

# Canadian Railway and Marine World.

July, 1913.

## The June Railway Mechanical Conventions at Atlantic City.

The two great railway conventions of the year, the American Railway Master Mechanics' Association, and the Master Car Builders' Association, were held at Atlantic City, N.J., the former on June 11 to 13, and the latter on June 16 to 18. The most important features of these annual conventions are the reports of the standing and special committees and the individual papers presented, the principal ones of which are given on this and following pages, either in full or in abstract.

### Individual Paper on Tests of Superheater Locomotives.

By C. H. Benjamin, Dean of Purdue University, Lafayette, Ind.

The work done by the author reported to the Association in 1911, showed a comparison of locomotive performance under different degrees of superheated steam. The Schmidt superheater was the last one which was installed. The work this year is a continuation of that accomplished upon the Schmidt superheater and shows the increased power of the superheater locomotive over the ordinary locomotive when both are using the same amount of coal. Last year a brief statement of the progress of the work was made, but no definite results were given. It was stated at that time that plans were under way to get a larger set of cylinders for the Purdue locomotive. This, however, was not done, and so the report this year only gives the increased power produced by superheating with the same sized cylinder. The work as outlined for the use of large cylinders remains yet to be carried out at a future time.

**EQUIPMENT.**—The locomotive known as Schenectady no. 2, for the saturated tests, and no. 3, for the superheated tests, was used in all the work. When used with saturated steam the locomotive was in normal condition. When the Schmidt superheater was installed the number of small 2 inch flues was reduced from 200 to 107, and 21 large 5 inch flues were installed. The original water-heating surface in Schenectady no. 2 was 1,322 sq. ft. The change in the flues made necessary by the installation of the Schmidt superheater reduced the water-heating surface to 1,080 sq. ft. The heating surface of the Schmidt superheater is 324 sq. ft., making a total water and superheating surface of 1,404 sq. ft. for Schenectady no. 3 after it was equipped with the Schmidt superheater. The nominal dimensions of Schenectady no. 3 as used in the tests with the Schmidt superheater installed are as follows:—

|  |         |
|--|---------|
| Type.....                                | 4-4-0   |
| Total weight (lbs.), about.....          | 109,000 |
| Weight on four drives (lbs.), about..... | 61,000  |
| Driving-axle journals:                   |         |
| Diameter (inches).....                   | 7 1/2   |
| Length (inches).....                     | 8 1/2   |
| Drivers, diameter (inches).....          | 68.99   |
| Valves (type, Richardson balanced):      |         |
| Maximum travel (inches).....             | 6       |
| Outside lap (inches).....                | 1 1/8   |
| Inside lap (inches).....                 | 0       |
| Ports:                                   |         |
| Length (inches).....                     | 12      |
| Width of steam port (inches).....        | 1.5     |
| Width of exhaust port (inches).....      | 3       |

|  |        |
|--|--------|
| Total wheel base (feet).....                   | 23     |
| Rigid wheel base (feet).....                   | 8.5    |
| Cylinders:                                     |        |
| Diameter (inches).....                         | 16     |
| Stroke (inches).....                           | 24     |
| Boiler (style, extended wagon top):            |        |
| Diameter of front end (inches).....            | 52     |
| Number of 2 inch flues.....                    | 107    |
| Number of 5 inch flues.....                    | 21     |
| Length of flues (feet).....                    | 11.5   |
| Heating surface in flues (sq. ft.).....        | 956.5  |
| Heating surface in fire box (sq. ft.).....     | 123.5  |
| Total water heating surface (sq. ft.).....     | 1080.0 |
| Length of fire box (inches).....               | 72.06  |
| Width of fire box (inches).....                | 34.25  |
| Depth of fire box (inches).....                | 79     |
| Grate area (sq. ft.).....                      | 17     |
| Thickness of crown sheet (inches).....         | 7-16   |
| Thickness of tube sheet (inches).....          | 9-16   |
| Thickness of side and back sheet (inches)..... | 3/8    |
| Diameter of stay bolts (inches).....           | 1      |
| Diameter of radial stays (inches).....         | 1 1/8  |
| The Schmidt superheater, as used in these      |        |

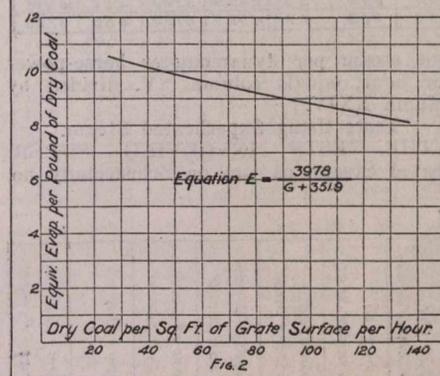
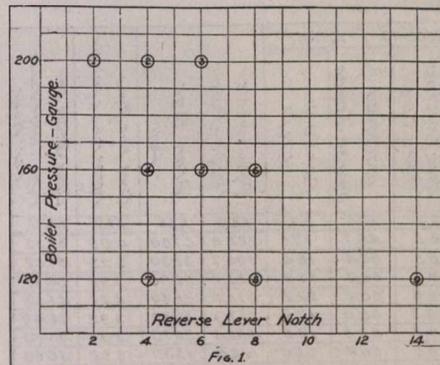


Fig. 1.—Conditions of Pressure and Cutoff for Saturated Steam Locomotive.

Fig. 2.—Relation Between Equivalent Evaporation per Pound of Dry Coal, and Dry Coal per sq. ft. of Grate Surface per Hour for Saturated Steam Locomotive.

experiments, has the following dimensions:—

|  |       |
|--|-------|
| Outside diameter of superheater tube (inches).....                                   | 1 3/8 |
| Number of double return loops.....   | 21    |
| Average length of the pipes in the double return loops (ft.).....                    | 42.88 |
| Total superheating surface, based on the outside surface of the tubes in sq. ft..... | 324   |

The fuel used in all these tests, both superheated and saturated, was Youghiogheny lump. Repeated analyses of this coal show it to have a very uniform heat value.

### Tests Using Saturated Steam.

**THE TESTS INVOLVING SATURATED Steam,** which were used in this report, were taken directly from tables IV. and V. in the report of Dean Goss to the Association in 1909. All the tests were run at a speed

of 30 miles an hour, and steam pressures of 200, 160 and 120 lbs. The conditions of pressure and cut off under which the tests were run are shown diagrammatically in fig. 1. The cut off is determined by the position of the reverse lever in notches. Each circle represents a test, and the number within the circle refers to the laboratory number by which the tests are identified. The results of the tests involving saturated steam are shown in tables I. and II.

**PERFORMANCE OF THE BOILER.**—In the 1909 report of Dean Goss, the relation between the equivalent evaporation per pound of dry coal and the equivalent evaporation per square foot of heating surface per hour for the locomotive using saturated steam is shown by the equation  $E = 11.305 - .221 H$ , in which E is the equivalent evaporation per pound of dry coal and H is the equivalent evaporation per square foot of heating surface per hour. This equation is assumed to represent the evaporative efficiency of the boiler when operated under saturated steam. In order to obtain the relation between the equivalent evaporation per pound of dry coal and the rate of firing, an equation was obtained in the following manner: Letting G equal the dry coal per square foot of grate surface per hour, 1,322 is the number of square feet of water-heating surface, 17 the number of square feet of grate surface, and H and E the same as above mentioned. Now, from the above values, the following equation is true:  $1,322 H =$

$$17 E G, \text{ or } H = \frac{17 E G}{1,322}$$

Substituting this value of H in the equation  $E = 11.305 - .221 H$ , we obtain the

$$\text{equation } E = \frac{3,978}{G + 351.9}$$

This equation gives the relation between equivalent evaporation per pound of dry coal and the dry coal per square foot of grate surface per hour when using saturated steam. The graphical representation of this equation is shown in fig. 2.

**PERFORMANCE OF ORIGINAL LOCOMOTIVE** assuming irregularities to have been eliminated. Table II. shows the performance of the locomotive, assuming irregularities due to boiler performance to have been eliminated. The results in this table were obtained as follows:—

Column XV., which gives equivalent steam supplied to locomotive per hour with feed-water at 60° F., equals pounds of steam supplied to locomotive per hour from original log multiplied by (B. t. u. taken up by each pound of steam minus [60 minus feed-water temperature]) divided by 970.4 (latent heat of evaporation).

Column XVI., which gives the equivalent evaporation per pound of dry coal corrected by equation, was obtained by substituting the values in column VI., table I, for H in the equation  $E = 11.305 - .221 H$ .

Column XVII., which gives dry coal fired per hour corrected by equation, equals column XV. divided by column XVI.

Column XVIII., which gives dry coal per square foot of grate surface per hour,

equals column XVII, divided by 17 (the number of square feet of grate surface).  
 Column XIX., which gives dry coal per indicated horse-power per hour, equals column XVII, divided by column X, in table I.

Column XXIV., which gives dynamometer horse-power, equals column X, in table I, minus column XXII, in table II.  
 Column XXV., which gives the drawbar pull, equals column XXIV, divided by (.000547 multiplied by the revolutions per

circle represents a test, and the number written in the circle represents the laboratory number by which the tests are identified. The results of tests under super-

Table 1.

| Number | Laboratory Symbol | Speed Miles per hour | Dry Coal per Sq. Ft. of Grate Surface per Hr. | Smoke Box Temperature Degrees F. | Eqv Evap per Sq. Ft. Heating Surface per Hr. | Eqv Evap per Pound of Dry Coal | Cut-Off Per-Cent of Stroke | M.E.P. pounds per Sq. inch | Indicated Horse-Power | Pounds of Steam per I.H.P. per Hr. | Pounds Coal per I.H.P. per Hour | Draw-Bar Pull Pounds | Draw-Bar Horse Power |
|--------|-------------------|----------------------|---|----------------------------------|--|--------------------------------|----------------------------|----------------------------|-----------------------|------------------------------------|---------------------------------|----------------------|----------------------|
| I      | II                | III                  | IV  | V                                | VI   | VII                            | VIII                       | IX                         | X                     | XI                                 | XII                             | XIII                 | XIV                  |
| 1      | 30-2-200          | 30.0                 | 55.0  | 673                              | 6.96   | 9.82                           | 14.19                      | 37.88                      | 262.9                 | 27.01                              | 3.48                            | 2965                 | 237.4                |
| 2      | 30-4-200          | 30.0                 |   | 682                              | 8.56   |                                | 18.87                      | 51.69                      | 367.1                 | 25.70                              |                                 | 3847                 | 307.4                |
| 3      | 30-6-200          | 30.0                 | 98.0  | 788                              | 11.12  | 8.83                           | 26.75                      | 68.90                      | 489.2                 | 24.91                              | 3.40                            | 5380                 | 430.1                |
| 4      | 30-4-160          | 29.9                 | 51.9  | 662                              | 6.60   | 9.89                           | 17.84                      | 38.39                      | 272.1                 | 26.86                              | 3.24                            | 2655                 | 211.9                |
| 5      | 30-6-160          | 30.0                 | 68.9  | 707                              | 8.75   | 9.87                           | 25.67                      | 54.08                      | 383.9                 | 25.28                              | 3.05                            | 3786                 | 302.5                |
| 6      | 30-8-160          | 30.0                 |   | 763                              | 10.91  |                                | 33.06                      | 65.58                      | 465.1                 | 25.69                              |                                 | 5130                 | 410.9                |
| 7      | 30-4-120          | 30.0                 | 35.4  | 608                              | 4.70   | 10.32                          | 17.62                      | 24.09                      | 171.0                 | 30.63                              | 3.52                            | 1277                 | 102.1                |
| 8      | 30-8-120          | 30.1                 | 63.6  | 676                              | 7.99   | 9.77                           | 32.79                      | 45.82                      | 325.5                 | 27.46                              | 3.32                            | 3369                 | 269.5                |
| 9      | 30-14-120         | 29.9                 | 130.7   | 835                              | 13.99  | 8.33                           | 56.25                      | 72.56                      | 514.0                 | 30.31                              | 4.28                            | 6258                 | 500.6                |

Column XX., which gives the equivalent steam per indicated horse-power per hour, equals column XV, divided by column X, in table I.  
 Column XXI., which gives the machine friction in terms of mean effective pres-

minute), in which .000547 is the tractive horse-power constant of the locomotive.  
 Column XXVI., which gives the coal per dynamometer horse-power per hour, equals column XVII, divided by column XXIV.  
 Column XXVII., which gives the equiva-

Table 2.

| Number | Laboratory Symbol | Eqv Steam for Engine per Hour | Eqv Evap per Pound of Dry Coal | Dry Coal per Sq. Ft. of Grate Surface per Hr. | Dry Coal per I.H.P. per Hr. | Eqv Steam per I.H.P. per Hr. | Machine-Friction        |                       |                 |                                    | Dynamometer Horse-Power | Draw Bar Pull | Coal per P.M.A. Horse Power per Hr. | Eqv Steam per P.M.A. Horse Power per Hour |
|--------|-------------------|-------------------------------|--------------------------------|---|-----------------------------|------------------------------|-------------------------|-----------------------|-----------------|------------------------------------|-------------------------|---------------|-------------------------------------|---|
|        |                   |                               |                                |   |                             |                              | Mean Effective Pressure | Indicated Horse-Power | Per Cent I.N.P. | Pounds of Steam per I.H.P. per Hr. |                         |               |                                     |   |
| I      | II                | XV                            | XVI                            | XVII  | XVIII                       | XIX                          | XX                      | XXI                   | XXII            | XXIII                              | XXIV                    | XXV           | XXVI                                | XXVII                                     |
| 1      | 30-2-200          | 8768                          | 9639                           | 891   | 52.4                        | 3.31                         | 32.60                   | 6.5                   | 46.1            | 17.1                               | 222.8                   | 2780          | 4.00                                | 39.35                                     |
| 2      | 30-4-200          | 11354                         | 9406                           | 1207  | 71.0                        | 3.29                         | 30.92                   | 8.5                   | 60.4            | 16.4                               | 306.7                   | 3830          | 3.93                                | 37.02                                     |
| 3      | 30-6-200          | 14685                         | 8850                           | 1659  | 97.6                        | 3.39                         | 30.00                   | 9.3                   | 66.0            | 13.5                               | 423.2                   | 5290          | 3.92                                | 34.70                                     |
| 4      | 30-4-160          | 8785                          | 9836                           | 893   | 52.5                        | 3.28                         | 32.28                   | 8.5                   | 60.4            | 22.2                               | 211.7                   | 2640          | 4.22                                | 41.50                                     |
| 5      | 30-6-160          | 11663                         | 9355                           | 1246  | 73.3                        | 3.25                         | 30.38                   | 9.3                   | 66.0            | 17.2                               | 317.9                   | 3970          | 3.92                                | 36.69                                     |
| 6      | 30-8-160          | 14347                         | 8906                           | 1611  | 94.8                        | 3.46                         | 30.85                   | 8.4                   | 59.6            | 12.8                               | 405.4                   | 5070          | 3.97                                | 35.39                                     |
| 7      | 30-4-120          | 6269                          | 10257                          | 611   | 35.9                        | 3.57                         | 36.69                   | 8.5                   | 60.4            | 35.4                               | 110.6                   | 1350          | 5.52                                | 56.68                                     |
| 8      | 30-8-120          | 10683                         | 9519                           | 1122  | 66.0                        | 3.45                         | 32.80                   | 8.4                   | 59.6            | 18.3                               | 265.9                   | 3320          | 4.22                                | 40.18                                     |
| 9      | 30-14-120         | 18654                         | 8186                           | 2278  | 134.0                       | 4.43                         | 36.29                   | 3.0                   | 21.3            | 4.1                                | 492.7                   | 6160          | 4.62                                | 37.86                                     |

sure, was taken from fig. 13, page 158, of the 1909 report of Dean Goss.  
 Column XXII., which gives the machine friction in horse-power, is obtained by using the values of m. e. p. of column XXI, and the speed in revolutions per minute of

lent steam per dynamometer horse-power per hour, equals column XV, divided by column XXIV.  
 Tests Using Superheated Steam.  
 THE TESTS INVOLVING SUPERHEATED Steam, as run on Schenectady no.

Table 3.

| Number | Laboratory Symbol | Speed Miles per Hour | Dry Coal per Sq. Ft. of Grate Surface per Hr. | Smoke Box Temp Degrees F. | Degrees Superheat F. | Eqv Evap per Sq. Ft. of Heating Surface per Hr. | Eqv Evap per Pound of Dry Coal | Lb of dry Coal | Cut-Off Per-Cent of Stroke | M.E.P. pounds per Sq. in | Indicated Horse-Power | Pounds of Steam per I.H.P. per Hr. | Pounds of Coal per I.H.P. per Hr. | Draw-Bar Pull | Draw-Bar Horse Power |
|--------|-------------------|----------------------|---|---------------------------|----------------------|---|--------------------------------|----------------|----------------------------|--------------------------|-----------------------|------------------------------------|-----------------------------------|---------------|----------------------|
| I      | II                | III                  | IV  | V                         | VI                   | VII   | VIII                           | IX             | X                          | XI                       | XII                   | XIII                               | XIV                               |               |                      |
| 1      | 30-2-200          | 30.3                 | 48.2  | 558                       | 187.0                | 6.08  | 10.40                          | 17.87          | 41.42                      | 290.2                    | 21.30                 | 2.92                               | 2808                              | 226.9         |                      |
| 2      | 30-4-200          | 30.1                 | 62.1  | 622                       | 222.0                | 7.79  | 10.38                          | 31.35          | 61.47                      | 438.1                    | 17.88                 | 2.41                               | 4499                              | 361.4         |                      |
| 3      | 30-6-200          | 29.9                 | 82.6  | 657                       | 246.2                | 9.20  | 37.45                          | 74.82          | 528.5                      | 17.49                    | 2.67                  | 5702                               | 452.8                             |               |                      |
| 4      | 30-9-200          | 30.0                 | 127.3   | 714                       | 238.5                | 12.42   | 8.06                           | 49.54          | 97.34                      | 696.4                    | 18.64                 | 3.11                               | 7454                              | 596.7         |                      |
| 5      | 30-4-160          | 30.0                 | 46.5  | 579                       | 201.6                | 6.01  | 10.70                          | 21.00          | 44.90                      | 317.2                    | 19.56                 | 2.50                               | 3282                              | 261.2         |                      |
| 6      | 30-6-160          | 30.0                 | 59.2  | 609                       | 226.3                | 7.30  | 10.20                          | 30.00          | 55.30                      | 394.0                    | 18.77                 | 2.55                               | 4165                              | 334.3         |                      |
| 7      | 30-8-160          | 30.0                 | 74.4  | 610                       | 245.4                | 8.88  | 9.86                           | 38.00          | 69.06                      | 490.7                    | 18.38                 | 2.58                               | 5293                              | 423.2         |                      |
| 8      | 30-9-160          | 29.6                 | 92.7  | 627                       | 270.3                | 9.85  | 8.78                           | 44.55          | 77.59                      | 544.4                    | 18.67                 | 2.90                               | 5543                              | 437.8         |                      |
| 9      | 30-11-160         | 30.0                 | 109.3   | 682                       | 253.1                | 11.70   | 8.84                           | 52.40          | 86.90                      | 615.1                    | 19.75                 | 3.02                               | 6664                              | 532.6         |                      |
| 10     | 30-12-160         | 28.9                 | 124.2   | 842                       | 244.3                | 12.30   | 8.18                           | 56.82          | 93.41                      | 643.5                    | 20.09                 | 3.28                               | 7199                              | 553.6         |                      |
| 11     | 30-8-120          | 30.0                 | 59.6  | 583                       | 229.6                | 7.03  | 9.77                           | 38.93          | 47.59                      | 343.2                    | 21.30                 | 2.95                               | 3845                              | 308.8         |                      |
| 12     | 30-10-120         | 30.0                 | 65.0  | 584                       | 243.9                | 8.24  | 9.74                           | 44.13          | 59.37                      | 419.7                    | 20.14                 | 2.64                               | 4702                              | 374.2         |                      |
| 13     | 30-14-120         | 30.0                 | 96.9  | 629                       | 277.1                | 10.86   | 8.99                           | 59.84          | 72.19                      | 511.4                    | 21.52                 | 3.21                               | 5856                              | 469.7         |                      |
| 14     | 30-15-120         | 31.2                 | 103.3   | 685                       | 305.1                | 11.68   | 9.34                           | 60.48          | 74.04                      | 548.8                    | 21.87                 | 3.20                               | 5288                              | 441.3         |                      |
| 15     | 30-16-120         | 30.0                 | 110.3   | 696                       | 293.1                | 11.71   | 8.76                           | 64.45          | 75.42                      | 535.7                    | 22.54                 | 3.50                               | 6137                              | 491.0         |                      |
| 16     | 30-18-120         | 29.9                 | 121.7   | 726                       | 280.0                | 12.95   | 8.79                           | 73.08          | 77.79                      | 550.6                    | 24.50                 | 3.76                               | 6342                              | 503.4         |                      |

the individual test, together with the indicated horse power constant or the locomotive.  
 Column XXIII., which gives the machine friction in per cent. of indicated horse-power, equals column XXII, divided by column X, in table I, and multiplied by 100.

3, were at a speed of 30 miles an hour, at the same pressures as were used on the original locomotive—that is, 200, 160 and 120 lbs. The conditions of pressure and cut off under which the tests were run are shown diagrammatically in fig. 3, in which the cut off is determined by the position of the reverse lever. Each

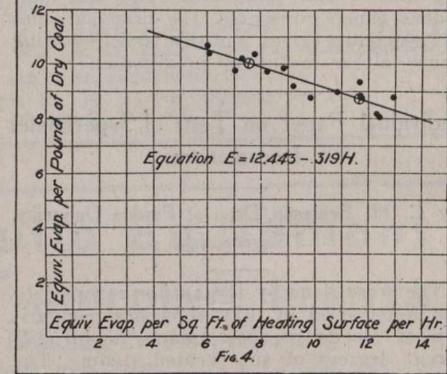
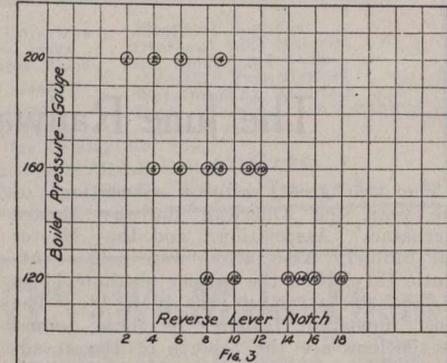


Fig. 3.—Conditions of Pressure and Cutoff for Superheated Steam Locomotive.

Fig. 4.—Relation Between Equivalent Evaporation per Pound of Dry Coal and Equivalent Evaporation per sq. ft. of Heating Surface per Hour for Superheated Steam Locomotive.

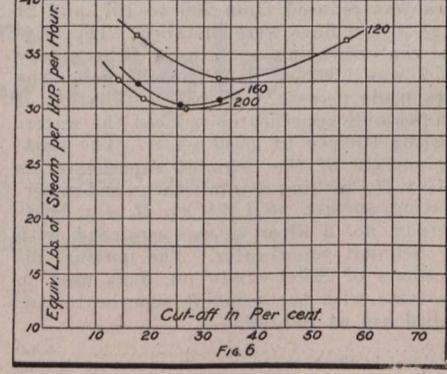
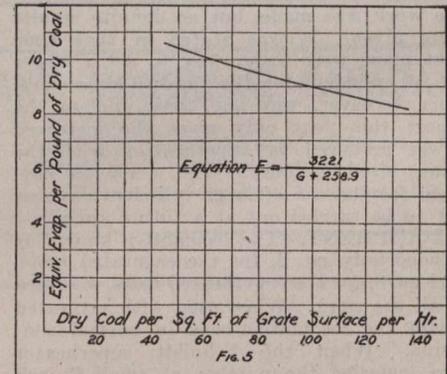


Fig. 5.—Relation Between Equivalent Evaporation per Pound of Dry Coal, and Dry Coal per sq. ft. of Grate Surface per Hour for Superheated Steam Locomotive.

Fig. 6.—Relation Between Equivalent Pounds of steam per i.h.p. Hour and Cutoff for Saturated Steam Locomotive.

heated steam are shown in tables III, and IV. It will be seen that the reverse lever was carried to a higher notch than with

the saturated steam.

PERFORMANCE OF THE BOILER. — The equivalent evaporation per square foot of water and superheating

equation for the line as shown, which most nearly approximates all the points, is  $E=12.443-.319 H$ ; where E is the equivalent evaporation per pound of dry coal and

Table 4.

| Number | Laboratory Symbol | Equiv Steam for Engine per Hour Pressure-Cut. | Equiv Evap. per pound of dry coal $E=12.443-.319 H$ | Dry Coal Fired per Hr | Corr. by Equation | Dry Coal per Sq. Ft. Grate Surface per Hr Pounds | Dry Coal per I.H.P. per Hr. | Equiv Steam per I.H.P. per Hr. | Machine-Friction        |                       |                 |       | Dynamometer Horse-Power | Draw-Bar Pull | Coal per Dyna Horse power per Hr. | Equiv Steam per Dyna Horse Power Per Hour |
|--------|-------------------|---|---|-----------------------|-------------------|--|-----------------------------|--------------------------------|-------------------------|-----------------------|-----------------|-------|-------------------------|---------------|-----------------------------------|---|
|        |                   |   |   |                       |                   |  |                             |                                | Mean Effective Pressure | Indicated Horse Power | Per Cent I.N.P. |       |                         |               |                                   |   |
| I      | 30-2-200          | 8397  | 10.50   | 800                   | 47.1              | 2.76   | 28.94                       | 6.5                            | 46.5                    | 16.00                 | 243.7           | 30.17 | 3.28                    | 34.45         |                                   |   |
| 2      | 30-4-200          | 10737   | 9.96  | 1078                  | 63.4              | 2.46   | 24.50                       | 8.5                            | 60.2                    | 13.70                 | 377.9           | 4706  | 2.85                    | 28.42         |                                   |   |
| 3      | 30-6-200          | 12817   | 9.51  | 1348                  | 79.4              | 2.55   | 24.25                       | 9.3                            | 65.2                    | 12.30                 | 463.3           | 5840  | 2.91                    | 27.67         |                                   |   |
| 4      | 30-9-200          | 17435   | 8.48  | 2056                  | 120.9             | 2.95   | 25.04                       | 7.7                            | 54.7                    | 7.90                  | 641.7           | 8018  | 3.20                    | 27.17         |                                   |   |
| 5      | 30-4-160          | 8349  | 10.53   | 793                   | 46.6              | 2.50   | 26.32                       | 6.5                            | 45.7                    | 14.40                 | 271.5           | 3415  | 2.92                    | 30.75         |                                   |   |
| 6      | 30-6-160          | 10060   | 10.11   | 995                   | 58.5              | 2.53   | 26.91                       | 6.5                            | 60.2                    | 15.30                 | 333.8           | 4162  | 2.98                    | 30.14         |                                   |   |
| 7      | 30-8-160          | 12372   | 9.61  | 1287                  | 75.7              | 2.62   | 25.22                       | 9.3                            | 65.7                    | 13.40                 | 425.0           | 5320  | 3.03                    | 29.12         |                                   |   |
| 8      | 30-9-160          | 13835   | 9.30  | 1480                  | 87.5              | 2.73   | 25.41                       | 7.7                            | 54.0                    | 9.90                  | 490.4           | 6217  | 3.03                    | 28.21         |                                   |   |
| 9      | 30-11-160         | 16424   | 8.71  | 1886                  | 110.9             | 3.07   | 26.70                       | 6.0                            | 42.6                    | 6.90                  | 572.5           | 7161  | 3.29                    | 28.69         |                                   |   |
| 10     | 30-12-160         | 17272   | 8.52  | 2027                  | 119.2             | 3.15   | 26.84                       | 5.0                            | 34.2                    | 5.30                  | 609.3           | 7917  | 3.53                    | 28.35         |                                   |   |
| 11     | 30-8-120          | 9932  | 10.20   | 974                   | 57.3              | 2.84   | 28.94                       | 8.4                            | 59.5                    | 17.30                 | 283.6           | 3533  | 3.43                    | 35.02         |                                   |   |
| 12     | 30-10-120         | 11436   | 9.81  | 1168                  | 68.7              | 2.78   | 28.94                       | 6.9                            | 48.5                    | 11.70                 | 371.2           | 4666  | 3.15                    | 30.80         |                                   |   |
| 13     | 30-14-120         | 15183   | 8.98  | 1691                  | 99.5              | 3.31   | 29.69                       | 3.0                            | 21.2                    | 4.20                  | 490.2           | 6112  | 3.45                    | 30.98         |                                   |   |
| 14     | 30-15-120         | 16399   | 8.72  | 1881                  | 110.6             | 3.43   | 29.88                       | 3.0                            | 22.2                    | 4.00                  | 526.6           | 6334  | 3.57                    | 31.14         |                                   |   |
| 15     | 30-16-120         | 16436   | 8.71  | 1887                  | 111.0             | 3.52   | 30.68                       | 3.0                            | 21.3                    | 4.00                  | 514.4           | 6311  | 3.67                    | 31.95         |                                   |   |
| 16     | 30-18-120         | 18186   | 8.31  | 2188                  | 128.7             | 3.97   | 33.03                       | 3.0                            | 21.2                    | 3.90                  | 529.4           | 8123  | 4.13                    | 34.35         |                                   |   |

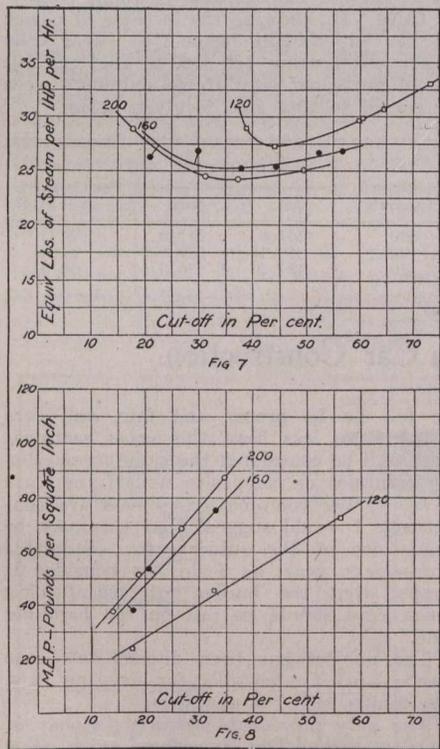


Fig. 7.—Relation Between Equivalent Pounds of Steam per i.h.p. Hour and Cutoff for Superheated Steam Locomotive.  
Fig. 8.—Relation Between m.e.p. and Cutoff for Saturated Steam Locomotive.

H is the equivalent evaporation per square foot of water and superheating surface per hour. The area of the heating surface is based upon the interior surface of the fire box and the exterior surface of the boiler and superheating tubes. This equation was derived from all tests at all pressures and therefore fairly represents the average performance of the boiler at any pressure when operated under superheated steam. It is a noteworthy fact that this equation

the equation  $E = \frac{3,221}{G + 258.9}$ , which shows the relation between the equivalent evaporation per pound of dry coal and the dry coal per sq. ft. of grate surface per hour when using superheated steam. The graphical representation of this equation is shown in fig. 5.

PERFORMANCE OF THE SUPERHEATER LOCOMOTIVE, assuming irregularities to have been eliminated.—Table IV. shows the performance of the locomotive when using superheated steam, assuming irregularities to have been eliminated. The results in this table were obtained in exactly the same manner as those from the locomotive when using saturated steam as shown in table II., and may be compared with them.

The Increase of Power of the Superheater Locomotive. Having now obtained the values as shown in tables II. and IV. for the two types of locomotives, the curves as shown in figs. 6 to 9 were plotted. By the use of the equations of the curves in figs. 2 and 5, the equivalent pounds of steam per pound of coal can be determined for any rate of firing of either locomotive. Also, from figs. 6 and 7, the equivalent pounds of steam per i. h. p. per hour can be determined for any cut off, and from the lines shown in figs. 8 and 9 the mean effective pressure for any cut off can be ascertained. Now, assuming that the curves as shown in these figures fairly represent the performance of each locomotive, it is possible to obtain the performance of each locomotive at the same rate of firing—that is, burning the same number of pounds of coal per sq. ft. of grate

Table 5.

| Dry Coal per Sq. Ft. of Grate Sur. per Hour | Steam Pressure | Equiv. Evap. per Pound of Dry-Coal |      | Equiv. Pounds of Steam per-Hour |         | Cut-Off in Percent |       | Equiv. Pounds of Steam per I.N.P. per Hr. |      | M.E.P. Lbs per Sq. In. |       | Indicated Horse Power |       | Percent Increase in I.N.P. |
|---|----------------|------------------------------------|------|---------------------------------|---------|--------------------|-------|---|------|------------------------|-------|-----------------------|-------|----------------------------|
|   |                | Sat                                | Sub  | Sat                             | Sub     | Sat                | Sub   | Sat                                       | Sub  | Sat                    | Sub   | Sat                   | Sub   |                            |
| I   | II             | III                                | IV   | V                               | VI      | VII                | VIII  | IX  | X    | XI                     | XII   | XIII                  | XIV   | XV                         |
| 110   | 200            | 8.61                               | 8.73 | 16100.7                         | 16325.1 | 29.5               | 48.1  | 30.1                                      | 24.9 | 75.3                   | 92.4  | 534.8                 | 655.8 | 22.6                       |
| 110   | 160            | 8.61                               | 8.73 | 16100.7                         | 16325.1 | 32.3               | 52.4  | 30.7                                      | 26.4 | 73.8                   | 87.1  | 524.3                 | 618.4 | 18.0                       |
| 110   | 120            | 8.61                               | 8.73 | 16100.7                         | 16325.1 | 49.9               | 63.05 | 34.7                                      | 30.3 | 65.4                   | 75.8  | 464.2                 | 538.5 | 16.0                       |
| 120   | 200            | 8.43                               | 8.50 | 17197.2                         | 17340.0 | 31.6               | 50.9  | 30.3                                      | 25.2 | 80.0                   | 96.9  | 567.8                 | 688.1 | 21.2                       |
| 120   | 160            | 8.43                               | 8.50 | 17197.2                         | 17340.0 | 34.3               | 55.5  | 31.1                                      | 26.7 | 77.9                   | 91.5  | 553.1                 | 649.6 | 17.5                       |
| 120   | 120            | 8.43                               | 8.50 | 17197.2                         | 17340.0 | 52.5               | 63.95 | 35.3                                      | 31.1 | 68.6                   | 78.5  | 487.2                 | 557.5 | 14.4                       |
| 130   | 200            | 8.25                               | 8.28 | 18232.5                         | 18298.8 | 33.4               | 53.2  | 30.5                                      | 25.5 | 84.2                   | 101.0 | 597.8                 | 717.4 | 20.0                       |
| 130   | 160            | 8.25                               | 8.28 | 18232.5                         | 18298.8 | 36.0               | 58.2  | 31.5                                      | 27.1 | 81.5                   | 95.1  | 578.8                 | 675.2 | 16.7                       |
| 130   | 120            | 8.25                               | 8.28 | 18232.5                         | 18298.8 | 54.9               | 68.7  | 35.8                                      | 31.8 | 71.7                   | 81.0  | 509.2                 | 675.3 | 13.0                       |

is practically the same as that obtained from the lower rates of firing reported to the Association in 1911. The equation for the nine points as obtained that year was  $E = 12.450 - .318 H$ . In the same manner as used in the original locomotive, G equals the dry coal per sq. ft. of grate surface per hour, 1,404 the number of sq. ft. of water and superheating surface, 17 the number of sq. ft. of grate surface and H and E the same as before mentioned, the

area per hour. Table V. shows this comparison of the two locomotives while burning 110, 120 and 130 lbs. of coal per square foot of grate.

Column I. of this table shows the rate of firing per sq. ft. of grate per hour. Column II. gives the steam pressure, the comparisons being made at three pressures, namely, 200, 160 and 120.

Column III. gives the equivalent evaporation per pound of dry coal for the original locomotive, and was obtained by substituting the values in col. 1 for G in the equation  $E = \frac{3,978}{G + 351.9}$

Column IV. gives the equivalent evaporation per pound of dry coal for the superheater locomotive, and was obtained by substituting the values in column I for G in the equation  $E = \frac{3,221}{G + 258.9}$

Column V. gives the equivalent pounds of steam per hour for the ordinary locomotive, and was obtained by multiplying the values in column I. by those in column III. and then by 17.

Column VI. gives the equivalent pounds of steam per hour for the superheater locomotive, and was obtained by multiplying

Table 6.

| Superheater Engine 120 <sup>st</sup> Dry Coal Per Sq. Ft. of Grate Surface per Hour |                              |   |                            |                               |   |                              |                            |   |
|---|------------------------------|---|----------------------------|-------------------------------|---|------------------------------|----------------------------|---|
| Steam Pressure  | Cut-Off in Percent of Stroke | Equiv. Lbs. of Steam per I.H.P. per Hr. | M.E.P. Pounds per Sq. Inch | Cut-Off at Maximum Efficiency | Equiv. Lbs. of Steam per I.H.P. per Hr. at Maximum Efficiency | M.E.P. at Maximum Efficiency | Percent Increase in I.A.P. | Diam of Cyl. in inches to give Maximum Efficiency |
| I   | II                           | III                                     | IV                         | V                             | VI  | VII                          | VIII                       | IX  |
| 200   | 50.9                         | 25.2                                    | 96.9                       | 35.0                          | 24.2  | 70.0                         | 3.97                       | 18.82   |
| 160   | 55.5                         | 26.7                                    | 91.5                       | 37.0                          | 25.2  | 66.7                         | 5.62                       | 18.73   |
| 120   | 65.95                        | 31.1                                    | 78.5                       | 44.0                          | 27.3  | 58.0                         | 12.22                      | 18.62   |

surface per hour and the equivalent evaporation per pound of dry coal, columns VI. and VIII. in table III., were plotted as shown in fig. 4. There were 16 different tests run under superheated steam, and, as shown, each point represents one test. The

following formula is true:  $1,404 H = 17 E G$ , or  $H = \frac{17 E G}{1,404}$ . Substituting this value of H in the equation  $E = 12.443 - .319 H$ , we obtain

the values in column I. by those in column IV. and then by the grate area, which is 17 square feet.

Columns VII. to XIV. were obtained in a "cut and try" method, which is shown by the following example: When using 110 lbs. of coal per square foot of grate area under a steam pressure of 200 lbs., we get at a 48% cut off;

From the curve in fig. 7, 24.9 lbs. of steam per i. h. p. per hour;

From the line in fig. 9, 92.2 lbs. mean effective pressure.

$$\text{Thus, i. h. p.} = \frac{16325.1}{24.9} = 655.6.$$

$$\text{Also, i. h. p.} = 4 (92.2) (.012144) (146.2) = 654.6.$$

At 48.2% cut off we obtain from the curves in fig. 7 24.9 pounds of steam per i. h. p. per hour, which gives i. h. p. = 655.6, and from the curves in fig. 9 92.7 mean effective pressure, which gives i. h. p. = 658.2.

By looking at the above sets of values, it can be seen that at 48% cut off the i. h. p. figured from the basis of lbs. of steam per i. h. p. is greater than that figured from the basis of the m. e. p., and at 48.2% cut off just the reverse is true. Therefore, the proper values must lie somewhere between 48 and 48.2% cut off.

The proper value of 48.1% cut off was found to give the same i. h. p. figured from the pounds of steam per i. h. p. per hour as figured from m. e. p.; that is, with 48.1% cut off, the steam per i. h. p. per hour is 24.9 as obtained from the curve and gives an i. h. p. of 655.6. The m. e. p. at this

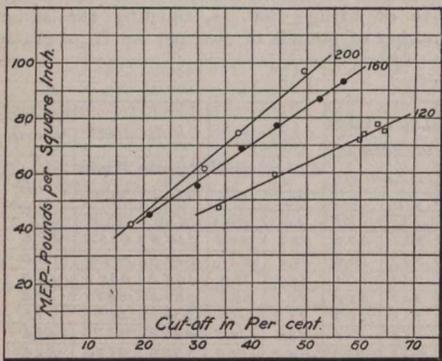


Fig. 9.—Relation Between m.e.p. and Cutoff in Superheated Steam Locomotive.

cut off is 92.4, and gives an i. h. p. of 656.0. These are so near the same that the 655.8 value was taken as the i. h. p. developed while burning 110 lbs. of coal per sq. ft. of grate. The four values mentioned above were used in the tables. The same process was used in determining the values for each line of table V.

Column XV. of table V., which gives the per cent increase in indicated horse power of the superheater locomotive over the other locomotive, when using the same amount of coal, equals column XIV. minus column XIII. divided by column XIII. and multiplied by 100.

#### Discussion of Results.

**INCREASED POWER DUE TO SUPERHEATING.**—It can be seen from column XV., table V., that the increase in power due to superheating, when burning from 110 to 130 lbs. of coal per sq. ft. of grate surface per hour, varies from 22.6 to 13.0%. Also from the values in this column it can be seen that for any steam pressure the per cent increase of power decreases as the coal consumption increases, and that for any coal consumption, the increase of power increases as the steam pressure increases.

**THE EFFECT OF INCREASING SIZE OF Cylinder for Maximum Power.**—By comparing the values of equivalent pounds of steam per i. h. p. per hour it will be seen

that they are considerably larger than the best performance of the locomotive as obtained at a lower cut off; that is, the cut off of maximum efficiency for 160 lbs. steam pressure is approximately 37%, while the cut off as obtained under 120 lbs. of coal per hour is 55.5%. The relative steam consumption for these two values of cut off is 25.2 and 26.7 lbs. per i. h. p. per hour, respectively. It will be seen that the increase in power to be accomplished by having the cut off at the proper point to give maximum efficiency is about 5.6% as is shown in column VIII. That

$$\text{is, } \frac{26.7 - 25.2}{26.7} \times 100 = 5.6\%.$$

In order to show this more clearly, the values in table VI. have been worked out.

Columns I., II., III. and IV. were taken from columns II., VIII., X. and XII., respectively, in table V., at 120 lbs. of dry coal per sq. ft. of grate surface per hour. The values in column V., which give the cut off at maximum efficiency, were taken at the lowest points of the curves in fig. 7. The values in column VI., which give the equivalent pounds of steam per i. h. p. per hour at maximum efficiency, were taken from the curves in fig. 7 at the points of cut off shown in column V. The values in column VII., which give the m. e. p. at maximum efficiency, were taken from the curves in fig. 9 at the points of cut off shown in column V. The values of column VIII., which give the per cent. increase in indicated horse power, equals column III. minus column VI., divided by column III. and multiplied by 100. The values in column IX., which give the diameter by cylinders necessary to obtain maximum efficiency, equal 16 times the square root of values given in column IV., divided by the

square root of values given in column VII. The following sample calculation will show this more clearly. The diameter of the cylinders at present is 16 ins. The ratio of this to the new diameter required to give the same indicated horse power must be inversely proportioned to the roots of the mean effective pressures. For 200 lbs. pressure

$$X = \frac{\sqrt{96.0}}{\sqrt{70.0}} = \frac{9.86}{8.38}$$

$$16 = \frac{X}{18.82}$$

where X, is the new diameter of cylinder.

The average of the three values in column IX. is about 18¾ ins. Now, if the locomotive were equipped with 18¾ in. cylinders, when using 120 lbs. of coal per square foot of grate, the cut off could be at the most efficient point to obtain maximum power.

Under these conditions there would be an increase in power as shown in table VII., or, in other words, the increase in power of the superheater locomotive over the other for the 160 and 200 lbs. pressures would be about 25% if the size of the cylinders were increased to 18¾ ins., whereas at present the increase is about 20%.

Table VII., showing the increase of power of the superheater locomotive over the other when using 120 lbs. of coal per sq. ft. of grate per hour if the cylinders were increased to 18¾ ins., is given below.

| Steam Pressure | I. H. P. |       | Per Cent In. in I. H. P. |
|----------------|----------|-------|--------------------------|
|                | Sat.     | Sup.  |                          |
| 200            | 567.8    | 217.0 | 26.3                     |
| 160            | 553.1    | 689.0 | 24.5                     |
| 120            | 487.2    | 636.0 | 30.0                     |

## Report of Committee on Car Construction.

The Master Car Builders' committee, W. F. Kiesel, Jr., Assistant Mechanical Engineer, Pennsylvania Rd., chairman, reported as follows:—

The following letter from D. F. Crawford, General Superintendent Motive Power, Pennsylvania Rd., gives the reason for this investigation:—

Prior to the 1911 M.C.B. Code all steel underframe and all steel cars were subjected to the same combinations and the same delivering lines' defects as wooden underframe, composite underframe and all wooden cars were. The consequences were that in interchange defect cards were being requested for damage which in no event would be repaired. In order to correct this situation rule 43 was introduced. The interpretation of this rule is, in effect, that a steel underframe car or an all steel car will not be damaged in fair usage; consequently, the combinations should not apply, and the handling company was made responsible for all damage which necessitated repair, except such damage as might occur through corrosion and weakening of the parts.

"I have been advised that in some of the new all steel and steel underframe equipment which has been constructed recently, that in some instances the centre sill section has been reduced to such an extent that the steel and steel underframe cars are no stronger, if as strong, as the wooden cars, and under rule 43 the owner will receive the same protection as he would if the car had been of proper strength.

"It would seem desirable for the M.C.B. Association to set some minimum strength for steel cars which would adequately protect the handling line, specifying such cross sectional area of centre sill as may

be felt to be proper and fair, and cars which have less than this cross sectional area will be considered the same as wooden underframes or composite underframe cars in so far as combination defects are concerned. I would suggest that this may be made one of the subjects for committee work next year, as I do not consider it proper that the burden of maintaining weak cars should be put on the handling line."

The subject has been divided into two parts:—(a) Centre sills for existing cars. (b) Centre sills for new cars.

The only precedent we have is that of wooden cars. The experience with steel and steel underframe cars extends over about 15 years. This experience covers a large number of car types, showing great variations in end strain resisting qualities.

It was agreed that the relative values of steel and wood used in car construction for direct tension or compression should be based on the elastic limits of these materials, and that the committee use a ratio of four for the elastic limit of steel to that of oak or yellow pine.

Compared with a wooden car having two 4 in. by 8 in. centre sills, an equivalent steel car must have an effective centre sill area of not less than 16 sq. ins. between the points where end strain takes effect. The strains in car underframes due to lading do not add greatly to the stresses from end shocks. As a rule, a loaded car is less liable to damage from end strains than an empty car, for which reason it will not be necessary to introduce load strains, but base the minimum area and end resisting strength on end strains only.

Modern steel cars have the centre line of draft at varying distances below (seldom

above) the horizontal neutral axis of the centre sills, and draft stops riveted to the centre sills. The distance between the neutral axis of any member of the car and the centre line of strain acts as a lever arm, through which bending effect is added to direct tension or compression. Strains which do not act in line with the neutral axis of car members will be designated "eccentric strains." The ratio of stress to

$$\text{strain is } \frac{I}{A} \text{ plus } \frac{X}{SM}, \text{ in which}$$

A represents area, in square inches.  
 X represents lever arm, in inches.  
 SM represents section modulus of section.

Centre sills which are not properly tied together at rear draft stops, located at some distance from bolster, are subject to eccentric strains, which has a tendency to deflect them outward or away from the centre line of car between draft stops and bolster.

Compression strains acting on car through draft gear, or car ends, as the case may be, create strut action in the members of the car framing. Long struts are liable to buckle under compression, for which reason it is customary to set limits for ratio of length to radius of gyration of struts, in order to restrict the excess stress caused by this buckling tendency. The members or parts of members of car framing which require consideration are generally flanges of channels or I beams, and plates. Their cross sections are rectangular, or sufficiently close to rectangular to be so considered in order to avoid theoretical computations.

Your committee recommends the adoption of a ratio of 70 for length to radius of gyration, which corresponds closely with a ratio of 20 for length to depth d of a rectangular section. This depth must be

The anchorage of centre sills may be accomplished in various ways, the more common methods being by means of cover plates, or diagonal braces. The value of such braces increases the value of the centre sills. Cover plates add direct value, and diagonal braces add partial value, depending on their angularity. Braces at

the functions of centre sills, and must be subject to the same rules. The value of braces at point of minimum strength may be added to the centre sill area, taking effect in the horizontal plane in which such value lies.

RECOMMENDATIONS.— Existing steel or steel underframe cars, which have less

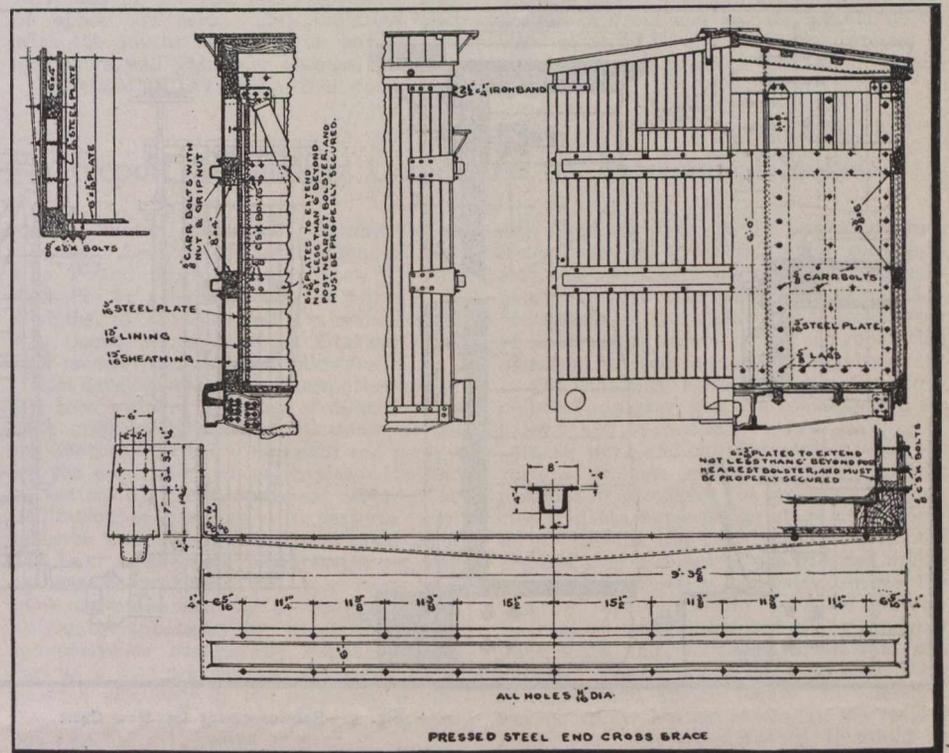


Fig. 1.—Reinforcement for Wooden Cars with Standard M.C.B. Lining.

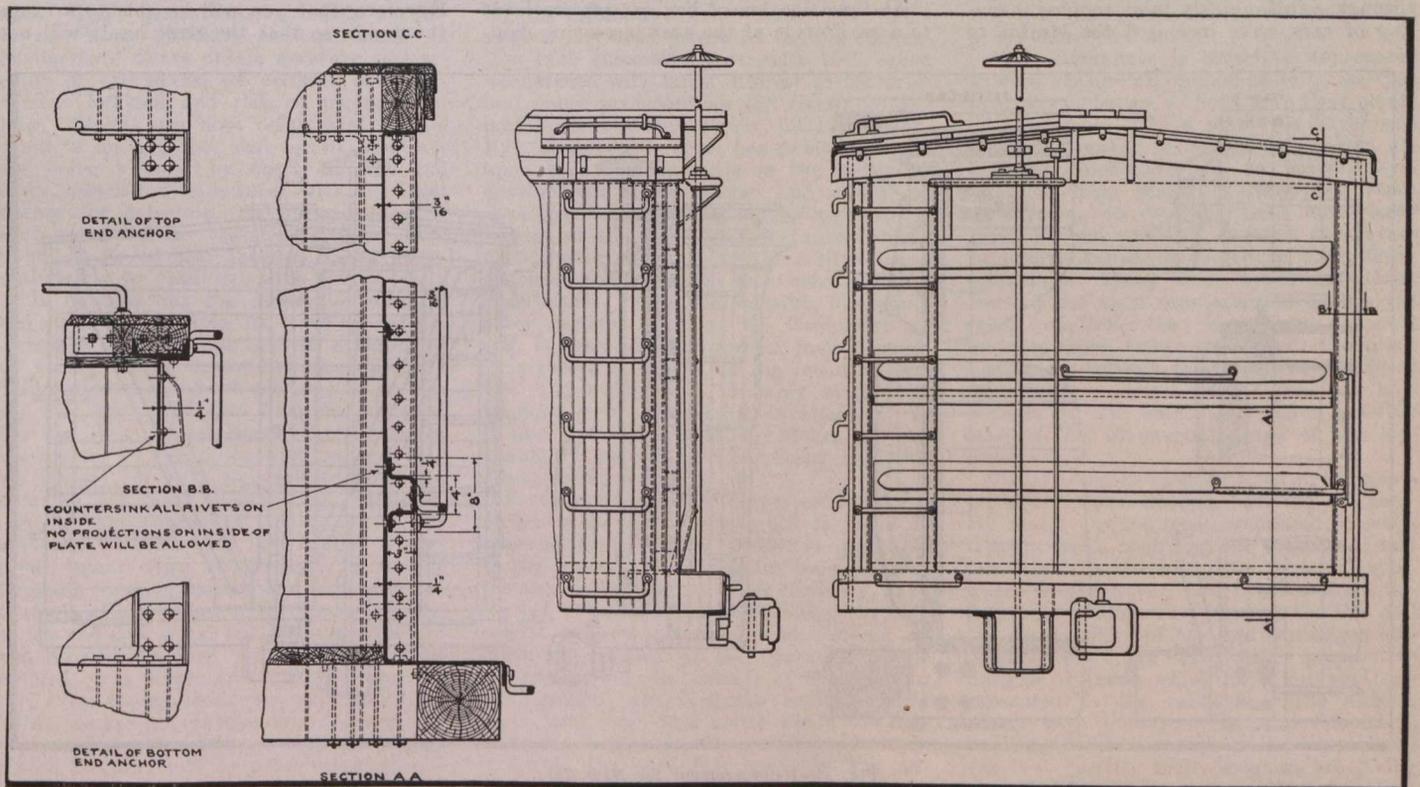


Fig. 2.—Reinforcement of Wooden Cars to Replace Broken Ends.

measured in the direction in which buckling may take place. To fulfill the restrictions just given, the length of a member should not be greater than 20 d, or the member must be securely anchored at intervals not exceeding 20 d.

right angles to centre sills add no value to the centre sill area, unless specifically designed as horizontal girders of sufficient strength to transfer all of the end strains from the draft to the side framing, in which case the side framing must perform

strength than that specified below, should be classified with wooden cars, and subject to the same rules for combining defects:—Area of centre sills not less than 16 square inches. Ratio of stress to end strain not more than 0.09. The length of centre

or draft sill members, or part of member between braces, to be not more than 20 d, where d is the depth of the member measured in the direction in which buckling might take place.

For new cars to be built after 1913 a greater strength should be required. Transportation requirements have increased

of stress to end strain, not more than 0.06. The length of centre draft sill members, or part of member between braces, to be not more than 20 d, where d is the depth of the member, measured in the direction in which buckling might take place.

**Box Car End Design and Strength.**

F. F. Gaines suggested to the M.C.B. As-

using metal ends without wood lining, the inside surface of the plate must have no projections, such as bolt or rivet heads. B. W. Dunn, on Mar. 21, 1913, advised as follows:—"Par. 1662 (f), I.C.C. Regulations, prescribes that in a freight car to carry dangerous explosives, special car must be taken 'to have no projecting nails or

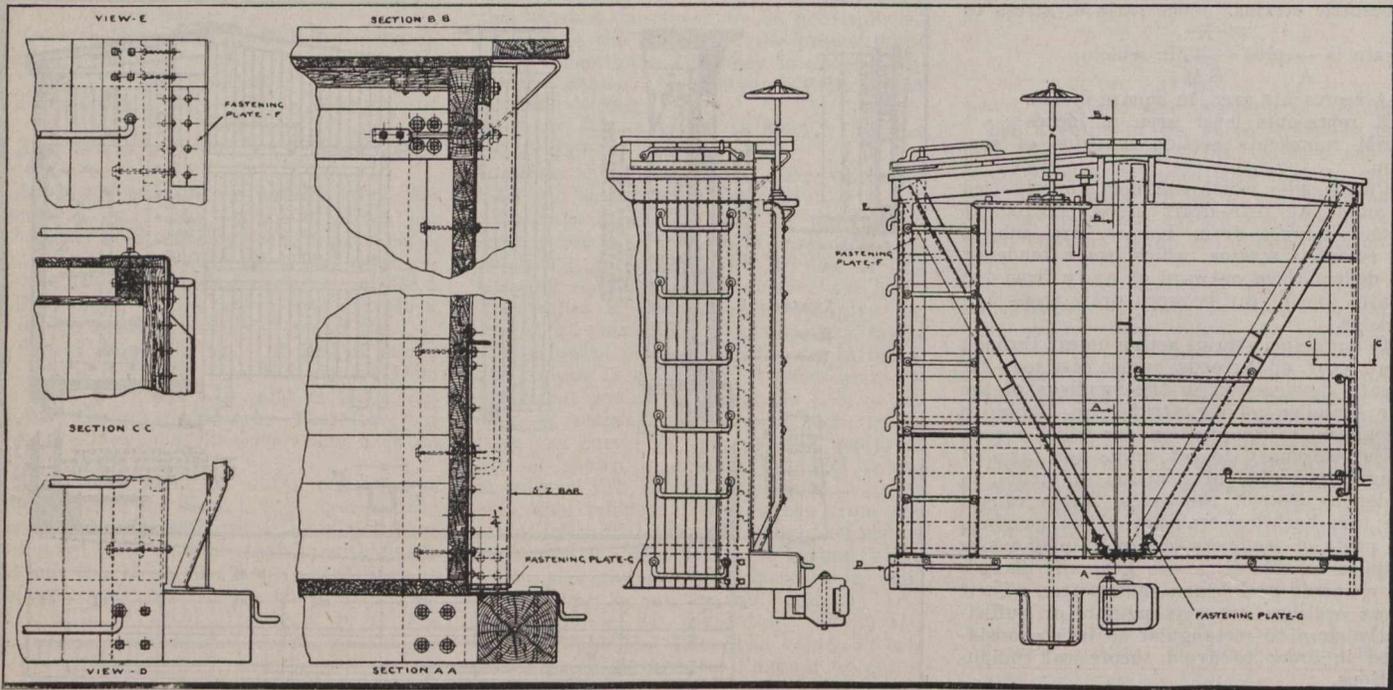


Fig. 3.—Reinforcement for New Cars.

greatly in the past ten years. Heavy freight locomotives, including Mallet road locomotives, greater efforts to pass cars through yards quickly, and rougher handling of cars, have increased the strains to

sociation that designs of end framing of box cars, to prevent damage to car by shifting load, be submitted.

An investigation of box car repairs leads to a realization of the ever increasing dam-

bolts or exposed pieces of metal which may work loose or produce holes in packages of explosives during transit.' It is hoped, therefore, that you will be able to arrange the design so that the rivet heads will not

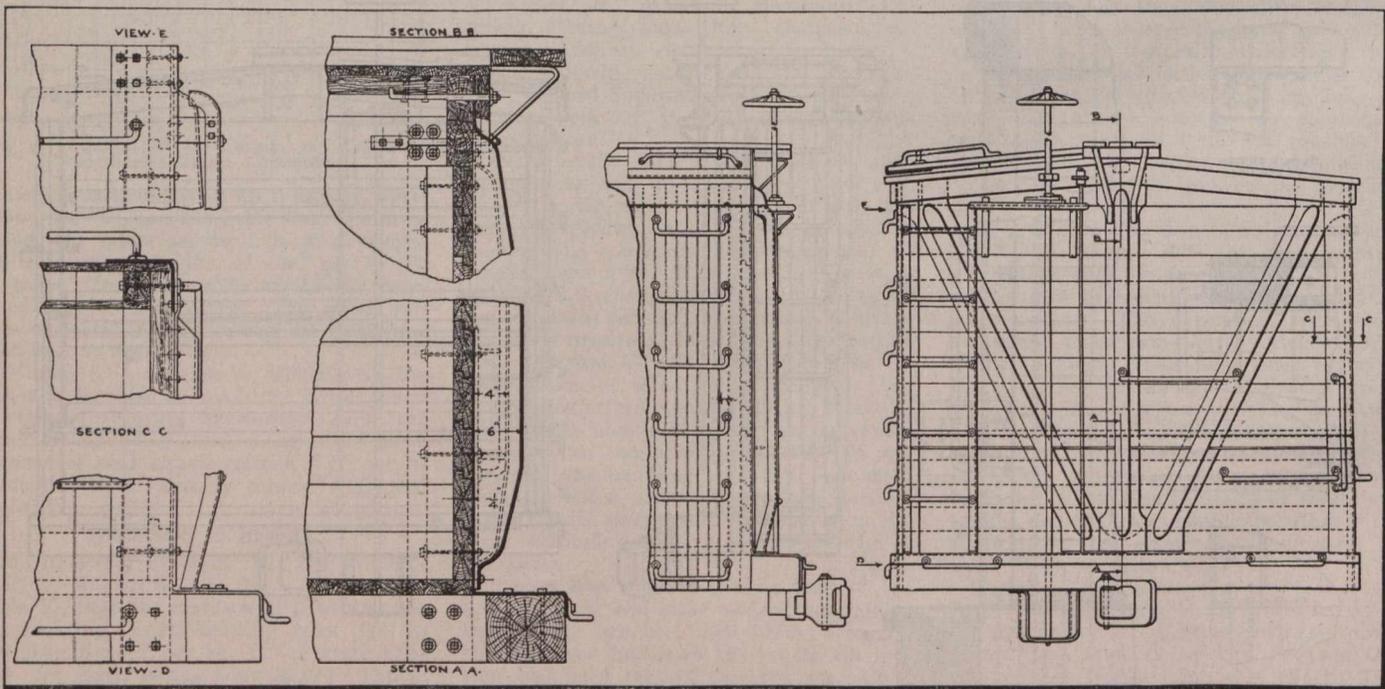


Fig. 4.—Reinforcement for New Cars.

cars, due to end shock, at least 50 per cent. Manufacturers of couplers, draft gears, draft attachments, etc., are all busy increasing the strength of their specialties, and are generally aiming to obtain double the original strength.

Recommendations for new cars.—Area of centre sills, not less than 24 sq. ins. Ratio

age to box car ends and consequent expense of repairs. Wooden ends without metal reinforcement no longer meet transportation requirements; therefore, metal ends and metal reinforcements have been applied, tested, and found much superior to wooden ends. Metal ends can be used either with or without wood lining. When

project. If there is to be no interior wooden lining, and projection of the rivets cannot be avoided, it would seem that the federal regulations would require a special wooden lining to be placed in the end of a car of this kind at least as high as the lading of explosive packages. I do not interpret the federal regulations to forbid

the presence of flat metal surfaces, such as this reinforcing plate would be, if the rivet heads did not project."

**RECOMMENDATIONS.**—Wooden cars with standard M.C.B. lining should have the ends reinforced with metal construction in accord with fig. 1, or its equivalent.

Steel underframe cars with end lining  $1\frac{1}{2}$  ins. thick and over should be equipped with outside braces, shown on fig. 1, but the inside plate may be omitted. In applying outside braces, due regard must be given to compliance with U.S. Safety Appliance Rules for coupler and end ladder clearances.

Cars with wood superstructure, requiring complete renewal of ends, should have steel ends applied, in accord with fig. 2, or its equivalent.

New cars should be equipped with ends of the type shown on figs. 3 and 4. The section modulus of the posts and braces, 2 ft. above floor line, not including corner posts or flat end plate, should not be less than 15. The Murphy or Van Dorn steel ends can be used instead of those shown on figs. 1, 2, 3 and 4.

Each end must be attached to the longitudinal car members, either directly or through other members, by fastenings sufficient in strength to develop the full strength of the end.

The constructions shown in the diagrams are equally applicable to outside or inside end sill cars by modifying the attachment at bottom to suit depth of end sill.

#### Seal Records of Box Car End Doors.

G. A. Hancock, General Superintendent Motive Power, St. Louis and San Francisco Rd., wrote a member of the committee as follows:—

"I have received a communication from the local freight agents of the Eastern Division on a subject which I think merits the attention of the committee of standards. Their communication reads as follows:—'Much difficulty is experienced in having yard clerks obtain accurate seal records of end doors, on account of inconvenient location and risk of personal injury. Claims are now being paid on account of no end door seal record, and cars are being pilfered by theft through end doors, which can be entered with the least chance for detection. Is an end door in a standard box car essential? If so, could it not be placed near the side of car where seals could be read from the side ladder?'"

"It brought out the discussion that an end door is desirable for loading certain classes of lumber, and that in a shipment of lumber there sometimes are specially designed pieces that are too long to go into the side door, and that have to go in at the end door, so the agents have referred the matter to this office with request that we advise: If it is essential to have end doors in box cars; if end doors are necessary, if they cannot be located where the seals can be read with less danger of personal injury than at present; if some standard location cannot be adopted so that all will be alike; if the vertical height of the end door could not be made standard and door so designed that it could not be entered by a person intent on robbing the car, even though door was not sealed.

"As we are not putting end doors in our modern box cars, but as they are being placed in cars built by other companies, I believe that this is a matter that should be handled by the committee on standards and recommended practices, in connection with reports they made in 1912 on the height of seals on side doors."

Both kinds of cars, those with and those without end doors, used for the purpose of loading lumber, have been common in years past, but each year fewer new cars

with end doors are built, because the end doors are valuable only on roads handling long lumber directly from the lumber regions as an important feature of traffic. Roads which formerly equipped all box cars with end doors have eliminated them from new cars, and are permanently fastening them in place on some of their old cars, leaving the end doors operative only on short box cars. This indicates that with the advent of the 40 ft. box car the end doors will gradually become obsolete.

**RECOMMENDATIONS.**—End doors used

for loading lumber in box cars are essential only on roads having long lumber loading in box cars as an essential feature of traffic. End doors must be so constructed that when closed they lock automatically, by means of a lock accessible only from the inside of the car, thus avoiding the necessity of taking seal records. Seal appliances now in use, and not accessible from ground or from end ladders, should be revised so as to be accessible from ground or end ladders, to promote the safety of employes.

## Report of Standing Committee on Mechanical Stokers.

The Master Mechanics' Committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., Roanoke, Va., chairman, and of which G. S. Hodgins, of the National Transcontinental Ry. Commission's Staff at Ottawa, Ont., is a member, reported as follows:—

The development of the locomotive stoker has been watched by many of us with more than ordinary interest and patience, it being another instance where skill and genius, by the application of mechanics, bids fair to materially reduce physical labor. The utilization of machinery to perform what hitherto was accomplished by manual labor has been achieved in much larger as well as smaller problems, but few have been more welcomed than the automatic or semi automatic apparatus by which the larger locomotive is successfully supplied with fuel at a rate and in such a manner as to produce efficiency in the operation of the locomotive, with a reduction in physical work on the part of the fireman.

Curiously enough, few stoker devices differing materially in principle have been launched since the earlier work of developing the locomotive stoker was begun. This subject has been presented to this convention each successive year since 1905, when we listened with much interest to the original paper presented by Mr. Garstang, Superintendent Motive Power, C.C.C. & St. L. Ry. Each year's report has dwelt at length upon the progress made in the continued development of the stoker, and to-day we have results bespeaking marvelous achievements; at the same time the advancement made during the past year, or a little more, has been much greater than heretofore accomplished. While the machine, like many other devices, including the locomotive itself, is susceptible of further improvement, it is receiving benefit as the result of service and study, and probably much will be done before perfection is attained. It is also fair to say that the stoker has undoubtedly reached a commercial stage of development.

Persistent energy in the perfection of the stoker is being rewarded, but it must be conceded that few, if any, devices applicable to the locomotive, having for their purpose the accomplishment of equal efficiency, have carried the difficulties surrounding the successful performance of the stoker, not so much on account of the operation to be performed, but the absence of choice as to arrangement, the absolute limitations in space, and conditions under which the machine must operate.

Within the past few years marked advancement has been made and there is no longer any question that the stoker is of practical value and a perfectly feasible proposition. Pioneers in the work evidently received but passing encouragement in their efforts, doubtless on account of there being probably less real necessity for anything of the kind in average locomotive service than now exists, and for the further rea-

son that any increase in power by such means was not given particular consideration. More recent history very strongly points to the inevitable conclusion that the success of the stoker is not exclusively of mechanical interest, but an operating question as well, and much has been due to the continued solicitude from the viewpoint of capacity, relative consumption, efficiency and operation.

In all work and experimentation with the various schemes suggested, two distinct methods or principles for stoking a locomotive still characterize the stage of development. In one the coal is delivered to the fire box over the bed of the fire, not unlike hand firing, which is generally termed the "scatter" system; while the other delivers the coal up through the bed of the fire from underneath and is designated as the "underfeed" stoker. Both methods have their advocates and strong points of defence. Consequently, having before us the results both types have accomplished, it would be unsafe to conjecture which school will ultimately survive. Probably both will continue to advance, but time only can foretell their fate, and which will in the end prove more economical.

Your committee is therefore unprepared to even venture an opinion as to which type of stoker is better, as both have their points of advantage. There seems to have been a larger number of designs of stokers attempted which have had the "scatter" system for their basic principle than those endeavoring to develop the "underfeed" machine, and probably because the inventors have hoped to reproduce hand firing conditions. Many more types have been worked out than now seem to occupy the field, but those that have lived are constructed upon either the one or the other principle, although they may have differed materially in detail from those that now remain on the market, or have possibly reached the commercial stage of development.

Time seems to have resulted in eliminating many stoker designs, reducing the number mainly to the most prominent, namely, the Crawford, typifying the underfeed; and the Street, representing the "scatter" type. There are, however, two other stokers undergoing development, namely, the Gee and the Hanna, both of the scatter design; and possibly there are many other prospective designs or types which have not yet been presented to the railroads. The stokers which have undergone some development, and may for that matter still be considered (as it is possible their designers are giving them further study with a view of further improvement, etc.), are the Strouse, Barnum, Hayden, Brewster, Harvey, Dickinson, Erie, Hanna, Gee, Crawford and Street. The stoker situation, as well as your committee has been able to ascertain, is as follows:—

**STROUSE STOKER.**—Seventy-six Strouse stokers have been built to date and ap-

TABLE 1.—RAILWAYS REPORTING HAVING STOKERS IN OPERATION, TYPES OF STOKERS AND ENGINES TO WHICH THEY WERE APPLIED.

| RAILWAY                             | STOKERS |   | PRINCIPAL DIMENSIONS OF ENGINES TO WHICH APPLIED |          |            |                        |                      |                 |            | EXPECT TO APPLY |   |        |   |
|-------------------------------------|---------|---|--|----------|------------|------------------------|----------------------|-----------------|------------|-----------------|---|--------|---|
|                                     | Number  | Type  | Type   | Weight   |            | Steam Cylinders Inches | Diam. Drivers Inches | Heating Surface | Grate Area |                 | Tractive Power                                  |        |   |
|                                     |         |   |  | Total    | On Drivers |                        |                      |                 |            |                 |   |        |   |
| Queen & Crescent.....               | 1       | Hanna   | Mallet   |          |            |                        |                      |                 |            |                 | Re-designed Hanna.                              |        |   |
| Carolina, Clinchfield & Ohio.....   | 1       | Hanna   | Mallet   | 342,650  | 299,250    | 23<br>35 x 32          | 57                   | 5,607           | 78         | 70,640          | One improved Hanna.                             |        |   |
| New York Central.....               | 1       | Street  | Mallet   |          |            |                        |                      |                 |            |                 |   |        |   |
| Buffalo, Rochester & Pittsburg..... | 1       | Street  | 2-8-2  | 275,000  | 217,000    | 26 1/2 x 30            | 63                   | 3,625           | 56.4       | 51,160          | Dependent on the market for nut and slack coal. |        |   |
| Vandalia.....                       | 4       | Crawford  | 2-8-0  | 240,945  | 216,450    | 24x28                  | 62                   | 3,839           | 54.9       | 45,327          | None.   |        |   |
| Norfolk & Western.....              | 41      | { 40 Street.....<br>{ 1 Street.....   | 2-6-6-2  | 405,000  | 337,300    | 22<br>35 x 32          | 56                   | 5,006           | 72.2       | 73,000          | } 50 Street and<br>} 1 Crawford.                |        |   |
|                                     |         |   | 4-8-0  | 262,000  | 222,000    | 24 x 30                | 56                   | 4,460           | 45.0       | 52,457          |   |        |   |
|                                     |         |   | 4-8-2  | 331,000  | 241,100    | 29 x 28                | 62                   | 4,129           | 66.7       | 58,100          |   |        |   |
| Chesapeake & Ohio.....              | 54      | { Street.....<br>{ Street.....  | 2-8-2  | 315,000  | 243,000    | 29 x 28                | 56                   | 4,052           | 66.7       | 60,800          | } No decision.                                  |        |   |
|                                     |         |   | 2-6-6-2  | 400,000  | 337,500    | 22<br>35 x 32          | 56                   | 5,041           | 72.2       | 82,000          |   |        |   |
| Baltimore & Ohio.....               | 50      | Street  | 2-8-2  | 282,200  | 223,600    | 26 x 32                | 64                   | 3,968           | 70         | 54,587          | } To 127 engines.                               |        |   |
|                                     | 13      | Street  | 0-8-8-0  | 461,000  | Fr 232,700 | 26 x 32                | 56                   | 5,578           | 100        | 105,000         |   |        |   |
|                                     | 1       | Street  | 2-8-0  | 220,370  | 198,650    | 22 x 30                | 60                   | 2,876           | 57.05      | 42,168          |   |        |   |
| Pennsylvania                        | 155     | { West of Pittsburgh.....<br>{ West of Pittsburgh.....<br>{ West of Pittsburgh.....<br>{ West of Pittsburgh.....<br>{ Grand Division..... | 98   | Crawford | 2-8-0      | 250,500                | 226,000              | 24 x 28         | 62         | 4,201           | 55.13   | 45,400 | } To probably large power built in future 140 on order. |
|                                     |         |   | 35   | Crawford | 4-6-2      | 293,250                | 189,525              | 24 x 26         | 80         | 5,098           | 55.4  | 32,600 |   |
|                                     |         |   | 18   | Crawford | 2-8-0      | 202,000                | 179,000              | 22 x 28         | 56         | 2,843           | 49.04   | 42,000 |   |
|                                     |         |   | 2  | Crawford | 0-6-0      | 135,000                | 135,000              | 19 x 26         | 51         | 1,755           | 31.54   | 28,200 |   |
|                                     |         |   | 2  | Crawford | Not given  |                        |                      |                 |            |                 |   |        |   |
| St. Louis & San Francisco.....      | 1       | Street  | 2-8-8-2  | 418,000  | 360,000    | 24 1/2 x 30<br>39      | 57                   | 5,230           | 75         | 83,500          | None.   |        |   |

plied to engines on 16 different roads, but on April 1, 1913, none were still in service, so far as known. This design of stoker interferes with the operation of the fire door when it becomes necessary to resort to hand firing. It is one where all of the coal must be shoveled from the tank into a hopper.

**BARNUM STOKER.**—Seven Barnum or C.B. & Q. stokers have been built to date by the Burlington; 1 being applied to a switch engine, 1 to a Prairie type road engine, 5 to Santa Fe decapod engines. All of the latter stokers, we are advised, have been taken out of service on account of difficulties experienced in connection with the driving mechanism used with the taper screws in the stoker trough, also on account of the unsatisfactory distribution of fuel where the lower grades of coal were handled.

**HAYDEN, HAYDEN MODIFIED, BREWSTER, Harvey, Dickinson and Erie Stokers.**—Nothing has been done during the past year with the above stokers. That is to say, none of them have passed from the experimental to the commercial stage. The experimental machines which were applied did not wholly meet the requirements of a stoker as viewed by your committee, in that several materially obstructed the fire door, which would interfere with hand firing should such a course become necessary, and the others have not been sufficiently developed.

**HANNA STOKER.**—Eighteen or twenty stokers were applied to Mallet, consolidation and Pacific type locomotives on the Queen & Crescent Rd., but it is our information they have all been taken out of service, in addition to the single stokers which were put on several different roads. The exception to the above is the one machine on the Carolina, Clinchfield & Ohio Rd., which is still in service. The one on the latter road, we understand, continues to do good work, and the manufacturers promise to bring out another within a very short time possessing still further improvements.

**THE GEE STOKER** is being developed on the Pennsylvania Rd. Only one of this design has been built to date. It is in service on one of their H-6 consolidation locomotives, and is reported as giving very good results.

**CRAWFORD STOKER.**—There have been 153 locomotives on the Pennsylvania Lines West equipped with the Crawford double underfeed stoker. There are 140 locomotives on order which will be equipped with this stoker. The report is that it is probable that larger power built in future will be equipped with this type of stoker. The Vandalia Rd. reports 4 Crawford stokers in operation, and the Pennsylvania Rd. also has 2 in service, making a total of 159 Crawford stokers in service and 140 on order, grand total of 299.

**STREET STOKER.**—In May, 1909, a locomotive on the I.S. & M.S. Ry. was equipped with the first experimental stoker of the Street design. In 1910 five more stokers were put in service, 3 of which were placed on the I.S. & M.S., where the first experimental stoker was operated. In the year 1911 seven locomotives on four different railways were equipped. All of the last seven, with but one exception, were provided with coal crushers carried on the tank, and handled run of mine coal. All of the machines, we are told, are still in regular service.

In the year 1912 165 machines of the screw-conveyor type were placed in service—70 on one railway, 50 on another, 40 on another, and 5 on another. Since Jan., 1913, seven additional machines were put in service, besides orders were placed for



should not necessarily be considered a poor performance. This information, while serving to show the operation of the stoker, unfortunately does not give the cost of maintenance and the character of its failures.

Table 3 has been prepared to show the performance of the Street stoker on Mallet engines of the Norfolk & Western and Chesapeake & Ohio Railways. The Norfolk & Western Ry., upon the receipt of 40 Mallet locomotives, all equipped with the Street stoker, instituted a systematic record for stoker data, so as to show their complete performance, their failures and responsibility, and cost of repairs, separated for labor and material, both for the stoker as well as the brick arch with which the engines were also equipped. This table also shows the total number of engine days, or days the engines have been in and out of service.

Taking the average performance of the Mallet engines on the Norfolk & Western Ry. up to Feb. 1, 1913, it will be observed that the average number of failures per month was 4½, and the average mileage per stoker failure was 11,679 miles. The average for failures other than those attributed to the stoker was 3,527 miles. The record shows 23.2% of the total failures were attributed to the stokers.

Another item of interest to which attention might be directed is the cost of stoker and brick arch repairs per 1,000 miles, which, as will be noted, averages \$5.34. The Chesapeake & Ohio Ry. furnish data showing the performance of 54 stoker fired engines, covering three months, namely, Nov. and Dec., 1912, and Jan., 1913. The average mileage per stoker failure is found to be 4,474 miles, which is lower than the reports received from the Norfolk & Western Ry. It will also be noted that the average cost for repairs per 1,000 miles is higher than indicated in the report from the Norfolk & Western, which might be a natural consequence, since the stoker failures were greater in number per miles service.

Your committee sought to establish some data to show the relative fuel consumption in hand firing as compared with the operation of the stoker, but there seems to have been very little reliable information so far obtained. The St. Louis & San Francisco Rd. has furnished a comparison of the coal consumption of the Mallet locomotive hand fired versus stoker fired, the runs being made over a district of 119 miles. The report shows that there were a number of delays occurring during the test runs which might to some extent affect the figures.

The information as presented indicates higher economy with hand fired locomotives. They show an average evaporation of 9.13 lbs. of water per pound of coal for four trips, while the stoker fired engine gave an equivalent average evaporation of 7.88 lbs. of water per pound of coal for five trips. No information is given bearing upon the quality, character or heat value of the fuel during the test, hence it is to be supposed that it was the same for the two tests.

General opinion seems to indicate that there is still some uncertainty as to any saving being accomplished in fuel. Some roads report that hand firing, if properly executed, shows economy over stoker firing, while there are just as many ready to report that the stoker has the advantage; then there are also others who regard it as a stand-off in coal consumption.

It is held by some who have been quite close to the work that under similar conditions there is some economy in fuel to be found with the stoker fired engine, possibly 5%, and this would seem quite logical, because it is conceded that the stoker

burns a better fire, with the scatter type running from 4 to 6 ins. in depth, as against 18 or 20 ins. hand fired. Furthermore, with the stoker the fire door is kept closed and the combustion must necessarily be more complete.

A saving in fuel, it would seem, can be expected, not only in quantity but in the grade it is possible to use with the stoker. Generally speaking, the best results seem to be obtained with the smaller sizes of fuel; in fact, with the scatter type machine, slack or crushed coal is necessary, and probably it can be used equally well with the underfeed machines, but the report is that the Crawford stoker has to date been giving good results with small lump coal. With improved combustion, coals lower in heat value (consequently cheaper in price) can be utilized, adding still further to economy conceded the stoker. It has also been observed that when starting out steam can be got up quickly, and probably with advantage as compared with hand firing.

It seems to be admitted by even expert firemen who have had some years experience hand firing, that they have derived valuable information in hand firing after handling the stoker and closely watching its operation. With a more perfect combustion there is naturally some reduction in the emission of smoke, or unconsumed carbon, and it is also reported that where the stoker is properly handled it becomes necessary to use the fire hook but very little, if any, on the road, all of which should mean something in the direction of economy.

With reference to the character of coal used on stoker fired locomotives, we find quite a variety of grades have been reported. In order to compare the different grades table 4 has been prepared, but comments seem quite unnecessary, as a glance at the information is sufficient to show that the successful operation of the locomotive stoker as reported does not seem to be confined to any particular grade or character of fuel.

It is unfortunate that it has been impossible so far to secure definite data for the relative consumption of fuel with the stoker as compared with hand firing. There are, however, some very elaborate tests under way, but they have not progressed sufficiently to justify reliable conclusions.

The Carolina, Clinchfield & Ohio Ry. reports heavier trains hauled, but does not say to what extent.

The Vandalia Rd. reports their stoker fired engines consume about the same time on the division, but that a more uniform steam pressure is maintained.

The B. & O. Rd. reports that it is possible to haul heavier trains with the stoker engines.

The Pennsylvania Lines West of Pittsburgh reports 15% more tonnage hauled with stoker fired engines on slow freight and on long, heavy grades.

The Buffalo, Rochester & Pittsburgh has not observed any difference between hand firing and stoker operation.

The St. Louis & San Francisco Rd. reports better performance with stoker fired engines, stating that some firemen are not able to keep up steam on heavy trains on the long runs.

The Norfolk & Western Ry. has not recognized any difference in tonnage rating between hand fired and stoker fired engines, since with but one exception all of their stokers are applied to one type of locomotive. It has been observed, however, that with the stoker operated properly the locomotive can be worked to its maximum capacity without any marked effect upon the steam pressure, which is a distinct advantage.

The Virginian Ry. reports some improvement in steaming capacity and tonnage hauled, but does not give amounts.

A review of the reports clearly indicate that while all concede the stoker is capable of handling heavier tonnage, no road is ready to name the amount. Probably if such information had been secured, it might have proven to be widely different on the several roads on account of the existence of widely different operating conditions. The stoker, it is generally believed, is capable of firing a larger amount of fuel and still retain uniformity in its work, from which it follows that higher boiler power is reasonably sure, unless there is a failure from some other cause, but this increased capacity would not be shown in the starting of the locomotive. On the contrary, higher steam pressure maintained would result in higher tonnage, speed if desired, or more work performed by the locomotive.

On some roads where peculiar physical

Table 4.

| RAILWAY                        | Kind of coal used  | Per cent. of ash | Difference in coal used on stoker-fired and hand-fired locomotives  |
|--------------------------------|--|------------------|---|
| C. C. & O.....                 | Bituminous, coking.....  | 7½ to 8 ..       | Same used in each case.   |
| Vandalia.....                  | Indiana semi-coking, Illinois coal of poor quality.....                | 8 to 12 ...      | Same coal when Indiana coal is used. No Illinois coal used on stoker fired engine.                                  |
| C. & O.....                    | Run of mine and nut and slack coal, some coking and some non coking    | 12 to 15 ..      | Same coal used in crusher type stokers. Picked, special coal used in conveyor type.                                 |
| B. & O.....                    | Non coking.....  | 10.....          | Non-coking coal used in stokers and coking coal used in hand fired engines.   |
| Pennsylvania.....              | Non coking bituminous from Indiana, Illinois, Pennsylvania and Ohio... | 6 to 16 ..       | Same coal used in each case.  |
| B. R. & P.....                 | Very good quality of coking coal....                                   | 9 to 11 ...      | Nut and a mixture of nut and slack sometimes very fine slack, for stokers. Run of mine used for hand fired engines. |
| St. Louis & San Francisco..... | Non coking.....  | .....            | Same coal used in each case.  |
| Norfolk & Western....          | Run of mine bituminous.....  | 7 to 10 ...      | The run of mine coal is screened; fine slack used on stokers, lump on hand fired engines.                           |

The relation of the stoker installation to the amount of tonnage handled, as against hand firing, was also sought, and in reply to this query, roads using the stoker have expressed themselves as follows:—

characteristics prevail with respect to ruling grades, etc., it might mean that an engine could be safely given a larger tonnage than had previously been handled, where the ability to start the train from

the usual stopping points had not been a controlling factor in determining the tonnage rating.

Therefore, the question resolves itself to one where each road is better able to work out for itself the question of using the stoker with any return after taking into consideration the physical characteristics of the road, size of engines, tonnage now being hauled, and what advantages might accrue. The question is rather one where it must be decided, first, if a more uniform rate of steaming is needed, and what expenditure might be warranted to secure such a condition.

Since with the scatter type of machine the arch brick is regarded as essential, and possibly of equal advantage in other types in the ratio of an engine with or without an arch hand fired, it would seem its use may be a prime consideration, since it would seem to have a specific value.

A superheater can be introduced, carrying with it some 10 to 15% improvement in fuel or steaming capacity; and if still further advantage is desirable and the quality and quantity of fuel to be fired becomes a factor, the use of the stoker will be felt in the production of a uniform steam pressure, with possibly some saving in fuel where the conditions are equal, or higher steaming capacity with higher speed.

Where it is possible to keep the fire door closed, it must follow that the temperature in the fire box is more uniformly maintained, which in turn must result in better service conditions for the fire box, flue sheet and seams, otherwise our theories fall flat. As a matter of fact, observations, though limited, seem to indicate that the life of the flue is being increased, and equal results must necessarily be in store for the flue sheet and the fire box generally, but some allowance should be made for what is accomplished by the arch brick.

Very successful results can be obtained in the operation of the stoker, but some intelligence is necessary to make sure that it is allowed to work efficiently, and one of the most important features to be observed is to prevent the engine from continually popping off, wasting steam and fuel; but even this can be controlled, simply by the manipulation of apparatus requiring no other energy than ordinary attention. No particular effort, as a rule, is required to keep the stoker properly adjusted, working regularly, and free from clogging or disturbance to the uniform supply of fuel to the fire box. In the event of a failure of the stoker mechanism, the fireman, as a rule, can do but very little, except to resort to hand firing, bringing the engine into terminal, where repairs can be made.

In handling stoker locomotives at terminals, or at ash pits along the road, there is some time to be saved, as the thinner fire can be knocked out or cleaned within 10 or 15 minutes time, as against probably twice the delay in handling a locomotive which has been hand fired.

There is no doubt that the maintenance of the stoker, by reason of its increased amount of machinery and working parts, is going to represent an item of repairs; and even if it has been rather low, as has been shown, some alteration in the figures is likely to take place as the stokers become older. It is also true that as the machines are improved and more substantial parts are applied, and greater proficiency in their manipulation is obtained, there should be a corresponding improvement in the cost of maintenance. However, such items, including the time required to turn, repair, and other-

wise put engines in shape for further service, should receive due consideration in summing up the net advantages derived by the stoker in service.

Reflecting for a moment upon the apparent work and interest manifested in the locomotive stoker, it is believed we must necessarily conclude that although the stoker has not been developed to a state of perfection, it has not only proven to be practical, but has demonstrated by service and endurance tests that it is of value, and that there is a growing field for its use.

In concluding, your committee wishes to show as a feature of this report what they

conclude are some of the requirements which should, and in fact are being met in the satisfactory locomotive stoker:—1. It should convey coal from the tank to the fire box with the minimum of physical work on the part of the fireman. 2. It should maintain a maximum steam pressure on the locomotive, and have a margin for additional feeding capacity. 3. It should leave the fire box door, and deck as much as practicable, unobstructed. 4. It should maintain an ideal fire for economic fuel consumption. 5. It should distribute fuel in the fire box in such a manner as to reduce to a minimum any necessity for disturbing the fire by means of the hook.

## Report of Committee on Overhead Inspection of Box Cars.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk & Western Ry., reported as follows:—

Your committee on rules for loading materials, to whom was last year assigned the formulation of rules for the overhead inspection of box cars for loading, was forced to present a report of progress at the last convention on account of its inability to satisfactorily cover the field a subject of so much importance seemed to warrant. With the assistance of the American Railway Association, the General Managers' Association of the Southeast, and others, a great deal of data showing in a general way what was taking place, and what claims were resulting from damaged and defective equipment, were secured; however, the statistics submitted at that time and those subsequently obtained seem to be much the same, except perhaps in quantity, rate of increase and losses sustained. In our previous report many of the various causes apparently responsible for damage to shipments were given in detail, covering no small space in the paper, hence such statistical information is regarded as needless at this time and has been omitted.

On account of the many damage claims presented, with the attendant difficulties in adjustment, often by reason of uncertainty in some instances as to the proportion of the claim that might belong to the condition of the car at the initial point of loading, and how much originated on the line of the road, its treatment, etc., it would seem proper to mention at the outset that the solution of the problem evidently narrows itself down to the important factor of inspection, selection and proper preparation of the car at the loading station.

As was alluded to last year, it is the obvious precaution with which such an undertaking must be approached that further time was asked for, and, as anticipated, we find ourselves confronted with innumerable difficulties and objections offered by railways explaining that latitude must be allowed on account of possible unwarranted interference to movement where unnecessary time might be consumed selecting and preparing equipment, especially where the supply and opportunity to obtain equipment is of considerable moment. It is still further argued that such a procedure might result in embarrassment if any specific and more stringent rules are established for the crating and inspection of equipment, even though the work be confined to cars for shipment of only certain commodities readily damaged by water, or leakage losses. At all events, it seems to be the general opinion, at least in certain localities, that steps might be profitably taken working to the standardization of rules and

requirements for the selection and inspection of equipment required for certain shipments, and it is the opinion of your committee that if it is going to be possible to secure improved conditions along this line, they are most likely to be obtained by confining our attention to shipments readily damaged by moisture, eliminating for the present the consideration of other commodities, at least until some systematic rule can be established and gotten under way.

It was with the idea that the best progress might be obtained by pursuing the lines of least resistance, your committee reached the conclusion that if it could, with the assistance of the American Railway and Master Car Builders' Associations, secure a complete list of the roads throughout the country using certificate of inspection cards, and obtain from them not only facsimiles of such cards used by them, but instructions going therewith, it might be possible to reduce the several forms to a composite card acceptable to all now using cards, and we would then have a card they would possibly be satisfied in the interest of uniformity to adopt, in lieu of any standard they might now be using. It has been the idea of your committee that this would seem to be the most profitable direction for their energies, and that a composite card acceptable to the roads now following the practice of securing certificate of inspection cards will be the first solid ground we might hope to reach towards working to a uniform practice. Furthermore, if the interest of such roads can be secured in this direction, the proposition will be readily given the necessary impetus to carry it as far as it can be employed with profit, and without danger of being used beyond the point of economy. Working to this end, therefore, and setting aside for the present any consideration of the shipment of products other than those readily damaged by moisture, your committee has secured, and show herewith, what is supposed to be a complete list of roads using certificate of inspection cards for the purpose above mentioned. They appear to be confined to the roads running out of Chicago, Minneapolis and St. Louis. The roads using such cards are as follows: Great Northern Ry., Chicago, Burlington & Quincy Rd., Chicago Great Western Rd., Chicago, Milwaukee & St. Paul Ry., Minneapolis, St. Paul & Sault Ste. Marie Ry., Illinois Central Rd., Atchison, Topeka & Santa Fe Ry., St. Louis & San Francisco Rd.

As a matter of information, and to show how deductions made by your committee have been reached, they present herewith facsimiles of cards used by the above roads, with instructions covering their use.

The Great Northern, Chicago Great Western, and Chicago, Milwaukee & St. Paul

use only one form of card, and the card used by each road is practically the same. This being the case, we are showing below only a facsimile of the card used by the C. M. & St. P.:

C. M. & St. P. Ry.

This car  
No. .... Initial .....  
FOR FLOUR.  
Inspected by .....  
Date....., 191.....

There have been no special instructions issued by these roads as to the inspection to be made, a specially trained man being selected for the work.

The C. B. & Q. uses four different forms of inspection cards. A facsimile of the cards used is shown herewith:—

(1.) C. B. & Q. R.  
This car  
No. .... Initial .....  
Is O. K. for  
FLOUR, CEMENT, GRAIN, ROUGH  
FREIGHT.  
Inspected by ..... At.....  
Date....., 191.....

(2.) C. B. & Q. R. R.  
This car  
No. .... Initial .....  
O. K. FOR FLOUR.  
Inspected by .....  
Date....., 191.....

(3.) C. B. & Q. R. R.  
FIT FOR GRAIN.  
No. .... Initial .....  
Inspected by .....  
Date....., 191.....

(4.) C. B. & Q. R. R.  
NOT FIT FOR GRAIN.  
No. .... Initial .....  
Inspected by .....  
Date....., 191.....

There are no specific instructions for inspection issued. The master mechanics are instructed to have the empty cars inspected and carded according to their condition and the requirements of traffic.

The M. St. P. & S. S. M. is using two inspection cards, one for cars suitable for flour loading, and one for cars not suitable for flour, grain or merchandise. A facsimile of the cards used is shown herewith:—

M. St. P. & S. S. M. Ry. Co.

This car  
O. K. FOR FLOUR.  
Date....., 191.....  
M. St. P. & S. S. M. Ry. Co.

This car must not be loaded with flour, grain or merchandise.

The instructions relative to the use of these cards are that the cars are to be given a special interior and exterior inspection, to see that sheathing, lining, flooring, roofing, doors and fastenings are in good condition; any small holes found in the floor are to be cleated over, care being taken to bevel the edges of the cleats to prevent damage to flour sacks. Cars with a bad odor, due to carrying hides, oil, etc., are not to be used for flour. Cars otherwise O.K'd, with the exception of having small oil spots on the floor, are to be painted over with quick-drying paint. All projecting nails, spikes or bolts to be removed or driven in to prevent damage to flour sacks, and all cars are to be swept out thoroughly clean. Cars fit for flour loading are to be carded O.K., and the numbers and initial of such cars are to be turned in to the agent.

The Santa Fe is using two inspection cards, one for flour and one for grain loading. There is no difference in the make-up of the cards, except one is printed in red and the other in green. A facsimile of the cards used is given herewith.

SANTA FE.  
FLOUR.

Inspected and placed in condition for flour loading.  
Inspector.....  
Date..... Station.....  
Car No. .... Initial.....

SANTA FE.  
GRAIN.

Inspected and placed in condition for grain loading.  
Inspector.....  
Date..... Station.....  
Car No. .... Initial.....

The Santa Fe instructions relative to the use of the inspection cards are as follows:—"Where car inspectors are located, cards will be furnished the inspectors, and at stations where there are no car inspectors, the local agents, or their representatives, will inspect all cars for grain and flour loading. If after proper inspection cars are found to be in suitable condition for grain and flour loading, a card is to be attached to the car door, three feet from the bottom of the door. Switchmen or local crews should be prohibited from placing at loading docks, platforms, or elevators, an empty car which does not have one of these cards attached. When a car has been inspected and card placed thereon and placed at loading dock, and when shipper or his representative has inspected the car and accepted same for loading, the card will be detached and returned to the representative of the company, and shall be attached to and filed by the agent with duplicate bill of lading or shipping instructions. Shippers must be notified when a car is made empty at their plant that the car must not be loaded until it has been inspected and necessary card attached."

The Santa Fe is now contemplating the use of another form of inspection card, which is made up in manifest form so that shippers can have a copy for their use. Following is a facsimile of this card:—

SANTA FE.  
THIS CAR O. K. FOR GRAIN LOADING.  
Car No. .... Initial.....  
Date....., 191..... Inspector.....  
At.....

The Frisco Lines are using three forms of inspection cards. A facsimile of cards used and the instructions to inspectors are given herewith:—

FLOUR SHIPMENTS AND OTHER MILL PRODUCTS.

"Form 255 standard, facsimile of which you will find below, must be properly filled out and applied to each car inspected by agents or car inspectors, which will indicate that car is suitable for loading of flour and other mill products. Agents or their representatives must not sign bills of lading unless form 255 standard is turned in by shipper, attached to the duplicate bill of lading or shipping receipt, and these forms must be retained in the office files for future reference.

FRISCO LINES.  
FLOUR, FEED AND OTHER MILL PRODUCTS.

Inspected and placed in condition for flour loading.  
Inspector.....  
Station.....  
Car No. .... Initial.....

"The roofs must be carefully inspected to ascertain if waterproof, the doors to see that they fit tight, and are in good condition. The interior must be inspected carefully to see that the floor is free from oil stains, and other substances that would result in damage. The doors should be pulled shut and inspected for leakage. All nails and other projections that might cause damage must be removed, driven in or covered up.

"The doors of all cars loaded on Frisco rails and on foreign line rails for movement via Frisco, must be wedged, papered and stripped in the following manner: Drive one wedge between each door shoe and the door, which will force the door up against side of car. After the wedges have been applied, a strip of odorless asphalt paper, 11 inches wide, must be applied over the openings of the car door, that is, one strip on each side of the door and one on the top of the door, the paper to be held in place with narrow wooden strips.

CEMENT AND PLASTER SHIPMENTS.  
"Form 261 standard, facsimile of which you will find below, must be properly filled out and applied to each car inspected by agents or car inspector, which will indicate car is suitable for loading. Agents or their representatives must sign bill of lading unless this form is presented by shipper, attached to the duplicate bill of lading or shipping receipt, and these forms must be retained in office files for future reference.

FRISCO LINES.  
CEMENT OR PLASTER.  
Inspected and placed in condition for cement or plaster loading.  
Inspector.....  
Date..... Station.....  
Car No. .... Initial.....

"Great care must be exercised in selecting cars for this loading. Roofs must be in first class condition, so as not to admit water, and all nails or other projections that will damage the product

removed. The doors must be wedged by driving two wedges between each door shoe and the door, which will force the door tight against the side of the car.

GRAIN SHIPMENTS.

"Form 256 standard, facsimile of which you will find below, must be properly filled out and applied to each car inspected by agent or inspector, which will indicate that car is suitable for grain loading, and has been properly coopered and burlapped. Agents or their authorized representatives must not sign bills of lading unless form 256 standard is presented by the shipper, attached to the duplicate bill of lading or shipping order, and these forms must be retained in the office files for future reference.

FRISCO LINES.

GRAIN.  
Inspected and placed in condition for grain loading.  
Inspector.....  
Date..... Station.....  
Car No. .... Initial.....

"A standard grain door section is 7 ft. long and 20 ins. wide. Usually three or more sections are used for each door. They should be placed in position and nailed to the door posts with 8 penny nails. Large nails or spikes must not be used. Care should be exercised to see that the doors fit closely, and that there are no holes in them. Nails protruding from door posts must be pulled out so that the grain doors will fit closely. Grain doors made of light material must not be used for the bottom or middle section, account pressure being greater on these sections. Doors made of good strong lumber should be used.

"Burlap will be furnished by the store department upon receipt of proper requisition, cut in strips 8 ft. long and 40 ins. wide for the doors, and 3 ft. long and 40 ins. wide to cover the draft bolts. Two strips 8 ft. long should be used to cover the grain doors. This leaves 6 ins. over each end of the grain door for tacking to the side of the car.

"The lower strip should be allowed to lap on the car floor 8 to 10 ins. in order to make a leak proof joint. It must not be tacked to the car floor. The top strip should lap over the lower strip from 4 to 6 ins. and should not be tacked to the grain door. Wooden strips will be furnished with the burlap to tack the ends of the burlap to the side of the car, so that the grain will not leak through between the end of the grain doors and door posts.

"The short pieces of burlap are to be tacked over the draft bolts and held in place by short strips of wood tacked around the edges. Burlap should be applied loosely and not stretched tight across the boards, so that it can give and not tear from the bulging of the doors.

"In addition to using burlap over the grain doors and draft bolts, it should also be used wherever necessary to prevent the leakage of grain."

As the result of an endeavor to fit together the cards now in use, your committee wishes to direct attention to some of the differences in their style; however, in the main they seem to have been designed for one and the same purpose. While the general practice seems to be to use cards bearing printing in large letters showing a specific commodity, or in some cases one or two products, we do not seem to be able to readily get away from a card on which provisions will be made for the designation of the shipment for which the car is inspected and made suitable without introducing more than one card, which was not wanted unless it can not be avoided. A sample of such a card, representing the result of a combination of all cards, with their instructions, would seem to be as follows:—

A. B. & C. Ry.

This car  
No. .... Initial .....  
O. K. FOR SHIPMENT OF COMMODITIES.  
Under..... Classification.....  
Inspected by .....  
Date....., 191..... Station.....  
(Size of card, 6 by 8 inches.)

Your committee wishes to point to the three apparent classifications of lading for which the box car is on some roads and in some localities receiving special attention before loading. The three classifications, as will hereinafter be referred to, would seem to cover the situation, at least until improvement can be suggested and worked out. The idea contemplates—

Classification A.—Flour and sugar.

Classification B.—Bulk grain.

Classification C.—Lime, cement, plaster; boxed, sack and crated packages of seeds, coffee and merchandise; hay, dry goods and

notions; high grades of finished lumber; tobacco, furniture, household goods and certain grades of tin and galvanized iron.

In the arrangement of the above classification, the items shown under A, viz., flour and sugar, have been grouped together in order to secure cars which might be necessary for such shipments, i.e., those free from soiled floors and interiors carrying odors liable to damage the goods; whereas cars selected for classification B, intended for bulk grain, clearly indicate by their character what might be suitable for their safe transportation; likewise classification C, covering the commodities mentioned, could be safely transported in a car which, while it should be tight, need not necessarily be as carefully selected as to other conditions as a car for classification A, intended for flour and sugar.

On back of cards, inspection instructions should be printed as follows:—

#### INSPECT FOR.

| Classification "A"   | Classification "B"                                       | Classification "C"                   |
|--|--|--------------------------------------|
| Leaky roof.  | Leaky roofs.   | Leaky roof.                          |
| Loose siding.  | Loose siding.  | Loose siding.                        |
| Loose roof boards.   | Loose roof boards.                                       | Loose roof boards.                   |
| Shifted roof sheets.   | Shifted roof sheets.                                     | Shifted roof sheets.                 |
| Broken Door stops.   | Broken door stops.                                       | Broken door stops.                   |
| Leaky doors, tops and sides.   | Leaky doors, tops and sides.                             | Leaky doors, tops and sides.         |
| Broken end posts.  | Broken end posts.  | Broken end posts.                    |
| Broken or loose door posts.  | Broken or loose door posts.                              | Broken or loose door posts.          |
| Protruding nails in floor and lining.  | Holes in floor and around center plates and draft bolts. | Protruding nails in floor and lining |
| Floors soiled by oil, grease or any material carrying odors likely to damage lading. |  |                                      |

#### METHOD OF INSPECTION BEFORE LOADING.

Inspection to be made at point of loading whenever practicable.

At point of distribution from which car is forwarded to loading station, and again by agent.

Cars received and unloaded at station where no inspectors are located, should be inspected by the agent.

Aside from the master car builders' inspection of car, including roof, running boards, air brakes, safety appliances, and running gear, as well as the external inspection of sides, ends, doors, ventilators and windows, an internal inspection must be made of the roof and siding, with doors, ventilators and windows in closed position.

Search for light indicating openings and cracks which might produce leaks.

For loose, damaged and broken boards, loose knots, knot holes, bad joints, etc.

For all nails and bolts extending above surface of floor and lining and nails protruding through roofing.

For water stains indicating cracks and air spaces.

For cracks sufficient to admit storm water beating through opening, also for openings and bad joints around window and doors.

For metal sheets out of position along edge of subcarlins or down from edge of ridge pole.

For small holes in metal roofs due to rust or small openings in roof from other causes.

Doors must open and close properly.

The floors should be clean, dry and free from defects sufficient to admit moisture, and any fouling by previous shipments, such as fertilizer, oils, and other freight which would damage more perishable commodities. If the centrepin is uncovered, it might be necessary to cover it with a piece of board, depending entirely upon the character of freight to be loaded.

Inspect closely for defects in framing which might, by reason of their weakness, allow the sheathing to be readily broken or damaged.

After a car is thoroughly inspected and known to be in good condition and suitable for the transportation of the commodities in classification A, B or C, as the case

may be, the inspector or agent, as provided for, making such inspection or able to certify to the condition of the car, must make out the prescribed certificate of inspection card and tack it to the car just under car number.

After the car is placed and accepted for loading, the certificate of inspection card must be detached from car and delivered to the agent before bill of lading is issued. The card must finally be attached to the agent's office copy of bill of lading or shipping ticket, for future reference in case of question arising as to the condition of car before loading.

Inspection of car bodies, doors, and the placarding of bad roofs, etc., as well as making notation of the extent of damage, is at present given attention; but it is also true that the general results seem to indicate that improvements can be made and higher efficiency obtained, since it seems

following not only the prescribed certificate of inspection card, but the instructions covering its use; and it is their belief that if the composite card, with instructions covering its use, is not satisfactory in all its details and in shape to be used on the roads now making use of such cards, very little work remains to make it uniform and satisfactory.

#### Supplementary Report from Committee.

When the report was sent to the Secretary for printing, a copy was also forwarded to the eight railways now using a certificate of inspection card, inviting from them criticism and suggestions as to what might be further offered in the committee's report. The real object, as explained to them, was to obtain their views upon the conclusions reached by the committee, and to further ascertain if in their judgment a uniform plan and the uniform card, as suggested by the committee, will meet the requirements; furthermore, if they would be willing in the interest of uniformity to use it in lieu of what might now be their practice. The following is a synopsis of the replies received:—

Great Northern Ry.: Is satisfied with present system of inspection, using a single card for flour lading.

Chicago, Burlington & Quincy Rd.: Considers it would be a good idea, if possible, to use the one card, but apprehends some difficulty in actual practice getting switchmen and trainmen to take time to read the card and handle the equipment accordingly, citing a somewhat similar situation surrounding the use of C. B. & Q. card 1, shown in the report. The use of this latter card contemplated scratching out all items except the one for which the car was suitable for loading. The objection was met by changing to special cards, printing them in different colors.

Chicago Great Western Ry.: Is very much in favor of a uniform system governing the inspection of cars for the different commodities, and regards the proposed card submitted by the committee as fulfilling the requirements.

Chicago, Milwaukee & St. Paul Ry.: Reports that the uniform card as suggested by the committee would seem to satisfactorily meet the requirements, but considers shippers would object to attaching the card to the bill of lading. This road is taken as acquiescing in the proposition, since it was not the intention that the card be attached to the bill of lading.

Minneapolis, St. Paul & Sault Ste. Marie Ry.: Accepts the card as a satisfactory solution, but suggests the addition of another classification to cover rough freight. But in this connection, as has been explained, your committee started out this year with the idea of avoiding any reference to rough freight, preferring to confine their time to methods necessary for the handling of commodities readily damaged by moisture, etc.

Illinois Central Rd.: Advises they see no reason why a uniform card covering the overhead inspection of box cars cannot be agreed upon for all railways, and express themselves as being very glad to modify the cards they now have in use, in the interest of uniformity.

Atchison, Topeka & Santa Fe Ry.: Answers by stating they consider there is a great deal of unnecessary switching and cross hauling of empty cars which might be overcome by such an inspection, etc., and would be satisfied to make a trial of the card recommended in the committee's report.

St. Louis & San Francisco Rd.: The position is taken that better results have been obtained by using a distinctive card for the different commodities. They are not in favor of using one card, as proposed

to be generally accepted that any observation, inspection, and amount of prevention can be more economically directed at the time of selection and preparation of the car than through repeated repairs and attention to cars en route, only to find car arriving at destination offering opportunities for criticism and possibly heavy damage claims. Hence the fact remains that the successful launching of any systematic and uniform practice hinges upon a closer inspection of equipment as to the physical condition of the superstructure for the loading of certain commodities, and such inspection should be made in the best possible manner, to meet local conditions.

Hoping that the committee has at least approximately succeeded in working out a composite certificate of inspection card which will be acceptable to the roads now employing such a practice of inspection, your committee would recommend that such roads be asked to use the card, or designate what might be done to make it acceptable, keeping in mind the desirability of reaching a uniform card. If this can be successfully obtained, it will give the association a standard card, and with the information gathered from them, other roads will be able to consider the card, and use it if they so elect.

While it is very clearly understood that several roads, as above indicated, have used the certificate of inspection card with profit, and have succeeded in very materially reducing the damage to shipments and claims therefrom, other roads have indicated their lack of particular interest in any such move on account of either a vast difference in the variety of commodities handled, or on account of the proportion of shipments not requiring such a careful inspection predominating, hence it would seem to remain with each road to work out and decide for itself what such a plan of inspection might net them. It is certain, however, that the most earnest and sincere cooperation on the part of the railways is absolutely necessary, otherwise the maximum benefit is not to be obtained for the amount of money thus expended.

Your committee believes it perfectly feasible for all roads interested in the proposition to enter into the work of inspection along the line of that referred to,

by the committee, and consider that one card would lead to errors in classifying cars.

Summing up the answers, therefore, it will be seen that your committee has failed to secure a unanimous approval of the inspection card recommended. While the majority of the roads agree to the arrangement of the card, and the plan covering its use as suggested, others think that better results can be obtained by using separate cards for each classification; either printing on the card the commodity to be handled, or by using cards of different colors.

The main objection raised against a single card for the three classifications is on account of requiring the inspector to write the letter A, B or C, indicating the classification; and there is still another objection raised, as it contemplates requiring the switchmen or trainmen to read the card and ascertain from the information written thereon the class of commodity the car is suitable for handling.

Your committee, endeavoring to make a complete review of the possibilities of determining what would seem to be required in the way of an inspection of equipment satisfactory for most of the commodities offered for shipment which might be readily

damaged by moisture, found that a schedule for such an inspection was feasible, as has been shown in the report, and that the requirements can be made to very readily fit in with whatever final form and plan of handling the card is adopted; but has not been so successful in working out a card satisfactory to all railways.

The use of colored cards would seem to be perfectly practicable, and would not necessarily disturb the fundamental inspection plan proposed, provided it would be considered better to relieve the inspection force from writing the classification A, B and C on the card (which as a matter of fact is practically nothing); and requiring as a substitute the carrying of a larger number of cards so as to designate the classification by color.

It would seem to your committee that even such an arrangement could be worked out and still obtain a uniform practice; but it is the opinion of your committee that since it has gone about as far as it can in the consideration of this subject from a mechanical point of view, it would suggest that the subject be referred to the American Railway Association, or that a committee be instructed to handle it in conjunction with that Association.

## Individual Paper on Maintenance of Electrical Equipment.

By C. H. Quereau, Superintendent of Electrical Equipment, New York Central and Hudson River Rd.

It is the intention not to stray into the pastures of the electrical engineer or indulge in speculations as to the advisability of electrifying steam railways or attempt arguments in defence of any particular system, single phase, three phase or direct current. Such discussions have already been vigorously carried on, with more or less success and satisfaction, by those much better equipped for such contests than the writer. As a result, noncombatants have reached the practically unanimous conclusion that "Time alone will settle the case."

We all recognize the fact that several important steam railways have, to a limited extent, replaced steam locomotives with electric locomotives and multiple unit cars; and that their successful operation for five or six years and the experience gained during this time makes the subject of the maintenance of electric equipment a live one. The fact that at least six American steam railways are now using electricity for motive power purposes and the recent announcements of plans for extensive electrification of main lines on western steam railways suggests the thought that almost any steam motive power organization may be called upon at an early date to maintain electric motive power and should make this subject of interest to all steam motive power men.

The word electricity naturally raises in the mind of a steam motive power man a suggestion of mystery, something he knows little or nothing about, and, what is worse, he is very apt to conclude he is "too old to learn." It is the object of this paper to try to show there is no more mystery about electricity than about water, steam, coal or other gifts of nature about which motive power men have enough knowledge and familiarity to successfully manage their work; if possible, to remove the natural, but useless, fear of the subject which most of us have.

Until about seven years ago, I had no practical knowledge of electricity or experience with electrical apparatus, having held the positions of engineer of tests, division master mechanic, superintendent of

shops and assistant superintendent of motive power with steam railways. This statement is made for the purpose of showing that the point of view of the paper is that of a steam motive power man and with the hope it will make what follows more convincing than otherwise would be the case.

When asked to take the position of superintendent of electric equipment, my first and very strong impulse was to decline because of lack of electrical experience, nor did the statement that all the expert electrical talent necessary would be supplied entirely remove the dread of entering the—to me—mysterious and untried field of electric traction. The assurance of the head of the railway department of an important manufacturer of electrical apparatus that at least 75% of the necessary training was supplied by experience in mechanical lines, did little more than somewhat reduce the distrust and the feeling that the field of electric traction was full of pitfalls and blind alleys. The experience of a few years has shown that the electrical expert was conservative and that at least 90% of the problems of maintenance to be solved and the faults to be remedied can be successfully worked out by a good mechanic, with a very limited electrical knowledge, who has had experience in the motive power department of steam railways.

To those acquainted with the men who are responsible for the maintenance of electric equipment—whether on trolley, interurban or steam railway lines—it is a matter of common knowledge that those master mechanics, general foremen and mechanics who have been trained in the motive power departments of steam railways have somewhat the advantage of those who have not. I have in mind a western mechanic and general foreman whose experience with electric equipment was limited to six months as electric inspectors' helpers, who are eminently successful in maintaining electric equipment. In the case of steam railways which are electrified, there are decided advantages in using men already in the organization, whose charac-

teristics are known, who are familiar with steam railway policy, methods and requirements and such a plan removes all ground for the possible feeling that electrification will crowd out of their positions men who have served the railway faithfully and satisfactorily for years. Some knowledge of electricity for such men is certainly necessary, but is very elementary and simple, preferably practical rather than theoretical, and can be acquired in such a short time that the advantages of using men for the maintenance of electric equipment who are already in the steam motive power department very decidedly outweigh the disadvantages due to lack of an extended knowledge of electrical apparatus. This conclusion has been reached after six years experience in an electric equipment maintenance department on a steam railway.

I am inclined to believe the greatest bugaboo for the steam motive power man, when considering electrical matters, is the fact that he is not familiar with electrical terms and therefore imagines the whole subject is difficult. When the uninitiated hears or reads of volts, amperes, watts and kilowatts, circuit breakers, contactors and other electrical terms, he finds these words as meaningless as so much Choctaw. As a consequence, he gets no real information or adequate conception of the subject discussed and, perhaps naturally, concludes it must be beyond his powers and altogether mysterious. A little reflection will show him that at one time he was equally ignorant about such common place matters as hydrostatic pressure, steam consumption, horse power, air brakes and superheaters, and that in all probability it would puzzle him, after years of practical use, to accurately define these terms, or even explain to a visitor from Mars what a foot really is, though for all practical purposes he knows each of them thoroughly and never imagines his inability to define technically the words he uses almost hourly is any handicap in successfully holding his job.

The volt is defined as "the practical unit of electromotive force which will cause unit current to be established in a circuit of unit resistance," but for all practical purposes may be considered as the unit for expressing the pressure or tension of an electric current, just as the pound is the unit used in expressing boiler pressure.

There is no doubt arising in the mind of anyone as to the meaning of the sentence, "the boiler carries a pressure of 100 lbs." nor is it necessary to be precise and add, "per square inch," because constant use has made us familiar with the meaning of the statement without looking in a book or stopping to think. We know that, other conditions remaining constant, steam at a pressure of 200 lbs. will do twice the work that steam at 100 lbs. pressure will. In the same way, a little practice will enable us to understand off-hand there is twice the power in a 200 volt current there is in a 100 volt current, because the former has twice the electric pressure of the latter. When we become familiar with the fact that the usual voltage of the electricity used about the home for lighting purposes is 110 and that the usual voltage for trolley and interurban, as well as multiple unit, electric cars, varies from 500 to 600, we have a working basis from which to understand the statement that a transmission is designed for 11,000 volts and a very large part of the wonder and mystery disappears.

With the above statements thoroughly fixed in our minds by constant use, if we read that the Chicago, Milwaukee & Puget Sound Ry. is planning to electrify several hundred miles of its lines, using a voltage

of 2,400, instead of wishing we had learned something of electricity when we were younger, we understand they are considering the use of an operating current having a voltage or pressure four times that which is usual.

The ampere is defined as "the practical unit of current, and represents that value of current which will cause the electrolytic deposition of silver at the rate of 0.001118 grams per second." For everyday use, we may think of the ampere as the unit for measuring the quantity of electricity used or available, just as we speak of pounds of steam, or gallons of water, and will know at once that an electric motor using 200 amperes of 600 volt current has twice the power of one using 100 amperes of current at the same voltage, or half the power of a motor using 400 amperes and a voltage of 600.

The watt is the unit of electric power and, for all practical purposes, is the product of the pressure, or voltage, by the quantity or amperes. For instance, the power of a current of 600 volts and 250 amperes is  $600 \times 250 = 150,000$  watts. The watt in electric power matters is used in the same way that the term horse power is in connection with steam power. It is reasonable to believe that anyone who can understandingly use the word horse power in speaking of steam motive power can become accustomed to the intelligent use of the term watt, and when he learns that 746 watts are equal to a horse power, can, with a little practice, compare the rated power of an electric motor or generator and a steam engine.

A kilowatt is simply a thousand watts and the term is used only for convenience. In the preceding paragraph mention was made of an electric current having a power of 150,000 watts. This is usually referred to as a current of 150 kilowatts, or simply 150 k.w. From what has been said, it is evident a kilowatt is almost exactly equivalent to one and one third horse power and a 150 k.w. current equals practically 200 h.p.

The terms watt hour and kilowatt hour are used in connection with electricity just as horse power is used in steam motive power discussions and means electric power of a watt or k.w. used, or available, for an hour.

The ohm is the unit expressing the resistance of a conductor to the flow of electric current and "represents the resistance of a column of pure mercury 106.3 centimeters long, of uniform cross-section and weighing 14.451 grams, at a temperature of zero degrees, centigrade."

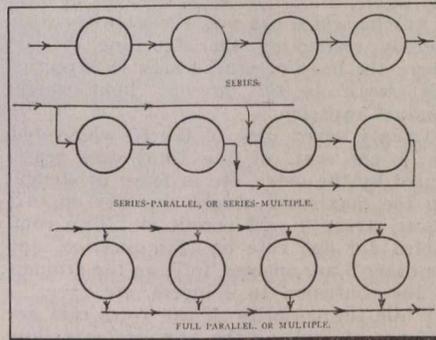
It will take but little practice to understand the statement that a conductor having a resistance of 5 ohms will carry twice the current that a circuit having 10 ohms resistance will, or half the current a circuit having  $2\frac{1}{2}$  ohms resistance will carry, assuming that the voltage is the same in each case.

I have previously stated that "some knowledge of electricity . . . is certainly necessary, but is very elementary and simple, preferably practical rather than theoretical." In this connection it should not be forgotten that this paper relates to the maintenance and is not concerned with the design of electric equipment. Experience has shown that the graduate in an electrical course, who is employed in maintaining electric apparatus, is apt to require wiring diagrams and blue prints showing the circuits and relations of the apparatus, while the inspector whose training has been wholly practical soon learns by precept and practice that a given symptom is caused by a given defect and does not find it necessary to trace the intermediate steps, but goes at once to the seat

of the trouble and removes the cause. For instance, when an electric locomotive loses power when the motors are operated in series parallel, after having operated satisfactorily in series, the embryo electrical engineer is prone to waste time in hunting up wiring diagrams and tracing circuits, while the inspector whose knowledge has been acquired by practical experience knows that either a certain fuse has blown, because of an overload, or a certain contactor has failed to operate properly and at once applies the necessary remedy.

It would be unwise to assume from the foregoing that an elementary knowledge of electricity and the ability to read wiring diagram blue prints are undesirable or unnecessary to anyone employed in the maintenance of electric equipment. Such knowledge is both desirable and necessary, just as much as for steam equipment, but no more. The point is that the average mechanic, without previous electrical experience, does not require any great amount of electrical knowledge in order to successfully compete with an electrician in maintaining electric motive power.

The average nontechnical reader has no doubt been mystified by the terms "series" and "series parallel" and figuratively thrown up his hands. If to these is added "full parallel" he is probably down and out, but for one who is willing to try, their meaning is as plain and easy to understand as the terms "simple" and "com-



pond" or "mallet" applied to steam locomotives.

Most electric locomotives have as many as four motors. When the electric current passes through these motors one after another, as shown in the accompanying diagram, the motors are said to operate in series, the circles representing the motors, the lines with arrow points representing the path of the electric current.

When the circuits are arranged so that the current passes through two groups of motors, each group consisting of two motors, they are said to be operating in series parallel, or series multiple; that is, two motors are operating in series in each of the two groups, while the two groups of motors are operating in parallel, or multiple; the current supplied to one group of motors flowing parallel to the current supplied to the other group.

If now each of the four motors receives its supply of electricity direct, that is, without flowing through any other motor, the motors are said to operate in full parallel, or simply in parallel, the current to and through each motor flowing parallel to that of each of the other motors.

It will not be surprising if some reader is unable to understand the diagrams representing the different groupings of motors. They will probably be readily understood if the circles are supposed to represent water motors—water turbines for instance—and the lines with arrow points are assumed to be a diagram of the water pipes, the arrows indicating the direction of flow.

This brings to mind the fact that the

most helpful illustration to an understanding of electric circuits and diagrams is to think of them as showing a water system. In place of the electric motor put a water motor, and consider the wiring plans as showing the distribution and connections of water pipes. The analogy can be carried farther; the water pressure stands for the voltage and the pounds or gallons of water flowing or available, the amperage of electric current; the horse power hours of a water turbine are the equivalent of the kilowatt hours or horse power hours of an electric motor or generator.

It is not the intention to write an elementary treatise on electricity or electric apparatus nor promote a dictionary of electrical terms with nontechnical definitions, but simply to give assurance to the average motive power man that his experience, together with a very elementary electrical knowledge, qualifies him for the maintenance of electric equipment. In addition, it is hoped the bugaboo of imaginary mystery surrounding electrical matters will lose most of its terrors.

In addition to the cloud of mystery, there is quite generally an exaggerated fear of electricity in the minds of the uninitiated—a fear of personal injury—that prevents them seriously considering the advantages and wider opportunities in the electric equipment department. That there are advantages and wider opportunities there is little room for doubt. This fear is doubtless in part due to the fact that lighting is generally known to be of electrical origin and to the further fact that electricity cannot be seen, as steam and fire can. A child is not encouraged to play with matches or fire in any form, nor anyone without experience to assume responsibility for steam apparatus. The same precautions used in connection with electric matters will assure as small a percentage of injuries and fatal accidents. Life insurance companies charge no higher premiums for men working about electric equipment than those employed in ordinary repair shops for steam equipment. The fact is, if simple and inexpensive precautions are taken, there is no greater danger in working about electric than steam equipment. No one with ordinary sense and experience would think of putting his bare hand on the unprotected steam pipe of an injector, even though he cannot see the steam flowing through it. There is no greater danger in connection with electric circuits if the same common sense is used. This refers to 600 volt direct current and would possibly have to be modified for materially higher voltage, nor to high tension lines where the hazard is undoubtedly greater.

The statement is occasionally made that an electric is a simpler machine than a steam locomotive. If this refers to ease of handling and operating or matters requiring the attention of the engine crew, such as injectors, steam pressure and water level, there is no possible doubt the statement is correct, but if it refers to the mechanical simplicity or number of adjustable or moving parts that must be inspected and kept in proper relation, the steam locomotive is very much the simpler. There is, however, this fundamental difference favoring the electric machine; that the moving parts of the control are of very light weight, easily accessible for inspection and repairs and not subjected to nearly as great wear as are the corresponding parts of a steam locomotive.

It will no doubt interest motive power men to know that the shop arrangement and tools for maintaining electric equipment are not essentially different from those they are accustomed to in repairing steam locomotives, except, of course, the

electric locomotive has no boiler or tender and it is necessary to provide facilities for rewinding armatures and field coils.

The steam motive power man will no doubt be much surprised when told the electric locomotive requires no shopping for a general overhauling, except for a general painting. This is made possible by having a stock of spare parts, permitting the removal of a defective part from a locomotive, the substitution of a repaired part and releasing the engine, the defective apparatus being repaired at leisure. For instance, a set of driving wheels needing tire turning are replaced by an extra set in good condition, this operation requiring not more than five hours, with adequate drop pit facilities. Air compressors, controllers and contactors can be handled in the same way. The steam locomotive cannot be maintained on this plan, as the boring of cylinders and resetting flues make it ne-

cessary to shop the engine, withdrawing it from service for a considerable length of time.

It is quite possible the foregoing statements of personal experience and opinions will not prove as convincing as the records made by an electric equipment maintenance department organized by and largely consisting of men whose earlier experience and training were obtained in the motive power department of steam railways. It seems reasonable common sense will conclude there can be no particular mystery or unusual danger in maintaining electric locomotives when the records for the year 1912, after five years service, show a cost of less than 4 cents per mile and an average of 48,271 miles per train detention due to electrical apparatus, with a banner record of 249,423 miles (equivalent to ten times around the world), without a train detention due to the electrical equipment.

## Report of Committee on Capacity Marking of Freight Cars.

The Master Car Builders' Committee, C. E. Fuller, Assistant General Manager, Union Pacific Rd., reported as follows:—

Your committee sent out to the members the following circular of inquiry:—"Your committee, appointed to look into and report on the subject of capacity marking of freight cars, having summarized the replies to M. C. B. circular 25, Capacity Marking of Freight Cars, notes under heading (d) five replies, 209,153 cars, against stenciling cars with their light weight and maximum weight, for the reason that it has not been demonstrated that this practice might not be applied to cars the body or trucks of which are structurally weak and which are at present stenciled to carry the maximum load to which they should be subjected.

"In view of the above, we believe it urgent for each individual car owner belonging to the Association to investigate and advise on the following four questions. (These questions are repeated with the answers below.)

To this circular the committee received 35 replies, representing 924 votes. A careful analysis of these replies is as follows:—

"1. Whether your company now owns or operates, or whether you know of any equipment the body or trucks of which are structurally weak. If so, give number and class of cars."

In answer to this question 16 lines, representing 322 votes, report owning or knowing of weak cars or cars that would prove structurally weak if loaded to full axle capacity. These cars are for the most part wooden cars in coal trade, which would not permit the maximum capacity stenciling.

Fourteen lines, representing 349 votes, do not own or know of any cars that are structurally weak. Five roads did not vote directly on this question.

"2. Whether your company owns or operates any cars the body or trucks of which are strong enough under the present stenciled capacity, but which would not be strong enough under the proposed light weight and maximum weight stenciling. If so, give number and class of such cars."

The majority of the roads vote in the affirmative in answer to this question. Out of the 924 votes, 662 report owning certain cars that are not strong enough and to which it would not be advisable to apply the maximum capacity plan of stenciling. While there does not seem to be any doubt, as a rule, regarding the structural strength of the modern car, and its ability to carry the increased load permitted by the maximum capacity plan of stenciling, 23 roads

report certain types of structurally weak cars, such as flat, gondola, and wooden underframe cars, which would develop higher stresses under the maximum loading than would be proper or permissible.

"3. Whether there can be any objection in applying the rule of light weight and maximum weight stenciling so far as it is applicable, consistent with strength of body or trucks which are not structurally weak, thereby restricting the stenciling of cars where the body or trucks may be structurally weak to the present light weight nominal capacity."

Twenty seven lines of the 35 who voted, or 75 per cent. of the total cars represented by the votes, are in favor of stenciling the maximum weight capacity on cars whose strength will permit it. Two companies did not vote on this question, and the other 6 are opposed to it on the grounds of the confusion to shippers, etc.

While the majority of the votes cast are in favor of limiting the proposed stenciling to cars that are strong enough, the question has naturally arisen as to what cars are strong enough, and how this strength should be calculated—that is, by the individual car owner or by a standard adopted by the Association.

"4. Whether or not it would be more advisable to apply the rule of light weight and maximum weight stenciling to steel and steel underframe cars exclusively, and moreover to such cars of this class as have a factor of safety sufficient to carry the maximum load; also, in the opinion of the members, what the minimum factor of safety should be for maximum loading, stenciling."

Of the 924 votes represented, 443 (12 roads) are in favor of confining the maximum weight method of stenciling to steel and steel underframe cars, 2 lines did not vote directly on the question, and 463 votes (21 roads) do not approve of this plan; some on the grounds that it should apply to all classes of cars whose strength would permit it, others on the ground of confusion to shippers, etc.

Relative to minimum factor of safety, only 11 companies expressed an opinion:—

Four companies suggest a maximum fibre stress of 16,000 lbs. per sq. in. in body structure.

One company suggests a maximum fibre stress of 12,500 lbs. per sq. in. in body structure with a partially distributed load, and for a buffing shock of 300,000 lbs. when car is empty or loaded.

One company suggests that the factor of safety should be at least 8 in any portion of the arch bars.

One company suggests on trucks a factor of safety of 15 on parts in compression, a factor of safety of 10 on parts in tension, and a factor of safety of not less than 5 in the rest of the structure of car.

Two roads recommend a factor of safety of 3 for steel and steel underframe cars.

One road is in favor of a factor of safety of 5, and one road suggests that the factor of safety should be variable for different classes of equipment.

In line with the limited views expressed as to factors of safety, we feel that the light weight and maximum load stenciling should be confined to cars of steel or having steel underframes that have a factor of safety of 3 or better in the body structure, when figured for the maximum load, and with respect to trucks under such cars, the rule should be applied to all trucks having arch bars of M.C.B. dimensions or better, and to all trucks having cast steel side frames, and to the various forms of special trucks such as pedestal type trucks of the box and other varieties, where the strength of factor of safety is equal to or greater than the equivalent M.C.B. arch bar.

On new cars the committee feels that the rule should be applied in its entirety, owing to the fact that practically all new cars are steel or steel underframe construction, and will in all probability be built to meet the proposed requirements of 24 in. minimum cross sectional area of centre sills, recently proposed by the Committee on Car Construction, to take care of buffing shocks, which imposes a construction which we feel will result in a high factor of safety on underframes from a load standpoint. With relation to trucks under new cars, the rule should be applied only when such trucks meet M.C.B. requirements or better as to arch bar construction, or have steel side frames, or have pedestal type trucks where the factor of safety is equal to or greater than the equivalent M.C.B. arch bar.

Pending further investigation on the part of the committee, we would endorse the recommendation of a member that the subject of stenciling the light weight and maximum load be referred to the American Railway Association in order to ascertain whether there are operating or traffic conditions with which the proposed method of stenciling would interfere.

## Report of Committee on Steel Tires.

The Master Mechanics' Committee, Lacey R. Johnson, General Superintendent, Angus Shops District, C.P.R., Montreal, chairman, reported as follows:—

Your committee has held meetings during the year to further revise the report submitted at the last convention. After comparing all the information received from the members and manufacturers during the year, we are unable to suggest any change in the specification presented last year, except to add a new sub-clause: (d) The elasticity shall be at least 50% of the tensile strength.

We have discussed the question of using alloy steels, such as chrome, vanadium, etc., but do not feel ourselves in a position to express an opinion.

We are again presenting the report for your consideration, and would suggest the advisability of appointing a standing committee on steel tires.

### SPECIFICATION FOR STEEL TIRES.

1. MATERIAL.—Stock for tires shall be made by the open-hearth or crucible process.

2. CLASSES.—There will be three classes of tires for the different classes of service, as follows:—

Class 1. Driving tires for passenger engines.

Class 2. Driving tires for freight engines.

Class 3. Driving tires for switching engines, and tires for engine truck, tender truck, trailers, and car wheels.

3. CHEMICAL COMPOSITION.

Class 1. Carbon, not less than 50 or over 70%. Phosphorus, not over 05%. Manganese, between 50 and 80%. Sulphur, not over 05%.

Class 2. Carbon, not less than 60 or over 80%. Phosphorus, not over 05%. Manganese, between 50 and 80%. Sulphur, not over 05%.

Class 3. Carbon, not less than 70 or over 85%. Phosphorus, not over 05%. Manganese, between 50 and 80%. Sulphur, not over 05%.

4. FINISH.—The tires must be free from defects of any kind, and finished tires must be accurately machined to the prescribed dimensions of the master mechanics' standard, and rough tires must not be outside the limits of the attached prints.

5. BRANDING.—The tires shall be distinctly stamped when hot with such brands as the purchaser may require, and in such a manner that those marks shall be legible when the tires are worn out.

6. SAMPLES FOR CHEMICAL ANALYSIS.—Drillings from a small test ingot cast with the heat, or turnings, from a tensile specimen, or turnings from a tire (where tires are machined at the works of the manufacturer) shall be used to determine whether the chemical composition of the heat is within the limits specified in paragraph 3. When required, the purchaser or his representative shall be furnished an analysis of each heat from which tires are made.

7. PHYSICAL PROPERTIES.—The steel for the different classes of service shall meet the following minimum physical requirements:—

| Class. | Tensile Strength<br>Lbs. per sq. in.                                   | Elongation per cent. in 4 in.                          |
|--------|--|--|
| (a)    | 105,000  | Quotient of 1,556,000 divided by the tensile strength. |
| (b)    | 115,000  | Quotient of 1,300,000 divided by the tensile strength. |
| (c)    | 125,000  | Quotient of 1,150,000 divided by the tensile strength. |
| (d)    | The elasticity shall be at least 50 per cent. of the tensile strength. |  |

8. FALLING WEIGHT TEST.—Should the contract call for a falling weight test, a test tire from each heat represented shall be selected by the purchaser or his representative and furnished at his expense, provided it meets the requirements.

8a. The test tire shall be placed vertically under the drop in a running position on a spring foundation with an anvil of at least 10 tons weight, and shall be subjected to successive blows, from a tup weighing 2,000 lbs. falling from heights of 5, 10, 15 and 30 ft. and upwards, until the required deflection is obtained as specified in paragraph 8b.

8b. The test tire shall stand the drop test described in paragraph 8a without breaking or cracking and shall show a minimum deflection equal to X in the following table:—

| Internal diameter of tire (=D).<br>Thickness of tire (=T). | Class No. 1  | Class No. 2  | Class No. 3  |
|--|--|--|--|
|  | Tensile breaking strength per sq. in. 105,000 lbs. | Tensile breaking strength per sq. in. 115,000 lbs. | Tensile breaking strength per sq. in. 125,000 lbs. |
| 3 ft. diameter and over.....                               | 3d   | 3d   | 3d   |
|  | 6c   | 10c  | 12c  |
| Under 3 ft. diameter                                       | 3d   | 3d   | 3d   |
|  | 10c  | 12c  | 14c  |

8c. A specimen for the tensile test is to be taken from a tire that has been subjected to a falling weight test, and it shall be cut cold from the tested tire at the point least affected by the falling weight test. The tensile test specimen when cut

from a tire that has been subjected to a falling weight test shall be cut normal to the radius and parallel to the face.

8d. Should the test tire fail to meet these requirements in any particular, two more test tires shall be selected from the same heat if the manufacturer so desires, and at his expense. Should these two tires fulfill the requirements, the heat shall be accepted.

9. INSPECTION.—The inspector representing the purchaser shall have free entry to the works of the manufacturer at all times while his contract is being executed. All reasonable facilities shall be afforded to the inspector by the manufacturer to satisfy him that the tires are being furnished in accordance with the specifications. All tests and inspections shall be made at the place of manufacture prior to shipment, and shall be conducted so as not to interfere unnecessarily with the operations of the mill.

Tires must be rolled in accordance with the best practice, sufficient metal being discarded to insure sound tires. The tire taken from the bottom of the ingot must be stamped with the letter A, before the tire number, the next above B, and so on up the ingot.

Tensile test specimens, one from each heat, must be forwarded to the engineer of tests of the railway company, together with a copy of the chemical analysis of each heat, showing the tire numbers rolled from each heat; also destination of each tire, together with the railway company's purchasing agent's order number. If, however, the manufacturer is rolling tires right along for the railway company, and their inspector is at their plant, the test specimens from heats ready at that time may be pulled at the manufacturer's plant by the inspector and the broken test pieces sent in for analysis, in which case the above information must be furnished the inspector.

An analysis of the test piece made by the railway company's test bureau must agree with that furnished by the manufacturer, and with an analysis made from turnings from the tires after received; a failure to agree within reasonable limits will be cause for rejection.

In addition to the above tests, the rail-

way company reserves the right to make a repetition of any tests to make sure that only material meeting all the requirements set forth in this specification be accepted, and all material found not up to any one or all of these requirements will be rejected.

Samples representing rejected material will be retained in the test bureau not longer than thirty days from date of test. If at the end of that period the sellers have not signified their desire for a rehearing, it will be understood that they agree with the results as reported. If by this time the sellers have not given shipping directions for material rejected at destination, the material represented by the samples will be returned to them at their risk, they paying freight both ways.

Freight Car Truck Sides and Freight Car Truck Bolsters.

The Master Car Builders' Committee, E. C. Schmidt, University of Illinois, chairman, reported as follows:—

The committee on specifications for truck sides and truck bolsters was appointed by the executive committee in 1911. In its first report, presented at the 1912 convention, it proposed for truck sides and bolsters specifications concerning the manufacture, chemical properties, physical properties, and inspection of truck sides and bolsters. By subsequent action these specifications have been added to the recommended practice of the Association.

In its first report the committee also proposed tentative specifications for tests of truck sides and bolsters. It recommended that if the committee were continued, funds be provided for making tests, in order to develop information which could form the basis for final specifications for testing truck sides and bolsters. The executive committee has not found it feasible to provide funds for this work during the past year and the committee has, therefore, been unable to make progress along the lines originally laid down. In the expectation that during the coming year funds may be made available to carry on this work, we recommend that the committee be continued.

Railway Supply Exhibits at the Atlantic City Conventions.

The larger portion of the space on the million dollar pier was, as usual, devoted to exhibits of railway supplies, machinery, etc., there being 88,222 sq. ft. of space occupied, against 83,507 in 1912. Among the principal exhibitors were the following:—

American Brake Shoe & Foundry Co., Mahwah, N.J.—Brake shoes and brake leads.

American Locomotive Company, New York, N.Y.—Reception booth.

American Vanadium Co., Pittsburgh, Pa.—Reception booth.

Anchor Packing Co., Philadelphia, Pa.—Air pump packing; throttle packing; air pump gaskets; Tauril; high pressure gauge glasses; superheat valve discs; specialties in packing.

Bowser & Co., Inc., S.F., Ft. Wayne, Ind., and Toronto, Ont.—Complete gasoline and oil storage equipment, consisting of long distance and first floor self-measuring pumps and storage tanks; "Red Sentry" enclosed long distance pump with electric lamp attachment; complete oil filtering system; self-registering pipe line measures.

Buffalo Brake Beam Co., New York, N.Y.—Buffalo passenger brake beams for all classes of service including P. C. and L. N. equipment, with adjustable, automatically

adjustable, and rigid heads; Buffalo freight brake beams for all classes and capacity of equipment, including E. & L. Beams for all classes and capacity of tenders and electrical equipment, for standard, broad and narrow gauge.

Carborundum Co., The, Niagara Falls, N. Y.—Carborundum and Aloxit wheels; Carborundum brand garnet paper; Aloxit cloth.

Chicago Railway Equipment Co., Chicago, Ill.—Brake beams of the PC Creco, EL Creco, Diamond Special, Diamond, Drexel, National, Hollow, Kewanee, Reliance, Sterlingworth, Ninety-six, Monarch, and special types; Monitor bolsters; Creco roller side bearings; brake slack adjuster; automatically adjustable brake head; semi-adjustable brake head; removable leg brake head; Creco sliding third point support and safety device; reversible and duplex brake beam struts.

Commercial Acetylene Railway Light & Signal Co., New York, N.Y.—Equipments for acetylene railroad signaling; acetylene headlights, car lighting, boat lighting, marine lighting and acetylene welding.

Consolidated Car-Heating Co., Albany, N. Y.—Packless steam specialties; sylphon diaphragms; single and twin vapor traps;

single and twin admission valves; quick opening end valves; automatic lock couplers; electric heaters and switches for 600 and 1,800 volts; door operators.

Dearborn Chemical Company, Chicago, Ill.—Scientific treatment for locomotive boiler waters, prepared to suit conditions shown by analyses of the waters, to prevent foaming, scale, leaking, corrosion, etc.

Detroit Lubricator Company, Detroit, Mich.—Bullseye locomotive lubricators; air cylinder lubricators; air pump lubricators; transfer fillers; boiler valves; balanced throttle valves; mechanical force feed oilers; flange lubricators.

Edison Storage Battery Co., Orange, N.J.—Edison storage batteries for car lighting, operation of railway signals, telephone train dispatching, ignition, and stationary lighting, and for operation of industrial and baggage trucks.

Flannery Bolt Co., Pittsburgh, Pa.—Tate flexible staybolts; adjustable crown staybolts; flush flexible staybolts; installation tools for applying Tate flexible staybolts; F. B. C. arch bar and column bolt nut locks.

Franklin Railway Supply Co., New York, N.Y.—Franklin pneumatic fire door; power grate shaker; water joint; strainer valve; ball joint; "K" lock nut.

Galena-Signal Oil Co., Franklin, Pa.—Reception booth.

Gold Car Heating Lighting Co., New York, N.Y.—Combination pressure and vapor system; straight vapor system; straight steam system; thermostatic temperature control; wedge lock couplers; pressure regulators; steam traps; quick opening valves; electric heaters; cyclone ventilators; curtain window ventilators, etc.

Goldschmidt Thermit Co., New York, N.Y.—All materials and appliances used in welding locomotive frames, driving wheel spokes, connecting rods, mud rings, cross-heads and for general repairs in a railroad shop. Metal and alloys free from carbon, particularly samples of ferro-titanium to purify and improve the quality of iron and steel. Materials for welding pipe by the Thermit process. Samples of Thermit, ignition powder and sample welds made by the process on locomotive frame sections, pipe, rails, etc.

Greene, Tweed & Co., New York, N.Y.—Palmetto packing in braided form for high steam pressures; in twist form for small globe valves, etc.; in sets for Westinghouse and New York duplex air pumps and in sets for locomotive throttle service. Manhattan packing for hydraulic pressures. Favorite reversible ratchet wrench.

Grip Nut Company, Chicago, Ill.—Grip nuts; Curran rivet bolts; Jatz door hangers and fasteners.

Hunt-Spiller Manufacturing Corporation, South Boston, Mass.—Hunt-Spiller gun iron in the form of cylinder packing, valve packing, piston heads, eccentrics, side rod bushings, air pump bushings, cylinder bushings, valve bushings, crosshead shoes, eccentric straps, knuckle bushings, air pump packing, driving boxes.

Independent Pneumatic Tool Co., Chicago, Ill.—Thor piston air drills, reversible and non-reversible, for flue rolling, reaming, tapping, wood boring, setting locomotive valves, drilling; close quarter drills for drilling, reaming and tapping in close corners; pneumatic grinders for grinding and buffing; one-piece pneumatic riveting hammers; chipping, calking and flue beading hammers; pneumatic staybolt drivers; holders on; hose; couplings and Thor electric drills.

Johns-Manville Company, H. W., New York, N.Y.—Steel car insulations; pipe coverings; boiler laggings; asbestos materials; moulded and electrical materials;

electrical fibre conduit; asbestos shingles; waterproofing; mastic; fire extinguishers; asbestos and regal roofing; packings; brake cylinder expander rings; flexible armored hose; cork; refrigerator car insulation; high temperature and insulating cements; asbestos wood; smoke jacks.

Locomotive Superheater Co., New York, N.Y.—Full size model of Schmidt superheater.

McCord & Co., Chicago, Ill.—Locomotive main valves and driving box lubricators in operation; continuous steel inserted malleable iron pedestal boxes; pinless lid box; lid locked box; double spring high capacity lever draft gear with flexible yoke cast integral; flexible drawbar yoke; bolster spring dampener; the National equalizing journal box wedge; outside metal dust guard.

Norton, Inc., A. O., Boston, Mass.—High speed lifting jacks.

Pyle-National Electric Headlight Co., Chicago, Ill.—Two latest electric headlight equipments, types E and S; electrically welded headlight case with reflector, together with models and sectional views of turbine.

Safety Car Heating and Lighting Co., The, New York, N.Y.—Pintsch car lighting equipment; axle driven electric lighting equipment; Pintsch and electric car lighting fixtures; glass and metal illumination reflectors; postal car lighting equipment.

Standard Car Truck Co., Chicago, Ill.—One full sized four-point bearing flat car; also models of trucks, centre plates and side bearings. Space on exhibit track at Mississippi Ave.

Templeton, Kenly & Co., Ltd., Chicago, Ill.—Simplex car, coach, locomotive, track and bridge jacks.

Titanium Alloy Manufacturing Co., The, Niagara Falls, N.Y.—Titanium treated steel, copper, bronze and brass.

U. S. Light & Heating Co., New York, N.Y.—U-S-L axle-driven electric light equipments for railroad cars; axle generators for electric lighting; regulators for electric lighting; suspensions for axle generators; storage batteries for electric lighting of railroad cars; storage batteries for signal service.

Westinghouse Air Brake Co., Pittsburgh, Pa.—Reception booth.

Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa.—Reception booth.

Wood, Guilford S., Chicago, Ill.—Wood's nipple end air brake hose protector; steel freight house trucks.

### A Locomotive Injector Patent Suit.

The case of United Injector Co., Hancock Inspirator Co., and T. McAvity & Sons, Ltd., versus James Morrison Brass Manufacturing Co., which came before the Trial Court in Toronto recently, was an action for damages for alleged infringement of patent for improved inspirators and trade marks of plaintiffs, for an account and for an injunction. The Chancellor delivered the following judgment: "Let judgment be entered restraining defendants from using words Hancocks, or Hancock, or inspirators in connection with locomotive injectors, not plaintiff's manufacture; for \$50 damages for improper use by defendants of plaintiff's trade name; restraining defendants from infringing plaintiff's patent; for \$300 damages for infringement, or at election of either a reference to Master to ascertain damages, dismissing counterclaim. Defendants to pay cost of action and counterclaim. In case of reference, defendants to pay damages found by Master forthwith on confirmation of report.

### Atlantic City Convention Notes.

Among the Canadian Railway officials in attendance were the following:—

Canadian Pacific Ry.—H. H. Vaughan, Assistant to Vice President; R. W. Burnett, General Master Car Builder; G. I. Evans, F. B. Zercher, A. Dixon, Superintendents of Shops; W. H. Winterrowd, Mechanical Engineer; L. C. Ord, General Inspector; J. Burns, J. H. Mills, H. G. Reid, C. R. Ord, Master Mechanics; A. W. Horsey.

Grand Trunk Ry.—W. D. Robb, Superintendent of Motive Power; J. Coleman, Superintendent, Car Department; J. Hendry, J. L. Hodgson, Master Car Builders; R. Patterson, J. Markey, Master Mechanics.

A. L. Graburn, Mechanical Engineer, Canadian Northern Ry. M. Goodrich, Master Mechanic, Ottawa and New York Ry. T. A. Summerskill, Superintendent of Motive Power, Central Vermont Ry.

At the annual meeting of the Railway Supply Manufacturers' Association at Atlantic City, June 14, the following officers were elected:—President, B. A. Hegeman, Jr.; Vice President, J. Will Johnson; Executive Committee, C. B. Yardley, Jr., J. C. Currie, C. F. Elliott and J. H. Kuhns.

### Election of Railway Mechanical Association's Officials.

The American Railways Master Mechanics' Association elected the following officers:—President, D. R. MacBain (L. S. & M. S.); First Vice President, F. F. Gaines (Cent. of Ga.); Second Vice President, E. W. Pratt (C. & N. W.); Third Vice President, Wm. Schlafge (Erie), and Treasurer, Angue Sinclair. Executive Members for two years:—W. J. Tollerton (Rock Island Lines), J. F. DeVoy (C. M. & St. P.), and J. T. Wallis (Penna.). F. H. Clark (B. & O.) was elected for one year.

The Master Car Builders' Association elected the following officers:—President, M. K. Barnum; First Vice President, D. F. Crawford; Second Vice President, D. R. MacBain; Third Vice President, R. W. Burnett, General Master Car Builder, Canadian Pacific Ry.; Treasurer, John S. Lentz; Executive Committee, C. E. Fuller, T. M. Ramsdell, G. F. Giles.

The American Society of Civil Engineers held its 45th annual convention, June 17 to 20, at Ottawa, Ont. Receptions were held by the Premier, the Mayor, the Canadian Society of Civil Engineers. There was a garden party at the residence of T. C. Keefer, C.M.G., a past President of the Society, and a reception by Collingwood Schreiber, C.M.G., an afternoon tea at the residence of Sir Sandford Fleming, one of the Society's oldest members, being cancelled on account of the death of Sir Sandford's son. At the business meetings a number of subjects were discussed, covering transportation routes in Canada, the National Transcontinental Ry., Canadian water powers, and navigation and grain elevators on the Great Lakes. Arrangements were made, for those members passing through Montreal, to inspect the construction work of the Canadian Northern Ry. tunnel through Mount Royal.

Intercolonial Ry. Freight Rates.—A new local freight tariff was put into effect on the I.R.C., in New Brunswick and Nova Scotia, May 28. D. A. Storey, General Freight Agent, is reported to have stated, June 2, that the general increase is from one to two cents per 100 lbs., but the maximum tariff is still lower than on other Canadian Railways. The minimum rate is increased from 25c. to 35c. The increase has been necessitated by the higher cost of operation.

## The Modified Zinc Chloride Process of Treating Railway Ties.

In an article in the May issue of this paper, dealing with the creosoting process for treating ties, it was pointed out that the art of preserving organic growth was known to the ancients, and that they practiced the art to a considerable extent, as evidenced by the excellent preservation of old mummies. It was also pointed out that an analogy has been discovered between the causes of decay in plant growth and in organic substances, both being due to the presence of certain germs, which cause the destruction of the substance if the conditions be favorable. The principle is to anticipate this decay by the introduction of such antiseptics as will not only destroy any existing germs, but will also retain their strength to such a degree as to prevent decay occurring at any future time. As the article above referred to emphasized, of all the many antiseptics that have been tried in preserving wood from decay, but two seem to have remained with any degree of security for future business. Of the creosoting process considerable was said at that time concerning the method of treating and the possibilities for future development with the present outlook for creosote oil supplies.

Zinc chloride, as a preservative of wood, has been in use for upwards of 100 years, but the first patent of the process taken out was by Sir Wm. Burnett in 1837, from which it was given the name of the Burnettizing process. That zinc chloride had great antiseptic powers was beyond question, but the great trouble with the use of wood treated with it was the difficulty of keeping it in the wood while in use, its great solubility in water being a decided drawback. Each rainstorm would dissolve out a certain amount from the fibres of the wood, and in time, all would have left the wood. Thus, while zinc chloride as a preservative was an excellent medium, this trouble of leaching placed it in disrepute.

Many ways of overcrowding this tendency of the absorbed salts to leach out were tried, the principle followed in the majority of instances being to immerse the

water, and in consequence, when forced into the tie, the salts have a tendency to filter out, remaining in the outer fibres of the wood, the core wood receiving a very diluted solution of the liquid, the major portion remaining near the outside.

The most recently developed process employing zinc chloride is claimed to overcome all the above-mentioned difficulties. This is the Bruening-Marmetschke process

stances into their component parts.

The use of aluminium sulphate in conjunction with zinc chloride creates a phenomenon, the reasons for which have not been discovered. Portions of the zinc chloride and aluminium sulphate remain fixed in the wood substances, the aluminium sulphate forming a coagulant of some of the substances in the wood that form food for decay. It may exist in the wood in a colloidal form, united chemically to the wood substance. At any rate, the zinc chloride, as added to the wood with the

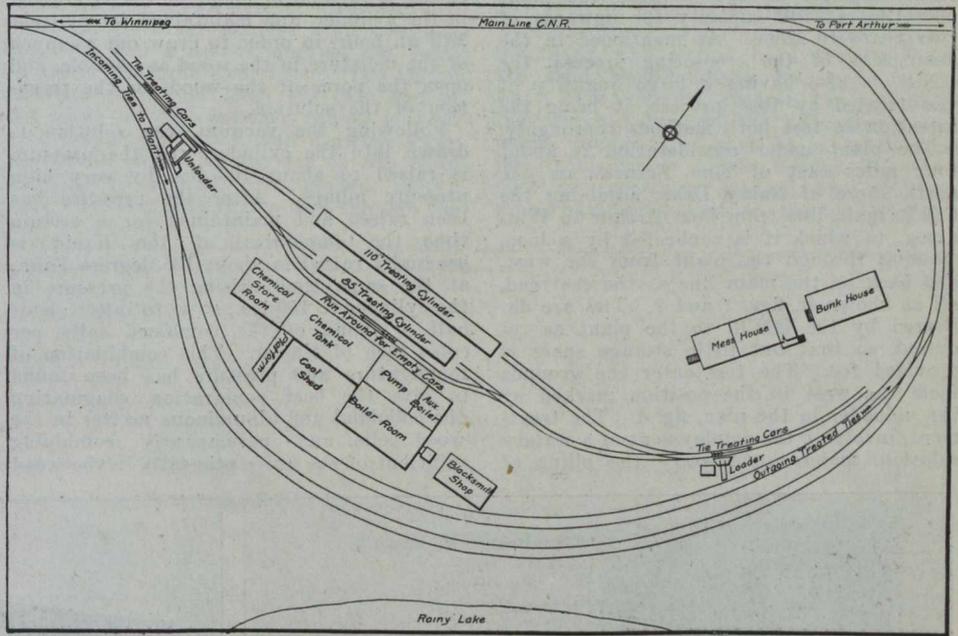


Fig. 1.—Layout of Buildings and Yard of a Modified Zinc Chloride Tie Treating Plant.

(commonly called the B. M. process), and is the one almost universally employed where zinc chloride is the antiseptic medium. In this process, to the zinc chloride solution there is added aluminium sulphate, the relation of the zinc chloride to the aluminium sulphate being 2 to 1.

As mentioned, zinc chloride forms an imperfect solution in water, and the resultant solution is more or less clouded from the presence of the suspended salts. Even

aluminium sulphate, seems to be free from leaching, as proved by experiments conducted by different authorities.

A valuable feature about zinc chloride treated wood is that it is fireproof, and will only char slowly when subjected to flame. Wood so treated is affected very slightly from an electrical standpoint. Shortly after treatment, the dissolved salts increase the conductivity of the tie to such a degree as to make necessary the

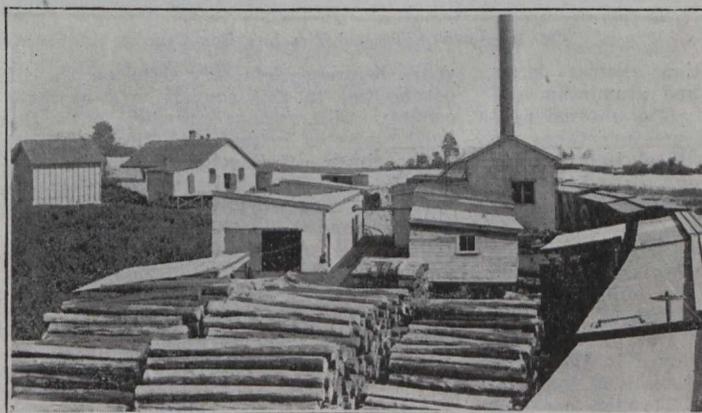


Fig. 2.—Treating Plant, from the West.

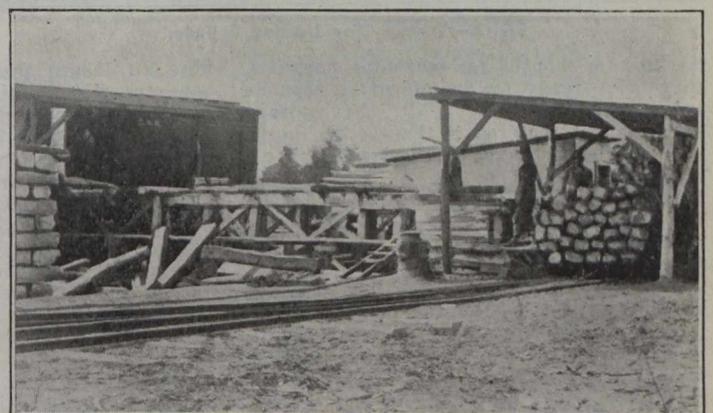


Fig. 3.—Unloading Ties from Box Cars.

treated wood in some special substances that would add a waterproof coating to the surface of wood, and thus make the interior free from the attacks of water. These various methods have all been used with more or less success, but have the objection that any mechanical abrasion of the surface leaves the tie unprotected from the leaching that is sure to result.

Another very decided objection to the ordinary zinc chloride process is the fact that the zinc chloride salt is in a rather imperfect state of solution in the treating

with a very weak solution this is true. It is a matter of chemical knowledge that if a small amount of aluminium sulphate be present in the solution, the whole of the zinc sulphate is dissolved; in other words, the solution is no longer in a state of equilibrium, but is a clear liquid. The resultant combined solution will not filter in, being forced through the pores of the wood into the core. From the clearness of the liquid, lower temperatures of impregnation are possible, obviating the danger of the heat breaking up the dissolved sub-

cutting down of signalling track circuits about 50%, but after seeing service for some months, the conductivity decreases to that normal for untreated wood. In the B. M. process, as opposed to the plain zinc chloride treatment, the strength of the wood is not affected. In the older treatment, on account of the heat of impregnation being rather high, the fibres of the wood were more or less disintegrated, weakening the wood structure.

In Alex. Bruce and Co.'s plant at Fort Frances, Ont., of which B. Blastorah is

Superintendent, the B. M. process of treating ties is practiced. The plant shown in figs. 1 and 2, was erected in 1911 as the result of a large contract secured from the Canadian Northern Ry. for treating ties. The treating company is a Scotch one, with plants at various points throughout the world, this being the first to be erected in Canada. Other plants are contemplated for Edmonton, Alta., and Victoria, B.C. The Fort Frances plant is employed exclusively on C.N.R. ties, of which the contract calls for enough to keep the plant operating at full capacity for upwards of two years to come. As mentioned in the description of the creosoting process, the C.N.R. is also having a large quantity of ties treated by that process, it being the intention to test both methods thoroughly.

The plant under consideration is about four miles east of Fort Frances, on the north shore of Rainy Lake, adjoining the C.N.R. main line from Port Arthur to Winnipeg, to which it is connected by a loop, passing through the plant from the west, and back on the main line at the east end, all as shown in figs. 1 and 2. Ties are delivered by the C.N.R. to the plant as required, so that but little storage space is provided for. The ties enter the grounds from the west to the position marked by the unloader in the plan, fig. 1. The treatment, involving the employment of a watery solution, makes unnecessary the piling of

The trains of cars, formed as in the former instance, are drawn into the cylinder by a steam winch and cable. The two cylinders are located side by side, the older one being 85 ft. long, and the new one 110 ft. A third cylinder is in prospect, similar to the last one installed. The construction of the cylinders is so similar to ones described in the creosoting process that the reader is referred to that article for this information. After the cylinder has been charged with timber and the doors closed, a vacuum of about 25 ins. is created in the cylinder, and maintained for at least half an hour, in order to draw out as much of the moisture in the wood as possible, and open the pores of the wood for the reception of the solution.

Following the vacuum, the solution is drawn into the cylinder, and the pressure is raised to about 160 lbs. by very high pressure pumps. After the pressure has been raised and maintained for a certain time, the temperature of the liquid is gradually raised to about 165 degrees Fahr., at the same time raising the pressure in the cylinder to 150 lbs., so as to inject about half a pound of the combined salts per cubic inch of timber. This combination of temperature and pressure has been found to give the best penetration, coagulating the colloidal and albuminous matter in the wood cells, and permanently combining sufficient of the antiseptic salts in the wood

convenient level at the door of a box car, where attendants carry them and pile them in the cars for delivery around the loop to the main line. The use of the same box cars that have just been emptied from the incoming ties, at a point a little further along the line, is a most important consideration in their shipment. It will be remembered that, with the creosoted ties, box cars cannot be used for shipping the ties away from the plant, on account of the damage to the interior of the car in the event of grain or other matter being carried. The B. M. treated tie looks but slightly different from an untreated one, and will not soil the interior of the car.

The plant is so isolated from settled communities that provision for the accommodation of the men employed is made in the bunk house and mess house to the east of the plant.

The B. M. process has many points in its favor. As compared with creosoting, on account of the cheapness of the materials employed, the cost is just about a third. The supply of raw material is practically unlimited. Both processes have much to be said in their favor, and both must be considered on their respective merits in deciding which is the better for the conditions of operation. The results on the C.N.R. in the use of the two processes will be awaited with interest, but as they have been employed such a short time, it will be some

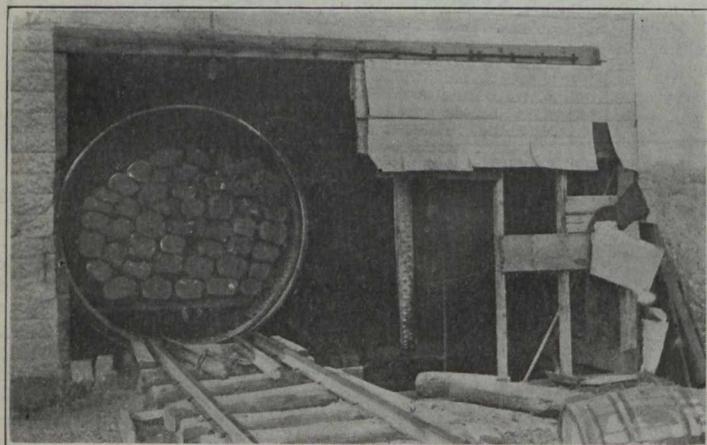


Fig. 4.—Treated Ties Leaving Cylinder.



Fig. 5.—Loading Treated Ties into Box Cars.

the ties for months for seasoning purposes, they being ready for treatment as soon as received in the plant. All the storage space as yet required is that to the north of the unloader, between the tracks, shown in the foreground in fig. 2. Immediately beyond this storage pile will be noted in fig. 2 the unloader sheds, shown more clearly in fig. 3, a view from the opposite direction.

Referring to fig. 3, on the left, the ties as received (barked at the point of loading, dispensing with that operation here), are loaded from box cars on to a platform slightly higher than the level of the car floor, across which there is a travelling chain, carrying them across to the shed on the right. In the plan, fig. 1, it will be noted that the standard gauge track is south of the buildings, while north of the buildings are narrow gauge service tracks, converging with the main tracks at the west and east end. On these service tracks, as in the creosoting plant, are small cars, with formed sides and hoops into which the ties are loaded, in the loading shed on the right in fig. 3, directly from the travelling table. As each car is loaded, it is run down the track by gravity to near the cylinder it is to enter. In fig. 2, there is only shown one cylinder, but since the photograph was taken a second has been added, as in the plan fig. 1.

fibre to insure protection against decay, both the zinc chloride and aluminium sulphate being antiseptics. The gradual raising of temperature and pressure takes upwards of an hour, the total impregnation being carried out in about three hours, depending on the nature and fitness of the wood to be treated.

The supply tank, from which the cylinders are filled, is located in a large buried vat, under the floor of the building across the service track to the south of the cylinders. The main floor of this building contains the chemicals employed in their concentrated form, and is the mixing room for preparing the solution. Through openings in the floor, the chemicals are dumped into the vat, approximately in the proportion of 3 parts of zinc chloride and 1½ parts of aluminium sulphate, to 100 parts of water. In the buildings adjoining this tank room are housed the power house, with its pumps, compressors, and complement of recording and indicating gauges, and back of the building is the boiler room.

The ties, as ready to leave the treating cylinder, are shown in fig. 4. From that point the train of cars is drawn down the service track by the capstan, to the loading machine in fig. 5. Here the ties are dumped off the small cars, one at a time, on to a sloping carrier operated by a small winch engine adjoining, being raised to a

years before satisfactory data on the life of the ties in this country will be forthcoming. Observations elsewhere show that both processes increase the life of the tie many times. Creosoting, being the older process, can cite more examples. There are cases on record of creosoted ties laid over 30 years ago and still sound and serviceable. Time will probably demonstrate the same thing of the B. M. process, for in instances where B. M. treated timber has been used in severe condition such as in damp mines, it has stood up well.

Statistics collected by the United States Government show that while the number of ties treated with zinc chloride in the U. S. has not increased in the last four years for which figures are available, the number treated with creosote has increased rapidly, the figures being as follows:—

|            | Zinc chloride. | Creosote.  |
|------------|----------------|------------|
| 1907 ..... | 9,864,765      | 5,750,874  |
| 1908 ..... | 8,640,230      | 9,620,420  |
| 1909 ..... | 8,051,054      | 9,943,360  |
| 1910 ..... | 9,195,861      | 14,841,843 |
| 1911 ..... | 9,445,961      | 16,510,721 |

These figures might be looked upon as an answer to the query:—"Which is the better of the two"? But after careful investigation it appears that the question cannot be dismissed so easily, and the evidence on both sides will be presented in an early issue of this paper, the subject being of the utmost importance.

## The Canadian Pacific Railway's Coal Handling Plant at Fort William.

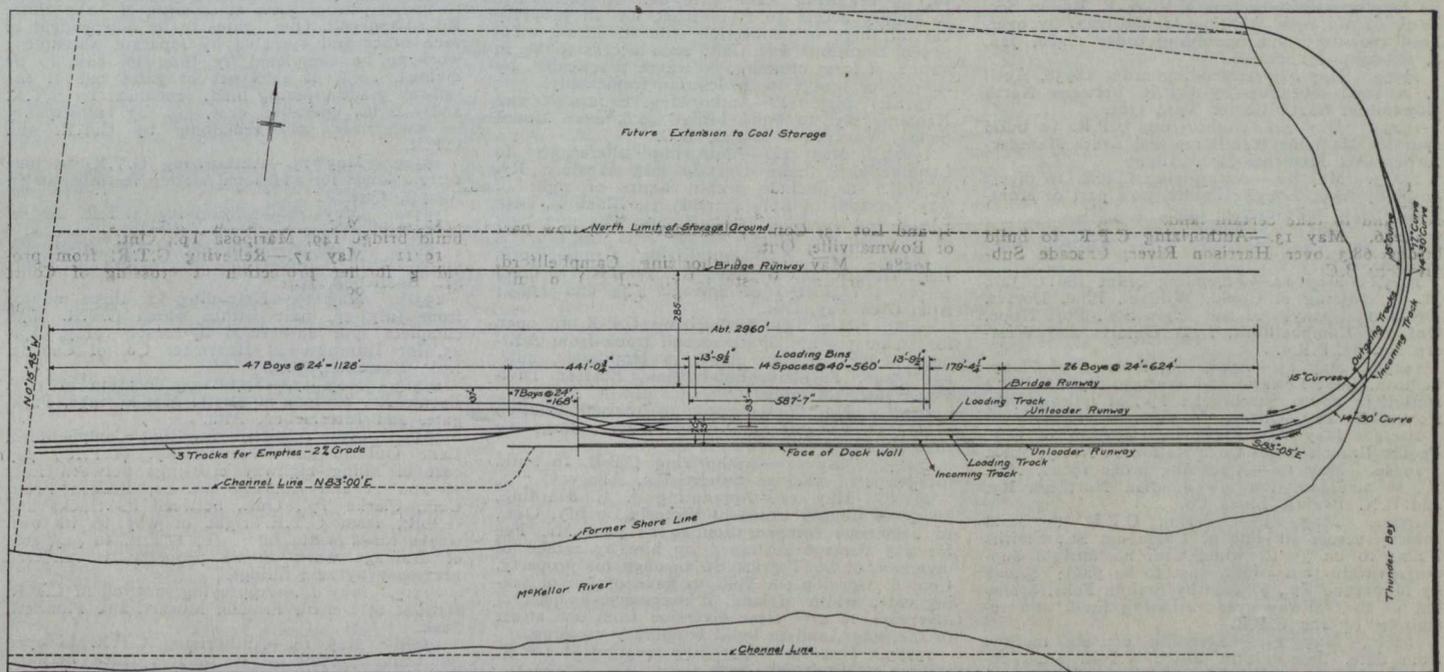
A complete description of the coal handling plant that the C.P.R. is having constructed for its own coal at Fort William, was given in the Canadian Railway and Marine World for Feb., 1912. That article covered the construction and operating details of the machine itself. The layout of the plant, with a view to continuous operation without pauses while waiting for the shunting in of cars, is rather ingenious, as an examination of the accompanying plan will show.

The plant consists of two unloaders, which lift the coal in 8 ton buckets from the vessel's hold, and carry it back either to a temporary storage pile beyond the north rail of the runway, or to 35 ton scale cars on double tracks between the unloader tracks. From a temporary storage pile, the coal is picked up by a 9 ton bucket, on a 520 ft. cantilever bridge, which bridges the main storage pile to the north of the temporary storage.

In operation, a switcher brings in a string of empties from the yard, running along the incoming tracks under the unloader, leaving the string on one of the three temporary storage tracks. From these tracks, the string can be run down into the plant, as required, by gravity, this being the object of the 2% ramp. Thus, 15 cars can be run in on either of the loading tracks. The box car loaders proceed along one string of cars, filling them up, then back along the other string. While one is being filled up, the other set of loaded cars is drawn further along through the plant by a car haulage system at the east end, and a set of empties run down by gravity to take their place. The loaded cars are drawn off from the east end of the plant by the switcher, which is kept busy bringing empties, and drawing away the loaded cars. By the use of this third incoming track, and the graded empty yard, the movement of the cars through the

## Proposed Railway From Quebec to Labrador.

The Newfoundland Legislature has been giving consideration to a measure providing a subsidy of 6,000 acres of land a mile, with a free right of way, exemption from taxation and some lesser privileges, towards the building of a railway in the Newfoundland Labrador. It is proposed that a contract shall be entered into with the Canadian Atlantic Corporation, the directors of which include Thomas Skinner and J. Foster, London, Eng. This corporation proposes to build a railway from Quebec to Cape Charles, or between that point and Bradore Bay; to operate a train ferry between the Labrador coast and Newfoundland, and a line from the ferry to the Reid Newfoundland Ry. near Bonne Bay. The present proposal covers only the proposed line on the Labrador coast, which would form part of a continuous line from Quebec to the coast. The corporation represents that it has made a provisional agreement to take a 99 year



Plan of C.P.R. Coal Handling Plant at Fort William, Showing Arrangement of Tracks for Continuous Movement of Cars Being Loaded.

There are 30 car loading bins located in a double row, as indicated on the plan, and under the scale cars, by which they are filled. The scale cars drop the exact amount of coal, corresponding to the capacity of the freight car, to be loaded into each of the bins, and from the latter the coal descends into box car loaders, which fill the box cars on the two loading tracks shown.

The ingenious feature of the layout is the planning of these loading and entering tracks. From the east, along the edge of the dock wall, runs the incoming track, which enters from the east, where the trackage comes from the adjacent yards, all the tracks coming in on a sharp curve from the rear of the storage pile. Proceeding west along the dock wall, to the south of the loading bins, the three tracks through the plant converge—that is, the two loading tracks and the incoming track. Beyond this converging track are three parallel tracks, rising on a 2% gradient, the tracks terminating at the west end of the plant. These three tracks are for the temporary storage of the empties on their passage through the plant.

plant is continuous.

It is of interest to note that the dock was sunk in the solid ground, and after completion, the ground outside was dredged out. At this section of Island no. 1, on which the plant stands, the ground was very low, so that the discharge from the hydraulic dredges working on improvements to the McKellar River channel were usefully employed in bringing the level of the ground to the proper height.

### Canadian Ticket Agents' Association.—

At a meeting of the executive committee at London, Ont., June 13, J. P. Hanley, C.P. & T.A., Grand Trunk Ry., Kingston, Ont., and W. Fulton, C.P.A., Canadian Pacific Ry., London, were appointed on the committee, vice C. E. Horning, now D.P.A., Grand Trunk Ry., and J. F. Dolan, who has been appointed D.P.A., Richelieu and Ontario Navigation Co., at Boston, Mass. J. A. McKenzie, C.P.A., Grand Trunk Ry., Woodstock, Ont., and 3rd Vice President of the Association, was appointed in place of Mr. Horning, as representative to the G.P. & T.A. convention to be held at Philadelphia, Oct. 14 and 15.

lease of running powers over the Quebec and Saguenay Ry. and its connections, between Quebec and Murray Bay, 86 miles; and has also acquired charter rights to build a railway from Murray Bay to Seven Islands, 380 miles, for which the Canadian Government has already granted a subsidy. Nothing has been arranged as to the route from Seven Islands to the Quebec-Labrador boundary. The company agrees to begin construction in four years, and to have the line completed in 10 years.

### Railway Lands Patented.—

Letters patent were issued during April, covering Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

|   | Acres.          |
|---|-----------------|
| Calgary and Edmonton Ry. ....                                     | 642.00          |
| Canadian Northern Alberta Ry. ....                                | 86.86           |
| Canadian Northern Ry. ....  | 1,456.63        |
| Canadian Pacific Ry. ....   | 47.04           |
| Grand Trunk Pacific Branch Lines Co. ...                          | 6.50            |
| Grand Trunk Pacific Ry. ....                                      | 55.46           |
| Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co. .... | 1,146.50        |
| <b>Total</b> .....  | <b>3,440.99</b> |

## Orders by Board of Railway Commissioners.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the orders took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

19246 to 19250. May 12.—Authorizing Lake Erie and Northern Ry. to build across 6 highways in Brantford Tp., across West Mill St., St. Paul Ave., Leonard St. and Morrell St., Brantford; to cross Grand Valley Ry. at grade at station 1059+06; to connect with C.P.R. at Galt; and to build across 4 highways in North Dumfries Tp., Ont.

19251. May 8.—Approving proposed deviation of G.T.R. main and Midland to Port Hope lines, District 8, Northern Division, between Ontario St. and Nicholson's File Works, Port Hope, and authorizing it to build same across Barrett St. at grade; approving deviation of its coal siding, dismissing application for building of freight siding track, and authorizing it to proceed with proposed cutoff.

19252. May 13.—Authorizing Abbotsford Timber and Trading Co., Abbotsford, B.C., to build its logging railway across V.V. & E. Ry. in Sec. 20-16 c.c.m., New Westminster District, by overhead crossing; and rescinding order 18488, Jan. 8, in same connection.

19253. May 12.—Amending order 18958, April 1, re road diversion by C.P.R. between North Gower and South Gower Tps., Ont.

19254. May 12.—Authorizing C.P.R. to build spur for Medicine Hat Pump and Brass Manufacturing Co., Medicine Hat, Alta.

19255. May 12.—Authorizing C.P.R. to divert Souigny Ave., Longue Pointe, now part of Montreal, and to take certain land.

19256. May 13.—Authorizing C.P.R. to build bridge 68.3 over Harrison River, Cascade Subdivision, B.C.

19257. May 12.—Amending order 18611, Jan. 31, re crossing of Gould, William, Pine, Dorset, Deblaque, Haywood and Elgin Sts., Port Hope, Ont., by Campbellford, Lake Ontario and Western Ry. (C.P.R.).

19258. May 13.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) station in South Sherbrooke Tp., at mileage 7.89 from Glen Tay, Ont.

19259. May 13.—Approving location of G.T. Pacific Branch Lines Co.'s station at Neely, Sask.

19260. May 13.—Amending order 19088, Apr. 21, re amalgamation of Canadian Northern Ry. and C.N. Branch Lines Co.

19261. May 13.—Ordering C.P.R. to build subway across its line at Chambers St., Smiths Falls; to be 35 ft. wide, with no upright supports within that width, cost to be paid: \$2,000 by Montague Tp., \$13,000 by Smiths Falls, \$5,000 out of the railway grade crossing fund, and remainder by the C.P.R.

19262. May 13.—Extending for six months from date, time within which C.P.R. shall remove telegraph poles between Place Viger and Hochelaga, Montreal, in compliance with order 12225, Nov. 9, 1910.

19263. May 13.—Authorizing C.P.R. to build subway at 7th Ave., Saskatoon, Sask.

19264. May 13.—Authorizing C.P.R. to build bridge across Humber River, Islington, at mileage 7.4, London Subdivision, Ont.

19265. May 13.—Ordering that C.P.R. shall by June 15 schedule train 30 to arrive at Finch to connect with Ottawa and New York Ry. train 20, due to leave Finch at 9.42 a.m.; when train 30 is late, and is carrying passengers for points on, or via O. & N.Y. Ry. between Finch and Ottawa, C.P.R. shall at or before 9.42 a.m. notify O. & N.Y.R. station agent at Finch, state number of minutes it will probably be late on arrival at Finch, and number of passengers desiring to make connection; and O. & N.Y.R. shall hold train 20 at Finch to permit the transfer of passengers, baggage and mail, unless C.P.R. train 30 will not arrive until after 9.55 a.m.

19266. May 13.—Relieving G.T.R. from providing further protection at fourth highway crossing north of Simcoe station, Port Rowan Branch, Ont.

19267. May 13.—Authorizing Toronto, Hamilton and Buffalo Ry. to build second main line track at grade across 6 highways in South Grimsby Tp., Ont.

19268. May 13.—Approving revised location of Nipissing Central Ry. on Lakeshore Road, near foot of Blackwall St., Haileybury, Ont.

19269. May 13.—Approving Supplement 12 to Express Classification for Canada no. 2.

19270. May 12.—Approving location of G.T. Pacific Ry. proposed station at Resplendent, B.C.

19271. May 13.—Authorizing G.T. Pacific Ry. to take, for signal tower site, land containing 0.018 acres, adjoining Empire Ave., and C.N.R. right of way in Park Lot 16, Port William, Ont.

19272. May 13.—Approving location of G.T.

Pacific Branch Lines Co.'s station at Ancrum, Sask.

19273, 19274. May 14.—Approving alterations in location of G.T. Pacific Branch Lines Co.'s station grounds, and grade of its Brandon Branch, mileage 8.7 to 9.5, and alterations in location of its station grounds at mileage 17.5, Brandon District, Man.

19275. May 14.—Extending to July 31, time within which G.T.R. complete siding for John Crew Lumber Co., Lindsay, Ont., authorized by order 18066, Nov. 18, 1912.

19276. May 14.—Authorizing G.T.R. to build siding for Beaver Companies, on Lot 48, Thorold Tp., Ont.

19277. May 13.—Ordering Kingston and Pembroke Ry. (C.P.R.) to remove trees for not less than 175 ft. from crossing on face of hill, and planting off to track and highway for not less than 200 ft. at crossing of Renfrew and Douglas Road, about 3½ miles southwest of Renfrew, Ont.

19278. May 13.—Approving location C.N.R. third class station at Conquest, Sask.

19279. May 14.—Authorizing C.N. Saskatchewan Ry. to build its Wroxton Westerly Branch across G.T. Pacific Ry. in Sec. 12-25-11, w. 2 m., Sask.

19280. May 15.—Amending order 19218, May 8, acquirement of certain lots in Regina, Sask., by Canadian Northern Ry.

19281. May 14.—Amending order 19087, Apr. 16, by requiring Lake Erie and Northern Ry. to supply access to river front for all property cut off there in connection with its location between Brantford and Galt, such access to be in nature of farm crossing, or where practicable, by subway or bridge for pedestrian traffic only.

19282. May 14.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 46.8, near Mount Sicker, Vancouver Island, B.C.

19283. May 14.—Approving alterations in Campbellford, Lake Ontario and Western Ry. (C.P.R.) to include within limits of right of way, portions of Lots 45 and 231, Block B, Con. 1, and Lot 13, Con. 1, Darlington Tp., now part of Bowmanville, Ont.

19284. May 15.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across 2 highways at mileage 3.33 and 159.94 from Glen Tay, Ont.

19285. May 15.—Authorizing C.P.R. to open for traffic portion of its second track from Adirondack Jct., mileage 40.66, to Highlands, mileage 42.46, Farnham Subdivision, Eastern Division, Que., 1.8 miles.

19286. May 14.—Approving revised location of C.P.R. Forsyth St. Branch, from mileage 0.0 to 0.20, Montreal.

19287. May 14.—Authorizing C.P.R. to build bridge 98.1, Macleod Subdivision, Alta.

19288. May 12.—Appointing J. E. Harding, Judge of County Court of Victoria County, Ont., to determine compensation to be paid Mr. Fee for any damage sustained by him by reason of diversion of St. Patrick St. through his property, Con. 6, Ops Tp.; C.P.R. to have option of taking extra width of land, if necessary, as part of diversion, to give clear diversion from one street to the other, and to build temporary crossing.

19289. May 13.—Approving location of C.P.R. station at Hitchcock, Sask.

19290. May 15.—Approving location of C.P.R. double track from mileage 49.5 from Broadview, westerly to mileage 70.27, Moose Jaw Subdivision, Sask., and authorizing its building across 16 highways.

19291. May 14.—Approving location of C.P.R. station at St. Joachim, Ont.

19292. Amending order 19048, Apr. 15, re C.P.R. sidings for H. B. Harrison, Owen Sound, Ont.

19293. May 12.—Ordering C.P.R. to erect fences, gates and cattle guards along portion of its right of way at Kingsgate, B.C.

19294. May 15.—Authorizing G.T. Pacific Ry. to operate over crossing of Canadian Northern Ry., St. Boniface, Man., pending installation of interlocking plant, which is to be installed by July 15.

19295. May 14.—Authorizing City of Toronto to build foot subway under G.T.R. south of Innis Ave., connecting Gilbert Ave. and Prescott Ave.

19296. May 8.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across road allowance between Lot 14, Con. 7, and Lot 15, Con. 8, Richmond Tp., mileage 54.88 from Glen Tay, Ont., and authorizing it to divert roadway between on Lot 14.

19297. May 13.—Authorizing C.P.R. to use bridges 57.8, 129.3, 6.5, 125.4, 125.2, 19.6, 85.1, 5.1 and 63.8.

19298. May 13.—Ordering C.P.R. to build bridge over its lines at mileage 12.23, carrying G.T.R., 0.84 mile north of Myrtle, sufficient for present G.T.R. requirements; work to be done by C.P.R., and completed within 4 months from date; if C.P.R. desires, Board will state a case, in writing, for opinion of Supreme Court of Canada upon question whether or not excess of cost, to be determined by Board's Chief Engineer, between a bridge sufficient to carry former traffic and bridge to carry traffic required by

G.T.R. conditions of today, should, under agreement, be borne by it; in event of Supreme Court advising that C.P.R. is not, under agreement, liable for difference in cost, G.T.R. shall pay difference to C.P.R.

19299. May 16.—Dismissing C.P.R. application to build one spur and four sub spurs on southerly side of London St., between Caron Ave. and Salter St. to Sandwicon St., Windsor, Ont.

19300 to 19302. May 9.—Approving interlocked signalling plants to be installed on C.P.R. at Breslay, mileage 5.94, Ottawa Subdivision, at South Jct., and at Mile End, Que.

19303. May 17.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands for diversion of Kingston Road and various intersecting highways in Murray and Brighton Tps., between mileage 91 and 95; and amending order 18447, Dec. 30, 1912, in similar connection.

19304. May 12.—Authorizing Lake Erie and Northern Ry. to build at grade across Brantford St. Ry. at Brantford, Ont.

19305. May 15.—Approving location and detail plans of C.N. Quebec Ry. station at Maisonneuve.

19306. May 15.—Dismissing applications of Lachine, Jacques Cartier and Maisonneuve Ry. (G.T.R.) and C.N. Ontario Ry. for order cancelling approval of C.P.R. plan showing bridge crossing said railways near Jacques Cartier Jct., Que., authorized by order 17931.

19307. May 15.—Authorizing G.T.R. to take certain lands for new freight shed and tracks in connection with extension of terminal facilities at Pembroke, Ont.

19308. May 16.—Ordering G.T.R. and C.P.R. to install pair of gates at crossing of Lake Shore Rd., Vaudreuil, Que., gates to be independent of each other and operated by separate watchmen; work to be completed by June 30, cost to be divided, 20% of each set of gates out of the railway grade crossing fund, remainder by G.T.R. and C.P.R., operation cost, 5% by municipality in each case, and remainder by G.T.R. and C.P.R.

19309. May 15.—Authorizing G.T.R. to take certain lands for additional station facilities at St. Agapit, Que.

19310. May 16.—Authorizing G.T.R. to rebuild bridge 149, Mariposa Tp., Ont.

19311. May 17.—Relieving G.T.R. from providing further protection at crossing of Court St., Coaticook, Que.

19312. May 19.—Extending for three months from July 25, time within which G.T.R. shall complete spur authorized by order 19127, Apr. 25, for International Harvester Co. of Canada, Ltd., Hamilton, Ont.

19313. May 17.—Approving location of G.T. Pacific Ry. stations at Miette Hot Springs, Parkgate, and Interlachen, Alta.

19314. May 15.—Ordering that Campbellford, Lake Ontario and Western Ry. (C.P.R.) pay cost of filling highway crossings between Lots 10 and 11 and Lots 20 and 21, Broken Front Con., Clarke Tp., Ont., between its tracks and G.T.R., from G.T.R. right of way to its own tracks for a width of 40 ft; G.T.R. to pay cost of drainage work on its property, if rendered necessary by said fillings.

19315. May 17.—Approving location of C.P.R. stations at Denzil, Froude, Mozart, and Plunkett, Sask.

19316. May 16.—Authorizing C.P.R. to open for traffic portion of its double track between Parkbeg and Walker, 8.8 miles, Swift Current Subdivision, Sask.

19317. May 19.—Extending to June 30, time within which C.P.R. shall install gates at Bartlett Ave., Toronto, required by order 18908, Feb. 12.

19318. May 16.—Authorizing C.P.R. to build spur for Imperial Oil Co., near Hastings, B.C.

19319. May 15.—Authorizing City of Fort William, Ont., to build its street railway across Canadian Northern Ry. at intersections of Victoria Ave. and Vickers St., and of Franklin St. and C.N.R.

19320. May 16.—Ordering that Great Northern Ry. and Northern Pacific Ry. issue regular tickets and carry passengers to and from Emerson and Morris on their trains, stopping at such points.

19321. May 14.—Authorizing Lake Erie and Northern Ry. to cross Grand Valley Ry. at grade, near Paris, Ont., and to divert and build its line under G.V.R. at station 387+05.

19322. May 16.—Authorizing Toronto Suburban Ry. to build under C.P.R. in Lot 11, Con. 5, York Tp., by means of undercrossing; and dismissing application for connection there.

19323. May 16.—Authorizing Toronto, Hamilton and Buffalo Ry. to build its double track across 18 highways in Pelham Tp., Ont.

19324. May 17.—Approving location and plans of Pere Marquette Rd. station at Coatsworth, Ont.

19325. May 13.—Authorizing C.P.R. to build spur for Canadian Metal Shelter Co., Winnipeg.

19326. May 17.—Approving alteration on Campbellford, Lake Ontario and Western Ry. (C.P.R.) to include extra lands required for station grounds in Lots 25, 26, 27 and 28, Con. 8, Camden Tp.

19327. May 19.—Relieving C.P.R. from providing further protection at first public highway west of Merrickville, Ont.

19328. May 19.—Authorizing C.P.R. to build its coal mine spur at grade across road allowance between Secs. 10 and 9, Tp. 2, r. 6, w. 2 m., at Bienfait, Sask.
19329. May 19.—Extending to July 15, time within which C.P.R. shall install bell at La Croix St., Chatham, Ont.
19330. May 17.—Ordering G.T.R. to move crank stand at crossing of Strachan Ave., West Toronto, Ont., to north and as near as possible to its south track and erect signal cabin over same; C.P.R. to pay 1-3 of cost.
19331. May 19.—Relieving G.T.R. from operating trains between Powassan and Trout Creek, Ont., at less speed than 15 miles an hour.
19332. May 17.—Approving Hull Electric Co. Standard Mileage Freight Tariff, C.R.C., F.1, for distances up to 15 miles.
19333. Jan. 31.—Authorizing C.N. Ontario Ry. to build subway between Cons. B and 2, Westmeath Tp., Ont.; to have 14 ft. headroom, and to be 20 ft. wide for travelled portion of highway.
19334. May 16.—Ordering that cost of subway under C.P.R. at Dundas St., Woodstock, Ont., required by order 16986, July 8, 1912, be paid, 20% out of the railway grade crossing fund, 70% of remainder by C.P.R., and 30% by City of Woodstock; provided city's contribution shall not exceed \$7,000; C.P.R. to pay cost of maintenance, city to maintain the roadway.
19335. May 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to divert Kingston road, Bowmanville, Ont., to carry diversion across its line overhead at mileage 149.5 from Glen Tay, to continue diversion northeasterly to connect with Kingston Road, to divert road allowance between Lots 14 and 15, to connect with forementioned diversion, and to carry road between Lots 14 and 15 across its line overhead, bridge and approaches on Kingston Road to be 25 ft. wide, and bridge and approaches on side road to be 20 ft. wide.
19336. Apr. 29.—Authorizing C.P.R. to build spur for International Malleable Iron Co., Guelph, Ont.
19337. May 20.—Authorizing C.P.R. to use bridges 44.7, Shuswap Subdivision; 37.3, 127.2, Mountain Subdivision; 108.6, 89.4, 90.6, 102.6, 95.2, and 110.1, Cascade Subdivision, B.C.
19338. May 10.—Authorizing C.P.R. to open for traffic portion of its double track between Pense and Belle Plaine, Sask., mileage 109.6 to 117.3.
19339. May 20.—Authorizing C.P.R. to build bridges 14.9, near Cookville, and 36.6, near Christie, Ont.
19340. May 20.—Extending to Aug. 31, time within which C.P.R. shall complete spurs for Ontario National Brick Co., Toronto Tp., as authorized by order 18723, Feb. 17.
19341. May 19.—Authorizing C.P.R. to divert Current River at Port Arthur, Ont., and to build bridge 126.5.
19342. May 19.—Authorizing C.P.R. to build spur for City of Medicine Hat, Alta.
19343. May 19.—Authorizing C.P.R. to build Vanguard ballast pit spur on its Swift Current Southeasterly Branch, across highways at mileage 0.22, 1.54, 3.82 and 4.3.
19344. May 20.—Approving G.T. Pacific Ry. stations at Pedley and Jasper House, Alta.
19345. May 10.—Authorizing G.T.R. to build siding for Dominion Cannery, Simcoe, Ont.
19346. May 10.—Authorizing Sandwich, Windsor and Amherstburg Ry. to cross Essex Terminal Ry. on east side of Wellington Ave., Sandwich East Tp., and Canada Southern Ry. spur to Postum Cereal Co., Windsor, Ont.
19347. May 14.—Ordering G.T. Pacific Ry. to erect station 3,000 ft. east of eastern boundary of Fort George townsite; and rescinding order 18902, Mar. 20, in that connection.
19348. May 16.—Ordering C.N. Ontario Ry. to build cattle passes for J. Fletcher and J. Wilson, Ross Tp., Ont.
19349. May 19.—Authorizing C.P.R. to use bridges 94.8, 104.9, Moose Jaw Subdivision, Sask., and 46.37, Broadview Subdivision, Man.
19350. May 19.—Authorizing C.P.R. to build bridges 12.2 over Pallets Creek, 19.9 over Credit River, and 28.4, London Subdivision, Ont.
19351. May 22.—Ordering that interlocking plant required to be installed at G. T. Pacific Ry. crossing of Port Arthur and Fort William Electric Ry., at Syndicate Ave., Fort William, by order 17657, be installed by July 31, and authorizing G.T. Pacific Ry., pending completion, to operate over same; trains to stop on each side of crossing; watchmen provided by G.T.P.R. to flag trains and cars.
19352. May 22.—Authorizing G.T. Pacific Ry., pending installation of interlocking plant, to operate trains over crossing of Canadian Northern Ry. at Empire Ave., Fort William, Ont.; interlocking plant to be installed by July 31; G.T.P.R. trains to stop on each side of crossing, and watchmen, appointed by C.N.R. and paid by G.T.P.R., to be placed there.
19353. May 22.—Authorizing G.T. Pacific Ry. to build extension in Empire Ave., across Syndicate Ave. and Vickers St. to connection with C.P.R., Fort William, Ont.
19354. May 22.—Authorizing G.T. Pacific Ry. to build spurs from its Lake Superior Branch in Empire Ave., Fort William, Ont., for Jas. Murphy and Copp Foundry Co.
19355. May 23.—Ordering that Campbellford, Lake Ontario and Western Ry. (C.P.R.) may close portions of road allowances to be diverted in Brighton and Murray Tps., Ont., as provided by order 18447, Dec. 30, 1912.
19356. May 22.—Extending express collection and delivery limits in Winnipeg to include portion of Elmwood, from corner of Chambers and Watt Sts., along Watt St. to Union Ave., and thence on Union Ave. to C.P.R.
19357. May 23.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.), plan 52401-1, Apr. 22, file 3701.232.
19358. May 21.—Approving location of C.P.R. station at Wolverton, Ont.
19359. May 23.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to provide two grade crossings for W. S. Provins, Kingston, Ont.
19360. May 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across forced road in Lot 14, Con. 7, Richmond Tp., at mileage 54.99, overhead; and dismissing application for grade crossing.
19361. May 22.—Approving location of C.P.R. station at Iratee, Ont.
- 19362, 19363. May 20, 23.—Authorizing C.P.R. to build bridges 119.2, Boundary Subdivision, B.C., and 91.48, over Deadfall Creek, Cartier Subdivision, Ont.
19364. May 21.—Authorizing C.P.R. to build its Forsyth St. Branch at grade across St. Leonard Road, Longue Pointe, Montreal, at mileage 3.83.
19365. May 21.—Authorizing G.T.R. to build siding for St. Mary's Portland Cement Co., Blansard Tp., Ont.
19366. May 22.—Approving location of G.T. Pacific Branch Lines Co. station at Ardley, Alta.
19367. May 20.—Authorizing G.T.R. to build siding and spur for Brown's Copper and Brass Rolling Mills, New Toronto, Ont.
19368. May 20.—Approving revised location of Niagara, St. Catharines and Toronto Ry. from boundary between Niagara Tp. and Niagara-on-the-Lake, Ont., along King St., mileage 11.1 to 12.14; and authorizing it to build across Cottage, Pafford, John, Castlereagh, Platoff and Picton Sts.
19369. May 21.—Approving Kettle Valley Ry. revised location from Hydraulic Summit to Penitence, mileage 50, to 58.12, B.C.
19370. May 17.—Recommending to Governor in Council for sanction, amalgamation agreement of Canadian Northern Ry. and Winnipeg and Northern Ry.
19371. May 23.—Authorizing C.P.R. to build (for double tracking) bridges 28.11, near Hornby, and 37.0, near Christie, Ont.
19372. May 23.—Authorizing C.P.R. to use bridges 17.4, Ottawa Subdivision, and 6, on Sherbrooke Section, Orford Mountain Branch.
19373. May 23.—Authorizing C.P.R. to cross and divert road on its Kerrobert Northeasterly Branch at mileage 34.05 from Kerrobert, Sask.
19374. May 26.—Approving location of C.P.R. station at Odell, Ont.
19375. May 23.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build ballast pit spur at grade across highway between Cons. Broken Front and 1, Clarke Tp., Ont.
19376. May 26.—Approving location of G.T. Pacific Branch Lines Co. station at Rossman, Sask.
19377. May 26.—Approving location of G.T. Pacific Ry. stations at Crest, Empire Ave., Horne, Linko and Dawson Road, Lake Superior Branch, Thunder Bay District, Ont.
19378. May 26.—Authorizing G.T.R. to build additional track across Woodbine Ave., Toronto.
19379. May 23.—Authorizing Montreal and Southern Counties Ry. to open for traffic portion of its line from the Country Club Branch, through Greenfield Park, to Central Vermont Ry., St. Antoine de Longueuil Parish, Que., 2.25 miles.
19380. May 23.—Authorizing Canadian Northern Branch Lines Co. to cross and divert public road between Secs. 36-34-5 and 1-35-5, w. 2 m., with its Sturgis to Hudson Bay Line.
19381. May 26.—Authorizing C.N. Ontario Ry. to divert public road between Cons. 3 and 4, Scarborough Tp., and carry road under its line by subway; company to build only that portion of diversion between north boundary of its right of way and where diverted road joins the original road on the south.
19382. May 23.—Authorizing Great Northern Ry. and British Columbia Electric Ry. to operate over crossing in New Westminster without stopping.
19383. May 26.—Authorizing C.P.R. to build bridge 7.17 over Reynolds Creek, Port Burwell Subdivision, Ont.
19384. May 26.—Authorizing G.T.R. to build siding for McCormick Manufacturing Co., London, Ont.
19385. May 26.—Approving location of G.T. Pacific Branch Lines Co. stations at Argo, Wakaw, Edenwold, Fee, Zehner and Siding 7, Sask.
19386. May 26.—Approving location of C.N. Ontario Ry. station grounds at Smoky Falls, mileage 253.38 from Ottawa.
19387. May 17.—Authorizing C.P.R. to build its Forsyth St. Branch under Montreal Tramway Co.'s tracks on Lasalle and Pie XI Sts., and to cross same on Aird St. at grade in Maisonneuve, Que.
19388. May 27.—Extending to Dec. 1, time for approval of C.P.R. telegraph tolls in Canada west, including Sudbury, Ont., to and from points west of Sudbury, from and to points east thereof, and east of and including Windsor, Ont., and authorizing use of existing tolls in meantime.
19389. May 26.—Authorizing C.P.R. to build branch for Godson Construction Co., Darlington Tp., Ont.
19390. May 27.—Amending order 18781, Feb. 25, re C.N. Ontario Ry. station grounds at various points.
19391. May 26.—Relieving Vancouver, Victoria and Eastern Ry. and Navigation Co. from erecting fences along its right of way from New Westminster to Vancouver, B.C., relief to cease when any land on either side becomes settled.
19392. May 26.—Ordering G.T.R. and C.P.R. to install improved types of automatic electric bells at crossing of Perth Road, near Kingston, Ont., and to remove mud piles.
19393. May 26.—Approving location of G.T. Pacific Ry. station at Thornton, Alta.
19394. May 17.—Authorizing Toronto Eastern Ry. to cross and divert Oshawa Creek, Oshawa, Ont., and to take portions of Lots 11 and 12, and strip of land 17 ft. wide on each side of approved location, question of value to be settled by arbitration if parties unable to agree.
19395. May 23.—Establishing collection and delivery limits of Dominion Express Co. in Gull Lake, Sask.
19396. May 26.—Ordering that G.T.R. and Campbellford, Lake Ontario and Western Ry. (C.P.R.) provide farm crossings for M. I. Way, Trenton, Ont., each company to do work on its own right of way.
19397. May 29.—Approving plans for carrying McIntyre drain under G.T.R., Southwold Tp., Ont.
19398. May 27.—Authorizing Toronto Suburban Ry. to connect with C.P.R., near Weston, Ont.
19399. May 29.—Approving location and revised location of Toronto Eastern Ry. through Pickering and Scarborough Tps.
19400. May 29.—Relieving C.N. Quebec Ry. from erecting fences along its right of way between mileage 22 and 49, Montfort Branch, until land on either side becomes settled.
19401. May 29.—Authorizing C.N. Ontario Ry. to build across highways in Stafford Tp. between Lots 30 and 31 and 31 and 32, Con. 1.
19402. May 29.—Authorizing C.N. Ontario Ry. to build across public road between Lots 32 and 28, Cons. 1 and A, Stafford and Alice Tps.
19403. May 29.—Authorizing Canadian Northern Ry. to build bridges over Shebandowan and Mattawin Rivers at mileage 55.2 and 51.1 from Port Arthur respectively to replace present structure.
19404. May 29.—Authorizing C.P.R. to build bridges 94.0 over Kettle River, Boundary Subdivision, B.C., and 1.0 over main irrigation canal, Bassano-Empress Subdivision, Alta.
19405. May 29.—Authorizing C.P.R. to build spur for Arlington Shingle Co., Nanoose District, Vancouver Island, B.C.
19406. May 29.—Authorizing C.P.R. to build spur for Ontario Stone Corporation, North Orillia Tp., Ont.
19407. May 30.—Approving change of grade in present grade crossings on C.P.R. London Subdivision, Ont., and authorizing it to build additional track across two highways at mileage 10.86 and 11.43, Etobicoke, Tp., Ont.
19408. May 27.—Approving location and revised grade, as built, of C.P.R. second track from Lot 23, Con. 3, Scarborough Tp., mileage 87.34, to Leaside Jct., Ont., at mileage 95.64 from Havelock.
19409. May 26.—Approving revised location of C.P.R. station at Stirling, Alta.
19410. May 26.—Approving location of C.P.R. station at Cloan, Sask.
19411. May 27.—Amending order 19265, May 13, re C.P.R. connection with Ottawa and New York Ry. at Finch, Ont., by providing that service at Chesterville and Merrickville be continued.
19412. May 27.—Authorizing Esquimalt and Nanaimo Ry. to open for traffic its Cowichan Lake Branch from Hayward Jct. to Cowichan Lake, B.C., 18 miles.
19413. May 30.—Authorizing Esquimalt and Nanaimo Ry. to build bridge 5.45 near Esquimalt, Vancouver Island, B.C.
19414. May 26.—Relieving G.T. Pacific Ry. from erecting fences along portions of its right of way west of Winnipeg, relief to cease when any land on either side becomes settled.
19415. May 26.—Authorizing G.T.R. to build siding and spur for J. G. Butterworth, Ottawa, Ont., crossing of Rochester St. to be protected by watchman.
19416. May 27.—Authorizing G.T.R. to build siding connecting its District 32, Ottawa Division (Canada Atlantic Ry.), with its District 12, Northern Division, at Scotia Jct., Ont.
19417. May 27.—Approving G.T.R. plans of new station at Port Hope, Ont.
19418. May 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to cross and divert road at mileage 55.87 from Glen Tay, in Richmond Tp., Ont.

19419. May 29.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) revised location from mileage 91.22 to 92.00 from Glen Tay, Ont.

19420. May 22.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands for diversion of Kingston Rd., Bowmanville, and road allowance between Lots 14 and 15, Con. 1, Darlington Tp., Ont.

19421. May 26.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build tracks of east and west spurs to gravel pit at grade across forced road in Lots 20 and 24, and roadway between Lots 24 and 25, Con. 8, Camden Tp., at mileage 47 from Glen Tay.

19422. May 31.—Approving G.T. Pacific Ry. Standard Freight Mileage Tariff, C.R.C. 16, to supercede C.R.C. 4, to apply between stations from Superior to Fort William, Ont., inclusive.

19423 to 19427. May 30.—Extending to Dec. 1, time for approval of telegraph tolls for Great North Western Telegraph Co., North American Telegraph Co., G.T. Pacific Telegraph Co., White Pass and Yukon Route and Canadian Northern Telegraph Co., and authorizing use of existing tolls in meantime.

19428. May 30.—Authorizing C.N. Ontario Ry. to build across highways between Lots 5 and 6 and between 3 and 4, Con. 1, Pembroke Tp.

19429. May 19.—Amending order 18592, Jan. 29, re stopping of G.T. Pacific Ry. trains at Harport, B.C., by striking out words "until the opening of navigation" in last line.

19430. May 19.—Ordering Great Northern Ry. to build foot subway 8 ft. wide by 7½ ft. high at foot of Subway Ave., White Rock, B.C., and to file within 30 days from date detail plans for approval; subway to be built within 3 months after approval; cost be paid, half by G.N.R., and half by Surrey Municipality.

19431. May 31.—Authorizing C.P.R. to open for traffic portion of its main line second track between Mission Jct. and Hammond, B.C., mileage 86.8 to 105.09.

19432. May 30.—Authorizing C.P.R. to build spur for J. Kerr, in Lot 16, Con. 10, Erin Tp., Ont.

19433. May 31.—Extending to June 30, time within which C.P.R. may operate over crossing with Hull Electric Ry.

19434. May 29.—Authorizing C.N. Ontario to build overhead across G.T.R. near Pembroke, Ont.

19435. May 30.—Amending order 7715, Aug. 5, 1909, re National Transcontinental Ry. crossing of Temiscouata Ry. at Grand Falls, N.B.

19436. May 22.—Authorizing C.P.R. to build bridge 35.1, near Christie, London Subdivision, Ont.

19437. May 22.—Ordering C.P.R., within two weeks, to add its standard fringe to crossing gates at Royce Ave., Toronto, leaving no opening, and fence to connect closely.

19438. May 30.—Authorizing C.P.R. to appropriate Subdivisions 170, 171 and 172 of primitive lot Cadastral 138, Montreal Parish, for team yard at Montreal Jct.

19439. May 31.—Approving plan showing guard rails for trestles and bridges on Kootenay and Alberta Ry.

19440. May 31.—Approving specifications of Coleman municipal drain under G.T.R., in Lot 25, Con. 2, Elma Tp., Ont.; G.T.R. to have option of doing work on its own right of way.

19441. May 31.—Authorizing G.T. Pacific Branch Lines Co. to build spur for L. R. Gransauil at Ferintosh, Alta.

19442. June 2.—Approving location of G.T. Pacific Branch Lines Co. station at Siding 1, mileage 5.9, Regina-Moose Jaw Branch, Sask.

19443. June 2.—Ordering that interchange tracks between G.T.R. and C.P.R. at Orillia be completed by July 1.

19444. June 2.—Authorizing C.P.R. to build bridge over Etobicoke River, near Summerville, Ont.

19445. May 31.—Authorizing C.P.R. to build spur for Cameron and Heap, Fort William, Ont.

19446. June 2.—Authorizing C.P.R. to build additional track at Lakeside across road allowance between Cons. 12 and 13, East Nissouri Tp., Ont.

19447. May 31.—Authorizing C.P.R. to build Bromhead ballast pit spur across highways at mileage 34.0, on its Estevan-Forward Branch, Sask.

19448. June 2.—Authorizing C.P.R. to build spur for Town of Estevan, Sask., to be completed within 3 months from date.

19449. May 31.—Approving revised location of C.P.R. Bassano Easterly Branch from mileage 0 to 8.25 from Bassano, and authorizing it to cross 9 highways.

19450, 19451. May 31.—Authorizing C.P.R. to build spurs for T. Jackson and Son, and Westrum Asphalt Paving Co., Winnipeg.

19452. May 31.—Authorizing C.P.R. to build additional tracks across highways at mileage 65.6 and 66.4 from North Bend, Cascade Subdivision, B.C.

19453. May 31.—Authorizing C.P.R. to build spur for Superior Sand and Gravel Co., St. Gabriel de Brandon Parish, Que.

19454. June 4.—Approving location of C.P.R. station at Retlaw, Alta.

19455. May 30.—Authorizing C.P.R. to build

spurs on its Lac du Bonnet Subdivision, Man.

19456. May 14.—Ordering C.P.R. to build grade crossing from Junction Ave., Gloucester Tp., Ont., across its line at right angles.

19457, 19458. May 19.—Authorizing C.P.R. to build two spurs for J. Coughlan and Sons, South False Creek, Vancouver, B.C., and for City of Kamloops, B.C.

19459. May 19.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to divert portions of George and Burns Sts., Vancouver, B.C.

19460. May 19.—Authorizing C.P.R. to build spur for Call Switch Co., Port Coquitlam, B.C.

19461. June 4.—Authorizing G.T. Pacific Ry. to build bridge across Mud River, mileage 452, Prince Rupert East, B.C.

19462. June 4.—Approving revised location of C.N. Ontario Ry. from Lot 338, Con. 1, Chatham Tp., to Lot 10, Con. 1, Grenville Tp.

19463. June 4.—Authorizing C.P.R. to build bridge 32.7 over Sixteen Mile Creek, near Milton, Ont.

19464. June 2.—Authorizing C.P.R. to use bridges 54.0, 24.5, 35.7 and 54.7, Macleod Subdivision, Alta.

19465. June 4.—Authorizing C.P.R. to open for traffic its Kerobert Northeastly Branch from mileage 0 to 36.1, and limiting speed of trains to 20 miles an hour, for 25 miles, and to 15 miles an hour for the remainder.

19466. June 4.—Authorizing C.P.R. to build second track across 8 highways, mileage 25.04 to 31.02, London Subdivision, Ont., and approving change in grade of existing crossings.

19467. June 5.—Extending to Dec. 1, time in which Bell Telephone Co. may charge existing telephone tolls.

19468. June 4.—Amending order 19304, May 12, re crossing of Brantford St. Ry. by Lake Erie and Northern Ry.

19469. June 4.—Authorizing Canadian Northern Ry. to build across and divert public road between Secs. 24-13 and 23-14-2-8, w. 2 m., Sask.

19470. June 5.—Approving location of C.P.R. station at Biggar, Sask.

19471, 19472. June 5, 4.—Authorizing C.P.R. to build spur for Canada Wire and Cable Co. at Leaside Jct., Ont., on condition that connection be removed when C.N. Ontario Ry. is in operation; and spur for Alberta Stock Yards Co., Calgary, Alta.

19473. June 5.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build at grade across highway at mileage 124.07 from Glen Tay; question of protection reserved until railway is in operation.

19474. June 6.—Authorizing Toronto, Hamilton and Buffalo Ry. to cross with its double track 16 highways in Gainsboro Tp., Ont.

19475. June 5.—Amending order 19321, May 14, re crossing of Grand Valley Ry., near Paris, Ont., by Lake Erie and Northern Ry.

19476. June 6.—Approving Canadian Northern Ry. location through Tps. 25-26, r. 20-23, w. 3 m., Sask., mileage 85.24 to 105.42.

19477. June 6.—Approving location of C.N. Branch Lines Co. through Tps. 2-3, r. 21-23, w.p.m., Man., mileage 64.77 to 80.05.

19478. June 2.—Authorizing C.P.R. to build additional track across 21 highways, mileage 10.86 to 31.02, London Subdivision, Ont., and approving change of grade of existing crossings.

19479. May 27.—Ordering Canadian Northern Ry. to divert east and west road allowance from mileage 150.3 to north and joining road allowance at mileage 150.6, and also divert to north road allowance at mileage 151.3 and join north and south road allowance at mileage 151.4; diverted portion to be made 66 ft. wide, company to do grading and acquire property for diversion and convey same to Chester Rural Municipality, 125.

19480. June 2.—Authorizing Welland County Telephone Co. to erect wires across G.T.R. and M.C.R. in Bertie and Willoughby Tps., Ont.

19481. June 2.—Ordering that C.N. Ontario Ry. and G.T.R. be connected at Belleville, so as to provide for handling and interswitching traffic, C.N.O.R. to file, within 15 days, plans showing proposed connection and interchange tracks, on south side of Wharf St., from its tracks to Canada Steel Co., and connecting with G.T.R. leading to same plant near George St.; apportionment of the cost reserved.

19482. June 6.—Ordering C.P.R. to build spur from ½ mile west of Brocket Bridge to Crownest Stone Co., Lethbridge, Alta.

19483. June 6.—Authorizing C.P.R. to build bridge over South Saskatchewan River, on its Swift Current Northwesterly Branch, Sask., on condition that it provide a draw span in bridge, as required by Public Works Department, when notified to do so.

19484. June 6. Approving location Toronto and Niagara Power Co.'s power line from Sunnyside Ave. to its proposed substation on Roncesvalles Ave., Toronto.

19485. June 6.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands in Port Hope, Ont., for diversion of highways, as authorized by orders 18611 and 19257, Jan. 31 and May 12 respectively.

19486. June 6.—Amending order 19219, May 7, re G.T. Pacific Ry. station at Cooking Lake, Alta.

19487. June 6.—Authorizing G.T.R. to build

siding for Ontario Government on Lot 6, Con. 1, Etobicoke Tp.

19488. June 6.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur in Hamilton, Ont., from west of Trolley St., on its Westinghouse Branch, easterly across Trolley St., to Avondale St.

19489. June 7.—Authorizing C.P.R. to open for traffic its double track from Belle Plain to Regina Yard, mileage 109.6 to 92.0, Moose Jaw Subdivision.

19490. May 19.—Approving Vancouver, Victoria and Eastern Ry. and Navigation Co.'s plans of times and method of building bridges over certain streets in Vancouver, B.C., detail plans to be filed for approval of the Board's Engineers.

19491. June 6.—Authorizing City of Lethbridge, Alta., to build highway across C.P.R. by extending Twenty First St. South to First Ave. North.

19492. June 7.—Authorizing G.T. Pacific Ry. to carry traffic on its Lake Superior Branch between Superior and Fort William, Ont., mileage 0 to 189.9, and rescinding orders 5918 and 5992, Dec. 22, 1908, and Jan. 2, 1909, respectively, in same connection.

19493. June 6.—Authorizing C.P.R. to build additional track across Rue Plinguet, St. Boniface, Man.

19494, 19495. June 6.—Authorizing City of Regina, Sask., to build its municipal railway across C.P.R. spur at intersection of Winnipeg St. and Eighth Ave., and on North Railway St., or Dewdney Ave., at grade.

19496. May 30.—Authorizing Canadian Northern Ry. to remove spur serving lots owned by W. A. Taylor, St. John Parish.

19497. May 15.—Dismissing application of Kelowna Board of Trade, B.C., for order directing C.P.R. to discontinue charge of \$1 made on all incoming and outgoing cars delivered from and taken to its car barges.

19498. June 6.—Ordering G.T. Pacific Ry. to provide cattle pass under its line, and two farm crossings for F. W. Green, Moose Jaw, Sask.

19499. June 5.—Authorizing Esquimalt and Nanaimo Ry. to build bridge over Tsable River on its Comox Extension, B.C.

19500. May 29.—Ordering C.P.R. to move to west of Government road allowance all its tracks on south side of main line at Herbert, Sask., passing track switch to be located not closer than 500 ft. from west side of allowance; no cars to be left standing closer than 450 ft. from said road on commercial or elevator tracks, or 500 ft. on mill or spur track, etc., and rescinding order 18613, Feb. 1.

19501. June 7.—Authorizing C.P.R. to build spurs for Builders' Supply Co., Winnipeg.

19502. June 6.—Authorizing City of Regina, Sask., to build its municipal railway across C.P.R. spur at grade on Dewdney Ave., immediately west of Broad St.

19503. June 5.—Authorizing C.N. Ontario Ry. to build undercrossings on farms of J. J. Stinson and R. Moore, Nepean Tp.

19504, 19505. May 14, 12.—Authorizing Lake Erie and Northern Ry. to build under G.T.R. between Paris and St. George, at station 538+16.9, and to build across 6 highways in South Dumfries Tp., Ont.

19506 to 19510. June 7, 6.—Authorizing City of Regina, Sask., to build its municipal railway across Canadian Northern Ry. on Fourth Ave., between McIntyre and Lorne Sts.; across G.T.P. Branch Lines Co. at intersection of Elphinstone St., immediately north of Sixteenth Ave., to G.T.P. station; across C.N.R. on Albert St., between Chicago and Washington Aves.; across G.T.P. Branch Lines Co., at Fifth Ave., between Ross and Parliament Sts.; and at Thirteenth Ave., between Ross and Allan Sts.

19511. June 6.—Authorizing Canadian Northern Ry. to build across and divert public road between Secs. 12 and 13, Tp. 6, r. 18, w. 2 m., Sask.; and to close portion of road allowance diverted within its right of way.

19512. June 9.—Establishing collection and delivery limits of Dominion Ex. Co. in Kelowna, B.C.; and rescinding order 16514, May 14, 1912.

19513. June 7.—Ordering Esquimalt and Nanaimo Ry. to build steel span girder bridge, with 14 ft. clearance and 40 ft. between abutments, over Hereward Rd., Victoria, B.C.; work to be done within 6 months from date, city to regrade highway; cost of bridge to be paid, 20% out of the railway grade crossing fund, 1-3 of remainder by E. & N.R., and 2-3 by City of Victoria.

19514. June 9.—Ordering G.T.R. to operate trains over crossing of Queen St., Mount Forest, Ont., at a speed not exceeding 10 miles an hour; all switching movements on siding to be flagged over crossing.

19515. June 9.—Dismissing application City of Calgary, Alta., for extension of express delivery limits as authorized under order 15149, Sept. 8, 1911.

19516. June 7.—Approving Quebec, Montreal and Southern Ry. plans showing piers of St. Francois River bridge, between St. Francois du Lac and Pierreville, Que.

19517. June 9.—Authorizing Toronto Suburban Ry. to connect with C.P.R. at Cooksville, Ont.

19518, 19519. June 9.—Authorizing C.N. Ontario Ry. to build across public road between Lots 3 and 4, Con. 3, York Tp.; and to divert

public road on Lot 11, Con. 1, Pembroke Tp., and to build across same by a bridge.

19520. June 9.—Authorizing form of bond to be given the New Toronto Municipality by G.T.R. in connection with laying additional 6 in. water main 4 ft. below surface for conveying water from Lake Ontario to G.T.R. terminals, across Lake Shore Road, under Toronto and York Radial Ry. along 6th St., and across New Toronto St., as authorized by order 18794, Feb. 26.

19521, 19522. June 9.—Authorizing C.P.R. to operate bridges 0.55 to Sortin, Smiths Falls Sub-division; 1.85, Montreal Terminals, Westmount, Que.; 140.5 and 96.6, Calgary Subdivision, Alta.

19523. June 7.—Authorizing C.P.R. to build extension to siding across road diversion in Lot 21, Con. 13, Medonte Tp., mileage 74.87, at grade.

19524, 19525. June 9.—Authorizing C.P.R. to build spurs for Regina Trading Co. and Rumely Products Co. Inc., Regina, Sask.

19526. June 9.—Authorizing Esquimalt and Nanaimo Ry. to build bridge over Rosewell Creek, Comox extension, B.C.

19527. June 9.—Amending order 19319, May 15, re crossing of Canadian Northern Ry. by municipal electric railway at Fort William, Ont.

19528. June 9.—Ordering G.T.R. to install improved type of illuminated electric bell at crossing at Fort Erie and Port Colborne Road, east of Sherston Station; 20% to be paid out of railway grade crossing fund.

19529. June 9.—Ordering that cost of subway under C.P.R. at Hunter and Bexley Sts., Woodstock, Ont., authorized by order 16086, July 8, 1912, be paid, 20% out of the railway grade crossing fund and the remainder by C.P.R.

19530 to 19534. June 9.—Establishing express collection and delivery limits in London Ont.; Taber, Alta.; Sault Ste. Marie, portion of Steelton, Ont.; Windsor, Ont.; and Walkerville, Ont., and rescinding order 15399, Oct. 24, 1911.

19535. June 4.—Authorizing G.T.R. to build sidings and tracks, or yard extensions for Canadian Furnace Co., Port Colborne, Ont.

19536. June 10.—Ordering C.P.R. to operate two first class trains, each way, per day, on week days, between Ottawa and Prescott: time of run to be not more than 2 hours; effective July 1; and restraining company from hauling freight cars on said trains.

19537, 19538. June 9.—Establishing express collection and delivery limits in St. Thomas and Haileybury, Ont.

19539. June 9.—Extending eastern and southern limits of area within which railway companies undertake cartage of freight in London, Ont.

19540. June 10.—Dismissing application of Dominion Townlots, Ltd., for authority to build a highway across C.P.R. at Broadway, Sask.

19541. June 10.—Authorizing Esquimalt and Nanaimo Ry. to divert Comox wagon road to connect with public road crossing its line at mileage 13.0, Comox Extension, B.C.; and rescinding order 9843, Mar. 10, 1910.

19542. June 10.—Authorizing G.T.R. to rebuild bridge 134 at mileage 222.32, District 2, over St. Francis River, near Richmond, Que.

19543. June 10.—Authorizing C.P.R. to build bridge 10.8 over South Spitzer Creek, near Ostrander Station, Ont.

19544. June 10.—Ordering Canadian Northern Ry. to build culvert under its tracks on Winchester Ave., Fort Garry, Man.

19545. June 10.—Ordering Canadian Northern Ry. and C.P.R. to deepen culverts by 3 ft., and ditches across their rights of way, except portion of C.P.R. right of way which provides roadway to station buildings at Maryfield, Sask., where culvert is to be lowered 1 ft.; ditch to and from right of way to be lowered by Maryfield Village, work to be completed by Aug. 15.

19546. June 10.—Authorizing Hamilton St. Ry. to build two tracks at grade across Toronto, Hamilton and Buffalo Ry. at intersection of Main and Trolley Sts., Hamilton, Ont.

19547. June 10.—Authorizing C.N. Ontario Ry. to build overhead across public road between Pembroke and Stafford Tps.

19548. June 10.—Authorizing Canadian Northern Ry. to build across 6 highways in Saskatchewan.

19549. June 10.—Extending to June 30, time within which G.T.R. shall install bell at crossing, 150 ft. west of St. Hilaire Station, Que.

19550. June 7.—Authorizing G.T.R. to build siding for J. B. Mustard, Stanley Tp., Ont.

19551. June 10.—Authorizing C.P.R. to cross, temporarily, with its Bergen North Easterly cut-off, Canadian Northern Ry. Oak Point Branch; crossing to be protected by watchman paid by C.P.R.

19552. June 10.—Authorizing C.P.R. to build spur for R. MacFarlane and Co., Montreal.

19553. June 12.—Dismissing application of H. Simpson and others, Niverville, Man., for order directing C.P.R. to stop express trains there.

19554. June 10.—Ordering Canadian Northern Ry. to place station agent at D'Arcy, Sask., by Aug. 1.

19555. June 11.—Ordering that Canadian Northern Ry. crossings at Central Ave. and First

Ave. East, Prince Albert, Sask., be protected by watchmen between 6.30 a.m. and 6.30 p.m., daily, except Sunday; to be paid, 2-3 by C.N.R., 1-3 by city; payment to be made monthly or quarterly as parties may agree; any dispute to be settled by the Board.

19556. June 10.—Authorizing C.P.R. to build diversion of roadway in Lot 6616, Kootenay District, B.C., mileage 46.7 from Colvalli, and to cross diversion at grade.

19557, 19558. June 11.—Authorizing C.P.R. to build road diversion at mileage 38.44 from Swift Current, Sask., on its Swift Current North-westerly Branch; and cross same at grade, and to divert and cross by a bridge, road allowance in Sec. 26-19-19, w. 3 m., on same branch.

General Order 105. May 22.—Amending Regulations for Transportation of Explosives by Railway Companies, operating in Canada, to provide that companies, subject to Board's jurisdiction, but only on such lines, or portions of lines, on which solid freight trains are not operated, be permitted to carry explosives, the carriage of which is not forbidden by General Order 100, and in accordance with regulations therein contained, in quantities not exceeding 500 lbs., in any mixed train; explosives to be contained in but one car, car to be so placed in train that not less than 5 freight cars are between it and the passenger coach, or coaches.

### Birthdays of Transportation Men in July.

Many happy returns of the day to:—

J. H. Black, ex-Superintendent, Timiskaming and Northern Ontario Ry.; now at Cobalt, Ont., born near Smiths Falls, Ont., July 8, 1874.

M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.

D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

H. F. Bradley, Passenger Manager, Allan Line Steamship Co., Montreal, born at Waterville, Que., July 20, 1876.

D. C. Coleman, General Superintendent, Manitoba Division, C.P.R., Winnipeg, born at Carleton Place, Ont., July 9, 1879.

Geo. Collins, General Manager, Central Ontario Ry., Trenton, Ont., born at Kingston, Ont., July 20, 1860.

G. C. Conn, Vice President, Pere Marquette Rd., Detroit, Mich., born at Woburn, Mass., July 1, 1867.

D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.

John Corbett, ex-General Foreign Freight Agent, C.P.R., Montreal, born in Lanarkshire, Scotland, July 19, 1863.

S. E. Dewey, Commercial Agent, G.T.R., Pittsburgh, Pa., born at Beckenham, Kent, Eng., July 4, 1879.

F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.

J. B. Gray, Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, born July, 1876.

J. H. Hanna, ex-Division Freight Agent, G.T.R., at Hamilton, Ont., now at Calgary, Alta., born at London, Ont., July 27, 1867.

A. D. Huff, ex-Division Freight Agent, G.T.R., Ottawa, now Traffic Manager, Laurentide Co., Montreal, born at Chatham, Ont., July 17, 1866.

C. A. Jaques, ex Steamship Owner, Montreal, born there July 15, 1849.

J. P. Kavanagh, Local Manager, Ogdensburg Coal and Towing Co., Montreal, born at Plattsburg, N.Y., July 17, 1862.

R. G. McNeillie, District Passenger Agent, C.P.R., Calgary, Alta., born at Lindsay, Ont., July 1, 1883.

J. M. Macrae, District Freight Agent, Canadian Northern Ry., Saskatoon, Sask., born at Stornoway, Scotland, July 31, 1884.

T. J. Maguire, Accountant, Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.

R. E. Perry, Assistant General Freight Agent and Chief of Tariff Bureau, Inter-colonial Ry., Montreal, born at Drayton, Ont., July 5, 1876.

R. Preston, Master Mechanic, Manitoba Division, C.P.R., Winnipeg, born at Toronto, July 28, 1863.

J. E. Quick, General Baggage Agent, G.T.R. and G.T.P.R., Toronto, born at Richmond, Ontario Co., N.Y., July 10, 1851.

G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.

P. E. Ryan, Secretary, National Trans-continental Railway Commission, Ottawa, born there July 26, 1876.

Geo. Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1870.

G. A. Stokes, Terminal Superintendent, G.T.R., Toronto, born in Nassagawaya Tp., Ont., July 23, 1879.

R. F. Struthers, Chief Inspector of Time Service, C.P.R., Winnipeg, born at Stratford, Ont., July 31, 1879.

Sir Thos. Tait, President, Fredericton and Grand Lake Ry. and Coal Co., born at Melbourne, Que., July 24, 1864.

H. T. Wilgress, Agent, C.P.R. Pacific Steamship Service, Yokohama, Japan, born at Lachine, Quebec, July 29, 1857.

### Prince Edward Island Car Ferry Terminals.

We are officially advised that contracts for the construction of terminals for the Prince Edward Island car ferry service have been awarded as follows:—At Cape Tormentine, N.B., to A. T. Mackie, Toronto; at Carleton Point, P.E.I., to Halifax Dredging Co., Halifax, N.S.

The work to be done at Carleton Point includes the construction of a car ferry landing slip; a pier protection to the same; a rubble mound breakwater; a rubble mound approach to the landing pier; the dredging of berths or trenches for cribs of pier to 20 ft. below low water mark; the filling of cribs, etc.; the excavation to 25 ft. below low water of all the area between the car ferry landing and breakwater, and between the 600 ft. entrance and certain other points shown on plans. The landing slip is to consist of 335 ft. of double row fender work, and the protection work of nine cribs. These will include reinforced concrete and stone work, with timber facings, etc.

The work at Cape Tormentine is of a similar character, except that the landing slip is to consist of 330 ft. of double row pile fender work; and the protection work is to consist of 12 timber cribs of close faced crib work. The present pier is to be widened by the construction of widening cribs. The work at both places is to be completed by Dec. 31, 1914.

The Quebec Transportation Club's annual meeting was held at Kent House, Montmorency Falls, June 3, when the following officers were elected for the current year:—Hon. President, H. G. Matthews, General Manager, Quebec Ry., Light, Heat and Power Co.; Hon. Vice President, E. O. Grundy, General Freight and Passenger Agent, Quebec Central Ry.; Hon. Second Vice President, W. M. Macpherson; President, J. S. Thom, Manager, Quebec Transportation Co.; First Vice President, M. P. Connolly, General Agent, Richelieu and Ontario Navigation Co.; Second Vice President, G. J. P. Moore, City Passenger Agent, C.P.R.; Hon. Secretary-Treasurer, J. S. Blanchet; Committee—W. Langford, W. J. Thompson, J. T. Cassels, A. T. Dion and J. A. Everell.

## Mainly About Transportation People.

LADY MANN and her son have returned to Toronto, after spending the winter in Europe.

GRANT HALL, General Manager, Western Lines, C.P.R., Winnipeg, is reported to be seriously ill.

C. E. E. USSHER, Passenger Traffic Manager, C.P.R., and his wife and family are visiting California.

SIR WILLIAM WHYTE, who spent some time recently, at his birthplace, Charlestown, Scotland, returned to Canada, June 20.

J. U. GREGORY, for many years agent of the Dominion Marine Department at Quebec, died there, May 30, aged 83.

H. CLARKE, Storekeeper, G.T.R., Montreal, retired on superannuation, May 31, and is now residing at Cobourg, Ont.

G. McL. BROWN, European Manager, C.P.R., has been installed as Master of Canada Lodge, A.F. & A.M., in London, Eng.

ANGUS MACMURCHY, K.C., local solicitor, Canadian Pacific Ry., Toronto, and Mrs. MacMurchy, have gone to England.

R. W. SHEPHERD, of the Ottawa River Navigation Co., who died suddenly in Montreal some few months ago, left an estate of \$99,137.

Mrs. Walker, wife of J. J. WALKER, Chief Accountant, Intercolonial Ry., Moncton, N.B., died at Point du Chene, N.B., June 6.

J. E. MUHLFELD, formerly Superintendent of Motive Power, Intercolonial Ry., is now located in New York, engaged in special and consulting work.

T. W. LOWE, General Boiler Inspector, Western Lines, C.P.R., Winnipeg, has been elected President, Master Boiler Makers' Association, for the current year.

A. DENNY, of Denny and Sons, Shipbuilders, Greenock, Scotland, who has been made a baronet, was formerly a director of the Dominion Atlantic Ry.

P. DOYLE, of the G.T.R. Bridge and Building Department, Montreal, was presented with a purse of gold by the staff, Jan. 22, on the occasion of his marriage.

G. OHAPMAN, for 30 years G.T.R. station agent at Courtland, Ont., was found dead in bed at St. Thomas, May 28. He retired from active service a few years ago.

W. W. ASHALD, Superintendent of Telegraphs, G.T.R., died suddenly of heart failure, at his home, Montreal, a few hours after he returned from his office, June 17, aged 67.

F. E. SKINNER, Auditor of C.P.R. Stores and Mechanical Accounts, Winnipeg, was presented with a cabinet of silver by the staff, June 20, on the occasion of his marriage.

LADY AND THE MISSES SHAUGHNESSY left Montreal, June 22, for their summer home, Fort Tipperary, St. Andrews, N.B., where Mrs. Beauclerk will join them later.

W. M. DELANEY, who died at Boston, Mass., June 9, was at one time in the Intercolonial Ry. service, acting as assistant to the late J. E. Price, and to W. Rennels, Superintendents.

ROBERT HOBSON, Vice President and General Manager, Steel Company of Canada, and Mrs. Hobson, left Hamilton, Ont., at the end of May, to spend about three months in Europe.

Mrs. Holt, wife of T. G. HOLT, Executive Agent, Canadian Ry., Vancouver, and the Misses Holt, have arrived at Vancouver

from England, and will spend the summer on the Pacific Coast.

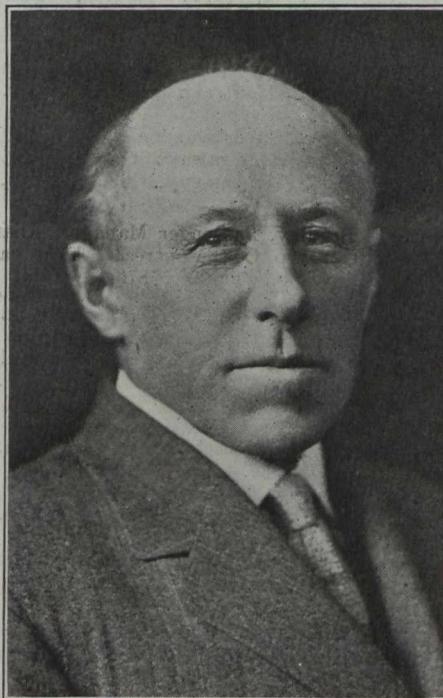
R. W. LEONARD, Commissioner, National Transcontinental Ry., has offered to erect a tower and supply a peal of bells for Grace Church, Brantford, Ont., with which he was formerly connected.

E. H. HILEY, heretofore Divisional Goods Manager, North Eastern Ry., of England, has been appointed General Manager of the New Zealand State Railways, comprising about 2,800 miles of line.

Mrs. Stitt, wife of W. STITT, General Passenger Agent, C.P.R., Eastern Lines, Montreal, accompanied by Miss M. Macfarlane, visited friends in Winnipeg, June 2, on her way to Vancouver, and Australia.

SIR W. M. AIKEN, M.P., who is interested in the company to which a franchise has been granted for the building of an electric railway in Medicine Hat, Alta., arrived in Montreal, from London, Eng., June 9.

FRANCIS KING, Counsel, Dominion Marine Association, Kingston, Ont., has



A. T. Tomlinson, M. Can. Soc. C.E.,  
Chief Engineer, North Railway.

gone to England in connection with a case before the Imperial Privy Council and is expected to return about the middle of August.

J. W. TROUP, Manager, British Columbia Coast Service, C.P.R., returned to Canada, June 5, from Great Britain, where he had been in connection with the placing of orders for the construction of two vessels for the service.

A. J. TAYLOR, Canadian Freight and Passenger Agent, Chicago, Milwaukee and St. Paul Ry., Toronto, who recently underwent an operation for gall stones, is convalescing satisfactorily, and is expected to return to business during July.

J. A. ROSS, C.P.R. city ticket agent and agent Dominion Express Co., was presented with a silver mounted umbrella by the company's staff at St. Thomas, Ont., on leaving to take up the duties of a similar position at Chatham, Ont., June 16.

F. H. PHIPPEN, General Counsel, Canadian Northern Ry., and Mrs. Phippen, are

staying at the King Edward Hotel, Toronto, for part of the summer, but later will go to their new house on Etobicoke River, near the new Toronto Golf Club.

Mrs. Kelly, Winthrop, Mass., who was killed in an accident on the New York, New Haven and Hartford Rd., at Stamford, Conn., June 12, was the wife of E. J. KELLY, who is spoken of in press dispatches as local land agent, C.P.R.

WM. WAINWRIGHT, Vice President, G.T.R. and G.T.P.R., has gone to England. Miss Marguerite Wainwright is going to Cushing's Island, Me. Miss Gladys Wainwright will spend the summer at Tadousac, Que., with her sister, Mrs. A. R. Chipman.

W. F. TYE, M. Can. Soc. C.E., left Toronto early in June for Europe, intending to return to Canada in the autumn and to then again take up his residence in Montreal. He has resigned the presidency of Sterling Coal Co., Ltd., of which, however, he remains a director.

MISS W. SAUNDERS, who has retired from the Secretary-Treasurership of the St. Thomas, Ont., St. Ry., was presented with a silver tea set and tray by the city hall officials, and with a drawing room clock by the street railway employes, June 22.

W. E. DUPEROW, General Agent, Passenger Department, Grand Trunk Pacific Ry., Vancouver, B.C., has been appointed chairman for the meeting of the North Pacific Coast Terminal Line Passenger Agents' Association, which will be held at Vancouver, Aug. 5.

C. H. MASSIAH, whose appointment as Paymaster, G.T.R., Montreal, was announced in our last issue, was born at Quebec, Que., May 1, 1883, and entered G.T.R. service Nov. 19, 1904, since when he has been, to Apr. 1, 1913, in the Treasurer's office at Montreal.

J. E. QUICK, General Baggage Agent, G.T.R., and G.T. Pacific Ry., Toronto, was elected Secretary and Treasurer of the American Association of General Baggage Agents, for the thirtieth successive year, at the recent annual convention at Colorado Springs.

FRANK A. FLEMING, eldest son of Sir Sandford Fleming, Hon. M. Can. Soc. C.E., died in Toronto, June 4, aged 58. He accompanied his father in a trip over the then projected route of the C.P.R. from Winnipeg to the Pacific Coast in the early seventies.

This is how the Toronto Globe referred recently to F. H. PHIPPEN, General Counsel, Canadian Northern Ry.:—"Hon. F. H. Phippen, an ex-judge of the United States, and chief counsel of the Canadian Northern, was the first witness for the defence."—"An ex-judge of the United States" is a gem.

Mrs. Reynolds, wife of M. M. REYNOLDS, Vice President, G.T.R. and G.T. Pacific Ry., died at Rochester, Minn., June 1, after an illness, which though lasting for some time, was not considered serious. Mr. Reynolds was on the way to take her back to Montreal when the news reached him. She was buried at St. Albans, Vt.

A. S. SWAN, on recently leaving Montreal, where he had been Assistant Engineer to the Harbor Commission, was the guest at a dinner given by the staff, and the recipient of a number of gifts. He left Montreal, for Valparaiso, Chile, June 6, where he will be engaged in dock construction work for the British firm of which Sir John Jackson is head.

J. J. HOWARD, for a number of years foreman with the James McDiarmid Co., Winnipeg, was presented with a purse of money on leaving that firm's employ, to

become Managing Director of the Fort Garry Construction Co. The James McDiarmid Co. has been engaged for some years in carrying out contracts for station and other buildings on the C.P.R. west of Winnipeg.

EJNER L. LANDORPH, who has been appointed Resident Engineer, C.P.R., Brandon, Man., was born at Copenhagen, Denmark, Sept. 9, 1888, and graduated as a civil engineer from the University of Copenhagen, Jan., 1911. He entered C.P.R. service, June 24, 1912, since when he has been, to Nov. 6, 1912, draughtsman, Winnipeg; Nov. 7, 1912, to Apr. 30, 1913, transitman at Brandon, Man.

A. S. MUNRO, whose appointment as Commercial Agent, G.T.R., London, Ont., was announced in our last issue, was born at Hamilton, Ont., Nov. 10, 1880, and entered G.T.R. service, Jan. 1, 1900, since when he has been, to Aug., 1905, yard and billing clerk, and secretary to General Agent, Hamilton; Apr., 1906, to May, 1913, Travelling Freight Agent, Middle and Southern Divisions, London, Ont.

H. W. WALKER, for many years General Auditor, G.T.R., Montreal, died in Winnipeg, June 10, aged 75. He entered the G. Western Ry. service in 1854; four years later he went with the Detroit and Milwaukee Ry., going to the G.T.R. in 1862, as chief bookkeeper. His subsequent appointments were: accountant, 1878; chief accountant, 1893; general auditor, 1896. He retired from the service Jan. 1, 1907.

J. HARVIE, who was conductor of the first train which operated on the old Northern Ry. out of Toronto in 1853, and was afterwards Traffic Superintendent, and W. Downie, General Superintendent, C.P.R., St. John, N.B., met recently at Vancouver, B.C., where both have been spending a holiday with their wives. Mr. Harvie is 81 years of age, and Mr. Downie received the first twelve years of his training under him.

JAS. BALKWILL, who has been appointed Assistant Trainmaster, M.C. Rd., St. Thomas, Ont., was born in Southwold Tp., Ont., Mar. 8, 1870, and entered M.C.R. service, Mar. 18, 1888, since when he has been, to Aug. 1, 1900, relief operator and agent at various points; Aug. 1, 1900, to Dec. 1, 1903, agent at Dutton, Ont.; Dec. 1, 1903, to Mar. 8, 1904, dispatcher, St. Thomas, Ont.; Mar. 8, 1904, to June 1, 1913, chief clerk to Division Superintendent, St. Thomas, Ont.

W. MACKLAIER, who has been appointed Chief Inspector of Weighing and Refrigeration, Eastern Lines, C.P.R., Montreal, entered C.P.R. service in 1896, as clerk in the Car Accountant's office, and was transferred to Vancouver, B.C., as chief clerk, in 1903, returning east as car tracer on foreign roads, and was subsequently appointed chief clerk, Car Service Department, which position he held to May 15, 1913, the date of his present appointment.

R. A. BECKER, whose appointment as Supervisor of Signals, Eastern Lines, G.T.R., Montreal, was announced in our last issue, was born at Washington, D.C., and entered railway service in 1892 with the Signal Contracting Co., and has since been constantly engaged on signal and construction work on various railways in the eastern U.S., and for the past four years was Assistant and Construction Engineer, Signal Engineering Department, New York Central Ry.

J. PATERSON, who died at Winnipeg, June 5, aged 84, had been a resident of Manitoba since 1879. He went west to look after the water supply on what is now the C.P.R., and remained with that company in the same capacity when it took

over the lines from the Dominion Government. On leaving the C.P.R. service he was appointed caretaker of the Parliament buildings at Winnipeg, from which position he retired some years ago, after over 20 years service.

R. F. McNAUGHTON, who was recently appointed Travelling Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., was born at Petrolia, Ont., June 23, 1889, and entered railway service, Oct., 1908, since when he has been, to Oct., 1910, telegraph operator and ticket agent, G.T.R., at various points; Oct., 1910, to Dec., 1911, assistant rate clerk, Canadian Northern Ry., Winnipeg; Jan. to Nov., 1912, ticket stock clerk, same road, Winnipeg; Nov., 1912, to Mar. 31, 1913, chief clerk District Passenger Agent's office, same road, Saskatoon, Sask.

HENRY CLARKE, Storekeeper, G.T.R., Montreal, who retired under the provisions of the pension rules, May 31, was born at Sunningwell, Berks, Eng., Aug. 8, 1843, and entered G.T.R. service, Jan., 1872, since when he has been, to Mar. 28, 1872, brakeman, Montreal; Mar. 28, 1872, to Sept. 14, 1880, shipper, Montreal; he left the service, Sept. 14, 1880, on account of ill health,



W. McLeod,  
Assistant Chief of the Department of Investigation, Western Lines, Canadian Pacific Railway.

and returned, July 4, 1882, since when he has been, to May 31, 1884, storeman; June 1, 1884, to July 31, 1896, chief storeman, and Aug. 31, 1896, to May 31, 1913, Storekeeper, at Montreal.

JOHN S. PLAYFAIR, who died at Toronto, June 2, aged 87, was born at Glasgow, Scotland. He was one of the founders of the Muskoka Navigation Co., of which he was President for several years. One of his sons, Jas. Playfair, Vice President and Managing Director, Richelieu and Ontario Navigation Co., who was a passenger on the company's s.s. Hamonic, bound for Port Arthur, for the launching of the s.s. Noronic, was recalled by wireless telegraph, transferring from the Hamonic to one of the R. & O.N. Co. freighters, in mid lake, about 80 miles from Sault Ste. Marie, and arriving in Toronto by special train.

JOHN ARCHIBALD, whose appointment as Locomotive Foreman, C.P.R., Coquitlam, B.C., was announced in our last issue, was born at Edinburgh, Scotland, Mar. 13, 1872,

and entered railway service in 1889, since when he has been, to 1894, apprentice fitter, C.P.R., Winnipeg; 1894 to 1898, fitter, Manitoba and North Western Ry., Portage la Prairie, Man.; 1899 to 1900, leading hand, C.P.R., Medicine Hat, Alta.; 1901 to 1906, leading hand, C.P.R., Calgary, Alta.; 1906 to 1907, Locomotive Foreman, C.P.R., Medicine Hat, Alta.; 1907 to 1908, Locomotive Foreman, C.P.R., Field, B.C.; 1908 to May, 1913, Shop Foreman, C.P.R., Vancouver, B.C.

H. H. SMITH, whose appointment as Car Service Agent, Canadian Northern Quebec Ry., Montreal, was announced in our last issue, was born at Quebec, Que., June 14, 1872, and entered railway service Oct. 14, 1890, since when he has been, to 1891, stenographer, Lower Laurentian Ry., Quebec; 1891 to 1895, accountant, same road, Quebec; 1895 to 1908, secretary to General Manager, Quebec and Lake St. John Ry., and Great Northern Ry. of Canada, Quebec; 1909 to May, 1913, chief clerk to General Manager, C.N.Q.R., Q. & L. St. J. R., Halifax and South Western Ry., and Inverness Ry. and Coal Co., Quebec, and since 1911 at Montreal.

H. N. MERRIAM, who was recently appointed Division Engineer, Pacific Great Eastern Ry., Lillooet, B.C., was born at Waupun, Wis., June 19, 1874, and entered railway service in June, 1898, since when he has been, to Aug., 1899, rodman, C.P.R., in British Columbia; Aug., 1899, to May, 1900, topographer, Great Northern Ry., in Montana and Washington; May to Dec., 1900, draughtsman, C.P.R.; Mar., 1901, to Mar., 1902, instrument man, Chicago Division, Chicago and North Western Ry.; Mar., 1902, to Mar., 1906, Resident Engineer on Construction, Western Lines, C.P.R.; Mar., 1906, to Apr., 1913, Assistant Engineer on Construction, Western Lines, C.P.R., his work covering different branches, including the building the spiral tunnel at Field, B.C., and double track work.

C. B. FOSTER, who has been appointed Assistant Passenger Traffic Manager, Eastern Lines, C.P.R., Montreal, and whose portrait appears in this issue, was born at Kingston, N.B., Sept. 30, 1871, and entered C.P.R. service in Apr., 1891, since when he has been, to Oct., 1892, stenographer in Passenger Department, St. John, N.B.; Oct., 1892, to Sept., 1893, senior clerk, Passenger Department, St. John, N.B.; Sept., 1893, to July, 1899, Travelling Passenger Agent, St. John, N.B.; July, 1899, to Feb. 8, 1902, chief clerk, Passenger Department, St. John, N.B.; Feb. 8, 1902, to Nov. 22, 1904, District Passenger Agent, St. John, N.B.; Nov. 22, 1904, to Sept. 8, 1908, District Passenger Agent, Toronto; Sept. 8, 1908, to Oct. 31, 1910, Assistant General Passenger Agent, Vancouver, B.C.; Oct. 31, 1910, to June 17, 1913, General Passenger Agent, Western Lines, Revelstoke, B.C., and east, Winnipeg.

FRANK E. WARD, who died at Chicago, Ill., June 6, was born July 29, 1867, and was educated at McGill Model School, Montreal. He entered railway service, Sept., 1881, and was, to Nov., 1885, apprentice clerk and stenographer in the Mechanical Department, G.T.R., Montreal; Jan., 1886, to Dec., 1887, secretary to Second Vice President, St. Paul, Minneapolis and Manitoba Ry., St. Paul, Minn.; Jan., 1888, to Nov., 1890, secretary and chief clerk to President and General Manager, Eastern Ry. of Minnesota; Jan., 1891, to July, 1894, secretary to President, Great Northern Ry.; July, 1894, to Feb., 1898, Assistant to President, same road; Mar. to Oct., 1898, General Superintendent, Montana Central Ry.; Nov., 1898, to 1903, General Superintendent, Great Northern Ry.; 1903 to Oct., 1907, General Manager, Great Northern Ry.; Oct., 1907, to Aug., 1912, General Manager, Chicago, Bur-

lington and Quincy Rd. lines east of the Missouri River, at Chicago, which position he resigned on account of ill health.

SIR STEPHEN W. FURNESS, M.P., on whom a baronetcy was conferred on the King's birthday, is Chairman, Furness, Withy and Co., and a nephew of the late Lord Furness, who was Hon. President of the Richelieu and Ontario Navigation Co.

JOHN L. WELLER, M. Can. Soc. C.E., Engineer in Charge, Welland Ship Canal, St. Catharines, Ont., whose portrait appears elsewhere in this issue, was born at Cobourg, Ont., Feb. 13, 1862. He entered Dominion Government service in 1883, as Assistant Engineer, Trent Canal, Peterboro, Ont., and was, from 1885 to 1888, Assistant Engineer, Murray Canal, Brighton, Ont.; 1888 to 1900, Resident Engineer, St. Lawrence Canals, Cornwall, Ont.; 1900 to 1912, Superintending Engineer, Welland Canal, St. Catharines, Ont.

F. J. HURKETT, who was recently appointed City Passenger Agent, C.P.R., Calgary, Alta., was born at London, Ont., Dec. 10, 1879, and entered C.P.R. service, Sept., 1897, since when he has been, to June, 1899, city ticket clerk, London, Ont.; June, 1899, to May, 1901, station ticket clerk, London, Ont.; May, 1901, to Nov., 1903, telegraph operator, London, Ont.; Nov., 1903, to Nov., 1904, chief clerk (freight), London, Ont.; Nov., 1904, to May, 1907, not in railway service; May, 1907, to July, 1909, joint ticket agent, C.P.R. and C.N.R., Regina, Sask.; July, 1909, to May, 1912, chief clerk, District Passenger Agent, C.P.R., Brandon, Man.; May, 1912, to Mar., 1913, ticket agent, C.P.R., Calgary, Alta.

V. J. MELSTED, whose appointment as Engineer of Water Service, Western Lines, C.P.R., Winnipeg, was announced in our last issue, was born at Gardar, N.D., Feb. 20, 1887, and entered transportation service, Apr., 1909, since when he has been, to Oct., 1909, instrument man, Great Northern Ry.; Oct., 1909, to Apr., 1910, investigating cement resources of Manitoba on behalf of a U.S. syndicate; Apr., 1910, to Feb., 1911, instrument man, C.P.R., Winnipeg; Feb., 1911, to Apr., 1913, Resident Engineer, Maintenance of Way, C.P.R., Brandon, Man. Prior to entering transportation service, he was, from March to Oct., 1906, chemist, Pembina Portland Cement Co., Concrete, N.D.; May, 1907, to Nov., 1908, on the staff of the North Dakota Geological Survey investigating cement resources of the State; Nov., 1908, to Apr., 1909, engaged variously in Nevada and Utah, chiefly in mining work.

H. B. DIBLEE, A.M. Can. Soc. C.E., who has been appointed Superintendent in charge of operation and maintenance of way and structures of the National Transcontinental Ry., between Moncton and Edmundston, N. B., now being operated by the Intercolonial Ry., was born at Woodstock, N.B., Dec. 6, 1879, and entered railway service, June, 1898, since when he has been, to June, 1904, chainman, rodman and instrument man, successively, C.P.R., in British Columbia; June to Dec., 1904, Resident Engineer, Lacombe Easterly Branch, C.P.R.; Dec., 1904, to Sept., 1906, transit man and Resident Engineer, Lake Superior Division, G. T. Pacific Ry.; Sept., 1906, to Jan., 1908, transit man and Resident Engineer, Pheasant Hills Branch, C.P.R.; May, 1908, to Nov., 1912, Resident Engineer, National Transcontinental Ry., Edmundston, N.B.; Dec. 1, 1912, to May 12, 1913, Roadmaster, New Brunswick Division, N.T.R., Edmundston, N.B.

R. W. BURNETT, General Master Car Builder, C.P.R., Montreal, who has been elected Third Vice President, Master Car Builders' Association, for the current year, was born at Farmer City, Ill., in 1868, and

entered railway service in 1890, in the Union Pacific Rd. Car Department, Denver, Col., subsequently transferring to the Pennsylvania Rd. service as Car Inspector at Chicago, Ill.; he was from Aug., 1892, to July, 1899, foreman, and General Foreman, consecutively, Car Department, Lake Shore and Michigan Southern Ry., Chicago, Ill.; 1900, General Foreman, Car Department, Long Island Rd.; 1900 to 1904, General Foreman, Car Department, Central Rd. of New Jersey, Elizabethport, N.J.; 1904 to Jan., 1907, Assistant Master Car Builder and Master Car Builder, consecutively, Erie Rd., Meadville, Pa.; Jan., 1907, to July, 1909, Assistant Master Car Builder, C.P.R., Montreal; and in July, 1909, on the retirement of W. E. Fowler, on account of ill health, he was appointed acting General Car Builder, being later confirmed in that position.

E. W. BEATTY, who has been appointed General Counsel, C.P.R., Montreal, was born at Thorold, Ont., in 1877, and moved to Toronto, with his parents in 1887. He was educated with the Model School, Harbord Collegiate, and Toronto University, graduating in 1898. He served his articles with the late D'Alton McCarthy, of the firm of McCarthy, Osler, Hoskin and Creelman, and was admitted to the bar in 1901. On the appointment of A. R. Creelman, K.C., as Chief Solicitor, C.P.R., in 1891, he accompanied him to Montreal, and later succeeded him in that position, as General Solicitor. He is a son of H. Beatty, of the C.P.R. Steamship Office, Toronto, and a brother of Dr. Beatty, Chief Surgeon, Ontario Division, C.P.R., Toronto.

JAMES McLERIE, who died at Dundas, Ont., recently, was born at Kilbarchan, Scotland, Nov. 6, 1850, and entered railway service, March, 1867, since when he was, to 1869, car number taker, Great Western Ry. (now part of G.T.R.), Hamilton, Ont.; 1869 to 1872, yard clerk, same road, London, Ont.; 1872 to 1873, clerk same road, Hamilton, Ont.; 1873 to 1877, cashier, same road, Ingersoll, Ont.; 1877 to 1878, agent, same road, Stratford, Ont.; 1879 to 1880, agent, same road, Tillsonburg, Ont.; 1880 to 1882, special freight agent, Manitoba business, with Traffic Manager, same road, Hamilton, Ont.; 1882 to 1895, Local Freight Agent, G.T.R., Hamilton, Ont.; 1895 to 1897, Contracting Freight Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; 1897 to 1904, Contracting Freight Agent, C.P.R., Hamilton, Ont.; Apr., 1904, to Dec., 1908, Northwest Agent, Montreal and Lake Superior Line, Winnipeg. Towards the end of 1908, his health broke down, and he subsequently returned to Ontario, remaining at Dundas, until his death.

F. W. ALEXANDER, A. M. Can. Soc. C. E., whose appointment as Division Engineer, C.P.R., Calgary, Alta., was announced in our last issue, was born at Fredericton Jct., N. B., Nov. 22, 1878, and entered railway service, June, 1897, since when he has been, to May, 1898, office boy, Chief Engineer's office, Bangor and Aroostook Ry., Houlton, Me.; May to Oct., 1898, chainman and rodman, same road; Oct., 1898, to June, 1900, level man, same road; June, 1900 to Sept., 1901, transit man, same road; Sept., 1901, to Feb., 1902, transit man, preliminary and location, Fish River Ry., Ashland, Me.; Feb., 1902, to Jan., 1903, Resident Engineer on construction, same road, Eagle Lake, Me.; Jan. to May, 1903, level man and topographer, Restigouche and Western Ry., Campbellton, N.B.; May 14, 1903, to Dec. 9, 1904, transit man, C.P.R., Moose Jaw, Sask.; Dec. 9, 1904, to Dec. 31, 1909, Resident Engineer, same road, Calgary, Alta.; Dec. 31, 1909, to June 30, 1910, Resident Engineer, same road, Cranbrook, B.C.; June 30, 1910, to Apr. 15, 1913, Assistant Di-

vision Engineer, same road, Calgary, Alta.

JAMES BAIN, whose appointment as General Superintendent, Halifax and South Western Ry., Halifax, N.S., together with his portrait, was given in our last issue, was born at Pictou, N.S., May 24, 1860, and entered railway service, May, 1875, since when he has been, to Mar., 1876, operator, Intercolonial Ry., Truro, N.S.; Mar., 1876, to June, 1879, operator and ticket agent, same road Stellarton, N.S.; June, 1879, to Nov., 1881, operator, same road, Truro, N. S.; Nov., 1881, to June, 1882, chief operator Western Union staff, Direct U.S. Cable Co., Tor Bay, N.S.; June, 1882, to Apr., 1886, dispatcher, Intercolonial Ry., at New Glasgow and Truro, N.S., and Moncton, N.B.; Apr. to Oct., 1886, dispatcher, Missouri Pacific Ry., St. Louis, Mo.; Oct., 1886, to May, 1892, Chief Dispatcher, Quebec and Lake St. John Ry., Quebec, Que.; May, 1892, to Nov., 1899, Manager's Assistant, same road; Nov., 1899, to Dec., 1907, Superintendent, Q. & L. St. J.R., Lower Laurentian Ry., and construction of Great Northern Ry. of Canada, Quebec, Que.; Dec., 1907, to May, 1913, Superintendent, Halifax and South Western Ry., Bridgewater, N.S.

A. T. TOMLINSON, M. Can. Soc. C.E., M. Am. Soc. C.E., whose appointment as Chief Engineer, North Ry., Montreal, was announced in our last issue, was born at Grand Falls, N.B., June 22, 1859, and graduated from the Royal Military College, June, 1882, with honors in civil engineering. He was, from July, 1882, to June, 1883, with the Toronto Bridge Co., Toronto; Aug., 1883, to June, 1884, section engineer, Lake Superior Division, C.P.R.; 1886, Engineer of Maintenance, Burlington and Missouri River Rd., Omaha, Neb.; Feb., 1887, to 1890, Assistant Engineer, Denver and Rio Grande Rd., Pueblo and Leadville, Col.; 1891 to 1893, Assistant Engineer, Brooklyn Elevated Ry., Brooklyn, N.Y.; 1894 to 1897, Assistant Chief Engineer, Northwestern Union and Lake St. Elevated Railways, Chicago, Ill.; 1898 to 1902, Consulting Engineer, Boston Elevated Rd., Boston, Mass.; 1902 to 1905, Civil Engineer, J. G. White and Co., New York; 1905 to 1908, Civil Engineer, Canadian White Co., Montreal; 1909 to 1912, District Engineer, G.T. Pacific Ry., Cochrane, Ont. He is also a member of the American Railway Engineering Association. During 1885 he served in the Midland Battalion, in the North West Rebellion.

C. A. HAYES, who has been appointed General Traffic Manager, Canadian Government Railways, was born at West Springfield, Mass., Mar. 10, 1865, and entered railway service in 1882, since when he has been, to 1884, clerk, Freight Auditor's office, Connecticut River Rd., now Boston and Maine Rd.; 1884 to Oct., 1887, similar position, Boston and Lowell Ry., Boston, Mass.; Oct., 1887 to Nov., 1890, clerk, General Freight Agent's Office, Boston and Lowell Ry., and its successor, Boston and Maine Rd.; Nov., 1890 to June 1892, General Freight and Passenger Agent, Central New England and Western Ry., Poughkeepsie, N.Y.; June to Oct., 1892, Division Freight Agent, Philadelphia and Reading Rd., while it had control of the C.N.E. & W.R., Hartford, Conn.; Oct., 1892 to June, 1896, New England Agent, National Despatch Line, Boston, Mass.; June, 1896 to July, 1899, New England Agent and acting General Manager, National Despatch Line, Boston, Mass.; July, 1899 to May, 1903, Manager, National Despatch-Great Eastern Line, Buffalo, N.Y.; May, 1903 to Apr., 1908, Assistant General Freight Agent, G.T.R., Chicago, Ill.; Apr., 1908 to Oct., 16, 1911, General Freight Agent, G.T.R., Montreal; Oct. 16, 1911, to June, 1913, Freight Traffic Manager, G.T.R., Montreal.

## Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

**Canadian Government Railways.**—It is unofficially announced that C. A. HAYES, Freight Traffic Manager, G.T.R., Montreal, will become General Traffic Manager, Government Railways, July 1, and that E. TIFFIN, the present General Traffic Manager, will be transferred to Toronto as General Agent.

H. H. MELANSON, heretofore Assistant General Passenger Agent, has been appointed acting General Passenger Agent, vice J. M. Lyons, superannuated. Office, Moncton, N.B.

C. B. BROWN, A.M. Can. Soc. C.E., heretofore Principal Assistant Engineer, Eastern Lines, C.P.R., Montreal, is reported to have been appointed Chief Engineer, Canadian Government Railways. Office, Moncton, N.B.

**Canadian Northern Ry.**—W. BRYCE, heretofore Locomotive Foreman, C.P.R., Ignace, Ont., has been appointed Assistant Locomotive Foreman, C.N.R., Rainy River, Ont., vice L. H. Boerger, transferred to Duluth, Winnipeg and Pacific Ry. service.

L. DAVIDSON, heretofore moulder, has been appointed foundry foreman, Winnipeg Shops, vice A. Knight, resigned.

**Canadian Pacific Ry.**—E. W. BEATTY, heretofore General Solicitor, has been appointed General Counsel, vice A. R. CREELMAN, K.C., resigned. Office, Montreal.

A. R. CREELMAN, K.C., General Counsel, having asked to be relieved of his duties that he may enjoy a well earned rest and recreation, the Board of Directors and Executive Officers in acceding to his wish, and accepting his resignation, desire to express their hearty appreciation of his advice and co-operation during the company's most progressive years. He continues his connection with the company as a director, and will act on occasion as Special Counsel.

B. W. ROBERTS, heretofore Commissary Agent, Winnipeg, has been appointed Assistant Chief Commissary Agent. Office, Montreal.

C. B. FOSTER, heretofore General Passenger Agent, Western Lines, lines Revelstoke, B.C., and east, Winnipeg, has been appointed Assistant Passenger Traffic Manager, Eastern Lines. Office, Montreal.

W. MACKLAIER, heretofore chief clerk, Car Service Department, has been appointed Chief Inspector of Weighing and Refrigeration, Eastern Lines. Weighing, refrigeration and heating reports heretofore sent to the Superintendent of Car Service, are now addressed to the Chief Inspector. Office, Montreal.

L. J. ROONEY has been appointed Assistant Commissary Agent at Quebec, Que., vice T. M. McKeown, promoted.

A. E. STEWART, heretofore District Master Mechanic, District 1, Ontario Division, Toronto, has been appointed Master Mechanic on construction, Campbellford, Lake Ontario and Western Ry. (C.P.R.).

A. BINNS has been appointed acting District Master Mechanic, District 1, Ontario Division, Toronto, vice A. E. Stewart, transferred to Campbellford, Lake Ontario and Western Ry. (C.P.R.) construction.

E. J. MURPHY, heretofore Assistant Foreman, West Toronto, has been appointed Locomotive Foreman there, vice F. Ronaldson, transferred.

F. RONALDSON, heretofore Locomotive Foreman, West Toronto, has been appointed Roundhouse Foreman at Lambton, Ont.

R. McLAUGHLIN, heretofore Assistant Foreman, West Toronto, has been appointed Night Roundhouse Foreman at Lambton, Ont.

G. BROWN, heretofore fitter, West Toronto, has been appointed Assistant Night Roundhouse Foreman at Lambton, Ont.

T. G. M. JAMIESON, heretofore chief clerk, city ticket office, Peterboro, Ont., has been appointed city ticket agent, agent, C.P.R. Telegraphs, and Dominion Express Co., at St. Thomas, Ont., vice J. A. Ross, transferred.

J. A. ROSS, heretofore city ticket agent, C.P.R., agent C.P.R. Telegraphs, and Dominion Ex. Co., St. Thomas, Ont., has been appointed to similar positions at Chatham, Ont., vice E. Fremlin, transferred.

A. WILLIAMS, Assistant Superintendent, District 1, Lake Superior Division, has had his office moved from North Bay to Sudbury, Ont.

W. McMULLEN, Trainmaster, Sudbury, Ont., having resigned, the position has been abolished.



C. B. Foster,  
Assistant Passenger Traffic Manager, Eastern  
Lines, Canadian Pacific Railway.

F. J. BAIRD has been appointed back shop foreman, Fort William, Ont., vice A. Sturrock, transferred to Vancouver, B.C., as announced in our last issue.

W. W. WEBSTER, heretofore Locomotive Foreman, Winnipeg, has been appointed acting District Master Mechanic, Kenora, Ont., vice A. West, on leave of absence.

J. MORTON, heretofore Night Locomotive Foreman, has been appointed acting Locomotive Foreman, Winnipeg, vice W. W. Webster, promoted.

W. J. ANDREWS has been appointed acting Night Locomotive Foreman, Winnipeg, vice J. Morton, promoted.

J. MORTON, heretofore Locomotive Foreman, Winnipeg, has been appointed Night Locomotive Foreman there.

A. PEERS, heretofore Locomotive Foreman, Brandon, Man., has been appointed Locomotive Foreman, Winnipeg, vice J. Morton, transferred.

D. FORBES, heretofore night coachyard foreman, has been appointed coachyard foreman at Winnipeg, vice H. W. Andrew, resigned.

H. THORNE, heretofore assistant coachyard foreman, has been appointed night coachyard foreman, Winnipeg, vice D. Forbes, promoted.

T. LINDSAY has been appointed assistant coachyard foreman at Winnipeg, vice H. Thorne, promoted.

T. M. McKEOWN, heretofore Assistant Commissary Agent at Quebec, Que., has been appointed Commissary Agent at Winnipeg, vice B. W. Roberts, promoted.

E. L. LANDORPH, heretofore transitman, has been appointed Resident Engineer, Brandon, Man., vice V. J. Melsted, assigned to other duties. Owing to a misprint in our last issue, the name was given as E. Landorth.

G. TWIST has been appointed Locomotive Foreman, Brandon, Man., vice A. Peers, transferred.

W. J. COLEMAN, heretofore Locomotive Foreman at West Roundhouse, Calgary, Alta., has been appointed Locomotive Inspector at Ogden, Alta.

J. G. RUTHERFORD, V.S., Superintendent of Animal Husbandry, Department of Natural Resources, is reported to have also been appointed Superintendent of Agriculture. Office, Calgary, Alta.

**Duluth, South Shore and Atlantic Ry.,** Mineral Range Rd.—E. R. LEWIS, Assistant to the General Manager, is dealing with all matters pertaining to engineering, bridges and buildings, V. D. Simar, Chief Engineer, having resigned. Office, Duluth, Minn.

**Duluth, Winnipeg and Pacific Ry.**—L. H. BOERGER, heretofore Assistant Locomotive Foreman, Canadian Northern Ry., Rainy River, Ont., has been appointed Locomotive Foreman, D.W. & P.R., at Virginia, Minn.

**Grand Trunk Pacific Ry.**—A. J. ROBERTS has been appointed Locomotive Foreman at Redditt, Ont., vice J. R. Morton, transferred.

J. R. MORTON, heretofore Locomotive Foreman, Redditt, Ont., has been appointed Locomotive Foreman, Melville, Sask., vice A. McTavish, transferred.

A. McTAVISH, heretofore Locomotive Foreman, Melville, Sask., has been appointed Locomotive Foreman, McBride, B.C., with temporary headquarters at Tete Jaune, B.C.

H. DARLING has been appointed acting Locomotive Foreman, Nicholl, B.C., vice J. Lambie, assigned to other duties.

The following agents have been appointed:—Elie, Man., E. R. Bierwith; Quinton, Sask., J. A. Babin; Landis, Sask., C. J. Leslie; Lebret, Sask., F. Z. Landry; Cudworth, Sask., C. Taylor; Holden, Alta., A. G. Jamieson; Wabamuh, Alta., R. E. Kirkpatrick; Dandurand, Alta., J. L. Syrong; Bashaw, Alta., F. S. Benyon.

**Grand Trunk Ry.**—E. J. McVEIGH, heretofore Storekeeper, Ottawa, has been appointed General Storekeeper. Office, Montreal.

W. J. P. MCGREGOR, heretofore in Vice President's office (traffic), Montreal, has been appointed Commercial Agent, Moncton, N.B., vice James Edward, whose appointment as Division Freight Agent, Ottawa, was announced in our last issue.

J. H. FARRAR has been appointed Storekeeper, Point St. Charles General Stores, Montreal, vice H. Clarke, retired under the provisions of the pension fund.

W. M. TISDALE has been appointed Special Agent, Eastern Lines, not Chief Special Agent, as mentioned in our last issue, vice J. H. Hodge, transferred to Toronto. Office, Montreal.

E. LOGAN has been appointed General Foreman, Toronto Shops, vice G. M. Wilson, assigned to other duties.

A. C. O'NEIL has been appointed Travelling Freight Agent, Hamilton, Ont., vice A. S. Munro, appointed Commercial Agent there, as announced in our last issue.

A. R. HUESTON has been appointed Joint General Agent, G.T.R. and Wabash Rd., at Windsor, Ont., with charge of agencies and yards at Windsor and Walkerville. The position of General Yardmaster, Windsor, heretofore held by C. Slaght, has been abolished.

A. R. DRAPER, heretofore ticket agent at Suspension Bridge, N.Y., has been appointed ticket agent at Niagara Falls, N.Y., vice R. R. Albertson, transferred to Toronto.

T. W. SAUNDERS has been appointed Superintendent, Buffalo Terminals, comprising Fort Erie, Bridgeburg, Black Rock, G.T.R. Freight House at River St., Wabash Rd. Freight House at Louisiana St., and the International Bridge.

W. V. BUTLER has been appointed Assistant Chief Claim Agent, in charge of the settlement of all personal injury, live stock, fire claims, etc., on the Western Lines, including lines in Michigan, Indiana and Illinois. Office, Detroit, Mich.

G. S. HUMPHREY has been appointed Claim Agent, reporting to the Assistant Chief Claim Agent. Office, Battle Creek, Mich.

The following agents have been appointed:—Lisgar, Que., J. C. Bachand; South Durham, Que., E. D. Auclair; Danby, Que., J. S. Marquis; St. Bazile, Que., J. A. Vaillancourt; St. Julie, Que., T. J. Twohey; Whites, Que., J. O. Lepage; Noyan Jet., Que., Z. Rheume; St. Polycarpe Jet., Que., L. A. Garland; Elmvale, Ont., C. Stewart; Toronto (Pass.), R. R. Albertson; North Parkdale Jet., Ont., F. E. Lye; Niagara Falls, Ont. (Pass.), A. R. Draper; Woodstock, Ont., W. A. MacMonagle; Tillsonburg, B. & T., Ont., P. B. Neale; Hespeler, Ont., F. H. Beattie; Walkerton, Ont., N. A. Walford; Dalkeith, Ont., R. J. Hardy; Otter Lake, Ont., J. Summerwill; Rose Point, Ont., A. H. Johnston; the station at Rymal, Ont., and the outside agency at King Edward Hotel, Toronto, have been closed.

**Intercolonial Ry.**—H. B. DIBLEE, A.M. Soc. C.E., heretofore Roadmaster, National Transcontinental Ry., Edmundston, N.B., has been appointed Superintendent, in charge of operation and maintenance of way and structures of that portion of the N.T.R. between Moncton and Edmundston, N.B., which is now being operated by the general officers of the I.C.R., as mentioned in our last issue, vice E. P. Cronk, who has left the service to enter private business. Office, Edmundston, N.B.

(See also, Canadian Government Railways.)

**Michigan Central Rd.**—JAS. BALKWILL has been appointed Assistant Trainmaster, Canada Division, vice F. W. Cowley, assigned to other duties. Office, St. Thomas, Ont.

**National Transcontinental Ry.**—See Intercolonial Ry.

**Northern Pacific Ry.**—F. J. BERRY, heretofore Travelling Agent for Western Canada, has been appointed Assistant General Agent at Winnipeg.

T. J. O'DONNELL, heretofore City Ticket Agent, Winnipeg, has been appointed Travelling Agent for Manitoba and Rainy River District.

J. P. RODDY, heretofore Contracting Freight Agent, has been appointed Travelling Agent for Saskatchewan and Alberta.

**Prince Edward Island Ry.**—See Canadian Government Railways.

Third class sleeping cars have been adopted in Norway. The cars are built with three berths to a section and 12 sections to a car, each berth being 24 ins. wide. The cars weigh 76,000 lbs. and cost \$8,800 each.

## Book Reviews.

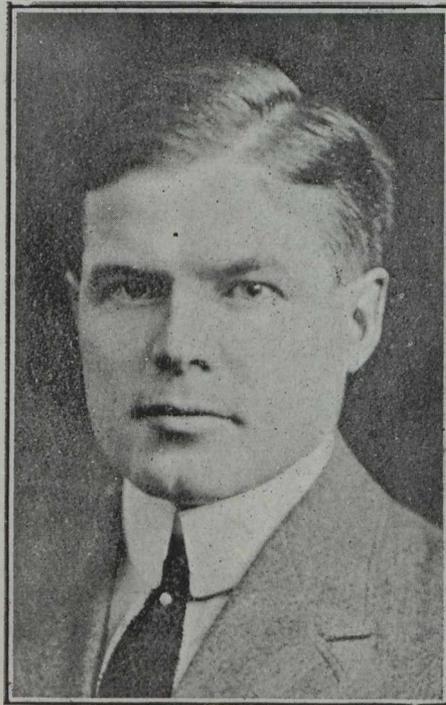
Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

### THE FIELD ENGINEER'S HAND BOOK.

—By G. Carveth Wells, A.C.G.I., Federated Malay States Government Railways, late of the Grand Trunk Pacific Ry., and A. S. Clay, B. Sc., A.C.G.I.; 227 pages, 4¼ by 6½ ins., with numerous illustrations and plans. London, Eng., Edward Arnold.

We submitted this book to H. K. Wicksteed, B.A.Sc., M. Can. Soc.C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., Ltd., who has favored us with the following:—

It has always seemed to the writer that a field book should be one containing only the essentials for field work, the tables and formulae for which it is not safe to trust the memory. It is not becoming that a man should sit down in the field, with half a dozen men waiting for him, to give them line or level, while he studies out the reasons for doing things in a certain way



E. W. Beatty,  
General Counsel, Canadian Pacific Railway.

or the best type of chain or other instrument very little in the way of tables and cannot ment to use. This sort of work he should have done at home outside of working hours.

The little volume under review contains be considered as in any sense a "Field Book." It is rather a text book for very young and inexperienced engineers, and is elementary in its opening especially, and in several places there is a want of precision. On pg. 2, for instance, the process of chaining is described, and it is directed that the head chainman take 11 pins with him and that when he gets the 11th in the rear chainman notes that "10 chains have been measured!" Surely this is a very loose method of chaining. If 11 pins are used, one of them should never get into the hands of the head chainman at all. So gross a blunder should not be left in an educational book by a thoughtful man.

The whole book bristles with old fashioned ideas and prejudices which strike a Canadian practitioner very strangely. For instance, on pg. 3 it is stated that "as a

unit of length for land surveying 66 ft. (Gunter's chain) cannot be excelled." We are rather unfortunately compelled, on account of old records, to use Gunter's chain at times, but in modern work the foot is the almost universal standard on this continent, except where the metric system is employed, and as to convenience, while the 66 ft. chain may be handier and lighter than the 100 ft. chain, the modern metal band is so much lighter than the chain that the 100 ft. standard is entirely unobjectionable and almost universal in railway work.

A chapter is devoted to the railway transition curve and at the very outset the authors make the following very extraordinary statement: "In order that the coach should not leave the track it is plain that the resultant of these two forces (gravity and centrifugal), must act between the rails and if possible be perpendicular to the cross section (plane) of the track, so that there may be no side thrust on the rails." The idea that centrifugal force is the only one producing a "side thrust on the rails," and that mere elevation is capable of obviating the latter, is so old and has been so long disproved and abandoned that it is rather a shock to find it being put forward with such evident claims to scientific knowledge as these.

The chapters on astronomy, and on finding of azimuth and position, are well worth reading, as is the whole book by the student of elementary problems, but it is a pity that the errors and misconceptions referred to should have been incorporated and that the writers should not have been more familiar with Canadian practice and ideas.

## Delaware and Hudson Co.'s Report for 1912.

The annual report of the D. & H. Co. for the year 1912 has been issued. The coal mining department shows a net revenue of \$469,326.88, and the railway department a net operating revenue of \$250,333.64. The directors recommend the declaration of a dividend at the rate of 9% for the year 1913, payable quarterly.

The company owns the Quebec, Montreal and Southern Ry., and the Napierville Junction Ry. in Canada. The accounts of these companies are included in the general statement, but the directors say in regard to them as follows:—"The Quebec, Montreal and Southern Ry. shows an increase in operating revenues of \$25,466.20 for 1912, as compared with the previous year. The operating expenses increased \$16,109.96. The net income, independent of interest charges due the D. & H. Co., was \$156,378.98, an increase of \$19,559.18. The Napierville Junction Ry. shows an increase in operating revenues for 1912 of \$12,400.11 as compared with the previous year. The operating expenses show an increase of \$11,089.12. The net income was \$19,416.44 or 3.23% on the capital stock outstanding. The operating expenses increased by reason of the severe weather conditions in the early part of the year; also by extensive repairs to locomotives. Personal injury claims also increased \$5,000."

The value of the Canadian road and equipment is carried as an asset of \$6,331,867.72, an increase of \$23,728.01 over 1911. The stocks owned by the company include \$1,000,000 common stock of the Quebec, Montreal and Southern Ry., and \$600,000 common stock of the Napierville Junction Ry.

**Railway Route Map Approved.**—The Minister of Railways and Canals has approved the route map of the C.P.R. between Empress and Mildred, 132.2 miles.

# Canadian Railway AND Marine World

ESTABLISHED 1898.

Devoted to Steam and Electric Railway, Marine, Express, Telegraph, and Railway and Canal Contractors' Interests. Official Organ of the various Canadian Transportation Associations.

ACTON BURROWS, LIMITED - Proprietors.  
70 Bond Street, Toronto, Canada.

ACTON BURROWS, A. Can. Soc. C. E.  
Managing Director and Editor-in-Chief.  
AUBREY ACTON BURROWS - Secretary and  
Business Manager.

Associate Editor - JOHN KEIR  
Associate Editor - DONALD F. KEIR  
Mechanical Editor - FREDERICK H. MOODY, B.A. Sc.

### SUBSCRIPTION PRICES, INCLUDING POSTAGE:

TORONTO AND WEST TORONTO POSTAL DELIVERY, \$1.25 a year.

To other places in CANADA, and to NEW-FOUNDLAND AND GREAT BRITAIN, \$1 a year.

To the UNITED STATES and other countries in the Postal Union, except those mentioned above, \$1.50 a year, or six shillings sterling.

SINGLE COPIES, 15 cents each, including postage.

The best and safest way to remit is by express money order. Where one cannot be obtained, a post office money order or bank draft, payable at par in Toronto, may be sent. Cheques or drafts not payable at par in Toronto cannot be accepted. Remittances should be made payable to CANADIAN RAILWAY AND MARINE WORLD.

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ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication.

TORONTO, CANADA, JULY, 1913.

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## A Clumsy Theft of Canadian Northern Railway Information.

In May a prominent official of the Canadian Northern Ry. system, in response to our request, supplied us with some official information in regard to the Toronto-Ottawa section of the Canadian Northern Ontario Ry. and also with reference to the projected line from north of Parry Sound to Callendar. This was published in Canadian Railway and Marine World as follows:—

"Canadian Northern Ontario Ry.—The last section of the Toronto-Ottawa line to be completed is that between the Jack River and Smiths Falls, Ont. The ballasting and final completion of the line will take several months.

"We are officially advised that the company has a route surveyed for a line from north of Parry Sound to Callendar, Ont., but it is not likely that the line will be built this year. The proposed line leaves the Toronto-Sudbury line at mileage 170 north of Toronto, and runs northeasterly through the villages of Whitestone, Golden Valley, Restoule and Nipissing to a junction with the company's transcontinental line near Callendar. The standard of curvature will be six degrees, although there will be one or two which will be temporarily sharper. The line will cross the Whitestone, Maganatawan, Pickeral, Commanda Creek, and Wistiwasing streams. The crossings of the Maganatawan and South Rivers are the only crossings of any moment—the former comprising a deck span of 100 ft. and some 300 ft. of trestle approach, 45 ft. above the water; and the latter 300 ft. long and 25 ft. high. There is a very large quantity of timber to be brought out from the townships of Mackenzie, Mills and Patterson, the estimate is from 350 to 400 million feet, 100 million feet being pine. Aside from running through this area of timber, the line traverses for over half the distance a very fair agricultural country, which has been settled since the early days of the lumber industry."

### The Theft Exposed.

Canadian Machinery, published in Toronto, appropriated the above matter and reproduced it in its issue of June 12, without giving any credit to Canadian Railway and Marine World, for which it was specially written. But the scissors and paste editor did his work clumsily, as Canadian Pacific Ry. was substituted for Canadian Northern Ry. This is how he reproduced our article:—

"The last section of the Toronto-Ottawa line of the C.P.R. to be completed is that between the Jack River and Smiths Falls. The ballasting and final completion of the line will take several months. It is officially announced by the C.P.R. that the company has a route surveyed for a line from north of Parry Sound to Callendar, Ont., but it is not likely that the line will be built this year. The proposed line leaves the Toronto-Sudbury line at mileage 170 north of Toronto, and runs northeasterly through the villages of Whitestone, Golden Valley, Restoule and Nipissing to a junction with the company's transcontinental line near Callendar. The standard of curvature will be six degrees, although there will be one or two which will be temporarily sharper. The line will cross the Whitestone, Maganatawan, Pickeral, Commanda Creek and Wistiwasing streams. The Maganatawan and South Rivers are the only crossings of any moment—the former comprising a deck span of 100 feet, and some 300 feet of trestle approach, 45 feet above the water;

and the latter 300 feet long and 25 feet high. There is a very large quantity of timber to be brought out from the townships of Mackenzie, Mills and Patterson, the estimate being from 350 to 400 million feet, 100 million feet of which is pine. Aside from running through this area of timber, the line traverses for over half the distance a very fair agricultural country, which has been settled since the early days of the lumber industry."

C.P.R. officials will be rather amazed to read that they are building a line between Toronto and Ottawa and that they have surveyed a line from north of Parry Sound to Callendar.

MORAL.—Don't steal, but if you do, it is advisable to conceal your tracks.

## A Railway Company's Liability for Loss of Baggage.

Canadian Railway and Marine World for June contained on pg. 258 the full judgment of County Court Judge Denton, of Toronto, awarding Harriet E. Spencer \$340.50, in a case in which she claimed \$500 damages from the C.P.R. for breach of contract in carrying a trunk from St. Thomas to Toronto, or for conversion. The C.P.R. appealed the case and on June 16 the Appellate Division of the High Court of Judicature of Ontario gave the following judgment:—

In the absence of a special contract the defendant company as a common carrier became liable generally for the safe delivery of the trunk. The onus therefore is on it to show assent, actual or constructive, on Mrs. Spencer's part to the condition pleaded in modification of the contract implied by law. Whether there has been any such assent is a question of fact. Here the findings of the trial judge are in substance to the effect that no notice was given to the plaintiff or to the taxicab driver of the condition on the check, that the plaintiff supposed the check to be a mere receipt for the trunk, and that obviously she in no way expressly or impliedly assented to any contract except such as grew out of the delivery of the trunk to the defendant company (common carrier) and its acceptance by the company for carriage. Appeal dismissed with costs.

## Gas Electric Car on Quebec and Lake St. John Railway.

The gas electric car for the Quebec and Lake St. John Ry., described in Canadian Railway and Marine World for April and May, 1912, operated from May 1 to Oct. 1, 1912, very successfully, running between Quebec and Lake St. Joseph, 22 miles, making 4 round trips daily, a total daily distance of 175 miles. The actual operating cost was about 16c a mile, exclusive of general repairs.

The car was placed in service to provide a more frequent service and encourage suburban traffic. A considerable increase in traffic was experienced, and as last year's operation was in the nature of an experiment, it is anticipated that this year will see a much greater proportionate increase in the suburban traffic handled. The absence of smoke and cinders in its operation makes it conducive to the development of tourist traffic.

This car is self propelled by electric motors on the forward truck, receiving their energy direct from a 375 h.p. generator in the forward compartment of the car, direct connected to a 6 cylinder gas engine. The car is 54 ft. long, with a seating capacity of 76, and is capable of attaining a speed of 55 miles an hour.

**Proposed Government Railway Ownership in Alaska.**

A bill has been submitted to the Territories Committee of the U. S. Senate, to authorize an issue of \$40,000,000 in bonds for the building of a Government railway in Alaska. It is proposed to put the work in charge of a commission of five under the direction of the President. Nothing is said in the bill as to the route of the line, and the question of its operation when built is left for future consideration. This is the outcome of the recommendations of a special commission which reported on the condition of transportation in Alaska, which report has been under the consideration of a Senate committee.

O. L. Dickeson, President, White Pass and Yukon Route, which owns 20 miles of railway from Skagway to White Pass, in Alaska, the remainder of the railway, boat and stage lines being in Canadian territory, recently addressed a letter to the committee, in which he claimed that the only conclusion which could be arrived at upon the Commission's report was that Government money should be put up to enhance the value of a private investment in the Copper River and Northwestern Ry., to the exclusion of every other line in Alaska. "If they build this railway," Mr. Dickeson added, "there is only one way the Government can avoid the question of confiscation of private capital, and that is to find some general scheme which is acceptable to all concerned to purchase outright, control and operate all other existing lines." The position which Mr. Dickeson takes, however, is "that there are innumerable good, sound arguments which can be presented against government ownership of railways."

Mr. Dickeson gave evidence before the committee, in the course of which he showed what his company had been doing for the opening up of Alaska, and the position in which it was placed in approaching investors since the proposition favoring government ownership of railways in Alaska had been suggested.

Some of the details of Mr. Dickeson's evidence are criticised in the U. S. Pacific coast transportation circles, mainly in so far as they refer to the main part of Alaska. The White Pass and Yukon Route runs across that strip of Alaska, about 500 miles long by from eight to 20 miles wide, which cuts off Northern British Columbia from the ocean. The main part of this strip was awarded to the U.S. by the Alaskan Arbitration Commission some years ago. In some U.S. circles a proposition is now being urged that the Government should offer this strip to Great Britain in exchange for some or all of the islands of the West Indies, and Honduras, in Central America.

**Canadian Pacific Railway Company**

**NORTH TORONTO GRADE SEPARATION**

**Notice to Contractors**

Sealed proposals will be received by the undersigned up to 12 o'clock noon on Saturday, July 12, for the construction of the substructure of a subway to be built at Yonge Street, at North Toronto.

Plans and specifications can be seen at the office of the Engineer of Grade Separation at No. 262 Avenue Road, Toronto, where proposal forms can also be obtained.

B. RIPLEY,  
Engineer of Grade Separation.

Toronto, June 26, 1913.

**Canadian Northern Railway Earnings, Etc.**

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1911-12, from July 1, 1912:—

|       | Gross Earnings | Expenses     | Net Earnings | Increase  |
|-------|----------------|--------------|--------------|-----------|
| July  | \$1,829,700    | \$1,335,100  | \$494,600    | \$133,000 |
| Aug.  | 1,745,800      | 1,375,000    | 370,800      | 56,100    |
| Sept. | 1,671,500      | 1,248,000    | 423,500      | 4,100     |
| Oct.  | 2,351,200      | 1,645,900    | 705,300      | 24,000    |
| Nov.  | 2,503,700      | 1,631,900    | 871,800      | 212,600   |
| Dec.  | 2,132,000      | 1,551,000    | 581,000      | 77,200    |
| Jan.  | 1,513,400      | 1,243,200    | 270,200      | 46,500    |
| Feb.  | 1,398,700      | 1,130,200    | 268,500      | 30,900    |
| Mar.  | 1,685,900      | 1,254,400    | 431,500      | 4,700     |
| Apr.  | 1,745,300      | 1,242,200    | 503,100      | 100,000   |
|       | \$18,583,200   | \$13,656,900 | \$4,926,300  | \$690,000 |
| Incr. | \$2,636,200    | \$1,946,200  | \$690,000    | .....     |

Average mileage in operation during above periods, 4,297, against 3,838. Approximate earnings for May, \$2,218,400, against \$1,822,100 for May, 1912.

**Canadian Pacific Railway Earnings, Etc.**

Gross earnings, working expenses, net earnings, increases or decreases, compared with those for 1911-12, from July 1, 1912:—

|       | Gross Earnings   | Expenses        | Net Earnings    | Increase or Decrease |
|-------|------------------|-----------------|-----------------|----------------------|
| July  | \$12,052,398.58  | \$7,604,221.68  | \$4,448,176.90  | \$745,148.57         |
| Aug.  | 12,251,715.87    | 7,333,790.21    | 4,717,925.66    | 642,354.65           |
| Sept. | 11,579,733.98    | 7,329,430.13    | 4,250,303.85    | 332,857.05           |
| Oct.  | 13,060,397.80    | 7,999,510.61    | 5,060,887.19    | 379,732.44           |
| Nov.  | 12,362,666.42    | 8,104,527.36    | 4,258,139.04    | 270,772.55           |
| Dec.  | 12,219,273.72    | 7,823,559.21    | 4,395,714.51    | 289,980.25           |
| Jan.  | 9,679,607.39     | 8,017,233.61    | 1,662,373.78    | 579,516.08           |
| Feb.  | 9,747,685.55     | 7,227,616.21    | 2,520,069.34    | 136,202.67           |
| Mar.  | 11,111,892.78    | 7,256,475.89    | 3,855,416.89    | 137,015.78           |
| Apr.  | 11,750,913.45    | 7,805,835.90    | 3,945,077.55    | 170,674.24           |
|       | \$115,816,290.54 | \$76,702,200.83 | \$39,114,089.71 | \$3,342,964.80       |

x Decrease.  
Approximate earnings for May, \$11,650,000, against \$11,133,000 for May, 1912.

**Grand Trunk Railway Earnings, Etc.**

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R. for April, as compared with those for same period in 1912:—

| Grand Trunk Railway.                   |       | 1913.       | 1912.       |
|--|-------|-------------|-------------|
| Earnings                               | ..... | \$3,645,500 | \$3,199,400 |
| Expenses                               | ..... | 2,621,800   | 2,283,600   |
| Net earnings                           | ..... | \$1,023,700 | \$915,800   |
| Canada Atlantic Railway.               |       | 1913.       | 1912.       |
| Earnings                               | ..... | \$193,900   | \$179,400   |
| Expenses                               | ..... | 188,700     | 149,200     |
| Net earnings                           | ..... | \$5,200     | \$30,200    |
| Grand Trunk Western Ry.                |       | 1913.       | 1912.       |
| Earnings                               | ..... | \$652,400   | \$582,600   |
| Expenses                               | ..... | 597,100     | 484,600     |
| Net earnings                           | ..... | \$55,300    | \$98,000    |
| Detroit, Grand Haven and Milwaukee Ry. |       | 1913.       | 1912.       |
| Earnings                               | ..... | \$193,400   | \$175,500   |
| Expenses                               | ..... | 192,200     | 168,100     |
| Net earnings                           | ..... | \$1,200     | \$7,400     |

Approximate earnings for May, \$4,914,004, against \$4,303,374 for May, 1912.

**TRAFFIC RECEIPTS OF THE SYSTEM.**

|               | 1913         | 1912         | Increase    |
|---------------|--------------|--------------|-------------|
| G.T.R.        | \$17,223,001 | \$14,868,816 | \$2,354,275 |
| C.A.R.        | 953,142      | 841,288      | 111,854     |
| G.T.W.R.      | 3,005,887    | 2,676,727    | 329,110     |
| D.G.H. & M.R. | 922,709      | 828,255      | 94,454      |
| Totals        | \$22,104,779 | \$19,215,086 | \$2,889,693 |

**Grand Trunk Pacific Railway Earnings.**

The earnings of the Prairie Section and Lake Superior Branch for May were \$485,603, and the aggregate for four months ended May 31, \$2,155,613.

**Train Service Between Ottawa and Prescott.**—The Board of Railway Commissioners has ordered the C.P.R. to operate two first class trains each way per day on week days between Ottawa and Prescott, Ont., time of run to be not more than two hours and no freight cars to be hauled on such trains.

**Decision on Alberta Legislation.**

The decision of the Supreme Court of Canada, on a reference by the Privy Council of Canada, on what is known as the Alberta railway case, was recently given. The court was asked to answer two questions:— First, as to the right of the Alberta Legislature to pass certain legislation affecting the rights of railways authorized by the Dominion Parliament, and being within the Province; and, second, as to whether the provisions would be intra vires if amended by striking out the word "unreasonable." The Act referred to is the Railway Act Amendment Act, passed by the Alberta Legislature in 1912, which, among other things, provided that the provisions of sec. 82 of the act of 1907 should "extend and apply to the lands of every railway company or person having authority to construct or operate a railway otherwise than under the legislative authority of the Province of Alberta, in so far as the taking of such lands does not unreasonably interfere with the construction and operation of the railway or railways constructed and operated by virtue of or under such other legislative authority." Justices Davis, Idington and Duff answered both questions in the negative, and Justice Brodeur answered the first question in the affirmative, thus rendering an answer to the second unnecessary.

**Railway Subsidy Contract.**—The Department of Railways and Canals has entered into a contract with the Kettle Valley Ry., for the construction of a line from near Coldwater, B.C., to the Fraser River, 50 miles.



**Department of Railways and Canals, Canada.**

**TRENT CANAL.**

**Steel Pontoon Gate Lifter.**

**NOTICE TO CONTRACTORS.**

SEALED TENDERS, addressed to the undersigned and marked "Tender for Steel Pontoon Gate Lifter, Trent Canal," will be received at this office until 16 o'clock on Tuesday, July 29th, 1913.

Plans, Specifications and form of contract to be entered into can be seen on or after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Superintendent Engineer, Trent Canal, Peterborough, Ont.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labour, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of \$1,000.00 made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderer will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,  
L. K. JONES,  
Asst. Deputy Minister and Secretary,  
Department of Railways and Canals,  
Ottawa, 25th June, 1913.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—44228.

## Railway Development

### Projected Lines, Surveys, Construction, Betterments, Etc.

**Alberta Interurban Ry.**—The Dominion Parliament has confirmed the appointment of the directors as made at a meeting held April 16, 1912, and has validated their subsequent acts (April, pg. 168.)

**Algoma Eastern Ry.**—A train service was put in operation on the line from Sudbury to Espanola, Ont., 40 miles, June 2. Construction on the line from Espanola to Little Current, Manitoulin Island, has been completed, and it is expected that the train service will be extended to the latter point early in July. (May, pg. 219.)

**Athabasca and Grande Prairies Ry.**—The Dominion Parliament has incorporated a company with this title to build a railway from the junction of the Athabasca and Solomon Rivers northwesterly to the junction of the Smoky and Muskeg Rivers, thence through the Grande Prairies country west of Beaver Lake, to Dunvegan, Alta. (Feb., pg. 83.)

**Blomidon Ry.**—The Nova Scotia Legislature has extended the time within which the company may build the lines authorized by chap. 111 of the statutes of 1911. (Oct., 1911, pg. 935.)

**British Columbia and White River Ry.**—The Dominion Parliament has extended the time within which the company may build the lines authorized by chap. 45 of the Statutes of 1911. (Jan., pg. 20.)

**Buctouche Ry. and Transportation Co.**—The Dominion Parliament has authorized the company to change its name to the Moncton and Northumberland Strait Ry., and has extended the time for the building of the extensions authorized. (Jan., pg. 20.)

**Calgary and Fernie Ry.**—The subsidy voted by the Dominion Parliament in 1912, for the building of a line from between Michel and Sporwood, northerly by the headquarters of the Elk River, and Kananaskis Pass, to Calgary, Alta., 100 miles, has been renewed. The Minister of Railways said under the original subsidy the line was to have started at Calgary, now it is to start from near Fernie. The directorate includes G. A. Fraser and S. S. Mahon. (May, 1912, pg. 238.)

**Canadian Central and Labrador Ry.**—The Dominion Parliament has incorporated a company with this title to build a railway from near Cochrane, Ont., to the Atlantic coast of Quebec Labrador. (Feb., pg. 83.)

**Canadian Northwestern Ry.**—The Dominion Parliament has incorporated a company with this title to build the line already described. The provisional directors are:—Lord Howard de Walden, Lord Clinton, Lord Montagu of Beaulieu, England; W. F. Morgan, Jr., Paris, France; H. E. Brittain, F. W. Barker, London, England. (April, pg. 167.)

**Cape Breton Coal, Iron and Ry. Co.**—A Sydney, N.S., press report states that negotiations are in progress with the Sydney and Louisburg Ry. to secure running powers over that line to Louisburg.

The Nova Scotia Legislature has extended the time within which the company may build the lines authorized by chap. 110 of the statutes of 1895 and acts amending the same.

We are officially advised that work has been carried on all winter on the extension of the line to Mira, and the company is waiting for the Dominion Government to proceed with the construction of the breakwater to continue the building of the railway. H. Mayhew, Broughton, N.S., is

Managing Director. (Dec., 1912, pg. 604.)

**Central Ry. of Canada.**—The Railway Committee of the House of Commons rejected the company's application for an extension of time, and other powers, recently. Following this the bill was introduced into the Senate and passed, but when it came before the House of Commons for consideration, June 2, a resolution was passed directing it to be dropped from the order paper. (May, pg. 219.)

**Esquimalt and Nanaimo Ry.**—The Board of Railway Commissioners has authorized the opening for traffic of the Cowichan Lake Branch from Hayward Jet. to Cowichan Lake, B.C., 18 miles.

The reconstruction of the original line from Victoria to Wellington, which has been in progress ever since the C.P.R. obtained control, is almost completed. The work laid out for this year includes the replacing of the last 12 wooden bridges with steel spans.

The improvements proposed to be made on the line during this year will involve the expenditure of \$1,000,000, according to a recent statement of R. Marpole, Vice President. (May, pg. 219.)

**Fredericton and Grand Lake Coal and Ry. Co.**—Work has been started on the completion of the main line from near Fredericton to Minto, N.B., and on the branch from Fredericton to Marysville by the general contractors, A. E. Trites and Son, who have sublet the concrete work on the branch line to G. F. Baird, Fredericton. (May, pg. 219.)

**Glangary and Stormont Ry.**—The Dominion Parliament has incorporated a company with this title. (May, pg. 219.)

**Great Eastern Ry. of Montreal.**—A company with this title, Robert Sevart, President, has been registered as doing business in Montreal, but we have been unable to locate it or to ascertain anything about it. No company with this title appears to have been incorporated either by the Dominion Parliament or the Quebec Legislature.

**Hudson Bay, Peace River and Pacific Ry.**—The Dominion Parliament has extended the time within which this projected railway may be built. (Feb., pg. 83.)

**Intermarine Ry. and Navigation Co.**—Press reports state that the projected route of this line is from near the head of Lake Winnipeg, north easterly for 122 miles, to a junction with the Dominion Government railway to Hudson Bay, at mileage 191 from Pas, Man.; that both steam and electricity will be used for motive power, and that it is expected to let contracts for the building of the line in the spring of 1914. W. S. Boyd, 715 Somerset Block, Winnipeg, is acting secretary of the provisional directorate. (April, pg. 169.)

**Kettle Valley Lines.**—The Dominion Parliament has revoked the subsidies granted in 1910 for the building of the following lines:—From Merrit to Pentiction Wharf, 135 miles; from a point on above line to Midway, 136 miles; from a point on first-mentioned line 23 miles south of Merrit to near Hope Station on the Fraser River, 55 miles. The Minister of Railways stated recently that \$353,709 had been paid on account of these subsidies, representing 18% on the first and 34% on the second. The company has 101 miles of the line in operation and 43 under construction.

A contract under the act granting aid to

certain railways was entered into with the company, April 2, for the building of a line from near Coldwater to the Fraser River, B.C., 50 miles, but has only just been formally signed. (May, pg. 278.)

**Lake Erie and Northern Ry.**—The contractors are reported to be making rapid progress with the grading on this line from Port Dover to Galt, Ont. The rails and ties are being delivered. A contract has been let for the removal of houses on the right of way in Brantford. It is expected that track laying will be started early in July. (May, pg. 220.)

**Lake Huron and Northern Ry.**—We are officially advised that the line built by the old Bruce Mines and Algoma Ry., 17 miles, is somewhat out of repair, but it is expected to put it in proper condition this summer, and to make a start on the projected extension northerly. The permanent board of directors of the reorganized company has not been elected, the acting officers of the company being:—President, G. P. McCallum; Vice President, H. Appleton. The offices are at Sault Ste. Marie, Ont.—(See Bruce Mines and Algoma Ry., May, pg. 219.)

**Little Nation Ry.**—The Dominion Parliament has renewed the subsidy voted in 1910 for the building of a railway from the C.P.R., between Thurso and Montebello, Que., northerly for 30 miles. No construction has been done. (Dec., 1912, pg. 615.)

**Lotbiniere and Megantic Ry.**—The Dominion Parliament has revoked the subsidy granted in 1910 for the building of a railway from Lyster to Lune Ridge, Que., 60 miles. The Minister of Railways said recently that the company has built from St. Jean des Chaillons toward Glenroy to Lyster. There has been \$96,000 paid on account of the line already built. (Jan., 1912, pg. 22.)

**Margaree Coal and Ry. Co.**—The Dominion Parliament has granted a subsidy, not to exceed \$6,400 a mile, for the following lines in lieu of the subsidy voted in 1911:—From the Intercolonial Ry., near Orangedale, to St. Rose, N.S., 46 miles, and from the Intercolonial Ry., near McIntyre Lake, to Caribou Cove, Port Malcolm, N.S., four miles. The Minister of Railways informed the House of Commons, June 3, that no construction had been done on the line, but the applicants stated that financial arrangements had been made for immediate construction. The applicants were A. W. Chisholm, C. E. Sherman, J. D. Taylor, T. S. Courtenay. (May, 1911, pg. 411.)

**Michigan Central Rd.**—We are officially advised that construction has been started on the new 13-stall locomotive house at St. Thomas, Ont. The contractors are the Arnold Construction Co., Chicago, Ill., who also prepared the plans. (May, pg. 220.)

**Mid Provincial and Nechaco Ry.**—The British Columbia Government has granted the company an extension of time to Dec. 31, to complete surveys and file plans, etc. (April, 1911, pg. 321.)

**Naas Valley and Northern Ry.**—The Dominion Parliament is being asked to incorporate a company with this title to build a railway from the mouth of the Naas River to the Stikeen River, B.C.; thence northerly along the Teslin Lake to the junction with Yukon Territory. Smith and Johnston, Ottawa, are solicitors for applicants. The bill had not been passed through all its stages when Parliament prorogued.

**New Brunswick Coal and Ry. Co.**—Press reports state that the C.P.R. has made an appropriation of \$117,000 for the betterments of this line, which is to be taken over from the New Brunswick Government, and

operated in connection with the Fredericton and Grand Lakes Ry. and Coal Co.'s line, now nearly completed. The principal work to be done will be the putting in of permanent concrete piers for the bridges, and the general improvement of the roadbed. The work will be started during the summer. (June, 1912, pg. 301.)

**Newfoundland Labrador.**—The Newfoundland Legislature has authorized the Canadian North Atlantic Corporation to build a railway from the eastern boundary of Canadian Labrador, through Newfoundland Labrador, to Cape St. Charles, or such other point as may be approved by the Government, as part of a line which is projected to run from Quebec City. The company is granted 6,000 acres of land a mile in aid of construction. On completion of this line the company is authorized to build a branch line to a point between Bradore Bay and Cape St. Charles, to operate a car ferry therefrom to the Newfoundland coast, at Bonne Bay, and to build a railway thence to connect with the Newfoundland system. Under certain conditions the Government may build this latter piece of line. Plans for the line through the Newfoundland Labrador have to be filed within two years.

Sir Thos. Skinner, Bart., of London, Eng., who is a director of the C.P.R., advises us that he is not interested in the Canadian North Atlantic Corporation, as reported, and that he knows nothing of it.

**North Ry.**—We are officially advised that the names and addresses of the engineers in charge of locating parties on this projected railway are as follows:—Alex. McLellan, Rivington, Que.; W. S. Robertson, Bell River, Que., via Cochrane, Ont.; H. B. Tourigny, River Desert, Que., via Maniwaki, Que.; J. F. Rose, Duhamel, Que.; A. W. Whitney, Cochrane, Ont. June, pg. 278.)

**Northern New Brunswick and Seaboard Ry.**—A subsidy not to exceed \$6,400 a mile, upon the usual conditions, has been granted for the building of the following line in lieu of that voted in 1912:—From Drummond Mines at Austen Brook to the Intercolonial Ry., where it intersects the branch line from Bathurst Station to Bathurst Harbor, N.B., 16.9 miles. This line is already built to the Intercolonial Ry. rather less than 16 miles, and it is to be extended to Bathurst Harbor, which is being dredged. The Minister of Railways stated recently that the original subsidy was for 26 miles, but it had been found that better harbor accommodation could be obtained by dredging out Bathurst harbor than by going further on. (Oct., 1912, pg. 502.)

**Northern Pacific Ry.**—J. M. Hannaford, Second Vice President, accompanied by a number of officials paid a visit to Vancouver recently. In an interview he is reported to have stated that the company will be running its trains into the city within a year, over the Great Northern Ry. tracks from Cloverdale. The section of the old New Westminster Southern Ry. from Sumas to Cloverdale will be rebuilt to make this connection, and the Great Northern Ry. passenger station will be used, but the N.P. Ry. will provide its own freight terminals.

It was reported recently that the company was negotiating for the purchase of the Kitsilano Indian Reserve, which adjoins the False Creek area, which is being laid out by the Great Northern Ry. and the Canadian Northern Ry. for their terminals. (April, pg. 169.)

**Pacific and Peace River Ry.**—The Dominion Parliament has extended the time within which the lines authorized by chap. 127 of the statutes of 1911 may be built. (Feb., pg. 84.)

**Pacific Great Eastern Ry.**—A survey party has started work at Soda Creek and Quesnel, locating the line between Lillooet and Fort George, B.C. Construction between Newport and Lillooet is being rapidly pushed and some clearing is being done beyond Lillooet. It is expected that the section from North Vancouver to Newport on Howe Sound will shortly be put under construction. (June, pg. 278.)

**Pere Marquette Rd.**—Press reports state that the company is expending a considerable sum upon the improvement of its terminal facilities at Rondeau, Ont., which is on the company's own line, to which point it has been gradually diverting the business at one time carried to Port Stanley, the terminal of the London and Port Stanley Ry. The latter line is being operated by the P.M. Rd., under a lease which is near its expiration.

**Pointe aux Trembles Terminal Ry.**—The Dominion Parliament has incorporated a company with this title to build a terminal railway and other facilities at Pointe aux Trembles, Que. (April, pg. 169.)

**Prince Edward Island Ry.**—The Dominion Parliament has voted the following sums on account of this line, in addition to those already mentioned in these columns:—To increase accommodation and facilities along the line, \$5,000; to provide car ferry and make necessary alterations incidental thereto, including change from narrow gauge to standard gauge, \$1,000,000. The Minister of Railways stated recently that the contract for the car ferry had been let to Sir W. G. Armstrong Whitworth and Co. for \$138,000; that for the pier at Cape Tormentine to A. P. Mackie for \$571,590; and that at Carleton Point to the Halifax Dredging Co. for \$199,493. These amounts it was estimated would complete the piers and ferry ready for service. It is not intended to do anything on the way of altering the gauge of the railway this year, and nothing has been decided as to how this is to be done. Engineers have been working on the matter, and the question of laying down a third rail is being considered. The Halifax Dredging Co. has twice thrown up the contract for the Carleton Point terminals, and new tenders have been invited. (April, pg. 169.)

The Halifax Dredging Co. has abandoned the contract for the building of the car ferry slip at Carleton Point, P.E.I. The company desired to use P.E.I. sandstone in the work, but as its durability is questioned the Government refused to sanction it. The estimated cost of the work is \$700,000. New tenders have been invited, to be submitted by July 2.

**Reid Newfoundland Co.**—Press reports state that the company has ordered 6,000 tons of steel rails. Construction has been resumed on the Trepassey branch line, the construction headquarters having been moved to Stag's Head, Nfld. It is expected to have this branch completed in August. Rapid progress is reported to have been made with the building of the Trinity spur line. (April, pg. 169.)

The Newfoundland Legislature has authorized the company to build a line from near Broad Cove to Heart's Content, and a branch line from Carbonear, extending along the north shore of Conception Bay to Grate's Cove, instead of the line from Broad Cove to Heart's Content and Gnates Cove, mentioned in the act of 1910. The subsidy granted in 1910 is made applicable to the relocated line.

**St. John and Quebec Ry.**—Track laying was started at Fredericton, N.B., May 27, on the first section of the line. Connection

is made with the C.P.R. near Victoria Mills, by a switch, over which the steel is being taken on to the grade. (April, pg. 170.)

The Dominion Parliament has voted \$6,400 a mile upon the usual conditions, in lieu of the subsidy of 1912, for the building of a line from Andover to St. John, N.B., 200 miles. This subsidy covers all the bridges on the line except those across the St. John River at Mistake, and across the Kennebecasis River at Perry Point.

The Minister of Railways, in reply to questions June 3, said there was no settled policy that the line would be built to Grand Falls. This would necessitate the building of an expensive bridge, and before the Government would subsidize the building of the additional 25 miles more information would have to be obtained as to the prospects than was at present available. The C. P. R. had offered to give the line running powers over its line from Andover to Grand Falls. (Feb., pg. 84.)

**Scotstown or Megantic, to International Boundary.**—The Dominion Parliament has renewed the subsidy voted in 1907, to aid in the building of a railway from the C.P.R., at Scotstown or Megantic, Que., to the International boundary, 35 miles.

**Southampton Ry.**—In 1911 the New Brunswick Legislature granted aid towards the building of a railway from Melville to Pokiok Bridge, N.B., 13 miles. At the last session it increased the total amount of aid given by way of a guarantee of bonds, from \$130,000 to \$156,000, the first instalment of \$50,000 to be issued on the completion of five miles of line, the second instalment of \$50,000 on the completion of ten miles of line, and the balance on the completion of the line to the St. John River. The line has been practically completed, and it will be operated by the C.P.R. (Feb., pg. 84.)

The Minister of Railways informed the House of Commons recently that a subsidy contract had been signed with the company under the terms of the act granting aid to certain railways. The line was to be 13 miles long, and \$48,442.88 has been paid on account of the subsidy.

By Dominion legislation the company is authorized to dispose of its line to the C.P.R.

**Taber Transit Co.**—Press reports state that it is hoped to be able to let a contract at an early date for the building of a line northerly from Taber, Alta., to the coal mines at Retlaw and Bow City. The work will be light, mostly earthwork, with about 20,000 cubic yards of rock, the approximate cut averaging about 5,000 cubic yards a mile, and the fill about 7,000 cubic yards a mile. The maximum gradient will be 1.9% and the maximum curvature 10 degrees. There will be eight short pile trestles, one steel bridge 420 ft. long, four stations, 12 freight sheds, and other necessary buildings. A coal and grain traffic is to be catered for. The company has power to use electricity as a motive power. J. V. Kramer is President, and V. O. Eastland is Chief Engineer. (Apr., pg. 170.)

**Timiskaming and Northern Ontario Ry.**—We are officially advised that it is expected to increase the capacity of the repair shops at North Bay, Ont., during this year, but that the plans have not been definitely settled. Press reports stated that plans had been prepared for new shops and increased terminal yards to cost \$350,000, and that it was probable that a contract for the work would be let to Sherwood and Sherwood, North Bay. (May, pg. 220.)

The Dominion Parliament has authorized the payment to the Province of Ontario of a subsidy of \$6,400 a mile for the follow-

ing lines which have been built, and are being operated by the T. & N.O.R. Commissioners. From North Bay to Cochrane, Ont., 252.8 miles; branch from Englehart to Charlton, 7.8 miles; branch from Cobalt to Kerr Lake, 3.9 miles; branch from Iroquois Falls to Timmins, 33.2 miles; branch from Earlton to Elk Lake City, 28.5 miles; branch from Iroquois Falls Jet. to Iroquois Falls, 7.25 miles. (May, pg. 220.)

**Tobique and Campbellton Ry.**—The Dominion Parliament has voted a subsidy at the usual rate and upon the ordinary conditions, for the building of a line from Plaster Rock, along the Tobique River valley, to Riley Brook, N.S., 28 miles. This is in lieu of the subsidy voted in 1910. The Minister of Railways said recently that he had received an assurance from the company that it was ready to go ahead with construction. The directors include D. Fraser, A. Fraser, H. N. Murchie. This line is an extension of the Tobique Valley Ry. now terminating at Plaster Rock, and operated as a C.P.R. branch. (May, pg. 220.)

**Toronto, Hamilton and Buffalo Ry.**—An alternative plan for the removal of grade crossings in Hamilton, Ont., has been submitted to the Board of Railway Commissioners. The company proposed a system of track elevation, but the citizens objected on the ground of its expense, and secured the advice of an engineer, who prepared plans showing depressed tracks, the cost of carrying out which he claimed would be considerably less than the \$2,900,000 which the company estimated the track elevation would cost. The estimate was not made public, but it was arranged that the whole matter would be gone into at a conference of engineers.

We are officially advised that grading for a second track between Welland and Fenwick is in progress, and all passing sidings between Hamilton and Welland are being extended to accommodate 90 cars. New passing sidings are also being established at some additional stations between these points. The second track is being built alongside the present track, and there are no diversions. No changes are being made in the grades, as the line is practically level from Vinemount east to Welland. The grading is very light and will not average over 2,500 cubic yards to the mile. The line will be laid with 100 lb. steel. The contractor is J. L. Boyd. Toronto, and the work is being carried out under the supervision of R. L. Latham, Chief Engineer. (May, pg. 220.)

**Van Buren Bridge Co.**—The Dominion Parliament has vested in the V.B.R. Co. the charter rights of the Restigouche and Western Ry. (now known as the International Ry. of New Brunswick), to build a railway bridge across the St. John River at St. Leonards, N.B. (May, pg. 220.)

**Western Dominion Ry.**—Press reports state that Great Northern Ry. interests have acquired the charter rights of the W.D. Ry. O. E. Culbert, Ottawa, the company's solicitor, was in Calgary, Alta., June 8, in connection with the company's interests, but refused to make any statement. (Feb., pg. 84.)

**White Pass and Yukon Route.**—O. L. Dickeson, arrived in Vancouver, B.C., June 3, and proceeded to Skagway and Dawson City, to inspect the line, and to give consideration to plans for its extension. In an interview at Vancouver he is reported to have stated that if the Canadian and United States Governments would grant subsidies the company would extend its line from White Horse down the Yukon River to Dawson, Yukon, and Fairbanks, Alaska.

### Railway Rolling Stock Notes.

The Quebec Central Ry. has received a 10 wheel locomotive from Canadian Locomotive Co.

The Duluth, Winnipeg and Pacific Ry. has received 300 box cars from Mount Vernon Car Mfg. Co.

The Algoma Central and Hudson Bay Ry. has ordered a baggage car from Canadian Car and Foundry Co.

The St. Lawrence Bridge Co. has ordered 4 steel underframe flat cars, 40 tons capacity, and 4 pairs of trucks, 50 tons capacity, from Canadian Car and Foundry Co.

The C.P.R., between May 14 and June 12, ordered the following rolling stock:—6 refrigerator freight cars, 16 vans, 7 stock cars, 1 box baggage car and 10 class U3 locomotives, from its Angus Shops; and 11 Bucyrus ploughs and 3 Western spreaders, from Mussels Limited.

The Mond Nickel Co. has ordered 12 Otis all steel ore cars from Hart-Otis Car Co. Following are chief dimensions:—  
Length over end sills ..... 21 ft. 0 1/2 ins.  
Length inside ..... 19 ft. 0 ins.  
Width over all ..... 9 ft. 11 1/4 ins.  
Width inside ..... 9 ft. 6 ins.  
Height inside ..... 9 ft. 6 ins.  
Height from rail ..... 8 ft. 10 13-16 ins.  
Number of doors on each side ..... 4  
Capacity ..... 100,000 lbs.

In response to questions in the House of Commons recently, the Minister of Railways and Canals, in referring to the appropriation of \$1,000,000 for rolling stock for the Intercolonial Ry., stated that on account of that sum, 400 steel frame cars and 20 freight locomotives had been ordered. The cost of the locomotives was \$470,000, and of the freight cars \$484,000, while inspection, etc., made up the balance.

The Canadian Northern Ry., between May 15 and June 13, received the following additions to rolling stock:—7 consolidation locomotives, from Canadian Locomotive Co.; 15 heavy ten wheel locomotives, from Montreal Locomotive Works; 6 first class cars, 5 baggage cars, and 50 box cars, from Canadian Car and Foundry Co.; 2 combination cars, from Preston Car and Coach Co.; 5 second class cars and 100 flat cars, 60,000 lbs. capacity (a further 41 have since been delivered), from Crossen Car Co.; 170 Hart cars, from Hart-Otis Car Co.

The Canadian Car and Foundry Co., between May 15 and June 15, delivered the following rolling stock:—to Canadian Northern Ry., 165 wooden ballast cars 40 tons capacity, 5 first class cars, 3 wooden baggage cars and 97 wooden box cars 30 tons capacity; to C.P.R., 553 box cars 40 tons capacity, 10 steel underframe flat cars 40 tons capacity, 200 ballast cars 50 tons capacity, 78 steel underframe stone cars 40 tons capacity, 6 plough cars and 7 wooden tourist cars; to Dominion Iron and Steel Co., 39 quarry cars; Hart-Otis Car Co., 3 plough cars; International Ry., 89 steel frame box cars 40 tons capacity, 4 steel frame box cars 30 tons capacity, 81 Hart ballast cars 40 tons capacity; Toronto, Hamilton and Buffalo Ry., 42 wooden ballast cars 40 tons capacity; Montreal Tramways Co., 3 steel street car bodies.

The C.P.R., between May 14 and June 12, received the following additions to rolling stock:—174 freight refrigerator cars, 45 stock cars, 8 horse cars, 9 suburban cars, 5 dining cars, 5 box baggage cars, 10 sleeping cars, 16 baggage and express cars, 8 class E3 and 1 class U3 locomotives, from its Angus Shops; 474 steel frame box cars, 19 steel flat cars, 177 ballast cars, 59 stone cars, and 4 tourist cars, from Canadian Car and Foundry Co.; 276 steel frame box cars, from National Steel Car Co.; 157 steel frame box cars, from Nova Scotia Car

Works; 4 Lidgerwood unloaders, from Canadian Allis-Chalmers Ltd.; 3 Jordan ballast spreaders, 2 Industrial wrecking cranes and 3 Rodger ploughs, from F. H. Hopkins and Co.; 1 Bucyrus steam shovel, 10 Bucyrus ploughs and 3 Western spreaders, from Mussels Limited; 20 class G2 locomotives, from Montreal Locomotive Works; 10 sleeping cars, from Pullman Co.; 54 air dump cars, from Western Wheeled Scraper Co.; and 240 steel frame box cars, from Barney and Smith Car Co.

### Railway Finance, Meetings, Etc.

**Algoma Central and Hudson Bay Ry.**—A special meeting of shareholders was called to be held at Sault Ste. Marie, Ont., June 16, to pass bylaws as to the number of directors, and the quorum necessary for a meeting.

**Canadian Northern Ry.**—Winnipeg and Northern Ry.—The Board of Railway Commissioners has recommended the Governor-in-Council to approve of the agreement amalgamating the W. & N. Ry., with the C.N.R. The W. & N. Ry. is a short line running out of Winnipeg, which has always been a C.N.R. line.

**Canadian Pacific Ry.**—Announcement was recently made that the C.P.R. Co. will redeem at once £7,191,500 of 5% mortgage bonds which fall due July 1, 1915. The redemption price is £102. Bondholders desiring to take advantage of the offer were asked to deposit their bonds, with Baring Bros. & Co., London, Eng., prior to June 29.

**Grand Trunk Pacific Ry.**—A meeting of shareholders is to be held at Montreal, July 16, to authorize an issue of \$15,000,000 of debentures under the provisions of the G.T.P. Loan Act of 1913.

**Intercolonial Ry.**—It was stated in reply to a question in the House of Commons recently that the receipts of the I.R.C. for the year ended Mar. 31 amounted to \$11,467,207.45, of which \$3,438,447.32 was from passenger traffic and \$8,028,760.13 from freight traffic.

**Kingston and Pembroke Ry.**—Application will be made to the Ontario courts to appoint a trustee in place of H. V. Rogers, deceased, in the matter of a mortgage of the K. and P. Ry., made Dec. 31, 1898.

**Temiscouata Ry.**—Gross earnings for March, \$22,979.89; operating expenses, \$15,751.04; net earnings, \$7,228.85. Aggregate net earnings for nine months ended Mar. 31, \$47,210.

It is anticipated that on account of the more favorable traffic returns for the year ended June 30, the directors will be enabled to pay a dividend of 1 1/2 or 2% on the 5% income bonds, against 1% for the past five years.

**Toronto, Hamilton and Buffalo Ry.**—Following are the directors for the current year, elected at the annual meeting, June 3:—J. N. Beckley, President; Sir Thos. G. Shaughnessy, Vice President; W. C. Brown, W. H. Newman, H. B. Ledyard, D. McNicoll, W. K. Vanderbilt, Jr., Sir Edmund Osler, W. F. Torrance, W. L. Scott and D. W. Saunders.

**White Pass and Yukon Route.**—Aggregate earnings for four months ended Apr. 30, \$134,805, against \$81,439 for the same period 1912.

The introduction of heavy passenger equipment is rapidly doing away with both 4 and 6 wheel wooden frame trucks, their place being taken by cast steel and riveted wrought steel frames, the reduced cost of maintenance amply justifying this change.

## Canadian Pacific Railway Construction, Betterments, Etc.

**Atlantic Division.**—A contract is reported to have been let to H. Post, Woodstock, N. B., for the erection of new shops at McAdam, N.B., at an estimated cost of \$100,000. The new buildings will be of concrete and steel, and will be built on a site partially occupied by other buildings, which are now being torn down, and the remaining part of the site cleared.

**Eastern Division.**—The new portion of the Windsor St. station, Montreal, was opened to the public, June 7. The entrance is from the corner of Windsor and St. Antoine streets.

It is expected that the alterations to the Place Viger hotel, Montreal, will be completed so as to permit of the addition being opened to the public early in July.

Press reports state that additions are to be built to the Angus shops, Montreal, at a cost of about \$500,000. The additions will be made, it is stated to the passenger and freight car shops, the locomotive shop, upholstering shop, pattern storage building, maintenance building, general office building, and the power house building.

**Campbellford, Lake Ontario and Western Ry.**—We are advised that the contract for the erection of all the buildings on this railway between Glen Tay and Agincourt, Ont., has been let to the John S. Metcalf Co., Montreal. The buildings include seven brick stations, 12 wooden stations, nine 40,000 gall. water tanks; a 12-stall locomotive house with turntable, machine shop, coaling plant, ash pit, and sand house; nine freight sheds at Trenton, Ont.; seven station residences, 25 tool houses, and several miscellaneous buildings, making in all 85 structures. It is intended to have all these completed by the end of this year.

**Ontario Division.**—The Board of Railway Commissioners has approved location plan for an additional track from lot 23, station 4611.59, concession 3, Scarboro tp., mileage 87.34 to Leaside Jct., mileage 95.64, Havelock Division, and has approved of revised grade as built. This forms part of the second track between Toronto Union Station and Leaside Jct., which is being built in connection with the Campbellford, Lake Ontario and Western Ry.

Considerable progress has been made with the grading for the second track from west of Islington to Guelph Jct. Most of the culverts have been put in and the piers for the larger structures are being built. None of the bridge structures are very large. It is expected that track laying will be started early in July.

**Tillsonburg, Lake Erie and Pacific Ry.**—The subsidy voted by the Dominion Parliament in 1912 for the building of a line from Ingersoll, northerly to a junction with the St. Marys and Western Ontario Ry., at Embro, Ont., 10.38 miles, has been revoked. The Minister of Railways stated that should this line not be built at once, there would be no further revote of the subsidy.

**Lake Superior Division.**—Work is reported to have been started on additions to the shops at North Bay, Ont. Among the buildings to be put up will be an erecting shop, with accommodation for the repair of ten locomotives; a car construction and repair shop; and an additional machine shop.

**Manitoba Division.**—It is expected that the new yards at North Transcona, east of Winnipeg, will be in full operation by Sept. 15. About 45 miles of tracks in the yards are being used, and on Sept. 15, an additional 47 miles will be ready for use. The cut-off connecting the west part of Winnipeg with the yard has been com-

pleted, with the exception of the bridge, the piers for which are being put in. The completion of this structure will enable the bringing of the grain traffic direct into the yard instead of hauling it through the city.

An agreement has been reached between the company and the Winnipeg City Council to remove the present subway at Main St., and to build a new one considerably wider and 6 ft. higher, the work to be done within two years.

It is expected that a start will be made at an early date on the alteration and enlargement of the passenger terminal facilities in Winnipeg. The improvements involve a 474 room addition to the Royal Alexandra Hotel, a six story office building to replace the present baggage and old express offices, extension to the waiting room and train shed, and other minor improvements. The estimated cost of the whole is \$1,500,000. The contract has been let to Westinghouse, Church, Kerr and Co. S. J. Brunckerhoff is in charge of the work for the contractors.

The subsidy voted in 1908 for the building of a line from Gimli to Icelandic River, at Riverton, Man., 30 miles, has been revoked by the Dominion Parliament. This is an extension of the Selkirk and Winnipeg Beach Branch beyond Gimli.

**Saskatchewan Division.**—The Dominion Parliament has revoked the subsidy granted in 1908 for the building of 123 miles of railway from Moose Jaw, Sask., north-westerly. The Minister of Railways stated recently that the line had been built, but the subsidy had lapsed.

The Board of Railway Commissioners has authorized the opening of traffic of the branch from Kerrobert northeasterly from mileage 0 to 36.1.

Press reports states that plans are under consideration for the building of machine and repair shops at Wilkie, at an estimated cost of \$180,000.

The Board of Railway Commissioners has authorized the building of a bridge over the South Saskatchewan River, on the branch north-westerly from Swift Current, subject to the conditions that a draw span be provided of such width as may be sanctioned by the Department of Public Works, which Department must also approve of the location of the bridge.

**Alberta Central Ry.**—The Dominion Parliament has regranted the subsidy voted in 1908 for the building of a line from Red Deer to Rocky Mountain House, Alta., 70 miles. The line is under contract, and a considerable amount of grading has been done.

**Alberta Division.**—The newly built line from Bassano to Irricana, was opened for traffic June 2.

The first passenger train to cross the new high level bridge over the Saskatchewan River at Edmonton left Strathcona June 2, and a regular train service was established into Edmonton June 15.

**Calgary-Vancouver Second Track.**—Contracts are reported to have been let for the following mileages of second track work:—Revelstoke to Taft, 24 miles; Westmore to Kamloops, 25 miles; Kamloops to Tranquille, 9 miles; the contractors being Grant Smith, McDonnell and Co., Pacific Building, Vancouver.

The Board of Railway Commissioners has authorized the opening of traffic of the second track completed between Mission Jct., and Hammond, B.C., 18.29 miles.

Winnipeg press dispatches, June 16, state that the contract for the building of the

double track tunnel under the Selkirk Mountains, starting from near Bear Creek Station, has been let to Foley Brothers, Welch and Stewart.

**Pacific Division.**—The plans for the new C.P.R. line from Port Moody to North Vancouver, are under the consideration of the Board of Railway Commissioners. The route from Port Moody is around the head of the inlet and west, bridging the north arm and on through North and West Vancouver to Point Atkinson.

Considerable progress has been made with the new station and terminal buildings in Vancouver.

It is proposed to erect a \$70,000 building at the False Creek yards, Vancouver, for the use of the sleeping and dining car department. (June, pg. 278.)

## Intercolonial Railway Construction, Betterments, Etc.

The Dominion Parliament has voted the following sums in addition to those already mentioned in these columns on account of the Intercolonial Ry. new terminal facilities at Halifax, \$2,500,000; second track from Chaudiere Jct. to St. Romauld, Que., \$173,000; improvements at Levis, Que., \$160,000; locomotive and car shops at Moncton, N.B., with equipment, \$136,000; car ferry and dock at Mulgrave, N.S., \$460,000; improvements at Point Tupper, N.S., \$90,000; additional facilities at Riviere du Loup, Que., \$28,000; surveys and inspections, \$25,000; diversions at Sydney Mines, N. S., \$40,000; increased accommodation and facilities at 19 points on line, and \$25,000 for contingencies, \$126,000; increased accommodation at Truro, N.S., \$155,000; spur to Wallace Harbor, \$69,500; to increase water supply \$41,500.

Reference was made on pg. 264 of our June issue to the plans for the construction of new terminals at Halifax. The Department of Railways has under consideration tenders for grading a double track line from Rockingham to the site of the new terminals. The Minister of Railways paid a visit to the city June 16 to look into the project, and Jas. MacGregor, the engineer in charge, has been in consultation with the City Engineer, in connection with a number of matters. He is reported to have stated that the building of the line will be started early in July, and that the surplus material from the cuttings will be used in filling up the wharves etc., at the terminal site. \$1,000,000 has been voted by the Dominion Parliament on account of the construction of a railway from Dartmouth via Musquodoboit Harbour and the Musquodoboit Valley to Dean's Settlement. The Minister of Railways stated recently that the line will be 73 miles long, and its estimated cost \$28,545 a mile. It will be laid with 65 and 67 ft. rails taken up from the Intercolonial Ry. The \$1,000,000 includes a revote of \$600,000. The contract was originally let by the late Government. The present Government is not yet prepared to make any announcement as to the building of the proposed line to Guysboro, the original estimate for the construction of which was \$68,000 a mile. (May, pg. 219.)

The Intercolonial Ry. has received the following additions to rolling stock:—19 box cars, 60,000 lbs. capacity, 218 box cars, 80,000 lbs. capacity, from the Canadian Car and Foundry Co.; 99 Hart convertible cars, from the Hart-Otis Car Co.; and 4 freight locomotives from the Canada Foundry Co.

## Canadian Northern Railway, Construction, Betterments, Etc.

**Canadian Northern Quebec Ry.**—The Dominion Parliament has extended the time for the building of certain branch lines in Quebec.

Plans have been approved by the Board of Railway Commissioners for the erection of a new passenger and freight station at Maisonneuve, Montreal, to be situated on the south side of the track at the junction of Third and Fourth Avenues.

Land has been acquired in Hochelaga for the enlargement of the company's yards and the erection of new workshops. It was reported at the City Hall that the carrying out of the work would involve the closing of a number of streets. The matter is being looked into by the engineer and a committee of the council.

**Canadian Northern Montreal Tunnel and Terminal Co.**—It was reported by S. P. Brown, Chief Engineer in charge of the tunnel construction work, June 5, that 800 ft. of heading in solid rock had been cut in 31 days from the Dorchester St. end. The heading has now advanced 3,750 ft. west of Dorchester St., and very nearly equal progress has been made on the other heading. It is estimated that, if the same rate of progress is maintained the headings will be joined in September. About 3,600 ft. of the tunnel has been completed.

**Canadian Northern Ontario Ry.**—A proposition is reported to have been submitted suggesting that the C.N.O.R. join with the C.P.R. and the G.T.R. for the building of a joint four track line from a common point near Queen St. East at the Don River, Toronto, where a union station can be built, alongside the Don, to the union station tracks.

Plans have been filed showing the proposed entrance into Toronto from the west. They show a line four miles long, and include a tunnel of 2,360 ft. from east of St. Clarens Ave., just south of Davenport Road, to Talbot St. The tracks will be depressed at the west end, and the Humber will be crossed by a high level bridge. We have been officially advised that it is expected to start construction of this bridge by the end of June. In connection with the entry of the line into Hamilton, the Mayor has been advised that the company is willing to enter into an arrangement with the other companies for a common right of way through the city, and the Mayor has arranged for conferences with a view of ascertaining whether such a plan would be feasible. It is reported that the project to build from Beamsville direct to the Niagara River has been abandoned, and that a route terminating at Bridgeburg or Fort Erie will be chosen. A bridge will be built across the river and the line extended to Buffalo, so the reports state.

**Montreal-Ottawa-Port Arthur Line.**—The agreement between the company and the North Bay Town Council respecting the route of the line through the town was approved June 11, and the Mayor authorized to sign it.

**Canadian Northern Ry.**—It was reported in Winnipeg, June 15, that about 200 miles of line, principally in Saskatchewan and Alberta, were ready to be handed over to the operating department.

Station construction work is being gone on with on the branch lines. A considerable number have recently been completed, a recent list shows those finished to be:—Delsie extension, west of McRory, 8 miles; Swift Current extension from Avonlea, 11 miles; Prince Albert-Battleford branch, 6 miles; Melfort-Humboldt branch, 2 miles; Saskatoon-Calgary line from Excel, mileage

198, 8 miles; Vegreville-Calgary line, 10 miles.

Work is being pushed on the Vonda-Melfort branch in Sask., and on the Vegreville-Calgary line, Alta., so as to have them both ready for traffic after the harvest.

**Canadian Northern Pacific Ry.**—A. R. Mann, of the Northern Construction Co., is reported to have stated in Vancouver, June 5, that grading will be finished to the Albreda Summit, 430 miles west of Edmonton, by the end of October, and that track will be laid over the whole of the line in British Columbia by Aug. 1, 1914.

Working eastward from Port Mann track has been laid to Boston Bar, 116 miles, and a train service was put on as far as Spuzum, 115 miles, June 16. An 11 span viaduct, 1,000 ft. long, is being built at Anderson Creek, a few miles further east, and other bridge work is being completed to Kamloops, to which point the grading has been finished. It is expected to have the track laid to Kamloops by the end of the year.

Ties are being delivered for the Lulu Island branch, and it was expected to start track laying by the end of June. (June, pg. 277.)

### Canadian Northern Railway Tunnel in Toronto.

The new line which the Canadian Northern Ontario Ry. has projected from Toronto to the Niagara frontier, will negotiate the escarpment near the northwest corner of Toronto by a tunnel 2,360 ft. long. The line, from the proposed union station at North Toronto, will parallel the C.P.R. North Toronto line for about 3 miles, branching off northwesterly, the original survey locating the line to the south of the shoulder of land which the revised line will pass under.

The east portal to the tunnel will be at the corner of Davenport Rd. and St. Clarens Ave., alongside the Canada Foundry Co.'s plant, the tunnel emerging at the west portal a short distance south of St. Clair Ave., just west of the G.T.R. Toronto-North Bay line, the greatest depth over the tunnel being 40 ft. From this point westerly to the outskirts of Toronto, the tracks will be depressed in a 15 to 20 ft. cut, all the streets crossing overhead. This tunnel and depressed tracks will mean a big saving in what would otherwise be heavy property damages, and at the same time will eliminate all grade crossings.

The tunnel will be double tracked, probably of the same form as that now being used in the tunnel the C.N.R. interests are building under Mount Royal at Montreal. This construction is the twin tunnel type of horseshoe construction, with a dividing wall between, it having the advantage of a saving in material and a self induced ventilation.

In the vicinity of the tunnel, there will be three railway crossings to be provided for, but by the use of the tunnel, none of them will be at grade. The G.T.R. Toronto-North Bay line will be passed under just before coming out at the west portal. This will also be the case with the crossing of the parallel lines of the G.T.R. old main line, and the C.P.R. Windsor line a short distance west of the west portal.

The C.P.R. has opened a city freight and passenger office at 404 Victoria Ave., Fort William, Ont., in which the staff of the District and City Passenger Agent and of the District Freight Agent are located.

## Burrard Inlet Tunnel and Bridge Company's Project.

The organization meeting of the company was held at Vancouver, June 5, the shareholders consisting of representatives of the district of Vancouver, city of Vancouver, North Vancouver, West Vancouver, and a number of individuals. The company was formally organized, and accounts for expenditures of \$56,000 were approved. Following are the officers and directors: President, F. Carter-Cotton, representing West Vancouver; Vice President, Reeve May, representing North Vancouver; other directors:—Alderman F. E. Woodside, representing Vancouver city; Alderman G. W. Vance, representing North Vancouver Council; G. H. Bridgeman and — Loutet, representing the district of North Vancouver. The solicitors are Burns and Walkem, Vancouver, Pringle and Guthrie, Ottawa.

The Dominion Parliament has voted \$350,000 towards the construction of the bridge proposed to be built across the Second Narrows of Burrard Inlet, Vancouver, B.C., in lieu of the subsidy granted in 1910. The subsidy was originally granted to the Vancouver, Westminster and Yukon Ry. The B.I.T. and B. Co. was merely a holding company representing the municipalities interested, which proposed to build the bridge with Provincial and Dominion aid.

The bridge, which is intended to cross the Second Narrows at an angle of 75 degrees to the average direction of the flood and ebb currents, is estimated to cost \$2,225,000. It will have a clear headway of 45 ft., and will be 64 ft. 5½ in. wide, providing space for a single track steam railway, a roadway with double track for electric cars, and an eight foot sidewalk. It will be built on six piers. The three principal spans will have a total length of 1,045½ ft. Two of these will be fixed spans of 232 ft. each, and the central swing span will be 581½ ft. long, revolving at the centre and giving a clear navigable waterway on each side of 225 ft. (April, pg. 168.)

### Dominion Government Internal Storage Elevators.

The Minister of Public Works recently announced that the Government had decided to erect two interior storage elevators, at Moose Jaw and Saskatoon, Sask., respectively, each to have a capacity of from 3,000,000 to 4,000,000 bush., and costing approximately \$1,000,000. Similar elevators will be built in Alberta, and though the locations had not been decided on, the first will probably be at Calgary. In addition to these storage elevators, the Government has decided to build a transfer elevator on the Pacific coast, to be owned and operated by the Government, in connection with the anticipated growth of the grain export trade, after the opening of the Panama Canal. A Government owned terminal elevator of large capacity will also be built at Port Nelson, the Hudson Bay terminus of the projected Government railway from Pas, Man., to Hudson Bay. Supplementary estimates include \$4,000,000 for this elevator construction, and orders have been given to the Grain Commission, under the supervision of which they will be built, to proceed at once with preparatory work in connection with those to be built at Moose Jaw and Saskatoon. The cities have offered free sites, and the Commission will proceed at once to select same. The elevators will be thoroughly modern, and will be equipped with full inspection and drying equipment.

### National Transcontinental Railway Construction.

The Dominion Parliament, at its recent session, voted \$19,000,000 on account of the construction of this railway from Moncton, N.B., to Winnipeg, Man. In reporting on the state of construction the Minister of Railways stated that on District A the 256 mile section from Moncton to the New Brunswick-Quebec boundary, the line is completed, with the exception of the painting of some of the bridges. On District B 509 miles of grading has been done, leaving about 10% to be finished; track has been laid for 500 miles, and 74 miles of sidings have been laid; 357 miles of telegraph lines have been strung, and a few of the bridges require painting. On District C.D., which extends from 204 miles east to 208 miles west of Cochrane, Ont., 395 miles of grading have been finished; track has been laid for 391 miles, and 82 miles of sidings have been put in; 240 miles of telegraph lines have been strung, and the bridge work is 42% completed on the C. portion of the section, and 98% on the D. portion. On District E, 195 miles, grading and track laying has been nearly completed; 17 miles of sidings have been laid, 18 miles of telegraph lines strung, and 25% of the bridge work is done. On District F, 376 miles, extending to Water St., Winnipeg, grading is fully completed and track laid, including six miles of second track from Transcona to Winnipeg and 132 miles of sidings and yards; 304 miles of telegraph lines have been strung, and the bridge work is 93% completed. The amount expended on the work to Dec. 31, 1912, was \$127,219,863, and it is estimated that \$34,087,937 will be required to complete the work. It is expected to have the track all laid, and the line completed easterly into Cochrane this year, and into Quebec early in 1914. It is hoped to have the car ferry in operation between Levis and Quebec by that time.

The time limit for the completion of the car ferry at Levis, Que., is May, 1914, and if this is observed it is expected to have the line in operation from Moncton to Winnipeg by the end of the summer of 1914. The Quebec City Council was informed, June 13, that the contract for the terminal station and the workshops at Quebec was being prepared, and would be submitted for signature as soon as ready. This matter has been under discussion for a considerable time, and several inspections of the sites have been made by the Commission's engineers in company with the representatives of the G.T.R. and the city council. The Minister of Railways, during the discussion of the matter in the House of Commons, May 29, said the Champlain Market St., would be retained, where a small station would be put up. The Harbor Commissioners had agreed to run a line to connect that with the St. Charles River. The main points as to the terminals proper had been agreed upon. Until the traffic warranted the building of a tunnel under the city from Wolfe's Cove, it is proposed to run over the C.P.R., and have a union station. In regard to the shops it had been arranged to locate them at St. Malo.

It is expected that the 30 miles necessary to complete the line easterly from Winnipeg to Cochrane, Ont., will be completed in September, when a train service will be put on. At Cochrane the traffic will be taken over by the G.T.R., which has running rights over the Timiskaming and Northern Ontario Ry., and thence will be carried over its own line from Nipissing Jct. to Toronto, Montreal and other ports. The through train service from Winnipeg to Fort William was inaugurated June 6.

The first section of the journey is over the N.T.R. to Superior Jct., and the second over the G.T. Pacific Ry. line from Superior Jct. to Fort William. (June, pg. 277.)

### Grand Trunk Pacific Railway Construction.

The Dominion Parliament has passed an act authorizing an advance from the Consolidated Fund not exceeding \$15,000,000 to assist the company in completing the line from Winnipeg to Prince Rupert; such advance to be repayable with 4% interest by July 1, 1913, and to be secured by debentures charged upon the company's property and ranking next after the securities issued under chap. 100 of the Acts of 1906, and to be guaranteed by the G.T.R. The Act also provides that the \$15,000,000 is in addition to any sums now remaining unborrowed and negotiable of the loans heretofore authorized.

The Minister of Finance, in explaining the proposals, said the object was to provide funds to complete the line so far as the proceeds of the funds already provided were insufficient. "The cost of construction of the prairie section up to April 30, as estimated by the chief engineer, was \$35,438,230.31. To meet this estimated outlay there has been available, from the three sources mentioned, \$30,737,409.21, leaving a balance of \$4,700,821.10 on the prairie section, plus some additions for trestle work, \$2,700,000; for additions including building additional elevator tracks and extending some of those already built, constructing new stations, section houses, tank houses, etc., of \$3,600,000, making a total of \$10,230,821 required to complete the prairie section. Then on the mountain section the estimated cost, which will be exceeded according to the latest available estimates of the Chief Engineer, is \$61,509,600. Call this \$70,000,000. Of this 25% is to be furnished by the G.T.P. This amounts to \$17,500,000. The proceeds of the series B bonds were \$9,000,000. This leaves a balance to be furnished from other sources—including this loan which affords \$15,000,000—of \$8,500,000. So, according to this estimate an additional \$10,000,000 is required to complete and fully equip the prairie section, and a balance of \$8,000,000 to complete the mountain section, making a total of \$18,000,000. This will be exceeded, so call it \$20,000,000. We are providing \$15,000,000, which will be available pro tanto for the work."

Collingwood Schreiber, C.M.G., returned to Vancouver, May 22, from an inspection of the line easterly from Prince Rupert, B.C., and subsequently inspected the construction in progress westerly as far as Fort George. He reports that the grading easterly has been completed to Bulkeley Summit, and it is expected to have track laid to that point by Sept. 1. A considerable amount of grading has been done east of Bulkeley Summit towards Fort George, 160 miles distant. Work is well advanced from the present rail head, 60 miles west of Tete Jaune towards Fort George, 100 miles further west, and it is expected to have the track laid to that point by the end of the year. It is expected to be able to drive the last spike early in the summer of 1914, at a point between Fort George and Fraser Lake, B.C. (June, pg. 277.)

The Master Boiler Makers' Association's annual convention was held at Chicago, Ill., May 26 to 29. The subjects which came up for discussion covered practically the whole ground which comes within the purview of master boiler makers in connection with the design and manufacture of locomotive boilers.

### The Toronto Viaduct Proposition.

The Dominion Parliament has passed the Toronto Viaduct Act, which authorizes the G.T.R., the C.P.R., and the Toronto Harbor Commissioners, or any of them, in addition to their respective powers under the Railway Act, to expropriate for the purposes of the Toronto viaduct and works connected therewith or incidental thereto, any lands in Toronto covered by water within the district south of the existing C.P.R. right of way, from Yonge St. to the prolongation southerly of Berkeley St., and thence south of the G.T.R. right of way to Cherry St., and extending out to Windmill lane, and also a strip not exceeding 150 ft. wide immediately south of Windmill lane from the prolongation of Parliament St. to Cherry St.

The Minister of Railways in explaining the necessity for the passing of this act said the Board of Railway Commissioners' first order was for a four track viaduct, but it was found that this would not be sufficient for the traffic. The matter was reconsidered, and it was determined to build a six track viaduct. The act gives authority to the railways interested and the city of Toronto to expropriate between the existing tracks and the water. The Toronto Harbor Commissioners were in favor of the proposition in order to facilitate the development of the harbor.

### Quebec Bridge Construction.

Three million dollars were voted by the Dominion Parliament at its recent session on account of the construction of the bridge across the St. Lawrence River at Cap Rouge, near Quebec. The Minister of Railways informed the House of Commons that up to the close of the construction season of 1912, there had been laid 63,792 cubic yards out of 105,000 cubic yards of masonry in the substructure. The north abutment and north outer pier are finished; south main pier about 50% done; north main pier about 75% done; north anchor pier about 50% done; south anchor pier about 10% done. He expects that the work will be completed by the end of this year. In connection with the superstructure he said:—The contractors have during the past year completed a new plant at Rockfield, Que., and they have turned out a large quantity of material. This plant has been in operation since the first of this year and about 1,500 tons of the members of the bridge have been fabricated, and part of the material has been sent to the bridge site. Steel for the false work, crane, etc., is being shipped to the site. Ten thousand tons of steel have been ordered from the mills at Pittsburgh, and of this, 6,200 tons have been delivered at the shops at Rockfield and 2,000 tons of the same have been manufactured. The contractors are putting in the concrete foundations for the false work for the approach span, and for the crane runways on the north side, and are erecting false work on the south side. The steel for the anchorage has been completed. The crane runways in the unloading yards are about ready for operation. Regular shipments of steel to the site will be commenced shortly. The amount paid so far to the contractors for the superstructure is \$471,495.26.

Examinations in connection with the three scholarships covering four years' free tuition in the Faculty of Applied Science at McGill University, offered by the G.T.R. to apprentices and other employes under 21, and to sons of employes, were held during June.

**Dominion Subsidies in Aid of Canadian Northern Railway Lines.**

The Dominion Parliament has voted the following subsidies in aid of the building of the Canadian Northern Ry., and its allied lines:—To the Canadian Northern Ontario Ry., for a line from Toronto to Ottawa, Ont., 250 miles, at the rate of \$6,400 a mile; for a line from Ottawa to Port Arthur, Ont., 910 miles, \$12,000 a mile. To the Canadian Northern Alberta Ry., for a line from Edmonton to the boundary between Alberta and British Columbia, near the Yellowhead Pass, 260 miles, \$12,000 a mile. The lines are to be completed within three years from Aug. 1, 1913; running powers and other traffic facilities are to be given to other railways under conditions to be fixed by the Board of Railway Commissioners, but such orders may be varied or rescinded by the Governor in Council; transportation is to be furnished to the government for governmental purposes at reasonable rates, and in payment of these charges the government is to be credited by the company with a sum equal to 3% on the amount of subsidy received up to \$6,400 a mile; that books showing the cost of construction and cost of operation shall be produced when desired; that \$7,000,000 of the common stock of the C.N.R. shall be transferred to the Government, which may be disposed of at the discretion of Parliament, such stock to be held in trust by the Minister of Finance and Receiver General.

The Minister of Railways, in explaining the reason for the granting of this aid, said the total amount was:—Ottawa to Port Arthur, 910 miles, at \$12,000 a mile, \$10,920,000; Edmonton to Yellowhead Pass, 260 miles, at \$12,000 a mile, \$3,120,000; Toronto to Ottawa, 250 miles, at \$6,400 a mile, \$1,600,000, a total of \$15,640,000. The cost of the Toronto-Ottawa line was estimated at \$41,131 a mile, and the subsidy was at the regular rate. The average cost of construction of the Ottawa-Port Arthur line was \$49,381 a mile. The Dominion Government had already voted a guarantee of bonds for \$35,000 a mile, but the company had only been able to dispose of its bonds at 90%, which produced \$31,760,000. The average cost of the Edmonton-Yellowhead Pass line was estimated at \$38,500 a mile, in aid of which the Government had already guaranteed bonds, varying from \$13,000 to \$35,000 a mile, which bonds had produced on an average \$22,400 a mile. The cost of these two lines was estimated at \$54,638,981, and they had been financed to the amount of \$34,578,220, leaving a deficiency of about \$20,000,000, towards which the government proposed to grant \$14,040,000. A comparison with the aid granted to the C.P.R. could not fairly be made, as that line was a pioneer line, but a comparison could fairly be made with the G.T. Pacific Ry. The saving to the G.T.P. Ry. by reason of the Government building the eastern section was estimated at \$26,979,640, and the aid given in respect of the western section was by way of guaranteeing bonds for \$62,187,000; by way of loan \$10,000,000, implementing guarantee \$13,000,000, interest on bonds for seven years \$10,561,320. The aid given or proposed to be given to the C.N.R. was as follows:—

|   |              |
|---|--------------|
| Guarantee of bonds—                           |              |
| Montreal to Port Arthur .....                 | \$ 8,060,000 |
| Grand View to Edmonton .....                  | 8,060,000    |
| Edmonton to Yellowhead Pass.....              | 6,720,000    |
|   | \$50,655,000 |
| Cash subsidies—                               |              |
| Ottawa to Hawkesbury .....                    | \$ 367,872   |
| Stanley to Fort Frances .....                 | 1,355,326    |
| Fort Frances to Rainy River .....             | 179,200      |
| Yellowhead Pass to Vancouver .....            | 6,180,000    |
| Cash subsidy under proposed legislation ..... | 14,040,000   |
|   | \$22,122,398 |

No land grant had been given direct to the company, but it had through the purchase of other lines acquired with them land grants for 4,000,000 acres, of which 1,225,600 acres applies on its main line.

The Minister of Finance gave an exhaustive analysis of the financing of the company, which showed that the Dominion Government had guaranteed bonds in respect of the building of 2,552 miles of line, of which \$57,992,268 had been issued, realising \$52,823,428. On the company's affiliated lines are bonds guaranteed by the Dominion Government amounting to \$37,216,664; Ontario, \$7,860,000; British Columbia, \$16,490,000; Manitoba, \$349,000; and there had also been issued \$32,808,283 of bonds which were not guaranteed. The total amount of bonds guaranteed for the C. N.R. and its affiliated companies by the various governments amounted to \$120,120,461, and of bonds not guaranteed \$145,379,151, making the total amount of securities outstanding \$265,499,612. The bonds guaranteed by the governments altogether were as follows:—

|                                    |              |
|------------------------------------|--------------|
| Dominion of Canada .....           | \$58,043,250 |
| Province of Manitoba .....         | 24,110,546   |
| Province of Saskatchewan .....     | 8,030,000    |
| Province of Alberta .....          | 5,586,665    |
| Province of British Columbia ..... | 16,490,000   |
| Province of Ontario .....          | 7,860,000    |

The mileages laid were:—Quebec to Montreal, 178; Hawkesbury to Ottawa, 57; Port Arthur to Edmonton, 1,265. There were under construction from Ottawa to Port Arthur 910 miles, from Edmonton to Yellowhead 260 miles, and from Yellowhead to Vancouver 525 miles; total, 1,695 miles. Contracts called for completion by the end of 1913, and by the summer of next year it was expected that the C.N.R. would be running across the continent.

The following figures were given, showing subsidies granted:—Ottawa to Hawkesbury, \$367,000; Ottawa to Port Arthur, nothing; Stanley to Fort Frances, \$1,355,000; Fort Frances to Rainy River, \$179,000; Winnipeg to Summit, nothing; Montreal to Quebec, \$1,927,000; Yellowhead to Vancouver, \$6,180,000. The total of guarantees, Dominion and provincial, on the main line from Montreal to the Yellowhead Pass was \$57,000,000, or about \$20,000 a mile on the 2,700 miles.

Replying to questions in the House of Commons, June 2, the Minister of Railways said the maximum gradient against eastbound traffic between Port Arthur and Montreal, was 0.50%, or 26.4 ft. a mile, and that against westbound traffic on the same line 0.60%, or 31.68 ft. a mile; the maximum gradient against eastbound traffic on the line from Edmonton, Alta., to Port Mann, B.C., was 0.70%, or 37 ft. a mile; and that against westbound traffic on the same line was 0.50%, or 26.40 ft. a mile.

On June 4, the Minister stated in reply to further questions that the mileage under construction to be controlled and operated by the C.N.R., and not included in the answer given June 2, was 3,143 miles; the total amount guaranteed by the Dominion Government in aid of the construction of such lines was \$43,419,585, and the amount granted to date for these lines was \$6,180,000; the amount guaranteed by other governments for these lines had not been ascertained by the Department.

It is said that the subsidies will be paid over, so far as constructed lines are concerned, on the completion of inspections which are now being made, and on the remaining mileages as the work progresses.

Six wheel trucks, rivetted wrought steel frames, M.C.B. standard axles, parts and pedestals, and 36 in. wrought steel wheels, have been advocated for exclusive use in steel passenger car truck design.

**Dominion Government Railway to Hudson Bay.**

The Dominion Parliament at its recent session voted \$4,500,000 for the construction of this railway, and the provision of terminals. The Minister of Railways stated that the contracts as let, together with the estimated cost are:—Pas to Thicket Portage, 185 miles, \$2,500,000; Thicket Portage to Split Lake Jct., \$1,000,000; from Split Lake Jct. to Port Nelson on Hudson Bay, \$1,000,000. About \$1,500,000 of the vote is on account of harbor work. It is expected to send a number of men with supplies and a complete plant to Hudson Bay to start the development of the harbor there. It is proposed to put a wireless station at Port Nelson and another at Pas. The latter will be removed elsewhere when the land telegraph lines are completed. The bridge across the Saskatchewan River at Pas was only finished at the end of April; track-laying has been commenced north of the river, but he had not received any report as to the progress made. Grading has been completed for over 100 miles, and it is hoped to get track laid on the 185 miles to Thicket Portage by the end of the year. (June, pg. 273.)

**Grand Trunk Railway Betterments, Construction, Etc.**

**Granite Ballasting Montreal-Toronto Line.**—The project for the reballasting of the line between Montreal and Toronto, with crushed granite, has apparently been dropped for the present. The rock crushing plant which had been provided has been put in storage at Kingston, Ont., and the preparations which were being made for installing it at Kingston Mills have been stopped.

**Union Station at the Don, Toronto.**—A proposition is reported to be under consideration for the building of a union station, to be used by the G.T.R., the C.P.R., and the Canadian Northern Ontario Ry., on the west side of the Don River, just north of Queen St. East, Toronto. The G.T.R. and the C.P.R. now have stations at the Don, within sight of each other, and the Canadian Northern is preparing to build its eastern entrance. The suggestion is that the present stations be abandoned, and that the three lines join up at a certain point and build a four track line to Toronto Union Station.

**Erie, London and Tillsonburg Ry.**—A re-vote of the subsidy granted in 1910 for the building of a railway from Port Burwell to London, passing through, Vienna, Calton, Aylmer, Kingsmill and Belmont, Ont., 35 miles, has been granted by the Dominion Parliament. The charter for the building of this railway is held in the interests of the G.T.R. The Minister of Railways said recently he would support a motion to refuse any further renewal of the subsidy for this line. (June, pg. 276.)

Upwards of 1,500 responses were received by the New York, New Haven and Hartford Rd. in reply to a reward offered by that line for the invention of a practicable automatic train control device, following the fatal Westfort wreck last fall. A special force had to be set to consider the large number of devices submitted, but of these, it is said that less than 5% were worthy of consideration, and after final examination by the higher engineering officials, only two were deemed worth a trial.

### Telegraph, Telephone and Cable Matters.

The Nova Scotia Legislature has amended the act of incorporation of the Maritime Telegraph and Telephone Co.

The Department of Naval Service received tenders, June 25, for the erection of masts and buildings for wireless telegraph stations to be built at Kingston, Toronto and Port Burwell.

It is reported that the Western Union Telegraph Co. is contemplating the erection of a large station at Bay Roberts, Nfld., and that its station at Canso, N.S., will be ultimately abandoned in favor of Bay Roberts.

The Great North Western Telegraph Co. has opened offices at Ste. Felicite, Que., and Listowel station, Ont., has reopened its offices at Beaumaris and Grimsby Beach, Ont., and has closed its offices at Demorestville and Listowel, Ont.

The Board of Railway Commissioners has extended to Dec. 1, the time limited by Sec. 4, chap. 61, 7-8 Ed. VII., for approval of C.P.R. telegraph tolls between points in Western Canada, including Sudbury, Ont., and from points east thereof, and east of and including Windsor, Ont., during which it may charge such tolls as are authorized under that act.

The United States Forest Service is conducting experiments in the use of wireless telegraphy and wireless telephones as a practical means of communication between fire patrol men and the headquarters office. Quick communication means the arrival of fire fighters in the early stages of a fire. This in turn means that many fires will be extinguished in their incipiency, with only nominal loss.

The Board of Railway Commissioners has ordered that when the City of Hamilton, Ont., has provided underground conduits, in accordance with plans prepared by the City and approved by the Board's Electrical Engineer, the Great North Western Telegraph Co., C.P.R. Telegraphs and Bell Telephone Co. shall remove their poles, wires and cables from portions of certain streets there.

In an interview on the question of telegraph extensions by the C.P.R. during the current season, J. McMillan, Superintendent of Telegraphs, Manitoba Division, C.P.R., Winnipeg, is reported to have stated that about 4,775 miles of wire will be strung along the western lines, and that by the end of the summer, it is expected that about 2,280 miles of C.P.R. track west of Winnipeg will be operated by telephone.

The Dominion Government has awarded a contract to the Marconi Wireless Telegraph Co., for the erection of two stations, one at Pas, Man., and the other at Port Nelson, on Hudson Bay, in connection with the projected Hudson Bay railway. It is stated that the stations will be of 10 k.w. capacity, obtained from 20 h.p. Canadian Fairbanks-Morse engines, and that each station will have a range of 500 miles.

F. D. Boomer, whose appointment as local manager, Great North Western Telegraph Co., Quebec, was announced in our last issue, entered the company's service in April, 1902, at Adams, N.Y., and in Jan., 1903, took charge of the Postal Telegraph Co.'s office at Alexandria Bay, N.Y., being transferred to Ogdensburg, N.Y., Sept., 1903. From Sept., 1904, to May, 1906, he was all night manager at Watertown, N.Y., and re-entered G.N.W.T. Co.'s service, May, 1906, at Toronto, being appointed traffic inspector in Oct., 1910, and chief operator at Ottawa, June, 1911.

A bill is before the Newfoundland Legis-

lature providing for the confirmation of the agreement between the Government and the Marconi Wireless Telegraph Co. of Canada, for the operation of wireless telegraph stations at certain points in Newfoundland and Labrador. Stations have been erected at Battle Harbor, Venison Tickle, Seal Island, Domino, Grady, Indian Harbor, Cape Harrison and Mokka, and further stations are provided for under the agreement. The Government pays a subsidy of £100 on each of the stations, with an additional £50, a year for certain of them.

### Among the Express Companies.

The Canadian Northern Ex. Co. has opened its offices at Lake Joseph and Royal Muskoka for the summer season.

The Dominion Ex. Co. has moved its Edmonton, Alta., office, to its new building on Jasper Ave.

The Board of Railway Commissioners has defined delivery and collection limits, for Dominion Ex. Co., in Gull Lake, Sask.

The American Ex. Co. has resumed its service to St. John, N.B., operating over the Eastern Steamship Co.'s International Division.

The Dominion Ex. Co. has placed its service in effect on the Canada and Gulf Terminal Ry., between Ste. Flavie and Matane, Que., and has opened offices at Priceville, St. Ulric, Sandy Bay, Metis Beach and Matane.

The Board of Railway Commissioners has extended the express delivery and collection limits in Winnipeg, to include the portion of Elmwood, from the corner of Chambers and Watt Sts., along Watt St. to Union Ave., and thence on Union Ave., to C.P.R.

### Dominion Express Co.'s Appointments.

L. D. CHURCHILL has been appointed cashier at Halifax, N.S., vice J. Doherty, transferred.

J. DOHERTY, heretofore cashier at Halifax, N.S., has been appointed cashier at St. John, N.B., vice W. E. Campbell.

W. E. CAMPBELL, heretofore cashier, has been appointed chief clerk, St. John, N.B.

P. T. DONNELLY, heretofore messenger, has been appointed agent at Levis, Que.

F. H. MCGARRETT, heretofore agent at Cobalt, Ont., has been appointed route agent, North Bay, Ont., vice D. F. Martin.

A. ROBERTS, heretofore agent at South Porcupine, Ont., has been appointed agent at Cobalt, Ont., vice F. H. McGarrett, transferred.

J. McLAY, heretofore agent at Kenora, Ont., has been appointed agent at Maple Creek, Sask.

### Reduction of Express Rates in Western Canada.

In Canadian Railway and Marine World for May, it was announced that the Board of Railway Commissioners had ordered a 20% reduction of express rates in the Prairie Provinces and British Columbia. Following is the official order (General order 104, Apr. 30.):—

In pursuance of the powers conferred upon it by secs. 28 and 348 of the Railway Act, and of all other powers possessed by the Board in that behalf its is ordered:—

1. That the express companies under the Board's jurisdiction be required to submit new standard tariffs of maximum mileage

rates to be charged for express freight classified as merchandise between points west of and including Sudbury, Ont., making a reduction of approximately 20% from the maximum mileage rates in excess of 50c. per 100 lbs. now being charged; the said reduced maximum rates to carry with them the appropriate tolls of the graduate table, scales K and N, and the special tariff for single shipments of 500 lbs. or over;

2. That the said maximum rates, so reduced, for the mileage group from 900 to 1,000 miles, do not exceed \$4 per 100 lbs. in the section between Sudbury, and Sault Ste. Marie, Ont., and Crownsnest, Canmore, and Thornton, Alta., and \$4.75 per 100 lbs. in the section west thereof, in place of \$5 and \$6, respectively, as now charged;

3. That the said reduced standard tariffs of maximum mileage rates be published and filed so as to become effective on or before July 15, 1913.

### Parcel Post Legislation in Canada.

While the Postmaster General's bill for the establishment of a parcel post system in Canada was under discussion in the Commons recently, he said that it had been decided to fix the weight limit of parcels at 11 lbs. and the maximum length and girth combined at 6 ft. The zone system will be adopted, each province forming a zone, with the exception of the three maritime provinces, which will form a zone together. The first zone, however, will be within a radius of 20 miles of the point where the parcel was posted, irrespective of the provincial boundary; the second zone will be outside the 20 mile radius, and within the provincial boundary. It is anticipated that the system will come into force, by proclamation, Jan. 1, 1914.

**South East Calgary Corporation.**—This company, owning about 4,000 acres of land in the neighborhood of the C.P.R. Ogdens Shops, near Calgary, Alta., has built about 6 miles of railway track through its land, south east of the Ogdens Shops, connecting with the Calgary Municipal Ry. at the city boundary. The line was built under the supervision of T. H. McCauley, Superintendent, Calgary Municipal Ry., and is fully equipped and quite up to date. One car has been received, which it was expected to place in operation, July 1. The fares for the six miles are at the same rate as those in the city, workmen's tickets 8 for 25c., and ordinary 6 for 25c., single fares 5c. Jas. Walker, D. W. Trotter and P. Burns, Calgary, are among those chiefly interested. We are advised that the line will be operated by the city of Calgary.

**The Use of the Screw Spike** for fastening down rails, is increasing in popularity. The principal objections to its use are that the first cost, and the difficulty of laying the rails and making repairs and renewals are increased; but it is felt by those using them that these disadvantages are more than offset by the increased life of the tie, decreased cost of maintenance, and the greater strength and stability of the track. From the fact that at each relaying they are driven in new holes for security, the old holes loosening in time, ordinary spikes cause the tie to become what is termed "spike killed," that is, the tie no longer will effectively hold the spike. It is for this reason that some roads that use tie treating, only have the process carried far enough to give a preservation corresponding to the mechanical life of the tie. The increased mechanical life from the use of the screw spike makes advisable more complete initial preservation.

# Electric Railway Department.

## The Niagara, St. Catharines and Toronto Railway System.

The Niagara, St. Catharines and Toronto Ry. operates a system of electric lines covering a considerable portion of the central Niagara peninsula in Ontario, following principally the portion of the country traversed by the Welland Canal, and covering throughout its length a rich manufacturing district that is increasing in value yearly through the influx of new industries attracted by the close proximity of the cheap Niagara power, the abundance of the labor market and the excellent shipping facilities. At the different towns served, there has been a marked influx of branches of U. S. industries coming into the Canadian field, the establishment of such branches having been rendered necessary on account of the Canadian protective tariff.

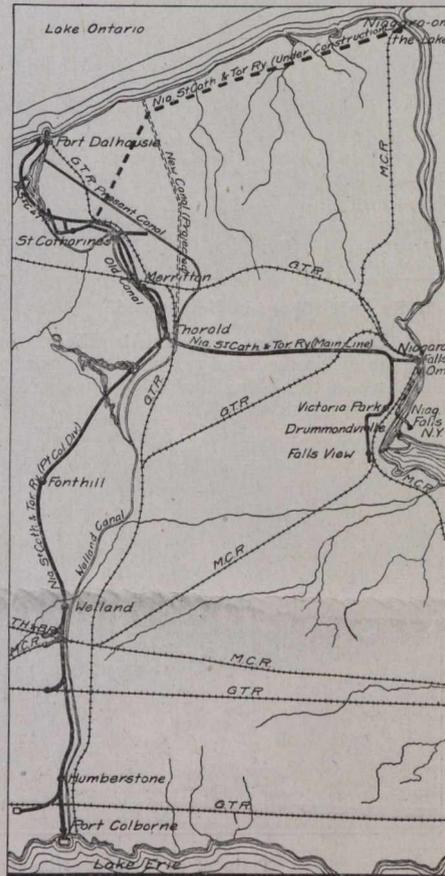
The Niagara, St. Catharines and Toronto Ry's present system consisted originally of three separate lines. The early history of these lines is typical of that of most organizations that have been formed from the amalgamation of several minor lines that to a certain degree have a community of central interests. The main line was the St. Catharines and Niagara Central Ry., a line chartered by the Ontario Legislature in 1881, to build a steam line from St. Catharines to the Niagara River, this privilege being extended by another Act in 1882, authorizing the company to extend the line to Toronto via Hamilton. No action was taken at that time, but application was made to the Dominion Parliament to have the work declared to be for the general advantage of Canada, which was granted in 1887. Construction was pushed forward, and a line was completed from St. Catharines to Niagara Falls and opened for traffic, Dec. 20, 1888. In 1890, the Dominion Parliament reserved the right to extend the line to Hamilton and Burlington, and in 1891 increased financial power was granted, with authority to make physical connection with

given to extend the line to several points westerly as far as Woodstock and Port Dover. Shortly after, the line fell into a receiver's hands, but was eventually re-

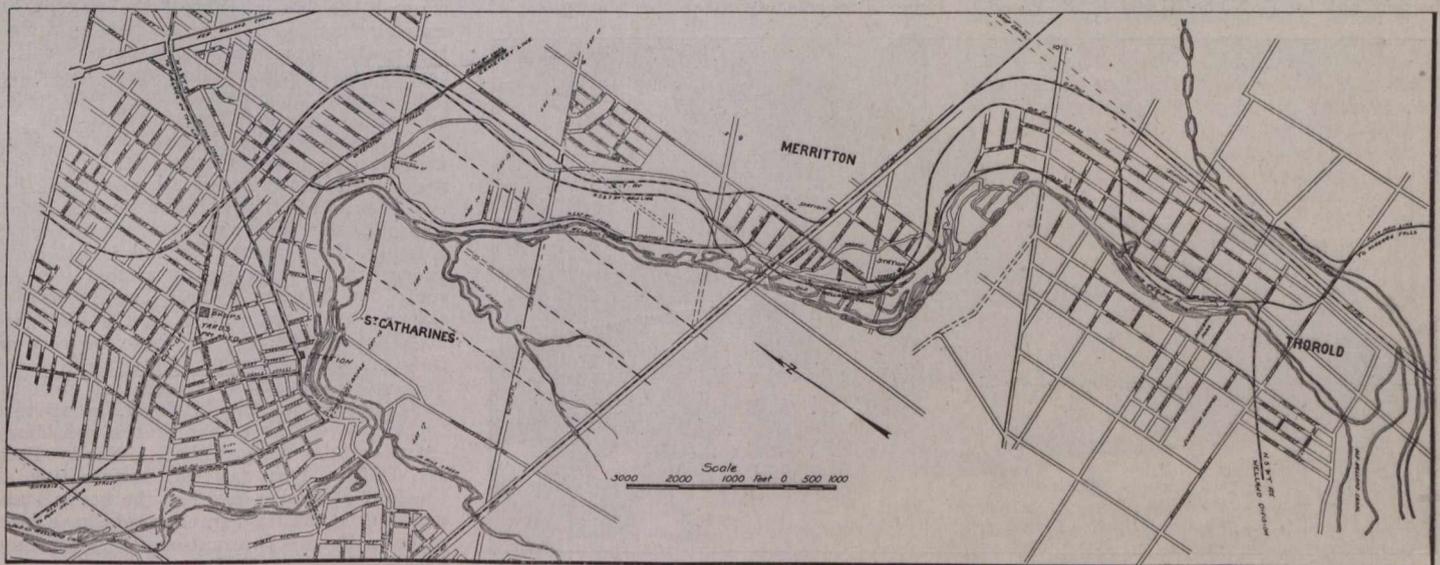
to acquire, by absorption or control of stock, the older company. The new company was given power to extend its lines in several directions, including to Toronto, via Hamilton, to Port Dalhousie, and to Fort Erie. Wide powers of operation were granted, including the acquisition of vessels for operation on the Niagara River and Lake Ontario to Toronto and points west. Further Dominion legislation within the next three years, to be mentioned later, permitted the acquisition of the other two lines now comprised in the system.

The smallest unit of the system is the Niagara Falls, Wesley Park and Clifton Tramway Co., Ltd., incorporated by Ontario letters patent, Aug. 7, 1886, to construct a tramway through certain streets of Niagara Falls and Stamford township, to be operated by any power desired. This line was built shortly after, operated at first as a horse car line, and then electrified, being sold under permission of Ontario legislation of 1901, to the Niagara, St. Catharines and Toronto Ry. Co., the latter company being permitted to acquire this line under Dominion legislation of 1901.

The earliest line of the system was the St. Catharines Street Ry. Co., incorporated by Ontario legislation in 1874, to operate a horse car line, with the option of sleighs in winter, in St. Catharines, Port Dalhousie, Merritton, Thorold, and Grantham township. No immediate action being taken under this charter, the time for construction was extended by the Legislature in 1877, following which the line was built from St. Catharines through Merritton to Thorold, and operated as a horse car line. In 1882 the Ontario Legislature changed the name of the company to the St. Catharines, Merritton and Thorold Street Ry. Co., and the operation continued as before, until in 1893 the name of the company was changed by letters patent to the Port Dalhousie, St. Catharines and Thorold Electric St. Ry.



Niagara, St. Catharines and Toronto Ry. Lines, Radiating from St. Catharines, Ont.



Niagara, St. Catharines and Toronto Ry. Local Lines in St. Catharines, Merritton and Thorold.

any railway other than the G. T. R., for transfer to and from New York State. Operation was continued under these conditions until, by Dominion legislation in 1895, the name was changed to the Niagara, Hamilton and Pacific Ry. Co., and authority

organized, and electrification was authorized by the Dominion Parliament in 1899. By this Act, the company was reorganized and the name changed to that which it at present holds—The Niagara, St. Catharines and Toronto Ry. Co. Power was given it

Co., but under this renewed charter, which granted the privilege of extending the line to Port Dalhousie from St. Catharines, no action was taken, the line operating as before. In 1902 the Ontario Legislature authorized the company to transfer its hold-

ings to the Niagara, St. Catharines and Toronto Ry. Co., the latter being permitted to take over the property by Dominion legislation of 1901, and the main company was given authority to absorb the two smaller companies.

From 1901, the history of the main company is the history of the subsidiary companies, on account of the complete absorp-

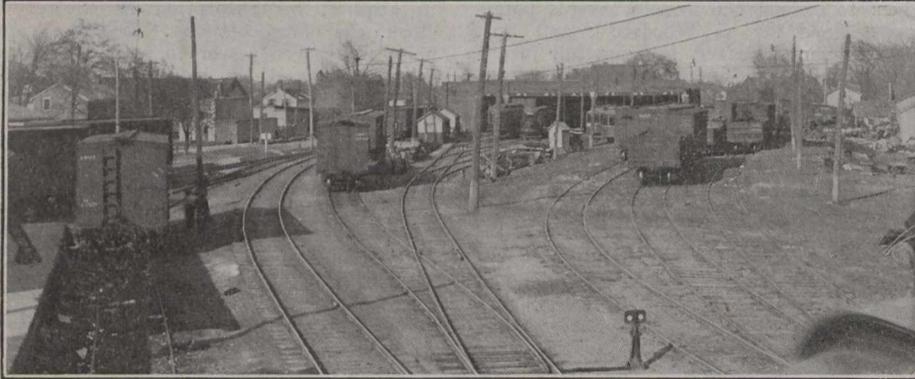
Wesley Park and Clifton Tramway had been operated as an electric line. The original line of this unit operated from Bridge St., Niagara Falls, Ont., through the town streets and out beyond Lundy's Lane, paralleling the Niagara River, some distance back from the river road. Immediately after absorption, the new interests had the line extended a short distance be-

City, had been purchased by that company the same year the line was extended. The boat line was changed in 1910 by the replacing of the Lakeside by the new steamboat Dalhousie City.

The Port Dalhousie, St. Catharines and Thorold Electric Street Ry. line through St. Catharines, Merritton and Thorold, is the same at present under the N. St. C. & T. R. Co. as before the absorption.

The company's lines were extended in 1907 from the main line at Thorold to Welland, and in 1908 from the latter point to Port Colborne, both lines being built under authority of Dominion legislation passed in 1906, which authorized several extensions, including one now under construction from St. Catharines to Niagara on the Lake.

The company's main line leaves the radial station on St. Paul St., opposite Mary St., in St. Catharines, following James and Raymond Sts. and Welland Ave. to the G.T.R. Port Dalhousie branch tracks, from which point it turns easterly over its own right of way, paralleling the G.T.R. very closely all the way to Merritton, and thence to Thorold, the general direction and location of the line being that of the original canal on the high land to the east. Merritton is situated on a low area, and as the line has passed up a steady grade coming out of St. Catharines, a drop into



St. Catharines Yards of the N., St. C. & T. Ry., with Shops in Background.

tion on this date of the amalgamation of interests. Shortly after the absorption, the Niagara, St. Catharines and Toronto Navigation Co. was formed, and the Dominion Parliament in 1902 granted the Niagara, St. Catharines and Toronto Ry. Co. authority to acquire the navigation company's stocks and bonds, which it immediately proceeded to exercise.

As mentioned, the main line of the company from St. Catharines to Niagara Falls was originally steam operated, and in the nineties fell into evil days and was placed in the hands of a receiver, who operated it for a number of years. In 1899, the insolvent line was taken over by a New York syndicate, associated with which were four Canadians, Z. A. Lash, J. H. Plummer, J. W. Flavelle and Aemilius Jarvis, of Toronto. F. A. Cheney was appointed General Manager by the new interests, and the electrification of the line was proceeded with at once. In 1900, E. F. Seixas was appointed General Manager, which position he still holds. In the same year the line was first operated by electricity. In 1905, the U. S. interests of the company were bought out by F. Nicholls and E. R. Wood.

yond Lundy's Lane, into Falls View, the high land immediately above the Falls. This gave a total length of 4.35 miles, which has not been extended since.



Train of 37 Cars on Niagara, St. Catharines and Toronto Ry.

The main line from Niagara Falls, Ont., to St. Catharines was originally 11 miles long. Immediately after the absorption of

Merritton is avoided by constructing the line at higher elevation than the ground through that town, part of the way on an embankment, but the greater part on a timber trestle over half a mile long, the line through this portion following an ascending grade, negotiating the height of land which is reached beyond Thorold. This ridge is over 350 ft. above Lake Ontario, from which the line rises through St. Catharines, the principal portion of the rise being between St. Catharines and Thorold. From Thorold, the line runs almost due east, crossing the present Welland Canal on a swing bridge, following an almost straight route for Niagara Falls. From the outskirts of St. Catharines to the outskirts of Niagara Falls, the line is exclusively on its own right of way. Entering Niagara Falls at the north west corner of the city, the line follows the highway, going into the city over the tracks of the subsidiary company, the Niagara Falls, Wesley Park and Clifton Tramway Co., terminating at the foot of Bridge St. For the heavy summer tourist traffic, arrangements have been made with the International Ry. whereby the N., St. C. & T. Ry. cars run over its line from the foot of Bridge St., along the river bank to the upper steel bridge across the river near the Falls, crossing that bridge, and thence a short distance to the terminal station of the International Ry., in the heart of Niagara Falls, N.Y., landing through passenger without change.



Welland Station on Niagara, St. Catharines and Toronto Ry.

of Toronto, the former becoming President. In 1908, the Mackenzie Mann Co. interests acquired control, D. B. Hanna, Third Vice President, Canadian Northern Ry., becoming President.

Prior to its absorption, the Niagara Falls,

the subsidiary lines in 1901, this was increased by extending the line through St. Catharines to Port Dalhousie, in order to connect with the controlled Niagara, St. Catharines and Toronto Navigation Co., two boats for which, the Lakeside and Garden

The company's Port Dalhousie branch leaves the St. Catharines station over the same lines as the main line, but instead of turning off at Raymond St., proceeds to Lake St. and Louisa St., leaving the west end of the latter street for its own right of way along the sides of the steep east bank of the old Welland Canal. Crossing the canal on a swing bridge, the line goes through the centre of Port Dalhousie to the Navigation Co.'s wharf, where connection is made with the Port Dalhousie-Toronto boats. Between Toronto and Niagara Falls, by way of St. Catharines, there has developed a considerable traffic, particularly in the tourist season. To accommodate this, there is a through service over the company's lines from Port Dalhousie to Niagara Falls, N.Y. From the Port Dalhousie branch to the main line, in the outskirts of St. Catharines, there is a cut off along Louisa St. for diverting this through traffic from the centre of the town, practically skirting the border of the city. The normal service over the Port Dalhousie branch is from the St. Catharines station to Port Dalhousie, this through service only being used to connect with the steamboats in the tourist season.

In St. Catharines, there is a purely local service, operating from the city park, at the south end of St. Paul St., the main thoroughfare of the city, through the business section, and out Queenston St. to the cemetery, located on the banks of the present Welland Canal, a total distance of about 2 miles, cars operating every 40 minutes.

The Merritton and Thorold division also operates a local service through a portion of St. Catharines, serving principally the manufacturing sections of these three places. The western terminus is at the McKinnon factory at the extreme west end of the city, near the point where the Port Dalhousie branch drops down the canal bank, crossing this line a few hundred feet from the end. Following Ontario and St.

canal bank closely, serving the numerous industries that are clustered along that old waterway. The local line thus acts as a feeder for the main line drawing from this rich district.

The company's new line southerly through Welland to Port Colborne leaves the main line a short distance south of Thorold station, branching off directly west, passing over the old Welland Canal on a swing bridge. All the way from the junction point to Port Colborne, the line runs on



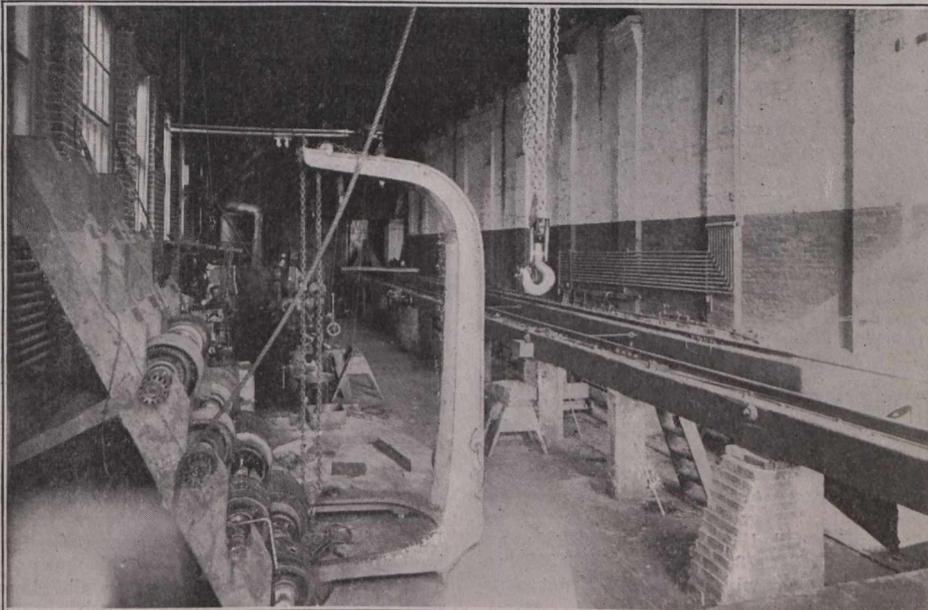
E. F. Seixas,  
General Manager, Niagara, St. Catharines and  
Toronto Ry.

to Niagara on the Lake, which is under construction, and is expected to be completed this year. This extension leaves the main line in St. Catharines at the corner of Geneva St. and Welland Ave., proceeding out Facer St. after crossing the present canal, striking across country on its own right of way after leaving the city, until it reaches the Lake Shore Road at the mouth of Ten Mile Creek, where the projected Welland Ship Canal is to be entered from Lake Ontario. For about half the remaining distance from this point to Niagara on the Lake, the line will run on the highway allowance, running across country the remaining distance on its own right of way south of the military reservation, going into Niagara on the Lake parallel to the M.C.R. tracks along King St., with the terminus at Queen St. The total length of this extension will be about 13 miles. The construction will be similar to that on the main line, using 80 lb. rails, 40 grooved trolley wire, and 35 ft. cedar poles. The maximum gradient will be 0.25%, with a minimum curvature of 500 ft. radius.

In general, the system is operated very much the same as a steam railway, with a train dispatcher located at Merritton, the most central point of the system. Telephone train dispatching is employed. At the principal points there are well appointed stations for both freight and passenger service, in charge of each of which is an agent. These stations are St. Catharines, Port Dalhousie, Merritton, Thorold, Niagara Falls, Fonthill, Welland, Humberstone and Port Colborne.

Freight is one of the principal items of revenue on this line, just as on a steam road. Along the company's lines are 60 industrial sidings, aggregating about 15 miles of track. All the freight is handled in trains, hauled by electric locomotives, and it is no uncommon sight to see trains of as many as 40 cars. In order not to interfere with the heavy passenger schedules, none of which are less than hourly each way during the daytime, the freight is handled as much as possible by night. In St. Catharines, where some of the sidings are from the local line, night handling of freight is required by law. In addition to the freight business the Dominion Express Co. operates over the company's lines. The freight business is so heavy that at St. Catharines there are 6 drays owned by the company in constant service. At other points on the system, the cartage is handled under contract. The St. Catharines freight terminals are quite extensive, and the traffic is so heavy that they are greatly overtaxed. In most particulars they resemble steam road freight terminals. Located where the Port Dalhousie cutoff strikes the main line near the outskirts of the city, the cutoff has been found a most useful adjunct for handling the through freight. On one side of the main line at these terminals is a platform shed, arranged in the conventional manner. On the other side of the main line are fairly extensive yards for an electric line, where trains are made up, and similar work performed.

The rolling stock equipment consists of the following:—50 interurban and local passenger cars, 7 electric locomotives, 3 snow ploughs (1 rotary and 2 push), 30 box cars, 30 gondolas, 16 flats, 1 derrick car, and 2 cabooses. The interurban passenger cars are of the double truck type, 50 ft. long, the majority closed, but several open for summer traffic. Each of these cars has a separate baggage compartment for handling passengers' luggage as expeditiously as a steam road. This is checked through to destination in the usual manner. The freight equipment is limited, but is all that



Interior of N., St. C. & T. Ry. Repair Shop at St. Catharines.

Paul Sts., it passes the terminal station, and then runs on Queenston St. to the Thorold Road, following the latter along the bank of the old canal through Merritton into Thorold, terminating at the main line station near the centre of the town, the main line crossing this line at three points en route. Thus the company has a rapid transit line over its own right of way from St. Catharines to Thorold, with a local line between the same points, following the

its own right of way, with very light grades. All over the system the gradients are very light, with the exception of the maximum 2% grade on a portion of the main line ascending the mountain at Thorold. This new line passes through Fonthill, and then on to Welland, cutting through the westerly fringe of that town. South from there, the line passes through Humberstone, and thence to Port Colborne.

The latest extension of the company is

is required, all outgoing freight being handled in foreign cars.

The traffic has increased very rapidly within the last few years. From 1,322,000 passengers in 1901, there were 3,831,786 in 1912. The freight increase is even more marked, reaching 344,656 tons in 1912. The line is particularly well situated for the development of local freight. From Lake Ontario to Lake Erie, there is an increase in elevation of 326 ft., most of this rise occurring at or near Thorold, the centre of a heavy manufacturing district along the old canal. The extremely hilly nature of the local country, and the close proximity of the numerous factories to each other along the canal, makes it very difficult for steam lines to run in sidings, they being compelled to seek more favorable grades for their lines than are essential for electric operation.

Power for the operation of the line is received from the Electrical Development Co. of Ontario at the generated pressure of 12,000 volts, and is transmitted to trans-



Sub Station of the N., St. C. & T. Ry. at Welland.

former stations located at different points on the line. The location and capacity of the stations are as follows:—Niagara Falls 700 k.w., Thorold 1,000 k.w., St. Catharines 1,000 k.w., and Welland 500 kw. At all of these stations are rotary converters delivering power to the line at 600 volts d.c.

Over the whole system, the overhead work is of 4/0 copper wire. The main lines are laid throughout with 80 lb. rails, with 60 lb. on the local lines. The main and local line trackage is 55 miles, which with the additional 15 miles of sidings, makes a total of 70 miles of rail line. The steamboat line adds another 30 miles, making a total system of 100 miles.

The officials of the Niagara, St. Catharines and Toronto Ry. are:—President, D. B. Hanna; Vice President, J. D. Morton; Secretary and Treasurer, A. J. Mitchell; General Manager, E. F. Seixas; Auditor, D. J. McIntosh; General Passenger Agent, R. L. Fairbairn; District Freight Agent, F. A. Young; Chief Engineer, W. P. Chapman; Superintendent, W. R. Robertson; Master Mechanic, W. Pay; and Roadmaster, J. Carey.

**Dogs on British Columbia Electric Ry.**—The B.C.E.R.'s traffic department has directed conductors to strictly enforce its rule on the city lines, that dogs will be carried on the cars only when in the lap or arms of the owner, and then controlled so as not to annoy passengers. This rule has been in existence for some time, but has not been strictly enforced. As a result, a dog fight took place in the aisle of a crowded car recently, the occupants becoming greatly frightened. The management considered the report of this instance in connection with other complaints concerning dogs soiling passengers' clothing, etc., and decided that this rule should hereafter be strictly enforced.

### The Tramway Situation in Montreal.

The report of G. Jarvis, City Engineer, on the tramway situation in Montreal, presented to the Board of Control, June 6, is a lengthy document, based on information collected by Mr. McLeod, of the city engineering staff, and the reports of a number of "experts," who had been engaged by various interests to make suggestions for the improvement of the service. Mr. Jarvis states that the overcrowding on all lines and at all hours has been found to be the rule and not the exception. He approves of the laying of car tracks on Dorchester St. between Guy St. and Beaver Hall Hill in order to facilitate the operation of the Guy-Beaver Hall line; the division of the Windsor-St. Lawrence line into two sections each returning from Place d'Armes Square; the making of Victoria Square the turning point for several lines by the installation of new tracks, and the relieving of the congestion on the lines by Point St. Charles, by a line from Wellington St., via Charlebois St., Center St. and Atwater Ave. to St. Catherine St. Other recommendations include the following: The elimination of all unnecessary stops; the placing of switchmen at every important junction point; that passengers should always have their fares ready; that larger and clearer signs be installed on cars; that the congestion on the rear end of cars be stopped; that freight be not handled in the day time; that traffic at junction points be more closely supervised; that delays at the central office be done away with; that the short turning of cars at the option of the conductor be stopped; and that autobus lines be put on to supplement the car lines.

At the meeting of the City Council, June 9, a special committee was appointed to act with the Board of Control in making a careful study of the report, and to report to the council with the least possible delay.

The Board of Control, which has been in consultation with E. A. Robert, President, M.T. Co., agreed on a report, June 17, to be presented to the City Council for adoption at the next meeting. The report recommends 15 new routes, the elimination of unnecessary stops, improved switching, and the modification of a number of existing routes.

### Electric Railway Finance, Meetings, Etc.

**British Columbia Electric Ry.** Gross earnings for April, \$565,294; operating expenses \$367,044; net operating expenses \$198,250; renewal funds \$51,620; net earnings \$146,630; approximate income from investments \$35,000; net income \$181,630 against \$476,058 gross earnings; \$302,135 operating expenses; \$173,923 net operating earnings; \$37,935 renewal funds; \$135,988 net earnings; \$25,000 approximate income from investments; \$160,988 net income, for April, 1912. Aggregate gross earnings for 10 months ended Apr. 30, \$5,702,995; net earnings \$1,933,173, against \$4,759,517 aggregate gross earnings; \$1,671,408 net earnings, for same period 1911-12.

**Calgary Municipal Ry.**—The estimates for the current financial year show that the railway will contribute \$42,000 to the general revenue as against \$100,000 last year. This is accounted for by the fact that the City Commissioners are putting the railway on a new basis of financing. Under the new system, instead of paying a lump sum from profits they will pay amounts totalling \$42,000 into various city departments for value received. The balance will be expended on extensions and improvements of the lines.

**Cape Breton Electric Co.** Gross earnings for April, \$27,916.65; operating expenses and taxes \$15,857.77; net operating earnings, \$12,058.88; interest charges \$4,891.67; balance \$7,167.21; sinking and improvement funds \$1,190; net balance \$5,977.21, against \$26,558.86 gross earnings; \$16,064 operating expenses and taxes; \$10,494.86 net operating earnings; \$4,495.83 interest charges; \$5,999.03 balance; \$1,206.67 sinking and improvement funds; \$4,792.36 net balance for April, 1912. The construction charges during April were \$2,498.29.

**Grand Valley Railway.**—By an arrangement made June 18, the action of the Brantford City Council against the company has been adjourned until September, the company agreeing in the meantime to pay, by July 1, \$5,000 on account of taxes in arrears, and \$2,500 additional, by Sept. 1. The city is making application for forfeiture of the company's charter on the ground of failure to live up to its terms and conditions.

**Montreal Tramways Co.**—The first call of 10% upon the new stock issued April 15, became due and payable June 20.

**Toronto Ry., Toronto and York Radial Ry., and allied companies.**—Gross earnings for April \$760,676; operating expenses, maintenance, etc., \$397,875; net earnings \$362,801, against \$658,174 gross earnings; \$296,286 operating expenses, maintenance, etc.; \$361,888 net earnings, for Apr., 1912. Aggregate gross earnings for four months ended Apr. 30, \$3,028,408; net earnings \$1,446,107, against \$2,622,724 aggregate gross earnings; \$1,345,987 net earnings for same period 1912.

The Toronto Ry. receipts for May were \$510,767.20, and the percentage paid to the city was \$102,153.84, against \$446,371 and \$89,274.20 respectively for May, 1912.

**Winnipeg Electric Ry.** Gross earnings for April, \$323,563; operating expenses \$174,465; net earnings \$149,098, against \$292,037 gross earnings; \$152,938 operating expenses; \$139,099 net earnings, for Apr., 1912. Aggregate gross earnings for four months ended Apr. 30, \$1,324,509; net earnings \$582,669, against \$1,209,557 aggregate gross earnings; \$554,437 net earnings for same period 1912.

### Moose Jaw Electric Railway Company's Report.

The report for the year ended Dec. 31, 1912, shows receipts of \$77,996, and passengers carried, 1,607,770. The earnings showed a steady monthly increase, and it is anticipated that this will continue through this year. There are nine miles of track in use, and 12 cars. During this year a further seven or eight miles of track will be laid, and ten cars have been ordered from the Ottawa Car Co., two of which have been received. The company has acquired a pleasure park site just outside the city, to enhance receipts from pleasure traffic. Power is generated by oil engines, the first in Canada to be used for this purpose. There are 200 h.p. units, and an additional unit of 500 h.p. is being installed.

The assets consist of property, plant and equipment, \$570,128; accounts receivable, \$2,239; total, \$572,367; and liabilities of \$557,008, leaving a balance to profit and loss of \$15,359. The stock was put on a 6% dividend basis in the early part of the year.

Following are the officers and directors: President, A. A. Dion; Vice President, N. J. Kerr; Secretary-Treasurer, D. R. Street; other directors, P. B. Mellon; D. O'Connor, Jr., T. F. Ahearn, E. J. Daly, C. E. Armstrong and A. H. Dion.

## Canadian Electric Railway Association's Annual Meeting.

The annual meeting held at Hamilton, Ont., May 28, 29 and 30, was in every way the most successful in the Association's history, and the attendance was larger than at any previous meetings, member companies from the Atlantic coast to the Pacific coast being represented, including officials from the St. John Ry., St. John, N.B., on the east, and from the British Columbia Electric Ry. on the west. The chair was occupied by the President, Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

After routine business four more companies were admitted to membership, viz.: Pictou County Electric Co., Stellarton, N. S.; Sherbrooke Ry. & Power Co., Sherbrooke, Que.; Montreal & Southern Counties Ry. Co., Montreal; and Moose Jaw Electric Ry. Co., Moose Jaw, Sask.

The Secretary-Treasurer, Acton Burrows, Managing Director, Canadian Railway and Marine World, presented an exhaustive report on the Association's work during the year, dealing with a number of important topics. The report was considered, section by section, and elicited some valuable discussions, decisive action being taken on a number of matters vitally affecting electric railway interests.

A special committee which had been appointed to consolidate and revise the constitution and bylaws presented a report which was adopted. The most important alteration recommended and approved was the changing of the name from Canadian Street Railway Association to Canadian Electric Railway Association.

A number of important papers were read, including the following:—

Application of standard code of train rules on electric interurban railways.

The property serving a population of twenty thousand or less.

Electric railway track construction.

The relations of a surgeon to a traction or railway company.

Electric railway switch work.

Some problems of interurban railway operation in Canada.

Modern tendencies in railway control.

Accident claims.

Adjudication of claims arising from industrial accidents.

Underground cables.

Hydraulic power vs. steam power.

Freight and express traffic on suburban and interurban railways.

Results of test operation of new types of cars and description of new standard city cars on the British Columbia Electric Ry.

The renewal of trolleys with steel wire. Training of employes.

The work order system as applied to electric railway accounting.

These papers, which are copyrighted by the Association, will be printed in the official proceedings and distributed to officials of member companies. They were very fully discussed and the opinions elicited will form a most valuable symposium on the important subjects dealt with.

On the election of officers being taken up, the Vice President, C. B. King, Manager London St. Ry., proposed the re-election of Patrick Dubee as President and paid a warm tribute to his energetic discharge of the duties. This was carried amid applause, Mr. King being unanimously re-elected Vice-President.

Acton Burrows was unanimously re-elected Secretary-Treasurer for the seventh consecutive year.

The following were elected as the execu-

tive committee:—James Anderson, Manager, St. John Ry.; Wilson Phillips, Super-Ry.; E. P. Coleman, General Manager, Dominion Power & Transmission Co.; A. Eastman, General Manager, Windsor, Essex & Lake Shore Rapid Ry.; J. D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Ry.; H. M. Hopper, General Manager St. John Ry.; Wilson Phillips, Superintendent, Winnipeg Electric Ry. The President, Vice President and Secretary-Treasurer are ex-officio members of the executive committee.

Aubrey Acton Burrows, Secretary and Business Manager, Canadian Railway and Marine World, was unanimously re-elected Assistant Secretary.

The representatives attending the meeting were taken by special train over the Dominion Power & Transmission Co.'s Hamilton and Brantford line, which proved a most enjoyable trip, the roadbed and track being in excellent shape and the scenery very attractive. Opportunities were also afforded for inspecting other portions of the company's system. E. P. Coleman, the



Patrick Dubee,  
Secretary-Treasurer, Montreal Tramways Co., and  
President, Canadian Electric Railway Association.

General Manager, who had charge of the local arrangements, was most assiduous in his attentions, his efforts being heartily supported by other officials of the company.

One of the interesting features was the inspection of a number of the important manufacturing industries in Hamilton, which are producing goods used by electric railways. Visits were paid to Canadian Westinghouse Co.; Steel Co. of Canada; Standard Underground Cable Co. and National Steel Car Co., a considerable time being spent at each plant, thoroughly viewing the different processes of manufacture.

As a most enjoyable wind up to the proceedings the Dominion Power and Transmission Co. gave a dinner at the Hamilton Club, which was attended by the officials of member companies and by a number of other invited guests. E. P. Coleman occupied the chair, and among the

other speakers were Sir John Gibson, Lieutenant Governor of Ontario, who is a director of Dominion Power & Transmission Co.; Patrick Dubee, President, and C. B. King, Vice President of the Association; W. C. Hawkins, Vice President and Managing Director, Dominion Power and Transmission Co.; A. Gaboury, Superintendent, Montreal Tramways Co., and Acton Burrows.

## British Columbia Electric Railway Co's. Social Features.

The employes of the British Columbia Electric Railway Company take great interest in the development of the social side of the company life, the management assisting in this movement, as it has been found that a social gathering of the staff works to the best interest of the service. During the past month the B.C.E.R. Social Club held a ladies' night and conversazione in its Vancouver quarters. It was attended by over 200 members of the club and their lady friends. General Manager Sperling and all the chief officials of the Company were present and took an active part in the programme. At Victoria the office staff gave a dance at the Alexandra Club, which was attended by over 200 members of the staff and their friends. In the Delta district the employes of the Company organized and gave a dance at Ladner, which was the chief social event of the season in the district. The management is paying attention to providing for the pleasure of its employes during the outdoor season. The company recently acquired 10 acres of land in the suburbs of Vancouver and plans to utilize it for the present as recreation grounds for its employes. This year one acre will be cleared, lawn tennis courts laid out, and a club house erected. The clearing work will be continued next year and continued until the grounds are available for all forms of outdoor sport.

## Transportation of Postmen by Electric Railways.

Canadian Railway and Marine World for April contained, on pg. 189 full particulars of the bill introduced in the House of Commons by the Postmaster General to confer on himself and his successors in office the power to decide the rate to be paid electric railway companies for the transportation of postmen, respecting which strong representations were made by a deputation from the Canadian Street Railway Association. The Association's Secretary-Treasurer continued to watch the measure, paying several subsequent visits to Ottawa for that purpose, and a counsel was retained. On May 31 the Postmaster General announced in the Commons that he had decided to withdraw the bill for the then current session at least. In the course of the discussion he stated that he had made a contract with the Toronto Ry. Co. recently to carry postmen and special delivery messengers for four years at \$12,000 a year. There being 355 postmen and special delivery messengers that averages \$33.74 per head per year, which average will be reduced as the number of men employed increases, the amount to be paid annually being stationary. In answer to questions he stated that a contract had been made with the Montreal Tramways Co. for a year at \$50 a postman. The Quebec Railway Light and Power Co. is being paid \$42.50 a man, and the Ottawa Electric Ry. is being paid \$75 a man.

## Electric Railway Projects, Construction, Betterments, Etc.

**Bell Island Transportation Co.**—The Newfoundland Legislature has passed an act for the encouragement of the construction of tramways at Bell Island. The Bell Island Transportation Co., which is registered under the Companies Act of 1899, is authorized to build inclined and other power tramways there for freight and passenger traffic, being given an exclusive franchise for 50 years under certain conditions, the Government guaranteeing 5% dividend on the capital expenditure, up to \$2,000 a year, or \$40,000 in 20 years; \$1,000 a year for 20 years after the completion of a wharf, and \$100 a year for 20 years for the conveyance of mails from the wharf up the inclined railway. Construction is to be completed within three years. The company's franchise is not to interfere with the rights of the Nova Scotia Steel Co., the Dominion Iron and Steel Co., or other mine owners to building tramways from their mines to their shipping piers.

**Berlin and Waterloo St. Ry.**—A bylaw has been passed by the ratepayers of Berlin, Ont., authorizing the city council to expend \$30,000 to build a second track from Wellington St. to the Waterloo boundary line during this year. (Nov., 1912, pg. 575.)

The Berlin, Waterloo, Wellesley and Lake Huron Ry. Co. has deposited with the Secretary of State at Ottawa an indenture setting forth that the line of the Galt, Preston and Hespeler St. Ry. has been conveyed to it. The G.P. and H. St. Ry. is a local line operated in conjunction with the C.P.R. and the B.W.W. and L.H. Ry., which is controlled in the interests of the C.P.R., and has power to build a number of lines in the district indicated by the names of towns in the title. (July, 1909, pg. 491, and G.P. & H. Ry., July, 1912, pg. 367.)

**Brandon Municipal Ry.**—While the first car was run over the recently completed municipally owned electric railway, May 16, the regular service was not inaugurated until June 2. Superintendent Antonisen is in charge of the lines. (June, pg. 286.)

**British Columbia Electric Ry.**—Work was started, May 30, on the construction of the Hastings St. line in North Burnaby, B.C. It will be two miles long, and it is expected to be in operation by the end of the summer. The new line to Kerrisdale, starting from Tenth Ave. and Crown St., was opened for traffic, June 2. The company has informed the Vancouver city council that it cannot undertake the extension of the proposed line on Broadway west from Alma Road this year.

The contract for the erection of a 700ft. double track trestle at the south end of Granville St. bridge, Vancouver, calls for the use of 1,000,000 ft. of lumber. The trestle is to be used in connection with the station to be built for the Lulu Island branch. The contract for the erection of a wharf at Port Moody, will require 200,000 ft. of lumber and the driving of 300 piles. W. G. Gilley is contractor for both works. (June, pg. 286.)

**Burrard Westminster Boundary Ry. and Navigation Co.**—The Dominion Parliament has extended the time within which the company may build its authorized lines. (June, pg. 286.)

The Cape Breton Electric Co.'s management has authorized the expenditure of a considerable sum upon improvements of its lines in and around Sydney and Glace Bay, N.S., the work to be done this year and during 1914. Among the more important are the building of an addition to the Sydney car barn, the construction of a

second track on Townsend St., and the putting in of additional turnouts so as to establish a 15 minute service on the Pier line.

**Conception Bay Electric Co.**—The Newfoundland Legislature has incorporated a company with this title having power among other things to build electric railways connecting Brigus, Cupids, Clarke's Beach, Port de Grave, Bay Roberts, Spaniards' Bay, and other towns and villages adjacent thereto. W. H. Jarret, Clarke's Beach, Nfld., and Rev. G. H. Field, Brigus, Nfld., are among the incorporators.

**Dominion Power and Transmission Co.**—The charter of the Brantford and Hamilton Ry., owned by this company, has been amended by the Dominion Government, so as to give power to build a branch from near Lynden to Galt, Ont. We were officially advised recently that preliminary surveys for this line had been made, but nothing has been definitely decided as to construction. E. P. Coleman, Hamilton, Ont., General Manager. (June, pg. 286.)

The D.P. & T. Co., we are officially advised, is considering the advisability of installing a steam plant of considerable size in Hamilton, not as an auxiliary, but for continuous operation as an extension of its power producing capacity. The plant, incidentally, will aid in dealing with frazile ice troubles at the DeCew Falls generating station, but this trouble is so slight that it would not warrant the installation of a steam plant for the sole purpose of dealing with it. No decision has been arrived at as to size of the plant, or when it is going to be installed. (June, pg. 286.)

The Dominion Ry. and Plaster Co. owns plaster deposits on Bras d'Or Lakes and Gilbert Lake in Cape Breton, N.S.; and has a charter to build an electric railway from these properties to Sydney. It is said that negotiations are being carried on with the Cape Breton Electric Co., and with the Sydney city council, with a view of arranging for the building of the line. Up to the present, however, nothing definite has been arrived at. The officers and directors are:—President, A. B. McCormack; Vice President, T. Cozzolino; Secretary, J. P. Joy; other directors:—J. C. Mathers, F. deYoung, all of Sydney, N.S.

**Edmonton, Stoney Plain and Wabamun Ry.**—Press reports state that arrangements are being completed for the building of the proposed railway from Edmonton, via Stoney Plain to Wabamun, Alta., 40 miles. E. S. McQuoid, Edmonton, Alta., is reported to be interested.

**Grouse Mountain Scenic and Incline Ry.**—An extension of time to Dec. 31 has been granted to the company by the British Columbia Government to make certain expenditures on surveys, plans, etc., which the regulations provided should have been done by June 30. (Nov., 1911, pg. 1071.)

**Imperial Traction Co.**—The Dominion Parliament has extended the time within which the already authorized lines may be built, and has given the company power to build the following additional lines:—From Smithville, in Lincoln County, to Bridgeburg, Welland County; and from Hamilton to Toronto. (Dec., 1912, pg. 622.)

The Levis County Ry. has been extended to Gareau bridge, a few minutes walk from the site of the south approach to the Quebec Bridge, where a picnic park has been laid out. (July, 1912, pg. 367.)

**London St. Ry.**—The directors made an inspection recently of the new track work in course of construction, and the new plant

which is being added to the power equipment. The work is expected to be fully completed by July 31.

The city council had before it, May 31, a report of the City Engineer, recommending that the company be asked to build some extensions of lines. (June, pg. 286.)

**Lunenburg Electric Ry.**—The Nova Scotia Legislature has extended the time within which the company may build the lines authorized by chap. 133 of the statutes of 1911.

**Manitoba Radial Ry.**—The Dominion Parliament has extended the time within which the company may build the lines authorized to be built by chap. 105 of the statutes of 1907. (Mar., pg. 141.)

**Medicine Hat, Alta.**—The ratepayers decided recently by a vote of 974 to 131 to grant a franchise to the Montreal Engineering Co. for the building of an electric railway in the city. A summary of the franchise agreement was given in our June issue, pg. 285.

**Montreal and Southern Counties Ry.**—The Board of Railway Commissioners has authorized the company to open for traffic its line from the Country Club branch through Greenfield Park to the Central Vermont Ry., St. Antoine de Longueuil, Que., 2.25 miles. From this point the C.V.R. is being electrified to Richelieu, 15 miles, and it is expected that this section will be opened for traffic shortly. The electrification of the C.V.R. from Richelieu to St. Cesaire, 15 miles, is expected to be completed this year. Surveys have been made for a line from St. Cesaire to Granby, 16 miles, but it is not expected that any construction will be gone on with this year. (June, pg. 286.)

**Montreal Tramways Co.**—Montreal papers, in discussing the tramway situation in that city, state that the company's plans involve the practical reconstruction of the system within the next two or three years. The standard to be maintained in all new work will be 116 lb. rails, with 132 lb. guard rails, with 7 ft. instead of 6 ft. ties, laid more closely than heretofore, and on a concrete roadbed 21 inches thick. The work will be done gradually, and it is stated that already nearly 1,500 men are engaged on it. Track has already been laid on Notre Dame St., and work is now in progress on St. James St. from McGill St. to St. Lambert Hill; on St. Catherine St., and on Bleury St., from St. Catherine St. to Sherbrooke St. (June, pg. 286.)

**Moose Jaw Electric Ry.**—A contract is reported to have been signed for the building of a line passing through Boulevard Heights and Parkdale Boulevard, at a cost of \$50,000. It will open up a considerable area of building land, the owners of which are providing the funds for building the extension. It is said that the line will be built this year. (Dec., 1912, pg. 622.)

**Morrisburg and Ottawa Electric Ry.**—A contract is reported to have been let to the Reliance Construction Co., Chicago, Ill., for the building of an electric railway from Ottawa to Morrisburg, Ont. (May, pg. 235.)

**Nipissing Central Ry.**—The Dominion Parliament has extended the time within which the lines authorized by chap. 112, statutes of 1911, as amended by chap. 135, statutes of 1912, may be built.

Track laying was started June 11 on the extension to Armstrong St., Liskeard, Ont., and it is expected to have the whole work completed early in July. (June, pg. 286.)

**Ontario Hydro-Electric Power Commission's Proposed Electric Railways.**—Resolutions have been passed by the Whitby, Ont., town council, asking the Commission

to submit an estimate of the cost of constructing an electric railway from Toronto, with terminals in Uxbridge, Port Perry and Whitby. The Barrie, Ont., town council has passed a resolution asking the Commission to submit an estimate for the building of an electric railway from Barrie to a junction with the C.P.R. Toronto-Sudbury line. The Civic Utilities Committee of Kingston, Ont., has asked the Commission to submit an estimate of the cost of building a line from Kingston to Cornwall. The act under which this construction may be done was given in full in our May issue, pg. 234.

**Ottawa and St. Lawrence Electric Ry.**—We are officially advised that plans and profiles have been prepared for the section of this projected railway from Ottawa to Morrisburg, Ont., and from a point on this line to Russell, 55 miles. This mileage is ready to be put under contract, and it is expected that it will be let at an early date. The company is applying to the municipalities through which the line will pass to grant subsidies in aid of construction. (June, pg. 286.)

**Ottawa, Rideau Lakes and Kingston Electric Ry.**—Press reports state that financial arrangements for the construction of this projected railway are being made. It will be 125 miles long, from Ottawa to Kingston, passing through Smiths Falls, with a branch to Perth and Lanark. The maximum gradient is 0.7%. N. M. Clougher, Ottawa, is President. (May, pg. 235.)

**Regina Municipal Ry.**—Recent information states that the extensions of the electric railway in Regina, Sask., will be completed by Aug. 31. They include lines to the R.N.W.M.P. barracks, the Canadian Northern Ry. shops, the Grand Trunk Pacific Ry., the country club, and the sewage disposal works. Seven gangs of men and 440 teams are employed. H. Doughty is Superintendent.—(June, pg. 286.)

**St. Thomas Electric Ry.**—At a meeting of the St. Thomas, Ont., city council, June 3, a bylaw was prepared for submission to the ratepayers to authorize the expenditure of \$17,500 on the laying of a second track on Talbot St. (April, pg. 185.)

**Saskatoon Municipal Ry.**—The ratepayers recently passed a bylaw authorizing the expenditure of \$100,000 upon the extension of the railway. (June, pg. 289.)

**Stratford Ry.**—It is said that arrangements have been completed for the immediate starting of construction of the lines proposed to be built in Stratford, Ont. A. Waddell, Stratford, is President, and J. E. Rothery, of Mackenzie, Mann and Co.'s staff, Toronto, is Manager. (May, pg. 236.)

**Toronto Suburban Ry.**—We are officially advised that at the end of May 90% of the grading on the eight mile extension from Weston to Woodbridge, Ont., had been done, and that the remaining grading was well forward. Tracklaying has been started, and it is expected to have the line finished early in July. Nothing definite has been decided as to the construction of the new line on a private right of way from Weston into Toronto, reference to the filing of the plans for which was made in our May issue, pg. 236.

The work in progress on the line to Guelph starts at the Senate Hotel, Dundas Road, runs into Lambton Park, crossing Humber River, and Mimico Creek, thence northerly and under the C.P.R. tracks to Dundas St., which is crossed at Islington. The route follows Dundas St., on the north side to the Etobicoke River, where it crosses to the south side, and gradually approaches the C.P.R., which is followed closely to

Cooksville station, thence the line swings northward to Meadowvale, crossing the Credit River, then through Churchville and Huttonville, where it gets out of the Credit River valley, passing near Norval, through Georgetown and Limehouse on the south side of the G.T.R. to Acton, through that village, and on in a direct line through Eden Mills to Guelph, where there will be a station on Dundas Road. The line will be 46.25 miles long. It is intended to extend the line from Guelph, crossing the Speed River at the old grist mill, and on by a fairly direct route to Berlin. The G.T.R. line to Harrisburg will be crossed, and there will be two crossings of the Grand River. No surveys have yet been made for any extension beyond Berlin.

The contract for the construction of the line from Lambton to Guelph is being carried out by Ewen Mackenzie, who has sublet portions of the work. The grading is more than 50% completed, and good progress is being made with the bridge work. Tracklaying was expected to be started by June 20, at Cooksville, the gangs working east and west. It is hoped to have the line completed in the fall. (June, pg. 287.)

**Vancouver Hydro-Electric and Tramway Co.**—We are advised that M. Yates, 511 Union Bank Building, Victoria, is the trustee for the company. The bylaw which has been approved by Ladysmith city council, granting a franchise to the company, provides for the building of an electric tramway system on such streets as may be agreed upon, the first lines to be completed within twelve months after the signing of the agreement. Regulations governing the operation of the lines are made, and it is provided that the city council may acquire the line at the expiration of 25 years, at a price to be agreed upon, and if the purchase is not then made the franchise is to be extended for five years, when the option to purchase may again be exercised. The company is to be exempt from taxation for ten years. (May, pg. 236.)

**Winnipeg Electric Ry.**—Wilford Phillips, Manager, recently announced that the company proposes laying about 14 miles of steel this year, which includes second track on existing lines, and some extensions. The St. Marv's road extension will be completed this summer to two miles south of the border of the St. Vital municipality. The Academy Road-Godfrey Ave. line will be extended to Ash St., and the Arlington St. line from William Ave. to Logan Ave. (June, pg. 287.)

An arrangement is said to have been practically concluded by which the company will start work immediately on the building of a line from the present terminus of the Park Lane line, along the Pembina highway, through the municipality of Fort Garry.

### Port Arthur and Fort William Electric Railway Rolling Stock.

The joint commission operating the Port Arthur and Fort William Electric Ry. has ordered four double truck and five single truck p.a.v.e. cars from the Ottawa Car Co. The whole cars will be of all steel underframe construction with monitor roof, similar to those recently put into service by the Ottawa Electric Ry. Following are the chief details:—

Double truck:—Length over buffers, 45 ft. 3 ins.; length over bulkheads, 33¼ ft.; length of front vestibule, outside, 4½ ft.; length of rear vestibule, outside, 6½ ft.; width of belt rails, 8 ½ ft.; seating capacity, 42 trucks, 27-G-1; motors, Westinghouse

101-B; air brakes, Westinghouse S-M-1; life guards; arc headlights; standard rattan upholstered seats.

Single truck—Length over bulkheads, 21 ft.; length over buffers, 30 ft.; length of vestibule, 4 ft. 6 ins.; width of belt rails, 8 ft. 2 ins.; seating capacity, 32; motors, Westinghouse 101-B; air brakes, Westinghouse, S-M-1; electric heaters; life guards; arc headlights; standard upholstered rattan seats.

### Regina Municipal Railway Notes.

Referring to the information on this subject, published in Canadian Railway and Marine World for June, pg. 1913, H. Doughty, Superintendent, writes: "The mention that wages are paid on the basis of 10 hours a day is somewhat misleading. On the old rates 10 hours a day was paid, but on the new scale, effective April 1 last, only 9½ hours a day is given."

A Regina correspondent writes:—"The city council has gone on record in favor of Sunday street cars. The matter will have to be referred to the people, a two third vote being required. There seems little doubt that before long the cars will be in operation on Sundays, as the council did not take action without an agitation having been first worked up in favor of Sunday operation.

"There is a possibility that workmen's special tickets will be done away with, as it is believed that but few avail themselves of the opportunity this cheap fare affords them of going home to dinner.

The consent of the Board of Railway Commissioner, to ten new crossings of steam railway lines is necessary before the city can carry out its programme of street railway construction."

### Dominion Power and Transmission Company's Railway Lines.

In the comprehensive article in Canadian Railway and Marine World for June, dealing with the above lines, a paragraph covering the Bartonville section of the Hamilton Radial Ry. was omitted. It is now given, as follows:—

The Hamilton Radial Electric Ry. also operates a short line from the southern terminus of the King East and Barton line of the city service, from the corner of Sherman Ave. and Main St., along the highway to Bartonville. This is single track, with a return trip distance of 2¼ miles. One single truck car operates on this line, carrying all the service, which, to this small suburb, is quite light. Between the city lines and this line, there is a transfer ticket arrangement. Between the lines of the Hamilton Street Ry., Hamilton, Grimsby and Beamsville Ry., and this Bartonville section of the Hamilton Radial Electric Ry., there is no physical connection, although the three lines come together at the corner of Sherman Ave. and Main St.

**Port Arthur and Fort William Electric Ry.**—Material for the construction of the new car lines in Fort William, Ont., has been delivered, and construction was started June 2. (April, pg. 185.)

**Quebec Rapid Transit Co.**—The Dominion Parliament has extended the time within which the company may build its authorized lines. (Nov., 1912, pg. 605.)

**Three Rivers Tramway Co.**—A second call of 10% on the subscribed capital has been made. R. Bournival, City Hall, Three Rivers, Que., is Secretary-Treasurer. (May, 1912, pg. 252.)

## The Proposed Acquisition of the Toronto Railway by the City.

Following on the legislation obtained by the city of Toronto at the recent session of the Ontario Legislature, to enable it to negotiate for the acquirement of the Toronto Ry., a series of conferences have been held between the President, Sir William Mackenzie, and Mayor Hocken, to arrive at a basis of agreement on which the necessary bylaw may be prepared for submission to the ratepayers. In an interview, June 16, Mayor Hocken is reported to have said that he had suggested that the city might give \$21,000,000 for the Toronto Ry., and all the electric railway lines in the city owned by the company, including the franchises of all portions of the Toronto and York Radial Ry. and the Toronto Suburban Ry., which are within the city limits, as at present defined. As it has been laid down by the company that only an offer which includes the purchase of the Toronto Electric Light Co. will be considered, the Mayor also stated that the city would probably pay \$7,500,000 for all the assets and franchise of that company, making \$29,000,000 for the two properties and all their assets. These figures are approximately on the basis of 160 for the Toronto Ry. shares, and 135 for Toronto Electric Light. It is understood that by acquiring these properties the city would also take over the unexpired contracts of the companies with the Electrical Development Co. of Canada for the supply of power for about seven and eight years respectively.

At a subsequent meeting of the Board of Control, an appropriation of \$10,000 was made to obtain the services of experts for a valuation of the physical assets of the companies, and R. A. Ross, Montreal; B. J. Arnold, Chicago; and J. W. Moyes, Toronto, were agreed upon to investigate and report.

Before the matter can be finally decided upon, in addition to being submitted to the company's shareholders for ratification, it will have to be approved by the Ontario Hydro Electric Commission, and then voted on by the qualified ratepayers.

Full details of the capitalization of the companies concerned, and their relations with other companies of the local electrical group, were given in Canadian Railway and Marine World for May, page 238.

## Personal Paragraphs.

BERT GREENWAY, until recently connected with the Brandon Municipal Ry., is now on the Regina Municipal Ry.'s staff.

T. STOTHERS has been appointed trustee for the three municipalities which have guaranteed the bonds of the Ontario West Shore Ry.

A. G. PERRY, Local Manager, British Columbia Electric Ry., North Vancouver, B.C., returned, June 1, from a holiday trip to England.

T. AHEARN, President, and J. D. FRASER, Director and Secretary Treasurer, Ottawa Electric Ry., left Ottawa, June 23, for a six weeks' trip in Europe.

G. W. WILSON has been appointed Treasurer of the International Railway Co., Buffalo, N.Y., vice N. P. Baker, resigned, who has gone to West Virginia to enter private business with his two sons.

R. A. SHAW, ticket agent, British Columbia Electric Ry., Vancouver, died suddenly on the street on his way to church, June 1. He was formerly in the Great Northern Ry. service at Langdon, N.D.

## Electric Railway Notes.

The Brandon Municipal Ry. was officially opened for traffic, June 2.

The Halifax Electric Tramway Co. is reported to be in the market for six closed street cars.

The City of Calgary, Alta., is reported to be in the market for six cars for its municipal railway service.

The Montreal Tramways Co. has received three steel street car bodies, from Canadian Car and Foundry Co.

The Edmonton Radial Ry. has received six single end, double truck, semi convertible city cars, from Preston Car and Coach Co.

The Montreal Board of Control has decided not to oppose the granting of permission to the Montreal Tramways Co. to haul freight during this summer.

The Grand Valley Ry. started the operation of its cars between Paris and Galt, Ont., by power supplied by the Hydro-Electric Power Commission, June 2.

The Cape Breton Electric Co. has authorized the purchase of some new cars for its lines in Sydney, N.S., and the purchase of an additional ferry steamboat.

The Ottawa Electric Ry. has ordered two double truck locomotive type snow sweepers from the Ottawa Car Co., for delivery in November.

The British Columbia Electric Ry. has ordered three single truck snow sweepers, similar to those supplied last year, from the Ottawa Car Co., for delivery in November.

The Board of Railway Commissioners has approved the Hull Electric Co.'s standard mileage freight tariff for all distances to and including 15 miles.

The Halifax Electric Tramway Co. has agreed to take back those of its employees who were engaged in the recent strike for increased pay. The company's offer of 21, 22 and 23c. an hour, according to length of service, was accepted.

The Ottawa Electric Ry. has decided to change the color of the exterior of its cars from maroon to dark green. The 20 new cars about to be put into use will be green, and the present cars will be repainted the new color when they go into the shops to be repaired.

A press report states that two of the cars which the Calgary Municipal Ry. is having built by the Preston Car and Coach Co., will be of the stepless type, and that the company is negotiating with the patentees in the U. S., for the securing of the Canadian rights.

A meeting of property owners at Fort William, Ont., recently, decided to petition the city council asking for an extension of the municipal electric railway on Victoria Ave. westward to the city limits, thence south on Neebing Ave. to Montreal St., where connection would be made with the present line, thus practically forming a belt line.

The Regina Municipal Ry. has received, from Preston Car and Coach Co., 8 double truck, and 3 single truck, p.a.y.e. Five of the double truck cars are equipped with G. E. 80 motors, and 3 are equipped with Westinghouse 101 B2 motors, as are the 3 single truck cars, all quadruple equipment, and all the cars have Westinghouse air brakes D. E. G. 1 compressors.

The Winnipeg Electric Ry. operates its cars over its subsidiary line, the Winnipeg, Selkirk and Lake Winnipeg Ry., on Sundays as far as Parkdale. It was expected that arrangements would be completed for extending their operation through the muni-

cipality of St. Andrews, starting on June 22. The people of Selkirk are petitioning to have the operation of the cars on Sundays extended into that town.

The City of Regina, Sask., is building at its municipal railway shops, one motor haulage and four flat cars. The haulage car will have 27G 1 double trucks, 16 ft. centre to centre, 4½ ft. wheel base, 32 ft. long over all, Canadian General Electric Co.'s G.E. 80 A motor equipment and Westinghouse air brakes; the flat cars will have F.E. single trucks, 8 ft. wheel base, 26 ft. long over all, reversible hand brakes and Ohio Brass Co.'s Tomlinson couplers.

The Port Arthur and Fort William Electric Ry. service has been in full operation during the past month, the strike of the employees having collapsed. The railway is owned by the two municipalities, and is operated by a joint commission, and an agreement as to rates of pay, etc., had still some time to run, when the men demanded increased pay, and when that was refused, they struck work. Outside assistance was brought in, and a partial service was given for some time, but as the public generally opposed the strike, it soon collapsed.

The British Columbia Electric Ry., in conjunction with the New Westminster Progress Club, has arranged a series of excursion trips between Vancouver and New Westminster, for the season. Special cars will leave Vancouver at 1 p.m. daily for New Westminster, where parties, after spending a short time in the city, will embark on a steamboat for a trip down the Fraser River to Steveston, returning over the Lulu Island line to Vancouver, which will be reached about 5 p.m.

The Manitoba Public Utilities Commission has issued an order, taking effect July 1, under which the Winnipeg Electric Ry. Co. is directed to carry passengers on the lines to a point in Kildonan, at the same rate schedule as if the territory were part of the city system. The Commissioner held that he had power to fix this rate under the terms of the franchise, which states that the fare to be charged shall not be in excess of certain figures. The agreement mentions the maximum fares to be charged, and it is accordingly evident that conditions should be examined into from time to time to see how the service, both as to rates and transportation provision, stands in relation to the public interests on the one hand, and fair returns to the company on the other. The order will provide for an adjustment of rates to the extent mentioned, and will require the filing of a plan and construction of a connection to improve the service.

The Quebec Court of Review gave judgment, June 12, on a question raised by the Montreal Street Ry. Co., in connection with the application made some two years ago by a number of its employees for the appointment of a Board of Conciliation under the Industrial Disputes Act. The company raised the point that it was a provincial organization and questioned the right of the Dominion Government to interfere, but on this point the court decided against the company. The men making the application were 40 in number, who formed a union after their dismissal, and the court has now held that this organization could not be regarded as a trades union as defined by the Quebec Act. Only one of the men forming it could be held to be an employe of the company at the time the union was formed. And the company had over 2,000 employes with whom there was no dispute. The court held that the men did not come within the provisions of the act and consequently the original prohibition against the appointment of the Board of Conciliation must be upheld.

# Marine Department.

## The New Welland Ship Canal Between Lakes Erie and Ontario.

The new Welland Ship Canal (tenders for the construction of a portion of which have been called for), as finally located, follows the course of the present canal from Port Colborne on Lake Erie to Allanburgh, Ont., half way across the peninsula. From this point an entirely new cutting is to be made, crossing the present canal just below lock 25, the water level of the two canals at this point being the same, viz.: 568 ft. above sea level. The new canal will again cross the present one below lock 11, the water of both canals at this point being at an elevation of 382 ft. above sea level.

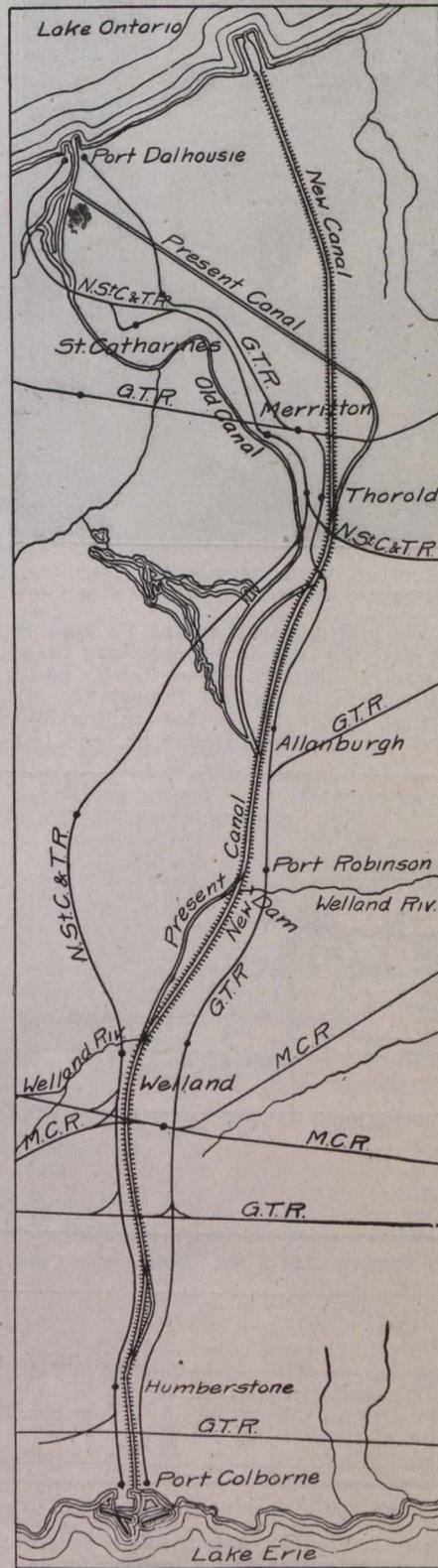
The new canal will be entered from Lake Ontario at the mouth of Ten Mile Creek, about three miles east of Port Dalhousie, the entrance to the present canal. The total length of canal from lake to lake will be 25 miles, and the difference in level between the two lakes, 325½ ft., is to be overcome by seven lift locks, each having a lift of 46½ ft. These locks are to be 800 ft. long by 80 ft. wide in the clear, and with 30 ft. of water over the mitre sills at extreme low stages in the lakes. The width of the canal at the bottom will be 200 ft. and at first the canal reaches will be excavated to a depth of 25 ft. only, but all structures will be sunk to the 30 ft. depth, so that the canal can be deepened at any future date by the simple process of dredging out the reaches.

A new western breakwater, consisting of an immense rubble mound of stone from the excavation north of Port Colborne, and terminating in a timber and concrete head block located some 2,000 ft. farther out in the lake than the present breakwater, will be built to insure quiet water in Port Colborne harbor during storms, which is not the case now, the present breakwater not being far enough out in the lake to deaden the swells. The outer harbor at Port Colborne now has a 22 ft. depth of water at ordinary stages of the lake, which is as much as is available at most of the lake ports and in the channels connecting the lakes at present, and the deepening of this portion of the harbor may be left for a few years until the connecting channels in the lakes allow deeper navigation. The inner harbor at Port Colborne will be deepened to the proposed new depth, and the old locks and regulating weir now in the centre of the village will be entirely removed.

The present rock cut from Port Colborne to Humberstone will be deepened and widened on the west side, and just below Humberstone a thorough cut will be made across the point now forming Ramey's Bend, to materially straighten the canal. The material from this cut will be nearly all rock, and will be used to form the breakwater previously mentioned. A guard lock will be built in the rock cutting a short distance below Humberstone, and when this new cutting is ready for navigation a regulating weir will be built across the abandoned portion of the present canal, which will be used as a by pass to furnish water to the canal. This lock and regulating weir will control the elevation of the summit level of the canal, which it is proposed to keep at the level of extreme low water in Lake Erie, viz.: 568 ft. above sea level.

From Ramey's Bend to Welland the pre-

sent canal will be deepened and widened by excavating a strip along the western bank. Instead of building a new aque-



Route of New Welland Ship Canal.

duct at Welland, to carry the canal over the Welland River, it is proposed to raise the level of the river to that of the sum-

mit level of the canal, viz.: 568 ft., by means of a dam across the river at Port Robinson. This dam will be provided with a large overflow and regulating weir, which will control the elevation of the summit level, allowing any surplus water to overflow into the old Welland River and pass out into the Niagara River, at Chippawa, as at present. A sufficient quantity of water will be allowed to run constantly to keep the river clean.

The present aqueduct at Welland will be dredged out, also the bank between the canal and the river, which latter will be utilized between Welland and Port Robinson, instead of the present canal, being somewhat straighter and entailing considerably less excavation. At Port Robinson a cut will be made through the present bank between the canal and the river, through which vessels will again enter the canal prism.

The raising of the Welland River, above Welland, will flood some 1,600 acres of low land adjoining the river bed. This land is not of any great value, as it is flooded every spring by the flood water in the river and is principally used for pasturage. The Wainfleet Tsp., adjoining the Welland River on the south side, consists principally of low lying ground which drains into the Welland River, and to prevent damage to this land on account of the raising of the river, it will be necessary to open up most of the ditches from the point of their present entrance to the river to the intended high water mark.

The turning of the Welland River into the canal will pollute the waters which are at present used by the towns of Welland, Thorold and Merriton, and by the City of St. Catharines for domestic purposes. This may necessitate the construction of extensive filtering plants, which scheme is not looked upon with favor by those interested. An alternative scheme, to lay a pipe line from Lake Erie to the reservoirs of the different municipalities, through which clean water would be continuously pumped, is under consideration and appears to be the most feasible scheme available.

Between Port Robinson and Allanburgh what is known as the deep cut (deepest cutting 66 ft.), will be deepened and widened by cutting a slice off the western bank. Allanburgh is now the junction of the present and old Welland Canals, and the water required for the latter, which is quite considerable, on account of the numerous power developments along it, is taken into the canal through a weir at this point.

In connection with the construction of the new canal, it is proposed to close the present old canal entirely between Allanburgh and Marlatts Bridge, near Thorold, first building a new weir at the head of lock 25 of the present canal, to supply the above mentioned water. A dam will then be thrown across the old canal at Allanburgh, and the old bed of the canal between the dam and Marlatts Bridge will be utilized as a dumping ground in which to place the material removed from the above water in widening the deep cut. This will form a very convenient dumping ground, and the old canal will become more self contained, as at present the entrance works are situated at an inconvenient distance from the remainder of the canal.

If it is desired to continue navigation

on the old canal, entrance may be had to it through lock 25 of the present canal, when the new canal is completed, by making a short cut through the bank separating the two waterways.

A pair of twin guard gates are located on the proposed canal, near the southerly limits of the Town of Thorold, and a short distance north of them will be located lock 7, the head of this lock being directly opposite the head of lock 24 on the present canal. The portion of the present canal between locks 25 and 24, together with a pond of about 27 acres, formed by flooding the upper valley of the Ten Mile Creek, will be utilized as a regulating basin from which water to fill lock 7 will be drawn. This method of drawing water from a side pond, instead of directly from the canal above, avoids the formation of objectionable currents and surges in the canal and locks, and is the method adopted for filling all of the locks.

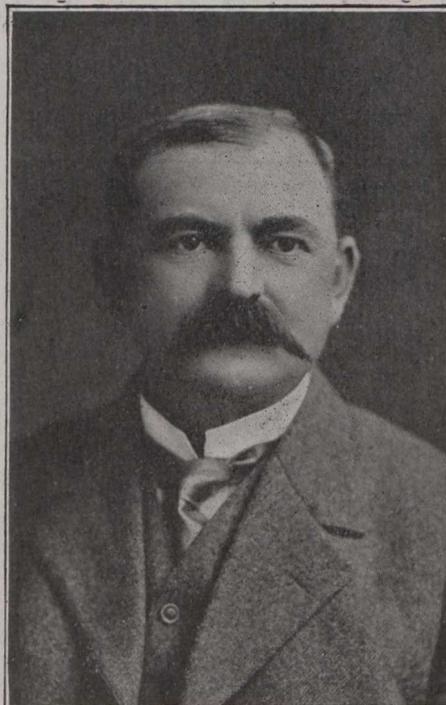
Below lock 7 will be a short reach of canal, with an adjacent side pond or regulating basin having a surface area of about 84 acres, and immediately below will be located twin locks 6, 5 and 4 in flight. These three locks will overcome a descent of 139½ ft. One flight will be used for down bound vessels and the adjoining flight for up bound, a double flight being required to save long delays in the passage of vessels through the canal.

The G.T.R. main line between St. Catharines and Niagara Falls will cross over the foot of twin locks 4, by means of two short bascule lift bridges.

The G.T.R. Port Dalhousie-Welland branch is situated just where the new locks are to be built, and it will be necessary to divert it some distance to the west. The diverted line will bear the same relation to the new canal as the present line does to the present canal, following upon the west side of the locks, but remaining on the west side of the canal for some distance above the present lock 25, when it will

elevation of 382 ft. above sea level, which is the level of the present canal at that point. This will enable small vessels, which wish to do so, to use the Port Dalhousie entrance as at present, as far as lock 11.

Lock 3 will be located immediately north



J. L. Weller, M. Can. Soc. C.E.,  
Engineer in Charge, New Welland Ship Canal.

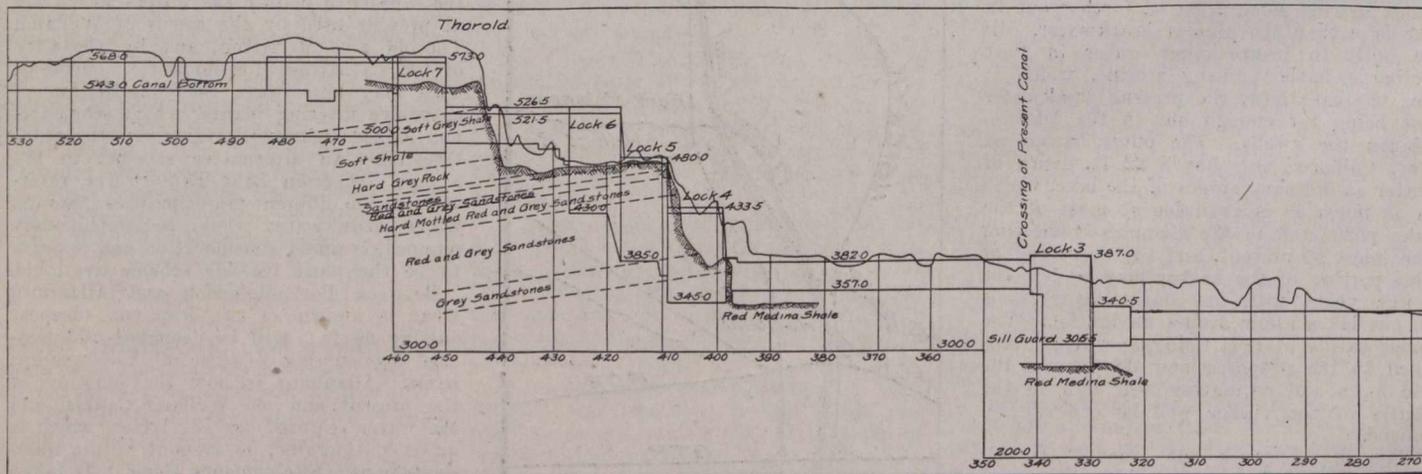
of the present canal, and at its head on the east side will be an equalizing basin, or pond, of 150 acres. Below lock 3 a heavy cutting will be required through the village of Homer to the bed of Ten Mile Creek again, above Carleton St., and just

elevation of 335½ ft. above sea level, and will flood about 200 acres of land in and adjoining the bed of Ten Mile Creek. Below lock 2 the canal will follow the bed of the creek to the lake, lock 1 being situated just below the Lake Road. The pond at the head of lock 1 will cover an area of 107 acres.

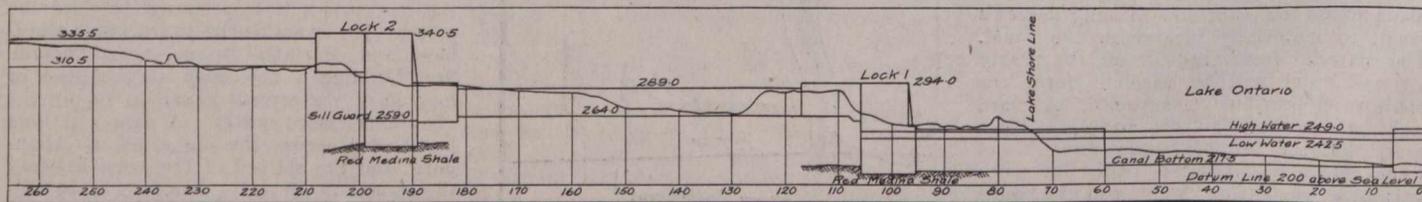
The outer entrance piers in Lake Ontario will be placed about a mile and a half from shore, where the depth of water is 30 ft. A wide channel will be dredged from these piers to lock 1. The sides of this channel will be protected near the shore end by reinforced concrete cribs, with concrete superstructures, alongside which vessels may lie. From the shore line of the lake to the outer entrance piers an embankment about 500 ft. wide will be formed on either side of the channel, from material excavated from the canal between the lake and Thorold. For the purpose of conveying this material from the different contracts to the lake, the Railways and Canals Department will build a double track railway along the west side of the canal from the foot of the flight locks near Merriton to the lake, and temporary trestles will be built out in the lake on either side of the harbor, from which to start the dumps. The railway will also be utilized to haul crushed stone from the site of the flight locks to locks 1, 2 and 3, where it will be used for making concrete. The contractor for the rock excavation from the site of the flight locks will, under his contract, be obliged to crush a sufficient quantity of the good rock taken from his excavation to supply all the crushed stone required for making all the concrete for the different locks and structures.

The lock walls will be 82 ft. above the top of the gate sills, and including the necessary foundation work required below this level two of the locks will have walls 100 ft. high.

The lock gates will be of the single leaf type, swinging on a hinge at one side of



Profile of North End of New Welland Ship Canal.



Profile of North End of New Welland Ship Canal (Cont'd.)

cross over the new canal on a bascule lift bridge to the east side.

From lock 4 the new canal will cross the meadow to the north, following in part the bed of Ten Mile Creek till it crosses the present canal at the foot of lock 11, at an

below Carleton St. lock 2 will be located. It was difficult to find a location for this lock on account of the lack of rock for a foundation, but eventually a suitable foundation was found at the present site. The canal at the head of lock 2 will be at an

the lock, and resting in a notch cut in the opposite wall, a single leaf thus spanning the whole width of the lock chamber. The gate at the foot of each lock will be 83 ft. high and 88 ft. long, and will weigh about 1,100 tons.

The valves and culverts in the walls will be of large dimensions and will permit of the lock being filled in less than eight minutes. This will mean that the time of passage through the canal will be very much reduced below that required at present, the estimated saving being three hours.

The length of the first section for which tenders have been invited is about 3 miles, and will include the pier works at the Lake Ontario entrance, and lock 1.

The original and present canals followed a route from Port Colborne across the Niagara peninsula, practically paralleling each other at the northern end, entering Lake Ontario at Port Dalhousie. The original canal was commenced in 1824, and completed in 1833, the line following very closely certain water courses, to facilitate construction, making the length 27½ miles. This canal contained 27 locks, 24 of which were 150 by 26½ ft., and the other three, 200, 230 and 270 by 45 ft., respectively. The depth of water on the sills was 10¼ ft., with a total lift of 326¾ ft. The initial construction of these locks gave a depth of 8 ft., the increase of 10¼ ft. being a subsequent change. The present canal was commenced in 1872, and completed in 1887. The route at the northerly end was slightly changed to the east near St. Catharines, the canal coming out into Lake Ontario at the same point as the original one. The locks are 26 in number, 270 by 45 ft., with a depth of 14 ft. over the sills.

The surveys for the new canal were made under the direction of J. L. Weller, M. Can. Soc. C.E., Engineer in charge, who also prepared the plans, etc., and to whom we are indebted for the foregoing particulars.

### Work on the St. Lawrence Ship Channel.

In reference to the \$894,000 provided for expenditure on the St. Lawrence Ship channel, the Minister of Marine recently stated in the House of Commons, that it is for the maintenance and operation of the dredging fleet, and was made up as follows,—6 elevator dredges with tugs, at \$45,000 each, \$270,000; 1 new steel elevator rock dredge or tug, \$45,000; 1 new steel elevator rock dredge with tug, now under construction, and expected to be ready for next season, \$45,000; 1 new self propelling steel elevator dredge with tug, being built by contract, half season, \$25,000; 1 hydraulic dredge with two tugs, \$118,000; 2 suction hopper dredges, 1 tug and 1 self propelling hopper barge, \$150,000; 2 dipper dredges with tugs, at \$40,000 each, \$80,000; 2 inspection and sweeping tugs, at \$18,000 each, \$36,000; 2 stone lifters and 1 floating shop, \$15,000; 1 rock cutter, \$10,000; amount for outfitting, docking and providing extra parts for dredging fleet generally, including the necessary improvements to fleet, \$100,000. It is estimated that to obtain a channel 35 ft. deep at extreme low tide, and 1,000 ft. wide, in the north channel below Quebec, 16,153,173 cu. yds. of material would have to be dredged. Of this 2,211,000 cu. yds. had been dredged up to Sept. 28, 1912. With the present two dredges in operation, it will take about eight months to complete the work, but as the various shipping interests are anxious that it be completed in a shorter time, it will be necessary to acquire an additional powerful dredge.

The Department of Railways and Canals has awarded the contract for the construction of a stern wheel tug, required in connection with the work of the Hudson Bay Ry., to Polson Iron Works, Toronto.

### Fishery Patrol Steamboat for Lake Winnipeg.

The fishery patrol steamer now being built for the Department of Marine and Fisheries for service on Lake Winnipeg will be of the following dimensions:—Length over all 149½ ft.; length b.p. 140 ft.; breadth moulded 26½ ft.; breadth extreme 27 ft. ¾ in.; depth moulded 13½ ft.; draft mean 7½ ft.; indicated horse power 900; speed 12 knots.

The vessel has been specially designed for this particular service, and, in addition to performing general patrol duties, will be equipped with arrangements for carrying large quantities of spawn in connection with the fish hatchery at Lake Winnipegosis, together with an installation for the handling of buoys on Lake Winnipeg.

The vessel will be built of steel throughout, to Lloyds 100 A. 1. (lake service) class, and will have a raked stem and cruiser stern. The hull will be divided by five main transverse watertight bulkheads, and two longitudinal bunker bulkheads which will also be watertight. At the fore end, special strengthening will be introduced in order to meet the stresses set up when working in light ice. The under water portion of the vessel will be completely sheathed with wood, to afford protection as much as possible from wear and tear through grounding in shallow waters and working in ice.

The deck auxiliaries will include the usual wheellass, capstan and steering gear. The steering engine will be located in the engine casing, connected to the rudder head by chains and quadrant, and controlled from the wheelhouse on the navigating bridge. Complete systems of steam heating, ventilation, pumping and draining, fresh water and sanitary services will be provided throughout the vessel, the latter service being on the pressure system, supplied from a duplex pump situated in the engine room. The electric generating plant will consist of a steam turbo-generator of 14 k.w. capacity, capable of supplying at the same time both the ordinary ship's lighting and searchlight. The searchlight, which will be located on the wheel house top, will be of 16,000 candle power, and arranged to work from the wheel house. The equipment of the vessel will be in accordance with Lloyd's rules and the Canadian Steamboat Regulations. In addition to the usual lifeboat accommodation, which will be sufficient for all on board, there will be provided on the boat deck a motor launch having a speed of about eight miles an hour.

Accommodation will be provided for a total complement of 17, including officers, men and fish crew. On the lower deck forward will be the dining saloon, steward's room, pantry, and cold storage, whilst aft on the lower deck will be the engineers', officers' and men's quarters, including crew's mess room and lavatories, and officers' bath and w.c. On the main deck will be the captain's cabin, entrance hall, bathroom and w.c., and spare stateroom, the galley being situated between the engine and boiler casings. At the aft end of the deckhouse will be a large spawn house, fitted up with racks and rollers, etc., and every convenience for the rapid handling of a large quantity of spawn. The navigating bridge will be on top of forward deckhouse, on which will be the wheelhouse, containing compass, wheelstand, chart table, etc. The coal bunkers will be placed longitudinally on each side of the boiler room, and have a capacity of about 60 tons.

The propelling machinery will consist of two knots of inverted, vertical, direct acting,

triple expansion, jet condensing engines having cylinders 11, 18 and 30 ins. diameter by 20 ins. stroke, capable of developing 900 i.h.p. when running at 180 revolutions a minute with 180 lbs. steam pressure in boilers. The engine room auxiliaries, which will include air pump of the twin beam type, bilge pump, general service pump, two feed pumps, multiflow surface feed water heater, filter, injector, and fresh water and sanitary pump, will all be independent of the main engines. The motive power will be supplied from two cylindrical, single ended boilers 11 ft. diameter by 10½ ft. long, fitted with Morison's furnaces and working under a patent system of forced draught, the fan and engine being situated in the engine room.

The vessel has been designed by and is being built under the superintendence of Chas. F. M. Duguid, Naval Constructor to the Department of Marine and Fisheries.

### The Launching of the 'Cunard' Line s.s. Alania

The s.s. Alania, which the Cunard Line is having built for its Canadian service, was launched at Greenock, Scotland, June 7. She is a sister vessel of the s.s. Andania, launched for the same service in March. Her chief dimensions are, length 540 ft., breadth 64 ft., depth 46 ft., and she will be equipped with two sets of quadruple expansion engines, balanced to reduce vibration to a minimum. She will have all modern appliances for safety and comfort, including Marconi wireless telegraph apparatus, submarine signalling, etc. There will be accommodation for 2,140 passengers, for two classes, 520 second and 1,620 third. The cabins will be entirely on B and C decks, those on the former being all outside rooms. The lounge and writing room will be on A deck, also the smoking room, while immediately aft of the lounge will be a completely equipped gymnasium. The dining saloon will be on D deck, with all the customary kitchen accommodation. The third class accommodation has been designed to give the best service, and includes a ladies' room, two smoking rooms and a general room for music, etc.

### Judgment on Appeal in the Bengore Head Stranding Case.

The appeal of Capt. Hoy, of the Head Line's s.s. Bengore Head, against the decision of the Dominion Wreck Commissioner, Oct. 17, 1912, re the stranding of the vessel in the Strait of Belle Isle, Oct. 5, 1912, when his certificate was suspended for three months, was heard before the Admiralty Court in London, Eng., recently, when the decision was quashed. In delivering judgment, the President, Sir Samuel Evans, said that he saw no reason to suppose that the master was inaccurate, negligent or over confident in taking bearings, and in the circumstances, (he had been on duty for 30 hours, and on the bridge for 20 hours), he was quite justified in going below after giving proper instructions to the second officer. To find the master primarily responsible for the casualty, under sec. 470 of the Merchant Shipping Act, the court obviously must have found that it was caused by his wrongful act or default, and this was not borne out by the evidence. The master's anxiety to clear his character was shown by the fact that the notice of appeal was given within six days, and the President thought he was justified in his action. The decision of the Canadian court must be reversed and the certificate restored as from the date of the suspension.

## Suction Dredge for Dominion Government Harbor Work in Hudson Bay

Construction on the new harbor which the Dominion Government is to build in Hudson Bay at the terminus of the railway from Pas, Man., is to be pushed forward during this summer, and a 24 in. suction dredge has recently been ordered for the work, to be completed for delivery within four months from the commencement of the construction, early in April. This will mean delivery in August, so that the dredge may be towed to the north before the close of the season. The Government intends using it in the latter part of the year, if the plans at present proposed are fulfilled. The progress of the work to date is such as would indicate that the delivery will be as contracted for.

A plan and elevation of the dredge are given herewith. It will be the second largest dredge ever built in Canada. Completely equipped, it will weigh 1,200 tons. It is to be 180 by 43 ft., with a moulded

engines on the rear end of the deck. The suction pipe of 26 in. seamless tubing,  $\frac{1}{2}$  in. thick, will connect at the boat, through a ball connection, to a pipe running back to the centrifugal pump, which will discharge through a similar pipe running along the side of the boat to the front, where connection will be made with piping, 3,000 ft. of which is to be supplied. This latter is to be of the floating type, carried on each side by floating cylinders. When working with a short length of discharge pipe, the capacity will be 20 cu. yds. of solids a minute, or 1,200 cu. yds. an hour. When using the full length of discharge pipe, that is, 3,000 ft., the discharge will be reduced to 800 cu. yds. an hour. The design of the dredge is such that a side connection from the dredge near the pump can be easily arranged.

The operation of the dredge will be out of the ordinary, it not being of the stern

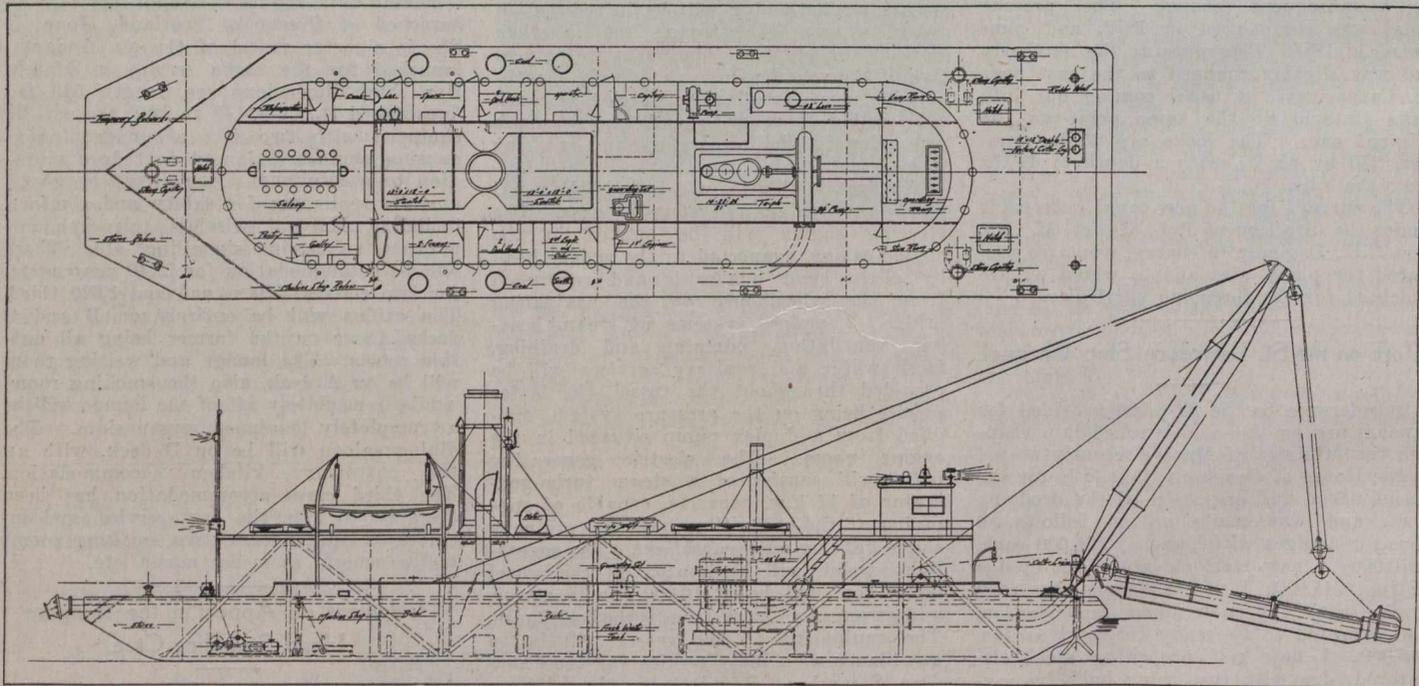
lighting the ship, and for the search lights above the deck, front and rear.

A most important feature of the dredge will be a complete machine shop, equipped with lathes, planer, drills, etc., in a room in the hold at the stern. In addition, there will be a compressed air unit with a supply of air tools, and a small brass furnace for the production of small brass castings. This will make the dredge self contained in the event of break downs far away from supplies.

Both sides of the main deck at the front of the engine room are to be divided off into cabins for the officers and crew, and the central part of the main deck at the front is to form a saloon. A crew of 35 will be carried.

The dredge, while operating for the most part in fresh water, is to be given salt water equipment throughout. This will include copper piping and there will be a fresh water tank of 80 tons capacity. The coal capacity will be 250 tons.

The dredge is to make the trip from Toronto, where it is being built, to Hudson Bay by way of the St. Lawrence River,



24 inch Suction Dredge for Government Harbor Service in Hudson Bay.

depth of 11 ft., and a draught of  $6\frac{1}{2}$  ft. It will be a double decked structure, steel throughout, and fitted with five bulkheads, dividing it into six watertight compartments. The 24 in. suction pump will be located in the forward end of the hold, directly connected with a 14 by 22 by 36 by 21 in. triple expansion engine, obtaining steam from two 13 by 12 ft. Scotch boilers, also located in the hold to the rear of the engines.

At the rear of the dredge will be the suction pipe and cutter head, on an arm pivotted to the rear end of the deck and supported at the outer end by cables from shear legs, one on each side of the deck, these latter being braced by cables from near the front of the boat. The cutter arm will dredge to a depth of 48 ft. The cutter at the outer end of the suction pipe arm is a steel casting with six attached manganese steel blades. Two sizes of cutters are to be employed, 4 ft. for hard material, and 5 ft. for soft material, both of the same general construction. These are to be driven through a shaft along the cutter and suction arm, and a system of bevel gears, by double 12 by 12 in. vertical

pivot type. Two steam capstans will be located at the stern, and one at the bow, and by means of anchors located some distance each side of the vessel at both front and stern, the dredge will be moved from side to side bodily, the dredge end of the discharge pipe moving with it. The cutter and suction arm at the front will be raised and lowered by a winch engine in the centre of the vessel. All the control of the suction, cutter and winch machinery will be from a central point at the rear in an operating room, on the upper deck.

An 8 in. centrifugal bilge pump will be located on deck on the starboard side of the dredge, connected with all the bulkheads. This pump will be steam driven, obtaining the steam from a 48 in. locomotive boiler in front of it on the deck. This latter will also be used as a source of auxiliary steam, for use in heating the vessel when it is laid up and the main boilers are out of commission, also for auxiliary purposes.

There will be a 10 k.w. steam driven generating set in the engine room for the supply of electrical power. This will be used for

being of a suitable size to pass through the locks, and round the Labrador coast, being towed all the way. Temporary rudders on each side of the stern will be added for the trip. The dredge is to be provided with 600 ft. of  $1\frac{1}{2}$  in. stud link chain with a 3 ton anchor. There is also to be a sea anchor in case it is necessary for the tugs to cast the dredge adrift at sea.

The dredge is being built by the Polson Iron Works, Toronto, to the designs of Wm. Newman, A.M.I.N.A., Works Manager. The motive power and auxiliary machinery were designed by J. Sharp, Chief Engineer. The short time allowed for the completion of the work by the company has necessitated carrying it on 24 hours a day. The cost of the dredge will be about \$270,000.

The Lake Winnipeg Shipping Co. is arranging to extend its dock on the Red River, at Winnipeg, from the southern end of the existing dock near Broadway Ave., southerly for 475 ft., and also northerly for 100 ft. Hugh Sutherland, Executive Agent, Canadian Northern Ry., is President of the company.

## The Northern Navigation Company's New Steamship Noronic.

The steamship Noronic, which was launched at Port Arthur, June 2, and which will run between Sarnia, Port Arthur and Fort William, Ont., and Duluth, Minn., will be the largest passenger vessel on the Great Lakes. Her principal dimensions are as follows:—

|                                     |         |
|-------------------------------------|---------|
| Length over all .....               | 385 ft. |
| Length between perpendiculars ..... | 362 ft. |
| Breadth, moulded .....              | 52 ft.  |
| Depth, moulded .....                | 28¾ ft. |

The hull is built on the Isherwood system of longitudinal framing. The frames, instead of running transversely, as in ordinary ships, run fore and aft, or longitudinally, and are supported by large plate web frames, fitted transversely, spaced 10 ft. apart. This construction is very much stronger than the old system, and is lighter, thus gaining in carrying capacity and speed. A double bottom is fitted 4¾ ft. deep, extending the full length of the vessel, and the hull is divided by eight watertight transverse bulkheads into nine compartments. Two collision bulkheads are fitted forward.

There will be six decks, all being made of steel, as follows: Main, spar, promenade, observation, boat and hurricane deck. The entrance hall or lobby will be on the main deck, the side walls will be panelled with quartered oak, with interlocking rubber tiling floors. The main stairway will lead to the social hall on the spar deck, and the office will be on the port side. This office is to be fitted similar to that of a large hotel, where clerks will be on duty at all times. There will be 151 staterooms on this deck, and it will be well equipped with lavatories, bathrooms, barber shop, etc. The main corridors of the spar deck will be finished in white enamel, with the social hall panelled in quartered oak.

The promenade deck will be panelled throughout in mahogany. At the forward end will be the drawing room, fitted with comfortable lounges, upholstered in Spanish leather. Aft of the drawing room will be ten en suite cabins, furnished in mahogany. These rooms will be fitted with brass beds and each will have a private bathroom adjoining, finished in white tiling. The smoking room, at the after end, will be finished in fumed oak. There will be 70 ordinary staterooms on this deck. There will be a wide promenade extending completely around the vessel. The distance around will be about 889 ft.

The observation deck will contain the observation room, dining room, kitchen, store rooms and refrigerating rooms. The observation room, at the forward end, will be 140 by 38 ft., panelled in quartered oak. The floor will be waxed oak for dancing. The observation room will be divided from the dining room by folding glass partitions, and an orchestra stand will be built at this point, so that the music may be used for dancing or the glass doors may be folded back for the dining room. The dining room will be 180 by 50 ft., with a seating capacity of 286. The side walls will be panelled in mahogany, the tables and chairs will be of mahogany, and the ceiling will be enamelled white, with raised ornamental figures. The electric lighting will be indirect, large bowl fixtures being fitted over each table. Fireless cookers will be fitted at each table for the purpose of keeping vegetables, etc., warm. The kitchen will contain ranges, steam tables, plate warmers, broilers, electric toasters, egg boilers, dish washers, etc. The refrigerating rooms will contain separate compartments for meats, fruits, butter and eggs, fish, and an ice making room. The cooling system will be

a 12 ton daily capacity, carbonic anhydride machine.

The boat deck will be finished throughout in quartered oak panels, and a large dome skylight will be fitted overhead extending the full length of the cabins. There will be 48 staterooms on this deck, together with large public lavatories. The officers' quarters and pilot house will be located forward, and the crew's quarters, mess rooms, recreation rooms and bakery aft. Fourteen life boats will be fitted, each 24 ft. long. In addition, there will be carried life rafts, so that the combined capacity of boats and rafts will be sufficient to carry all the passengers and crew.

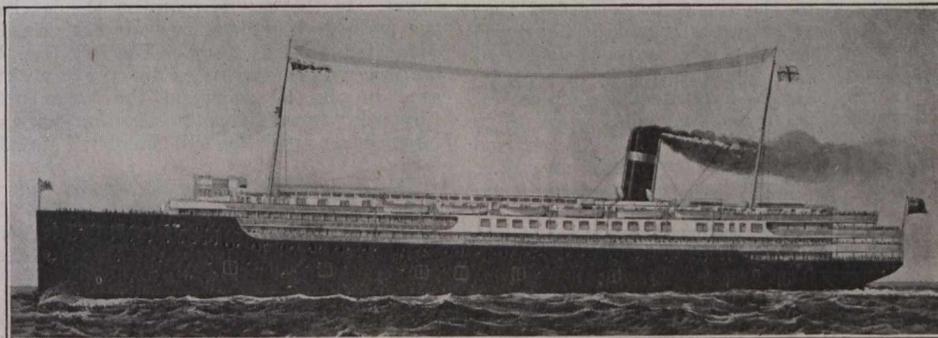
All of the staterooms will be completely fitted out with single upper berths and double lower berths, with electric reading lights at the head of each berth. Vitreous wash stands, with hot and cold running water, will be fitted in each room.

The electric fixtures and decorations throughout will be special features of the whole design, and are being tastefully obtained by a careful selection of woods worked out, simplicity, with rich effects was taken as the keynote, in preference to using large ornaments and gilt.

The lower hold will be divided into four cargo compartments, each provided with two cargo hatches through main deck. The

one piston valve, the int. two, the low pressure will have a double ported slide valve, with a square relief frame back of valves to relieve pressure and friction. All the valves will be operated and balanced by improved assistant cylinders. Connected to each low pressure engine will be an air pump 33 by 15 ins., and independent jet condenser. Bilge and cooler pumps will also be attached to the main engine. A double cylinder turning engine will be arranged for turning on main engine. The engine will be provided with a six collar horse shoe thrust bearing, lined with white metal. Propellers will be cast steel on cast iron hub. The bed plate will have six main bearings and will be of the box section, girder design. Circular steel shells in square boxes will be used on bearings, so they can be removed without disturbing shaft.

There will be four main boilers 15½ ft. inside diam., by 11 ft. inside of heads, for Canadian and Lloyd's rules, 200 lbs. per square inch. Each boiler will contain 452 2¾ o.d. tubes, 7¼ ft. long, and three 48 in. furnaces. The shell plates of the boilers will be made in two pieces, having no circumferential seam in centre. The auxiliary boiler will be 12½ ft. diam., by 11 ft. between heads, and will have 296 2¾ in. o.d. tubes and two 48 in. furnaces, shell in two plates, for 200 lbs. per square inch pressure. Forced draught will be used, air being supplied by two blowers, with 48 in.



Northern Navigation Co.'s s.s. Noronic.

'tween decks will have five gangways on each side, in addition to the passengers and engineers' gangways. The sides of the hold and 'tween decks will be covered with wood sparring, to prevent freight package from damage.

The engines will be of the four crank, triple expansion type, built for Dominion Government requirements, for 200 lbs. pressure at high pressure engine. The cylinders will be arranged from forward to aft with low pressure, high pressure, intermediate pressure and low pressure, the high pressure being 29½ ins. int., 47½ ins., and the two lows 58 ins., with a common stroke of 42 ins. The pistons will all be of the dished type, h.p. cast iron solid and the int. and low pressure of cast steel. The forward pair of cylinders will not be rigidly held together, but will have a brass slip joint, which will connect them to the after pair, allowing for expansion and vibration. The cylinders will be supported on four heavy back columns, which will carry an adjustable slipper guide with loose face, water cooled, and six front columns, well braced together. The cylinder lagging will be of planished steel. The connecting rods will be forked at the top end and tee heat at bottom, with steel bearings lined with white metal. The crank shaft will be 14¾ ins. diam., and the cranks will be counter-balanced to reduce vibration to a minimum. The valve gear will be the Stephenson link, with adjustable cut-off. The h.p. will have

wheel, direct connected with double enclosed, self oiling engine, arranged so that one blower can supply all the air should accident happen to the other. Patent flue blowers will be fitted in the breechings of each boiler, to blow tubes in boiler and air heater tubes. Four of the latest improved ash guns will be fitted in the fire rooms.

Two 12-16-18 in. ballast pumps are installed in engine room and connected to manifold, which in turn is connected to all ballast piping in boat. The two main feed pumps will be single 12-8 by 24 in. vertical pumps, which will pump directly to the feed water heater, the latter being of the horizontal film type, with copper tubes, and capable of raising the temperature of 80,000 lbs. water per hour from 130° Fr. to 210° at delivery. The tubular hot water heater will be fitted for sanitary system of boat, water heated by auxiliary steam after passing through main heater.

The main steam pipe will be of steel and will be connected by heavy forged steel flanges, expanded and rivetted to pipes. The steering engines will be of the direct acting type, both geared to cut toothed quadrant and arranged so that either can be thrown in or out of gear from pilot house at will. The windlass will be spur geared, 10 by 10 ft., and will be arranged with wire spools, and supplied with clutches and brakes for handling wire lines. A 12 by 12 in. cargo hoisting engine will be supplied with all necessary shafts and drums

for handling cargo.

A large party of Richelieu and Ontario Navigation Co.'s directors and guests went from Sarnia, Ont., on the s.s. Hamonic to witness the launching. The Managing Director, James Playfair, was called back shortly after the Hamonic passed Sault Ste. Marie, owing to his father's fatal illness, in consequence of which the christening was performed by Mrs. E. Bristol, wife of another director, instead of by Mrs. Playfair, as at first intended. A large number of Winnipeg people were also present, having travelled by special train. After the launching the guests were entertained at luncheon on the Hamonic by the builders, the Western Dry Dock and Shipbuilding Co.

### The Proposed Montreal-Georgian Bay Ship Canal.

In connection with the proposal to build a ship canal between Montreal and Georgian Bay, utilizing the French River for a portion of the route, and on the discussion, in the House of Commons, recently, on a vote for \$500,000 for French River waterways improvements, the Minister of Public Works stated that he was carrying out the recommendation made some years ago by the Royal Commission on Transportation, to the effect that it would be advisable to have an investigation made of the commercial feasibility of the project. Regarding the French River end of the route, he estimated that sufficient water power would be developed to repay interest of the proposed outlay of \$500,000. The report made by his predecessor in office had resulted in complete information being on hand with reference to the engineering features of the work, and in that respect it was regarded as feasible, but he considered it necessary also to ascertain the commercial value of the undertaking, and such information would be obtained. In the meantime it was proposed to develop the French River section.

The Canadian Gazette, London, Eng., which is usually well informed in regard to Canadian affairs and accurate in its statements, has evidently been misled in regard to the position of this project. In a recent issue it states that the scheme has made considerable progress, that both political parties have pledged their support to it, that it will be financed largely by means of bonds guaranteed by the Dominion Government, and that the financial side of the question is in the hands of Sir Robert W. Perks, who has recently returned to England.

It might be concluded from the Gazette's remarks that the Dominion Government has completely endorsed the project and is prepared to go ahead, but as above pointed it was distinctly stated in the House of Commons recently by the Minister of Railways and Canals that the commercial side of the matter would be thoroughly enquired into before anything is decided on. When this occurs the next decision for the Government to make will be whether the work shall be carried out as a public one, by letting contracts for construction to contractors, or if it shall be built by Sir Robert W. Perks' company under a Government guarantee or aid. The statement that the financial side of the question is already in his hands appears to be at least premature.

The hearing of the actions between Macenzie, Mann and Co. and James Duns-muir, arising out of the sale of the Duns-muir interests in collieries, etc., on Vancouver Island, in June, 1910, was begun in a British Columbia court, May 13.

### Dominion Government Lightship for Halifax

The Dominion Government has awarded a contract for the construction, equipment and delivery of a steel single screw steam lightship for service at Halifax, the vessel to be built at Paisley, Scotland. The principal dimensions are:—

|                     |                |
|---------------------|----------------|
| Length over all     | 135 ft. 9 ins. |
| Length on waterline | 114 " 0 "      |
| Beam, moulded       | 29 " 0 "       |
| Depth, moulded      | 14 " 8 "       |
| Draught             | 12 " 9 "       |
| Complement          | 16             |

The vessel is to be built of mild steel throughout, to be classed 100 A1. at Lloyd's, and fitted out in accordance with the Board of Trade regulations and Government inspection. The stem will be of the clipper, and the stern of the elliptical type. Four transverse watertight bulkheads will be fitted, while watertight flats at the bow and stern will, with the bulkheads adjoining, form trimming tanks. There will be three decks, the main and spar decks being continuous, and the lower deck extending from the stem to the coal bunker bulkhead, and from the stern to the after engine room bulkhead.

A powerful revolving lantern will be carried on a heavy steel tower, access to the lantern chamber being made by a stairway inside. Inside the lower portion of the tower will be a large air pressure tank for supplying the fog horn, which will be on the spar deck just forward of the tower. In the engine room on the level of the main deck will be two air compressors connected to this tank. The oil for the lantern will be controlled by a pump situated in the oil room on the lower deck forward. In addition to the fog horn, a large organ whistle will be fitted to the funnel.

The deck machinery will consist of a large windlass of special design, for the handling of the heavy mooring anchors, and a small steam winch on the spar deck for working the boats, etc.

A complete electric lighting installation will be fitted throughout the ship, supplied by a steam turbo generating set in the engine room.

Complete fresh water and sanitary, fire, and steam heating systems will be fitted in the most up to date manner.

Besides the lantern tower, the vessel will

have a main mast carrying a main sail and wireless aerials. The boat equipment will consist of one 23 ft. lifeboat on the port, and a 24 ft. motor launch on the starboard side.

Accommodation for captain, officers and engineers will be provided aft on main deck, while forward on the same deck will be the crew's quarters, including galley, pantry, mess rooms and store rooms. On the lower deck aft will be the engineer's workshop, sail room and provision rooms, and on the lower deck forward the carpenter's shop, oil rooms, cold storage, galley coal bunker, and various store rooms. On the spar deck aft, the wireless cabin and companion to officers' quarters will be located, and forward at base of lantern tower will be the chart room and companion to crew's quarters.

In the hold forward and in the tunnel aft will be placed large fresh water tanks of a capacity of 7,000 gals., while arrangements will also be made for catching, storing, and making use of any rain water which may fall on the decks.

The propelling machinery will consist of one set of fore and aft compound engines, having cylinders 16 and 32 ins. diameter by 24 ins. stroke, driving a right hand four bladed propeller. The complement of independent auxiliaries will be very complete, and will include air, circulating, feed and bilge pumps, general service fresh water and sanitary pumps, also an evaporating and distilling plant for the supply of fresh water, capable of distilling 2,000 gals. of fresh water per 24 hours.

Steam is to be supplied from two Scotch boilers 10½ ft. diameter by 10¾ ft. long, designed for a working pressure of 120 lbs. per sq. in.

The vessel was designed by Chas. Duguid, Naval Constructor, Marine and Fisheries Department.

The Marine Department will shortly call for tenders for the construction of a steamboat, to be named Scout, for use in the lighthouse service between Montreal and the Welland Canal. The dimensions of the vessel will be, length 155 ft., breadth 30 ft., depth 13 ft., and it is stated that a special stipulation will be made that the vessel is to be built in Canada.

### Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during May, 1913.

| ARTICLES            |           | CANADIAN CANAL | U. S. CANAL | TOTAL      |
|---------------------|-----------|----------------|-------------|------------|
| Copper              | Eastbound | 943            | 16,914      | 17,857     |
| Grain               | "         | 7,598,425      | 7,357,033   | 14,955,458 |
| Building stone      | "         |                |             |            |
| Flour               | "         | 345,180        | 980,041     | 1,325,221  |
| Iron ore            | "         | 4,780,603      | 2,235,023   | 7,015,626  |
| Pig iron            | "         |                | 3,759       | 3,759      |
| Lumber              | "         | 1,112          | 76,235      | 77,347     |
| Silver ore          | "         |                |             |            |
| Wheat               | "         | 11,615,249     | 11,060,723  | 22,675,972 |
| General merchandise | "         | 5,667          | 38,502      | 44,169     |
| Passengers          | "         | 806            | 852         | 1,658      |
| Coal, hard          | Westbound | 116,433        | 294,912     | 411,345    |
| Coal, soft          | "         | 497,921        | 1,873,482   | 2,371,403  |
| Flour               | "         |                |             |            |
| Grain               | "         |                |             |            |
| Manufactured iron   | "         | 13,665         | 43,887      | 57,552     |
| Iron ore            | "         |                |             |            |
| Salt                | "         | 5,201          | 168,937     | 174,138    |
| General merchandise | "         | 79,807         | 92,826      | 172,633    |
| Passengers          | "         | 1,316          | 346         | 1,662      |
| Summary.            |           |                |             |            |
| Vessel passages     | "         | 1,101          | 2,084       | 3,185      |
| Registered tonnage  | "         | 3,757,130      | 4,428,934   | 8,186,064  |
| Freight—Eastbound   | "         | 5,318,471      | 3,013,707   | 8,332,178  |
| — Westbound         | "         | 708,569        | 2,315,448   | 3,024,017  |
| Total freight       | "         | 6,027,040      | 5,329,155   | 11,356,195 |

### Hydrographic Vessel for Dominion Government Service.

The steamship *Acadia*, which was launched at Newcastle on Tyne, Eng., for the Dominion Government's Hydrographic Service, is 170 ft. long, 33½ ft. beam, and will attain the highest class in Lloyds Register. She will be schooner rigged and will be propelled by a set of triple expansion engines, supplied with steam by two boilers working under forced draught, and is expected to have a speed of 12 knots an hour.

She is built of steel, and strengthened to enable her to run through ice, and will be completely outfitted for her intended service, having two motor launches, sounding machine, marine sentry, sounding winch, electric light with projector, etc.

Besides the usual accommodation for the deck and engine room officers, there will be well furnished rooms for the various officials engaged in survey work.

The vessel is being constructed to the designs and under the superintendence of R. L. Newman, of Ottawa, who was present at the launch.

A full illustrated description of this vessel appeared in *Canadian Railway and Marine World* for Nov., 1912, pg. 577; see also C. R. & M. W., July, 1912, pg. 370; Aug., 1912, pg. 425; and Oct., 1912, pg. 530.

### Dominion Government Hopper Barge for St. Lawrence River Dredging.

The Dominion Government hopper barge No. 1, was launched at Levis, Que., recently. She is classed 100 A1, Lloyd's River Service, built under special survey and according to Canadian regulations. The deck arrangements consist of a series of six double doors on each side, operated separately or simultaneously, and when open, are so arranged that they do not extend below the bottom of the hull. The propelling machinery consists of triple expansion engines with cylinders 14¾, 24 and 38 ins. diam., by 22 ins. stroke, supplied with steam at 180 lbs. by two horizontal multitubular boilers, each 10 by 10 ft. There are two pumps of the vertical direct acting type, air pump, feed heater, evaporator and filter, centrifugal circulating pump, general service pump, two separate acting bilge pumps, sanitary and fresh water pumps, patent ash ejector, etc. The deck machinery consists of a capstan at the after end, a winch for operating the hopper doors, and windlass on the fore-castle deck for the anchors. A steam steering gear is operated from the flying bridge, and electric lighting and steam heating services are installed. The general dimensions are: length between perpendiculars 180 ft., breadth 32 ft., depth 14½ ft., draught 12 ft., gross tonnage 850.

### New Vessels for the Canadian Pacific Railway British Columbia Coast Service.

As reported in *Canadian Railway and Marine World* for June, the C.P.R. has ordered to be built at Dumbarton, Scotland, two vessels for service on the Pacific coast to be ready early in 1915. They will be somewhat of the appearance of the s.s. *Princess Charlotte*, and equipped with turbine engines, fitted with oil burning apparatus. They will be built on the cruiser stern principle, with three decks and three funnels. There will be accommodation for about 450 first class, and 80 second class passengers. J. W. Troup, Manager, C.P.R. British Columbia Coast Service, who went

to Great Britain in connection with the placing of the contract, returned to Canada, June 5.

### Canadian Notices to Mariners.

The Department of Marine has issued the following:—

138. May 7. New Brunswick, east coast, Northumberland Strait, Shediac Bay, Pointe du Chene, Shediac north channel range light towers increased in height.

139. May 7. Quebec, Gulf of St. Lawrence, Anticosti lightship, date to be replaced on her light station.

140. May 7. Quebec, River St. Lawrence, St. Thomas bank, gas buoy established.

141. May 7. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Gentilly front range light, illuminating apparatus.

142. May 9. Quebec, River St. Lawrence, Lake St. Louis, Lachine range lights, illuminating apparatus.

143. May 9. Quebec, Ottawa River, Lake of Two Mountains, St. Placide front range light, illuminating apparatus.

144. May 9. Ontario, Lake Ontario, Wickel Point, light to be discontinued.

145. May 9. Ontario, Lake Ontario, Cobourg harbor, change in character of buoy marking submerged portion of central pier.

146. May 9. Ontario, Lake Huron, north channel, Bruce Mines, change in color of light.

147. May 9. United States of America, Lake Superior, Duluth-Superior harbor, St. Louis River range lights, color to be changed.

148. May 12. New Brunswick, south coast, off Negro Head, change in character of buoy.

149. May 12. New Brunswick, east coast, entrance to Shippigan Gully, bell buoy to be established.

150. May 12. Nova Scotia, south coast, Port Hebert, buoy established.

151. May 12. Prince Edward Island, east coast, Cardigan Bay, Mosquito Shoal, buoy established.

152. May 13. Ontario, Bay of Quinte, Nigger Narrows, shoal removed.

153. May 13. Ontario, Lake Ontario, Burlington Bay, entrance to Desjardins Canal dredged.

154. May 13. Ontario, Georgian Bay, east side, Matchedash Bay and Coldwater Creek, dredging, buoys established.

155. May 14. British Columbia, Burrard Inlet, north arm, southwestward of Turtle Head, buoy established.

156. May 14. 156 British Columbia, Strait of Georgia, Sutil Channel, Mary Island, Boulder Reef, buoy established.

157. May 14. United States of America, Washington, Rosario Strait, Cypress Island, rock reported westward of.

158. May 16. Nova Scotia, north coast, Northumberland Strait, Caribou Reef, conical buoy to be replaced by bell buoy.

159. May 16. Prince Edward Island, north coast, Tracadie back range lighthouse, illuminating apparatus.

160. May 16. New Brunswick, Chaleur Bay, Petit Rocher, permanent light.

161. May 16. Quebec, River St. Lawrence, Long Pilgrim light, change in illuminant.

162. May 19. Nova Scotia, south coast, Lahave River, bell buoy to be established.

163. May 19. Nova Scotia, Gut of Canso, Port Hastings, removal of storm signal station to Point Tupper.

164. May 19. Prince Edward Island, south coast, Hillsborough Bay, Hazard Point, color of range lighthouses.

165. May 19. New Brunswick, east coast, Northumberland Strait, Shediac Bay, She-

diac harbor, dredging, buoy established.

166. May 20. Ontario, Lake Ontario, Toronto harbor, dredging.

167. May 20. Ontario, Detroit River, gas buoy at junction of Ballard Reef and Livingstone Channels, change in color of lights.

168. May 20. Ontario, Detroit River, Livingstone Channels, change in position of gas buoy.

169. May 23. Quebec-Ontario, River St. Lawrence, Lake St. Francis, western portion, chart, Lancaster Bar to Cornwall issued.

170. May 23. Ontario, River St. Lawrence, Thousand Islands, description of light on island west of Duck Island.

171. May 23. Ontario, Lake Ontario, Toronto harbor approaches, buoyage.

172. May 23. Ontario, Lake Huron, north channel, Little Current, construction of railway bridge, north opening obstructed by false work.

173. May 26. Ontario, Georgian Bay, approach to Midland, east of Elimere Point, McNicoll range lights established, Old Midland range lights to be discontinued.

174. May 27. British Columbia, Burrard Inlet, First Narrows, west entrance, new lighthouse and fog alarm.

175. May 27. British Columbia, Queen Charlotte islands, Hecate Strait, gas lighted beacon moved from Koya Point to Danger Rocks.

176. May 30. Ontario, Lake Ontario, Oakville, harbor entrance, position of lighthouse corrected.

177. May 30. Ontario, Detroit River, Livingstone Channel, gas buoy no. 29, change in characteristic of light.

178. May 30. Ontario, Detroit River, Ballard Reef Channel, light vessel replaced.

179. May 30. Ontario, Georgian Bay, north side, western approach to Killarney, Ann Long Bank, buoy established.

180. June 2. Nova Scotia, Avon River, Dimock Point, change in color of light.

181. June 2. Nova Scotia, south coast, Aspotogan Peninsula, New Harbor, light established.

182. June 2. Prince Edward Island, south coast, Northumberland Strait, Belle River, light established.

183. June 2. Quebec, River St. Lawrence, Quebec harbor, off mouth of St. Charles River, buoy moved.

184. June 4. Maritime Provinces and Quebec, Canadian list of lights and fog signals, new edition.

185. June 4. Nova Scotia, Chedabucto Bay, Guysborough harbor, buoyage.

186. June 4. Quebec, River St. Lawrence, Godfrey River, range of day beacons established.

187. June 6. Nova Scotia, south coast, Torbay, entrance to Larry River, buoys established.

### Pilotage in the St. Lawrence River.

An order in council has been passed amending bylaw 22 of Montreal Pilotage District bylaws, which now reads as follows:—"Any pilot may, with the approval of the Minister, agree with the agent of one or more regular lines of vessels for special services for a season of navigation, and any pilot not having made such agreement shall when required by the superintendent repair on board and take charge of any vessel and pilot the same according to the tenor of the requisition so made to him. No agent or firm having only one vessel a month—a monthly service of one vessel—shall be allowed to engage a special pilot for that service, but may be authorized to arrange with another agent or firm in a similar position, to share the services of a pilot, and failing this to be obliged to go to the tour de role when a pilot's services are required.

## Canada Transportation Lines, Limited, to take Over the Richelieu and Ontario Navigation Company, Etc.

A special general meeting of shareholders of the Richelieu and Ontario Navigation Co., Ltd., was held at the company's office, Montreal, June 19, to ratify an agreement of sale of the company's assets and undertaking, as a going concern, to a new company formed for the purpose. The President, Jas. Carruthers, said:—

This matter has received the most earnest and careful consideration by your directors and before sending out this notice, they were unanimously of the opinion that it was in the interests of this company to become part of a large organization. A new company has been formed called the Canada Transportation Lines, Limited, the authorized capital of which is \$25,000,000, divided into 125,000 7% cumulative preference shares of \$100 each, and 125,000 ordinary shares of \$100 each, and with authority to issue 30 year 1st mortgage debenture stock of \$8,000,000, bearing interest at 5%, with power to increase the amount of such mortgage debenture stock from time to time, providing the proceeds thereof are used for the purchase of new boats or other property necessary for the company to acquire, and on the terms more fully to be set forth in the mortgage trust deed. The trustees for such debenture stock will be the Law Debenture Corporation, London, Eng., and the Prudential Trust Co., Montreal. The registrars for such stock will be the Royal Trust Co., Montreal, and Brown-Shipley & Co., London, Eng. The registrars for shares will be the Royal Trust Co., Montreal and London. Transfer agents, Prudential Trust Co., Montreal and London. Bankers, the Bank of Montreal. Brokers, J. & A. Scrimgeour, and Linton, Clarke & Co. Auditors, Marwick, Mitchell, Peat & Co.

Further particulars of the new company and other matters connected therewith will in due course be given to shareholders. It is expected the new company will eventually acquire as going concerns, including all their assets, good will and profits for the current year, the following companies:—Richelieu & Ontario Navigation Co., Ltd.; Inland Lines, Ltd.; Northern Navigation Co., Ltd.; St. Lawrence River Steamboat Co., Ltd.; Richelieu & Ontario Navigation Co. of U.S.A.; Quebec Steamship Co., Ltd.; Canada Interlake Line, Ltd.; Ontario & Quebec Navigation Co., Ltd.; Merchants' Montreal Line; S. S. Haddington; Thousand Island Steamboat Co., Ltd.

The assets of the above companies have all been appraised by the Canadian Appraisal Co. and the accounts have been audited by Marwick, Mitchell, Peat & Co. Their reports and statements are open to the inspection of shareholders, and have been carefully examined by your board. Assuming the purchase to be carried out on the lines proposed, the new company will have assets as shown by the statement of the appraisal company of \$33,055,538, in which vessels have been valued at \$16,866,834; real estate, buildings and dock properties at \$5,450,267.99 and \$661,531.04 would be cash on hand, and \$8,698,969.89 would represent the value of leases, contracts and goodwill acquired by the company and covered by ordinary shares. The new company would be free from debt over and above the debenture stock issued, and current accounts. The net earnings of the consolidated companies for the year ended Dec. 31, 1912, was \$1,494,554.48, which shows an ample amount for the payment of interest on debenture stock and interest on

the preference stock with a fair amount applicable to reserve and ordinary stock.

Allowing for new tonnage not in operation in 1912 on the same basis as earnings on similar tonnage in 1912, the increase in net earnings from this source alone over last year would amount to \$263,000. In the item of insurance premiums I am advised by competent authority that a reduction of a considerable amount can be effected.

The impression that prevails in some quarters that it will be necessary for the new company to advance rates in order to improve its financial position is entirely unfounded. After giving the matter careful consideration, I am of opinion that the savings that can be effected by the new company over the individual companies in handling their boats, in preventing overlapping, and by giving a prompter and more efficient service, would be very great.

The important points that your directors had to consider was whether in their opinion it was in the interest of the Richelieu shareholders to sell out the assets and undertaking of that company, and if so, whether the Richelieu shareholders were in their opinion obtaining a fair share of the stock of the new company for the stock which they now hold. It is proposed that the shareholders of this company receive \$12,000,000 7% cumulative preference shares of the new company for the \$10,000,000 of Richelieu stock. For example, each holder of 10 shares of Richelieu will receive 10 fully paid 7% cumulative preference shares of the new company, and in addition 4 fully paid ordinary shares, which I think you will agree with your directors is an excellent arrangement.

The most important reason for your board being willing to advise the sale of the Richelieu assets and undertaking at the present time, is the fact that in their opinion it is essential to put the affairs of the company on the soundest possible financial basis both for the present and future requirements.

The growth of the water transportation on the Great Lakes is assuming enormous proportions, and if Canada in the future is to continue to go ahead as she has in the past, the growth of this trade from year to year is going to be very great.

This means that if we are to give satisfactory service to the farmers and shippers of this country we must be in a position to provide new boats from time to time and see that the grain grown in the country gets out of it in the promptest, cheapest and most efficient manner. In view of the world-wide financial stringency and the fact that requirements for money would be practically a matter from year to year, it commended itself to the judgment of your directors to sell to the larger organization which, in our opinion, will be able to finance the new company on a much better and more satisfactory basis than any smaller individual company can do.

Furthermore, we believe it to be in the interests of the water transportation companies of Canada that they should get English capital on a large scale interested in this business just as it is today interested in the great railways of the country. The only way this could be accomplished successfully in the opinion of your Board was to be connected with a new company large enough to command the interest of some of the most important financial houses in London. The names which are

connected with the proposed financing of the new company are, in my opinion, the best available, and the result will be, in my judgment, the placing of the new company, which means your company, on a permanently sound financial basis where it can from time to time reach the money markets of the world on the most favorable terms.

Moreover, the fact that the \$25,000,000 authorized capital of the new company will be listed on the London Stock Exchange, and a substantial portion of the preference stock will be taken at par by strong financial interests in London, is, in my opinion, a strong factor in advising the shareholders of this company to confirm the sale which your directors advise.

The President, in response to questions, stated that the \$8,000,000 debenture issue would be utilized in retiring the bond obligations of the old company, in acquiring new properties, and in furnishing a working capital of approximately \$600,000.

A. Haig Sims and G. Caverhill asked about the disposition of the \$500,000 preferred and \$8,500,000 common stock in the new company which will be left over after acquiring the R. & O.N. Co., and as to how much of it was to be issued to promoters, etc., but the president said he was unable to answer this.

On motion of J. P. B. Casgrain and Aemilius Jarvis, a resolution sanctioning the agreement was adopted.

Of the companies named above, which will be acquired by the new company, the Richelieu and Ontario Navigation Co., Ltd., already controls, either by purchase outright, or by a large majority of the stock, the Inland Lines, Ltd., Northern Navigation Co., Niagara Navigation Co., St. Lawrence River Steamboat Co., Thousand Island Steamboat Co., and Merchants' Montreal Line, details of which have been given in previous issues of Canadian Railway and Marine World.

The Ontario and Quebec Navigation Co. was recently acquired by Aemilius Jarvis and Co., Toronto, and full details were given in our last issue.

The s.s. Haddington is owned by the Mathews Steamship Co., Toronto, and was built at Toronto in 1904, her dimensions being, length 256 ft., breadth 42½ ft., depth 15 ft.; tonnage, 1,603 gross, 1,010 register; and she is equipped with engine of 87 n.h.p., driving a screw.

The Quebec Steamship Co. owns the s.s. Cascapedia, operating between Montreal, Gaspé, Malbaie, Perce, Summerside, Charlottetown and Pictou; and in addition operates a service between New York, Bermuda and the West Indies, with the steamships Bermudian, Guiana, Parima and Korona. In summer it operates the s.s. Trinidad between Quebec and New York.

Canada Interlake Line, Ltd., was formed at the close of 1912 to consolidate the interests operating under the name of the Merchants' Mutual Line, and full details, covering the vessels operated, etc., were published in our January issue.

### Comparison of the Largest Vessels.

Below is a tabular statement of the dimensions of the Olympic, the largest vessel in service; the Mauretania, only recently the record holder; the Imperator, of the Hamburg-American Line, recently built; the Aquitania, of the Cunard Line; and the Vaterland, of the Hamburg-American Line, the two latter being under construction:—

| Ship.               | Gross tonnage. | Length, ft. | Breadth, ft. | Date.    |
|---------------------|----------------|-------------|--------------|----------|
| Mauretania . . . .  | 32,000         | 760         | 88           | 1907     |
| Olympic . . . . .   | 45,000         | 883         | 92           | 1911     |
| Imperator . . . . . | 50,000         | 900         | 96½          | 1913     |
| Aquitania . . . . . | 50,000         | 901         | 97           | Building |
| Vaterland . . . . . | 50,000+        | 950         | 100          | Building |

**Tug for Harbor Work in Hudson Bay.**

The Department of Railways and Canals has given a contract to Polson Iron Works, Ltd., Toronto, for a stern wheel tug, to be used in the harbor work at the government railway terminal on Hudson Bay. The dimensions will be: length over all 117 ft., breadth 18 ft., depth moulded 4 ft., draft aft 2 ft.

The framing is to be spaced 15 in. centres, and to consist of 2½ x 2½ x ¼ in. angles throughout; plating to be ¼ in. steel throughout; to have three transverse watertight bulkheads; two of the balanced type rudders of ⅜ in. steel plate; two docking keels of 3 x 10 in. oak. Wales to be of 4 x 8 in. oak, held in place by 3½ x 2½ x ¼ in. angles. Stringer plate to be ½ in. thick all around tug and connected to sheer plate by 2½ x 2½ x ¼ in. gunwale bar. Sheer plate to extend 12 ins. above above deck to receive cabin stanchions; forward of cabin, sheer plate to extend 30 ins. deck to receive cabin stanchions; forson and centre truss to consist of ⅜ in. plate, 15 ins. wide; to have two slide keelsons of 6 in. shipbuilding channels from end to end. To have ample accommodation for crew, with complete outfit such as electric light plant, plumbing and steam heating, galley furnishings, etc.

Machinery to consist of one pair of stern wheel engines, having cylinders 12 ins. in diameter by 48 ins. stroke, built for a working pressure of 160 lbs. Boiler to be

of the locomotive type, 56 ins. in diameter by 20 ft. long, for 160 lbs. working pressure. To have two pumps, outside packed, 5¼ x 3 x 6 ins., brass fitted, for feed and general service. Capstans to be of the double barrel type with 6 x 8 in. double reversing engines and wilcats for ¾ in. chain. Heater to be of the feed water type.

Hull to be bolted up in contractors' yard, then taken down and sent to Hudson Bay in knocked down shape, contractors furnishing men to rivet and complete the tug at destination.

had been suspended by the court for twelve months."

No reasons are given for the Board's decision.

**The Grand Trunk Pacific Railway's Dry Dock, Etc., at Prince Rupert.**

Canadian Railway and Marine World for Feb., 1912, contained a very complete illustrated description of the marine terminal for the G.T.P.R. at Prince Rupert, B.C., respecting the construction of which we have been furnished recently with some up to date official information. The work under contract consists of rock cut and pile approximating 200,000 cu. yds., the pier and platform work amounting to something over 200,000 sq. ft., or approximately five acres, and the foundation work for the buildings. On June 2 we were advised that nearly all the pile work had been completed, and that it was expected that the pier and platform work would be completed by the end of July, and that the foundations of all the buildings would be ready for the steel work by the end of September, but the steel is not due to reach Prince Rupert until Nov. 1.

The B.C. Premier announced May 5 that his Government had allowed space in the Songhees Reserve, Victoria, at the foot of Broughton St., for a site for the Dominion Marine and Fisheries Department, where a depot will be established.

**Return of Capt. Harrison's Certificate.**

As announced in a previous issue the British Board of Trade decided to return the certificate of Capt. Harrison, who was in command of the s.s. Royal George of the Canadian Northern Steamships line, which was stranded near Quebec, No. 6, 1912.

The official information in regard to the matter is of a very meagre nature. The Board of Trade has issued a printed sheet giving in full the decision of the Dominion Wreck Commissioner in the matter, as delivered in Montreal on Dec. 11, 1912, and which was published in full in Canadian Railway and Marine World. Appended to the decision is the following note:—"On April 18, 1913, the Board of Trade decided to exercise the powers vested in them by sec. 474 of the Merchants Shipping Act, 1894, and to return to Capt. Harrison his certificate of competency as master, which

**List of Steam Vessels Registered in Canada during May, 1913.**

Heretofore, Canadian Railway and Marine World has published throughout the year, complete lists of all vessels, of whatsoever nature, placed on the Canadian register, but owing to the large increase in the number of steamboats of small power, and of gasoline and other power driven launches, which it is now necessary to register, and to the growing demands on our space, power driven vessels of less than 10 n.h.p. will not be included in our published lists, in future. To a large extent, those which will be excluded, will not be engaged in commercial transportation, but will be utilized, more or less, for pleasure.

| No.    | Name                | Port of Registry  | When and Where Built |                      | Length | Breadth | Depth | Gross Tons | Reg. Tons | Engines, Etc. | Owner or Managing Owner                                     |
|--------|---------------------|-------------------|----------------------|----------------------|--------|---------|-------|------------|-----------|---------------|---|
| 133903 | Chambly             | Sorel, Que.       | 1893                 | Sorel, Que.          | 79 8   | 17 2    | 9 2   | 97         | 36        | 32 n.h.p. sc. | Minister of Marine, Ottawa.                                 |
| 131202 | East'rn Passage     | Liverpool, N.S.   | 1913                 | Liverpool, N.S.      | 65 5   | 14 0    | 6 4   | 36         | 15 10     | " "           | Nova Scotia Construction Co., Sydney, N. S.                 |
| 131050 | Emilia              | Sorel, Que.       | 1899                 | Sorel, Que.          | 79 1   | 17 0    | 8 2   | 89         | 30 25     | " "           | Minister of Marine, Ottawa.                                 |
| 13'909 | Frontenac           | "                 | 1901                 | "                    | 101 7  | 23 0    | 7 9   | 262        | 131 63    | " "           | " "   |
| 133908 | Iberville           | "                 | 1891                 | "                    | 86 3   | 17 7    | 10 3  | 123        | 42 42     | " "           | " "   |
| 180776 | J. F. Taylor (a)    | Sault Ste. Marie  | 1901                 | Lorain, O            | 346 0  | 48 0    | 24 1  | 3429       | 2030 160  | " "           | Algoma Central & Hudson Bay Ry. Co., Sault Ste. Marie, Ont. |
| 133902 | James Howden        | Sorel, Que.       | 1902                 | Sorel, Que.          | 90 6   | 22 0    | 8 6   | 177        | 66 44     | " "           | Minister of Marine, Ottawa.                                 |
| 130435 | Jno. B. Ketchum 2nd | Sarnia, Ont.      | 1892                 | Toledo, O.           | 193 0  | 40 5    | 12 3  | 1109       | 763 77    | " "           | Reid Wrecking Co., Sarnia, Ont.                             |
| 131216 | Julius Wolf         | Sydney, N.S.      | 1897                 | Lubec, Me.           | 60 5   | 13 7    | 6 6   | 35         | 13 10     | " "           | Atlantic Dredging Co., Louisburg, N.S.                      |
| 133901 | Lac St. Pierre      | Sorel, Que.       | 1901                 | Sorel, Que.          | 90 0   | 22 3    | 8 5   | 159        | 57 48     | " "           | Minister of Marine, Ottawa.                                 |
| 133906 | Lavolette           | "                 | 1912                 | "                    | 84 2   | 21 7    | 10 3  | 213        | 82 40     | " "           | " "   |
| 133904 | Levis               | "                 | 1901                 | "                    | 96 0   | 19 0    | 8 3   | 185        | 88 48     | " "           | " "   |
| 131057 | Martina (b)         | Port Arthur, Ont. | 1901                 | Wyandotte, Mich.     | 349 0  | 44 5    | 24 0  | 3'06       | 2010 161  | " "           | Canada Interlake Line Ltd., Toronto.                        |
| 133905 | Portneuf            | Sorel, Que.       | 1905                 | Sorel, Que.          | 80 0   | 17 2    | 8 1   | 104        | 31 17     | " "           | Minister of Marine, Ottawa.                                 |
| 133830 | Semiramis           | Montreal          | 1903                 | Morris Heights, N.Y. | 94 3   | 15 6    | 7 8   | 53         | 29 16     | " "           | C. B. Gordon, Montreal.                                     |
| 133907 | Varennes            | Sorel, Que.       | 1911                 | Sorel, Que.          | 85 7   | 22 4    | 9 7   | 187        | 61 4J     | " "           | Minister of Marine, Ottawa.                                 |
| 130775 | W. C. Franz (c)     | Sault Ste. Marie  | 1901                 | Wyandotte, Mich.     | 346 0  | 48 0    | 24 1  | 3429       | 2030 169  | " "           | Algoma Central & Hudson Bay Ry. Co., Sault Ste. Marie, Ont. |

(a) formerly Saturn; (b) formerly Mars; (c) formerly Uranus.

**List of Sailing Vessels and Barges Registered in Canada during May, 1913.**

| No.    | Name              | Port of Registry | Rig   | When and Where Built |                 | Length | Breadth | Depth | Reg. Tons | Owner or Managing Owner                       |
|--------|-------------------|------------------|-------|----------------------|-----------------|--------|---------|-------|-----------|---|
| 133852 | B. C. L. No. 1    | Vancouver, B.C.  | Scow  | 1912                 | New Westminster | 97 4   | 40 2    | 9 6   | 363       | F. L. Buckley, Vancouver, B.C.                |
| 133911 | Contribution      | Chatham, N.B.    | Schr  | 1913                 | Caraget, N.B.   | 31 7   | 10 2    | 4 5   | 11        | G. Chenard, Caraget, N.B.                     |
| 133853 | Corycia           | Vancouver, B.C.  | Sloop | 1913                 | Vancouver, B.C. | 31 0   | 9 2     | 3 6   | 6         | G. H. Wailes, Vancouver, B.C.                 |
| 133920 | Cute              | Chatham, N.B.    | Schr  | 1913                 | Lamek, N.B.     | 34 0   | 11 0    | 4 8   | 12        | A. Chiasson, Island River, N.S.               |
| 133840 | D. G. No. 7       | Vancouver, B.C.  | Scow  | 1911                 | Vancouver, B.C. | 60 0   | 26 0    | 4 0   | 161       | Dewdney Gravel Co., Vancouver, B.C.           |
| 133854 | E. C. E. XX       | "                | "     | 1911                 | "               | 83 3   | 29 8    | 8 2   | 195       | Evans, Coleman & Evans, Ltd., Vancouver, B.C. |
| 133916 | Etoile d'un Marin | Chatham, N.B.    | Schr  | 1913                 | Lamek, N.B.     | 42 0   | 13 0    | 6 0   | 20        | O. Noel, Lamek, N.B.                          |
| 133919 | Marie Delphine    | "                | "     | 1913                 | "               | 39 0   | 13 2    | 5 3   | 16        | J. H. Savoie, Lamek, N.B.                     |
| 133917 | Overseer          | "                | "     | 1913                 | "               | 41 0   | 13 8    | 5 6   | 20        | F. Chiasson, Island River, N.B.               |
| 133923 | Pembina           | "                | "     | 1913                 | "               | 39 0   | 13 4    | 5 0   | 17        | J. Ache, Lamek, N.B.                          |
| 122284 | Roseway           | Quebec, Que.     | "     | 1907                 | Shelburne, N.S. | 120 0  | 28 4    | 12 4  | 244       | A. Guay, Fraserville, Que.                    |
| 13'808 | Selma M.          | Lunenburg, N.S.  | "     | 1913                 | Tancook, N.S.   | 41 2   | 10 6    | 5 4   | 12        | A. Mason, Tancook, N.S.                       |
| 133913 | Selonia           | Chatham, N.B.    | "     | 1913                 | Lamek, N.B.     | 32 0   | 10 2    | 5 0   | 11        | A. T. Chiasson, Shippigan, N.B.               |
| 133914 | Shippigan Pearl   | "                | "     | 1913                 | Shippigan, N.B. | 26 0   | 9 6     | 4 6   | 10        | R. Brideau, Shippigan, N.B.                   |
| 133846 | T. R. N. No. 2    | Vancouver, B.C.  | Scow  | 1912                 | Vancouver, B.C. | 64 3   | 26 1    | 6 5   | 105       | R. M. Nickson, Vancouver, B.C.                |
| 130722 | Tacoma            | Halifax, N.S.    | Schr  | 1906                 | Tancook, N.S.   | 40 2   | 10 0    | 5 2   | 11        | R. G. Wambolt, Indian Harbor, N.S.            |
| 133921 | Vika              | Chatham, N.B.    | "     | 1913                 | Lamek, N.B.     | 47 0   | 14 8    | 7 2   | 29        | M. Poulin, Little Lamek, N.B.                 |
| 133809 | Warren M. Colp    | Lunenburg, N.S.  | "     | '93                  | Lunenburg, N.S. | 104 2  | 25 8    | 10 5  | 92        | M. Colp, M.O., Lunenburg, N.S.                |

Official Statistics of Canadian Shipping.

The total number of vessels on the Canadian register for the year ended Dec. 31, 1912, was 8,380, measuring 836,278 tons, an increase of 292 vessels and 65,832 tons, as compared with 1911. There were 3,667 steamers with a gross tonnage of 641,225, and assuming the value at \$30 a ton, the value of the net registered tonnage for 1912 was \$25,088,340. The number of vessels built and registered in Canada during 1912 was 420, measuring 34,886 tons net register, which, estimated at \$45 a ton, gives a total value of \$1,569,870. During the year, 241 vessels were removed from the register. It is estimated that 42,490 persons were employed on Canadian vessels during 1912.

The number and tonnage of vessels, according to Provinces, is as follows:—

|                  | Sailing ships and Steamships. | Steamships. | Gross tonnage of Steamships. | Net tonnage of Sailing Ships and Steamships. |
|------------------|-------------------------------|-------------|------------------------------|--|
| Ontario .....    | 2,017                         | 1,461       | 271,285                      | 253,376                                      |
| Quebec .....     | 1,566                         | 519         | 143,804                      | 227,048                                      |
| Nova Scotia ..   | 2,158                         | 359         | 44,457                       | 143,295                                      |
| British Columbia | 1,376                         | 988         | 125,909                      | 136,618                                      |
| New Brunswick.   | 1,001                         | 216         | 40,039                       | 57,369                                       |
| P. E. Island.... | 148                           | 23          | 4,583                        | 9,577  |
| Manitoba .....   | 95                            | 85          | 7,893                        | 6,096  |
| Yukon .....      | 14                            | 12          | 2,869                        | 2,543  |
| Saskatchewan ... | 5                             | 4           | 386                          | 356  |
| Totals .....     | 8,380                         | 3,667       | 641,225                      | 836,278                                      |

Ports of registry are distributed as follows:—Ontario 38, Nova Scotia 21, New Brunswick 7, Quebec 6, British Columbia 4, Prince Edward Island, Saskatchewan and Yukon, one each.

The new vessels built and added to the register during the year, according to Provinces, are as follows:—

|                            | Vessels. | Tonnage. |
|----------------------------|----------|----------|
| Ontario .....              | 71       | 11,170   |
| British Columbia .....     | 128      | 10,647   |
| Nova Scotia .....          | 126      | 5,853    |
| Quebec .....               | 49       | 5,744    |
| Manitoba .....             | 1        | 346      |
| Prince Edward Island ..... | 1        | 34       |
| Totals .....               | 420      | 34,886   |

The ports having a net tonnage of 10,000 and over are as follows:—

|                             | Vessels. | Net.   |          |
|-----------------------------|----------|--------|----------|
|                             | Sailing. | Steam. | Tonnage. |
| Montreal .....              | 522      | 322    | 170,663  |
| Victoria, B.C. ....         | 140      | 221    | 74,017   |
| Toronto .....               | 75       | 290    | 60,151   |
| Vancouver, B.C. ..          | 167      | 620    | 59,234   |
| Quebec .....                | 469      | 155    | 48,217   |
| St. John, N.B. ....         | 231      | 106    | 41,654   |
| Ottawa .....                | 134      | 264    | 32,460   |
| Lunenburg, N.S. ...         | 324      | 65     | 24,929   |
| Halifax, N.S. ....          | 336      | 108    | 24,833   |
| Windsor, N.S. ....          | 54       | 16     | 23,350   |
| Port Arthur, Ont. .         | 39       | 61     | 22,686   |
| Kingston, Ont. ....         | 69       | 140    | 21,822   |
| Midland, Ont. ....          | 6        | 27     | 16,369   |
| Hamilton, Ont. ....         | 9        | 32     | 14,691   |
| Yarmouth, N.S. ...          | 260      | 41     | 14,451   |
| Collingwood, Ont. .         | 4        | 57     | 14,302   |
| Parrsboro, N.S. ...         | 71       | 9      | 14,007   |
| Sault Ste. Marie, Ont. .... | 11       | 54     | 10,864   |
| New Westminster, B.C. ....  | 81       | 137    | 10,842   |

Of the vessels removed from the register during the year, 117 were broken up, reported out of existence, condemned, dismantled, or abandoned; 19 were wrecked, 19 lost, 6 foundered, 4 lost in collisions, 10 stranded, 3 abandoned at sea, 2 were reported missing; 13 transferred to Newfoundland, 7 to Barbadoes, and 3 to Bahamas; and 16 were sold to foreigners.

In a list showing the tonnage of the various maritime states of the world, Great Britain with its dominions and colonies (including Canada) stands first, with 12,580,488 tons, more than the combined tonnage of the next seven countries. Canada occupies the ninth place in the list.

Atlantic and Pacific Ocean Marine.

The Taconic Steamship Co., J. S. Lovell, Montreal, President, has increased the number of its directors from seven to eight.

During May, 65 ocean steamships arrived at Montreal with a combined registered tonnage of 445,098, as compared with 73 vessels, and 478,073 tons, in May, 1912.

The Canadian-Australian Line's s.s. Niagara arrived at Victoria, B.C., May 28, on her maiden voyage to the Pacific coast. The officers of the vessel were entertained by the Mayor and corporation, and the Board of Trade.

The Union Steamship Co. of New Zealand, operating the Australian-Canadian mail service between Australasia and Canada, has declared a dividend of 9 1/2% share for the six months ended Mar. 31. This does not, however, apply to the 200,000 shares recently issued.

An order in council has been issued amending the portion of bylaw 45 of the Montreal Pilotage District, by providing for the increase of pilotage fees for seagoing vessels, either up or down, of 50c. for each foot of draught, making a total of \$3 per foot draught.

The British s.s. Gerald Turnbull reported ashore on Gannet Rock ledges, near Yarmouth, N.S., at the end of May, was abandoned to the underwriters, June 2, all hope of saving her having been given up on account of local storms. She was on her second voyage, and was valued at \$250,000.

The C.P.R. has purchased the s. s. St. George, which has been operated for some time between Fishguard, South Wales, and Rosslare, on the southwest coast of Ireland, by the Great Western Ry. of England. She is 2,456 tons gross, was built at Birkenhead, Eng., in 1906, and valued at about £90,000. She will be utilized on the route between Digby, N.S., and St. John, N.B.

The Union Navigation Co., of Toronto, a subsidiary of the Union Sulphur Co., of New York, has acquired the s.s. Harley, which was recently transferred from the British to the Canadian register, in the name of C. W. Harrison, London, Eng., as managing owner. She was built at Hartlepool, Eng., in 1906, and is screw driven by engine of 336 n.h.p. Her dimensions are: length 359.8 ft., breadth 50.2 ft., depth 26.4 ft.; tonnage, 4,171 gross, 2,707 register.

Referring to the report that the Canadian Northern Steamships, Ltd., was about to add to its Atlantic fleet, Sir William Mackenzie, President, is reported to have stated in Montreal, June 12, that for the past three or four years there had been a boom in shipbuilding in Great Britain, that all the shipyards were choked with orders at present, and it would be necessary to wait until this state of affairs had subsided before the company could consider the question of ordering new vessels. It is reported that the company is laying a scheme before the Montreal Harbor Commissioners for better provision for its vessels there.

In connection with the collision last year between the C.P.R. Empress of Britain and the s.s. Helvetia, under charter by the Dominion Coal Co., by which the latter was sunk and lost, an appeal was recently made by the owners of the Helvetia, on the point of valuation, it being claimed that the value must be based on charter, which was until 1917. Judgment had been entered for £2,000 for loss of hire to the end of the 1912 season, and £65,000 for loss of the vessel, as against the claim of £24,320 loss of hire and £75,000 for the vessel. The Admiralty Court has referred the case back for a valuation to cover loss of hire for the remainder of the charter period. As both vessels were held to blame for the loss,

the damage was to be shared, the C.P.R. paying five twelfths.

The International Mercantile Marine Co.'s report for 1912 shows a combined surplus of all the component companies, of \$3,787,911, after meeting all fixed charges and operating expenses, including repair, maintenance and overhaul charges. The surplus for 1911 was \$4,509,269. On account of the Titanic loss during the year, the insurance fund shows a loss of \$1,498,885, but with the surplus brought forward from the previous year, the fund shows a surplus for 1912, of \$507,971. The report refers to the retirement of J. Bruce Ismay from the Presidency, and from the management of the Oceanic Steamship Co. (White Star Line).

The C.P.R. s.s. Empress of Russia, the first of the new steamships which the C.P.R. has added to its Pacific fleet, arrived at Vancouver, June 7, from Great Britain. She sailed from Liverpool, Eng., Apr. 1, with a large party making a tour of the world, entirely by the C.P.R. The route taken was by the Mediterranean and the Suez Canal, and it is announced that the whole trip was most successful, and passed off without accident. Her sister vessel the Empress of Asia, sailed from Liverpool, June 14, for Vancouver, by way of Maderia and the Cape of Good Hope, and is expected to arrive at Vancouver, Aug. 30. She is conveying another party on a round the world trip on the C.P.R., but by another, and longer route.

Maritime Provinces and Newfoundland.

The Nova Scotia Legislature has amended the Liverpool Marine Railway Co.'s act of incorporation.

It is reported in Sydney, N.S., that the Reid Newfoundland Co. is considering the question of removing its Canadian terminal there from North Sydney.

A powerful suction dredge for the N.B. Government was recently launched at St. John. She is of steel and is the largest steel vessel built at St. John, being 110 ft. long over all, and has 30 ft. beam.

The Sydney and Westmount Ferry Co.'s ferry boat Westmount, was launched at Westmount, N.S., June 4. She will carry about 100 passengers, and will be operated by gasolene engines.

On the arrival of the Canada Atlantic and Plant Line Steamship Co.'s new steamship Evangeline, at Charlottetown, P.E.I., on her first trip, June 6, the Board of Trade gave her an official welcome and presented H. L. Chipman, Manager of the company, with an address.

The s.s. Senlac, which has been lying up at Dartmouth Cove, N.S., since she was sold about two years ago, on account of the bankruptcy of her former owner, has been acquired for a 12 months charter in the mail service between St. Pierre, Miquelon and Halifax, N.S. This service has been performed during the past year, by the Newfoundland Produce Co.'s steamships Fogota and Sagona.

The Fredericton Steamship Co., the incorporation of which was announced in our last issue, has acquired the steamboat Hampstead, formerly operated on the St. John River and its tributaries, by the St. John River Steamship Co. She was built at Hampton, N.B., in 1893, and is screw driven by engine of 20 n.h.p. Her dimensions are, length 94 ft., breadth 17.7 ft., depth 7 ft., tonnage, 235 gross, 150 register. The company's office is at Fredericton, N.B. W. G. Clarke, Fredericton, is President, F. D. Swim, Doaktown, Vice President, and F. W. Porter, Secretary-Treasurer.

In response to an offer from England to establish a shipbuilding plant at Sydney, N.S., a reply has been sent to the effect that Sydney has already voted generous inducements, and considerable time and money have been spent by the council in the matter, without producing any results. While it may be taken for granted that the city will grant a large bonus to any company establishing a plant there, until a company expresses a definite resolution to locate there, the matter will not again be placed before the citizens for a vote.

The British owned s.s. Glace Bay, under charter to the Dominion Coal Co., and carrying ore from Newfoundland to Sydney for the Dominion Iron and Steel Co., and coal to the St. Lawrence for the Dominion Coal Co., which went ashore near Trepassey, Nfld., in May, and was subsequently abandoned to the underwriters, has been definitely abandoned by the latter, who made efforts to refloat her, without success, on account of storms. The wreck has been offered for sale as she lies on the rocks. She was insured for \$320,000, and was practically a new vessel.

The construction of a marine railway dock at Burin, Nfld., is under consideration there, a local company, for that purpose being in course of formation. It is intended to install a system similar to that now in operation at Harbor Grace, with the object of handling vessels which now have to go to St. Pierre, from Fortune Bay and Placentia Bay, for repairs. It is also considered likely that a similar plant will be built at Fortune Bay or Grand Bank. The Newfoundland Government recently passed an act by which it may grant aid in the construction of such works, by guaranteeing a return of 5% on the outlay for 15 years.

### Province of Quebec Marine.

The name of the steamboat Massachusetts, registered at Montreal, no. 130927, has been changed to Compton.

The Sincennes-McNaughton Line steam tug Aurelie G., arrived at Sydney, N.S., from Great Britain, at the end of May, and immediately proceeded to Montreal, where she was overhauled and put into service. The voyage across the Atlantic occupied 16 days.

During May, 879 permits were issued to vessels passing through the Lachine Canal, an increase of 298 over May, 1912. The number of vessel passages during May was 1,307, with a combined tonnage of 634,126; number of passengers, 1,923, and tons of cargo, 541,667, an increase of 246,726 tons.

It is anticipated that the new freight shed at the foot of St. Paul St., Quebec, will be completed by about the end of July. The freight building extension on the breakwater is about completed and the Commission's office building is progressing satisfactorily. Other work, in connection with the Louise docks and the bulkhead pier in the St. Charles River, are also progressing.

The estimated cost of the projected dam to be built in the St. Charles River, at Quebec, is \$2,500,000. It will be of concrete, 1,600 ft. long, an average height of 20 ft., with two locks, respectively 450 and 350 ft. long by 65 ft. wide at the entrance wall, each lock having 15 ft. of water on the sill at low water. Quinlan and Robertson, Montreal, are the contractors.

W. G. Ross, Chairman, Montreal Harbor Commission, returned to Montreal, June 10, after a tour of the terminal and grain handling facilities at the head of the lakes, and at other points. He is reported to have stated that he considered the present

season would be the greatest in the port's history, but that a large quantity of grain would necessarily pass through other channels, through lack of vessels calling at Montreal.

The supplementary estimates recently passed by the House of Commons, include \$1,000,000 for a dry dock to be located at Lauzon, Que., \$1,000,000 for Quebec harbor; \$500,000 for improvements on the St. Charles River, and \$14,000 for a deep water wharf at Levis. The Minister of Public Works stated that the dry dock would be one of the largest in the country, that the contract would be let within the next two months, and that the work would probably be completed in about two years.

In connection with the vote of \$1,000,000 for a dry dock at Lauzon, opposite Quebec, the Minister of Public Works stated in the House of Commons recently, that a site of about 32 acres is being expropriated, the value being something over \$200,000. The dock would be a graving one, 1,150 by 125 ft. It will be one of the largest in the world, and it is anticipated that it will be completed within two years of the letting of the contract, which will probably be in July, or August.

The improvement work in the Quebec harbor, which the Quebec Harbor Commissioners propose to carry out, and on account of which an appropriation of \$1,000,000 was made by the Dominion Parliament, recently, consists of the building of piers 1 and 2, composed of 38 solid close faced stone filled timber cribs, each 46½ ft. wide at the base, 20 ft. 10 ins. at the top and 45 ft. high, with concrete superstructure, with the necessary dredging in connection therewith, at an estimated cost of \$4,778,230.

A United States shipping paper recently stated that "in connection with the various handicaps imposed upon shipowners trading to St. Lawrence ports, the matter of dry dock accommodation is most important; for some years past there have been many vessels trading to the St. Lawrence, there are 28 such vessels today—of such beam that it is not possible to dock them for repairs in any dry dock in the St. Lawrence River." We might call our contemporary's attention to the floating dry dock installed at Montreal, which has a length over platforms of 600 ft., and over pontoons of 550½ ft., and a lifting capacity of 25,000 tons. This is the fourth largest of the type in the world, the largest being owned by Germany and Great Britain, respectively, in the order named. In a recently published list of the largest floating dry docks in the world, the U.S. does not appear.

### Ontario and the Great Lakes.

It is announced that W. H. Dwyer Co., of Ottawa and Montreal, has completed arrangements for the erection of a grain elevator of 100,000 bush. capacity, with full equipment of drying and cleaning machinery on Island no. 2, Fort William.

The Toronto Insurance and Vessel Agency, Ltd., had reduced its capital stock from \$500,000 to \$50,000, by the cancellation of 3,000 shares of authorized, but unissued stock, and of 1,500 shares of issued stock recorded in the name of the Winnipeg Insurance and Vessel Agency, Ltd.

A proposal is being considered in Collingwood, to build a 1,000,000 bush. elevator there, at a cost of about \$400,000. In connection with the financing of the scheme, it is stated that the intention is to issue 6% preference stock with a bonus of one share of common stock for each

share of preferred. It is also stated that Jas. Playfair, Vice President and Managing Director, Richelieu and Ontario Navigation Co., is interested in the matter.

The bulk freight steamship which is under construction at Port Arthur, for Montreal interests, as mentioned in our last issue, will be built on the Isherwood system, and otherwise practically the same as other lake vessels. Her chief dimensions will be, length over all 625 ft., keel 604 ft., beam 59 ft., depth 32 ft.

Excavation is proceeding on the site of the addition to the C.P.R. elevator D, at Fort William, Ont. The concrete bins will be built 10 square, making a total of 100 new bins, and capacity of 4,000,000 bush. The total capacity of the elevator, when completed, will be 7,604,500 bush., and the whole area will be 325 by 295 ft.

The s.s. W. H. Dwyer was recently launched at Sunderland, Eng., for Forwarders, Ltd., Kingston, Ont., for use on the Great Lakes. She is of full Welland canal size, and is expected to arrive on this side and be in operation on the route early in July. Capt. W. Steeves, of the company's s.s. Port Colborne, went to England to bring over the new vessel.

The charter of the Long Sault Power Co., granted by New York State in 1907, for developing power on the St. Lawrence River, and which has been consistently combatted by the Dominion Marine Association and other similar interests, has been revoked by the Governor of the State on the grounds that its provisions were improvident, unwise and indefensible, both from an industrial and economical point of view.

The wrecking tug Premier, which recently passed through the Welland canal on its way from New York to Georgian Bay ports, and which was reported to have been acquired for operation as a passenger vessel by Inland Lines, Ltd., on the Georgian Bay, was in reality purchased by Jas. Playfair, for use by the Midland Towing and Wrecking Co., of which he is President and General Manager. The vessel has been generally overhauled at Collingwood.

The U. S. Government has decided to carry out the proposed widening of the Livingstone Channel entrance in the Detroit River by the removal of the westerly corner of the channel bank at the entrance to the new passage, beginning about 2,500 ft. above the apex of the Livingstone and Ballard Reef channels, and extending in a diamond shape to the upper end of the westerly dyke. The work covers an area of about 500,000 sq. ft., and will cost approximately \$200,000.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater, for May, as follows:—Superior, 602.13; Michigan and Huron, 581.05; Erie, 573.98; Ontario, 247.97. Compared with the average May levels for the past ten years, Superior was 0.11 ft. above; Michigan and Huron, 0.33 ft. above; Erie, 1.22 ft. above, and Ontario, 1.14 ft. above. It was anticipated that during June, Superior, Michigan and Huron would rise 0.3 ft.; Erie, 0.2 ft., and Ontario, 0.15 ft.

The Toronto Harbor Commission has awarded the contract for dredging in connection with the water front development at Toronto, to the Canadian Stewart Co., Montreal. The plans and specifications call for the removal of approximately 35,000,000 cubic yards of material by hydraulic dredging, and borings indicate that 70% is sand and gravel, and 30% a mixture of sand, silt and clay. The estimated amount to be spent in harbor development, is \$19,142,088, of which \$6,462,344 will be expended in dredging.

The Dominion Government has awarded a contract to R. Miller and Son, Toronto, for the lock gates on sections 3 and 4 on the Trent Valley Canal, to complete the outlet to Trenton on the Bay of Quinte, from Lake Simcoe. It is stated that the contract covers the construction and erection of 40 double lock gates, for about \$250,000. The work is to be commenced at once, and it is anticipated that the entire contract will be completed by the fall of 1914. It is also announced that tenders will be called for shortly for work on the northern section of the canal, from Lake Simcoe to the Georgian Bay, by the way of the Severn River. The total expenditure on the canal, to date, is about \$11,000,000, and it is estimated that the expenditure of a further \$5,000,000 will complete it and give a continuous waterway from Georgian Bay to Lake Ontario, of from 6 to 7 ft. deep.

### Manitoba, Saskatchewan and Alberta.

The Dominion Parliament has voted \$70,000 for the construction of approaches to the bridge over the dam at the St. Andrews lock and dam on the Red River, near Winnipeg.

The Winnipeg Harbor Commission has decided to ask the Dominion Government to grant \$50,000 for the construction of docking facilities along the frontage on the Red River, to enable the Commissioners to cope with the congested traffic there.

The channel of the Red River, between Provencher and the Canadian Northern Ry. bridge, Winnipeg, is being dredged to obtain a greater depth of water, necessitated by the increased traffic. A wharf on the south side of Provencher is being built, and rails have been laid connecting it with the railways in the vicinity.

The Hudson's Bay Co. has appointed the following officers for its vessels for the current season. The second column gives the names of the captains, and the third those of the chief engineers:—

|                 |               |               |
|-----------------|---------------|---------------|
| Athabasca River | G. B. Naylor  | Wm. Johnson   |
| Grahame         | G. B. Moore   | C. E. Halpin  |
| Highlander      | T. Garson     |               |
| Inewew          | G. R. Redfean | H. E. Weller  |
| McKenzie River  | G. A. King    | W. Johnson    |
| Mooswa          | A. Sinclair   | I. Reid       |
| Peace River     | J. Gullion    | I. Sutherland |
| Port Simpson    | — Montgomery  | J. H. Talbot  |
| Primrose        | R. Johnson    |               |
| Slave River     | J. D. Watson  | W. Hays       |

### British Columbia and Pacific Coast Marine.

The Fraser River Navigation Co. announces a daily steamship service between New Westminster and Port Coquitlam, and in connection with it, will build a wharf at Pitt River.

J. E. Dalrymple, Vice President, G.T.R. and G.T. Pacific Ry., is reported to have stated recently, that the G.T.P.R. is preparing plans for the erection of an elevator system of about 10,000,000 bush capacity, at Prince Rupert, B.C., so that the company will be in a position to handle grain through that port, on the opening of the Panama Canal.

In connection with the incorporation of the Vancouver Harbor Commissioners, it had been reported in Vancouver, that the Harbor Commission would absorb the Pilotage Commission. This matter was taken up by C. Gardiner Johnson, Lloyd's Agent, there, with the Minister of Marine, who replied to the effect that the Pilotage Commission would not be absorbed.

A press report from England states that the appeal of J. H. Welsford and Co. against the decision of the High Court, in the matter of the purchase of the Union

Steamship Co. of British Columbia, has been dismissed with costs. On behalf of the appellants it was claimed that there had been misrepresentation by the previous owners, and on account of this the final payment by J. H. Welsford and Co. had been withheld.

Side Streams Navigation Co., Ltd., recently incorporated, as mentioned in a previous issue, has appointed the following officers for its steam vessels for the current season:—Eveyn, captain W. Bragg, chief engineer, R. R. Crosby; Pauline, captain, J. S. Raymond, chief engineer, E. A. Dixon; Vidette, captain, E. Gray, chief engineer, G. Waltenbough.

The Vancouver Harbor Commissioners have been incorporated by the Dominion Parliament, with jurisdiction over the harbor, which includes Burrard Inlet, with the North Arm and Port Moody, False Creek and English Bay, and all other tidal waters lying east of a line drawn from the Point Atkinson lighthouse southerly to the most westerly point of Point Grey. The corporation shall consist of three commissioners appointed by the Governor-in-Council, on the recommendation of the Minister of Marine, two of whom shall form a quorum.

In connection with press reports emanating from Vancouver, and mentioned in our last issue, to the effect that C. H. Nicholson, Manager, G.T. Pacific Coast Steamship Co., had recently visited Winnipeg for a conference with the management regarding plans for the construction of a steamship to be ready for service in 1914, we are officially advised that the reports were entirely unauthorized and are not correct, and that the management has no knowledge of any vessels to be built for the company, at present.

The Vancouver civic harbor and improvements committee of the Board of Trade harbor and navigation committee have appointed a special committee, to consider the question of the appointment of an expert to advise on the needs of the city in regard to dry dock accommodation. It was stated that there were two companies in the field with applications for Government subsidies, and it was suggested that in addition to finding out the actual standing of the companies, the kind and size of dock best suited to Vancouver should be thoroughly discussed.

The North Fraser Harbor Commissioners have been incorporated by the Dominion Parliament, to control the North Fraser harbor, the limits of which are,—from a line drawn across the North Arm of the Fraser River in continuation southerly of the westerly boundary of New Westminster, thence down stream to the North Arm on both sides to the average high water mark, to lines drawn across the outlets of the North Arm into the Gulf of Georgia, but not extending further southerly than a point equidistant between the most southerly and the most northerly points of the western shore of Lulu Island, nor extending further northerly than Point Grey; including the adjacent waters of the Gulf of Georgia on Sturgeon Bank as far seaward as may be determined from time to time. The corporation is to consist of three commissioners, two appointed by the Governor-in-Council, and one, elected by a majority of four persons, one of the latter each being selected by the municipalities of Richmond, South Vancouver, Burnaby and Point Grey, for the purpose, and such commissioner shall be appointed for three years.

The act passed at the recent session of the Dominion Parliament, incorporating the New Westminster Harbor Commissioners, provides that the limits of the harbor

shall extend from a line drawn north and south to each shore of the Fraser River from the average high water mark, on the eastern end of Manson, or Douglas Island, known as Point Sebastien, at the mouth of the Pitt River, thence down stream extending on both sides to lines drawn across the outlets of the Fraser River into the Gulf of Georgia, but not extending further northerly than a point equidistant between the most southerly and most northerly points of the western shore of Lulu Island; including the adjacent waters of the Gulf of Georgia on the Sandheads as far seaward as may be determined from time to time, but not including any portion of the North Arm of the Fraser River west of a line drawn across the North Arm in continuation southerly of the westerly boundary of New Westminster. The corporation shall consist of three commissioners, one appointed by the New Westminster City Council and two by the Governor-in-Council, the city Commissioner being appointed for three years.

### The St. Lawrence and Chicago Steam Navigation Co.'s s.s. James Carruthers.

The s.s. James Carruthers, the launching of which, at Collingwood, May 22, was mentioned in our last issue, is of the single deck type, with estimated carrying capacity of 15,000 tons on a 19 ft. draught, and has been specially designed for carrying coal, ore and grain. She is of steel, constructed on the arch and web frame system, the holds being entirely free from pillars and other obstructions. There are 31 cargo hatches, each 38 by 9 ft., spaced 12 ft. centres, and she is built with complete double bottom with side tanks to main deck. The bottom tank is supported by a centre keelson and side girders of the depth of the tanks, and there are two collision bulkheads. The hold is divided into six compartments, and the double bottom into five compartments, and there is a transverse bunker bulkhead between the boiler and engine rooms. The spar deck stringer plating is supported by longitudinal channel girders.

The propelling machinery consists of triple expansion engines with cylinders 24, 40 and 66 ins. diam., by 42 ins. stroke, supplied with steam by three Scotch boilers, each 13 ft. diam., by 11 ft. long, at 185 lbs. pressure. The furnaces are equipped with Howden's forced draught, and there is a grate area of 45 sq. ft. to each boiler. Steam steering gear is placed aft on the main deck and is controlled from the pilot house by hydraulic telemotor. There is also an emergency steering gear and independent steam gear. The auxiliary equipment is of the most modern type, and there is a complete electric light installation for about 200 lights.

The officers' quarters are situated forward on the fore-castle deck, and are rather more commodious than customary, on account of the greater size of the vessel.

Her dimensions are, length over all 550 ft. 8 ins.; length between perpendiculars 529 ft.; beam 58 ft., moulded depth 31 ft.

**Rules of the Road.**—An Ottawa press dispatch says:—"In connection with the alteration in the rules of the road designed to make navigation on the Great Lakes harmonize as between Canadian and United States shipping, the shipping interests have been advised that any changes will be effective only on the Lachine Canal and westward. Montreal harbor and the river eastward, and also the Maritime Provinces will not be affected. There has been opposition to any change which might lead to confusion and resultant accident."

### A Canadian Transatlantic Radiotelegraph Contract.

The Postmaster General introduced a bill into the House of Commons, May 5, to provide for more advantageous telegraphic communication between Canada, the United Kingdom and other parts of the British Empire. Under the title of The Ocean Telegraph Act, provision is made for the appointment of a Government Ocean Telegraph Board, consisting of the Postmaster General, Minister of Marine, Minister of Railways and Canals and Minister of Public Works, with power to issue licenses for the landing of cables on the Canadian coast, and for the building of radiotelegraph stations, and for the operation of such cables and stations. Provision is also made for the confirmation of an agreement with the Universal Radio Syndicate Ltd., London, Eng., for the erection and operation of wireless telegraph stations for a social, press, commercial and Government service. The service is to be guaranteed at a speed of at least 400 letters a minute, and in any dispute as to service, the decision of the Board of Railway Commissioners is to be final. The rates for the service between Montreal and all parts of the United Kingdom, shall be not more than 4d. a word for messages in plain language, not deferred; not more than 8d. a word for code messages; not more than 2½d. a word for Government messages (including those of Canada, Great Britain, Australia and New Zealand), and such messages to have precedence over all others; not more than 2d. a word for press messages; and so far as Canada is concerned these rates are to cover the amounts to be paid by the Syndicate to the land line administrations, of ¾c. a word in the provinces from the Atlantic to, and including Ontario, for all messages other than press messages; ½c. a word for press messages in the forementioned territory, and ¾c. a word from, and including Manitoba to the Pacific coast, and if after having obtained consent of the Board of Railway Commissioners, the land administrations charge more than the foregoing rates, then the Syndicate shall have the right to charge such further additional amount. The rates mentioned shall also apply to all traffic passing to, or from, the Pacific Cable Board's system, the Syndicate handing over such traffic at Montreal without extra charge.

Any apparatus, or material, required for the erection and operation of such wireless telegraph stations as may be licensed by the Board may be imported, but as soon as it is found that the business is self supporting, and will allow, after providing for fixed charges and usual depreciation and sinking funds, a payment of a dividend of 6% on the amount actually and properly invested in the enterprise, such apparatus and material must be manufactured in Canada. Two stations are to be erected, one in the United Kingdom, and the other at some point in Nova Scotia or New Brunswick to be selected by the Syndicate, and they shall be completed and in operation within 12 months after the signing of the agreement, and of the approval of the Canadian site. An office is to be opened at Montreal, and communication maintained between Montreal and the coast station at the Syndicate's expense. On the signing of the agreement the Syndicate shall deposit with the Government, £10,000, half of which shall be repaid when \$50,000 (half of which shall have been spent in Canada) has been expended, and the balance on the completion and satisfactory operation of the stations in Canada and the United Kingdom respectively.

Other clauses cover the taking over of the stations named, by the Government, in certain events, the restrictions relating to making of traffic agreements with other companies, the jurisdiction of the Board of Railway Commissioners, the guarantee of the validity of patents, and a declaration that the Syndicate enters the field of competition at its own risk and expense.

### Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

JOHN SAXBY, founder of Saxby and Farmer, Limited, manufacturers of railway signals, etc., London, Eng., which has a branch in Montreal, died in England recently, aged 92.

C. W. GENNET, of Robt. W. Hunt & Co.'s Chicago office, has been appointed Treasurer and Manager of Robt. W. Hunt & Co., Ltd., engineers, inspection, testing, analyses and consultation, Montreal, succeeding Charles Warnock, appointed Sales Manager, Algoma Steel Corporation Ltd.

THE HERBERT MORRIS CRANE AND Hoist Co., Ltd., has been incorporated under the Dominion Companies Act, with head office in Toronto, to continue the Canadian business of Herbert Morris, Ltd., by manufacturing lifting and shifting machinery. Herbert Morris, President of the English Company, will also be President of the Canadian one.

The SAFETY CAR HEATING AND Lighting Co.'s monthly bulletin for April gives details of illumination tests on postal cars in relation to Pintsch gas and electricity for lighting purposes; and also illustrates a Pintsch gas lighted spar buoy for use in shallow water, a number of which were recently ordered by the U. S. Government.

THE GOLDSCHMIDT THERMIT CO., 103 Richmond St. West, Toronto, has issued an illustrated booklet covering a number of repairs to steamships carried out by the thermit welding process, without removing the heavy parts from their places, thus avoiding considerable expense and delay. A general description of the method employed is also given, and detailed directions for the various operations shown will be supplied on request.

THE OHIO BRASS CO., Mansfield, Ohio, reports the following recent sales:—610 couplers and draft gears for Boston Elevated Ry.; 52 couplers and draft gears for Gatalun, Spain. These are a heavy type designed for subway, elevated and heavy interurban work. Fifty-five couplers complete with spring carriers and anchorages; 100 ditto for Detroit United Rys.; 60 ditto for Cleveland Rys.; 210 ditto for United Rys. of St. Louis.

JOHN S. MacLEAN has been appointed to take charge of the publicity and advertising work of the Canadian General Electric Co., Ltd., and of the Canadian Allis-Chalmers, Limited, with headquarters in Toronto. The latter company, in addition to manufacturing an extensive line of machinery and appliances, will also act as sales agents for all the products of the Canada Foundry Co., Ltd. Mr. MacLean held a similar position with Allis-Chalmers-Bullock, Limited, for a number of years.

ALGOMA STEEL CORPORATION, LTD., announces that beginning July 1, all material manufactured by it, (steel rails, splice bars, tie plates, forging billets, etc.) will be sold to its customers direct instead of through the medium of agents as heretofore. (Drummond, McCall & Co., Montreal, have been the general sales agents for a number of years.) The corporation has appointed as its Sales Manager, Chas. Warnock, heretofore Treasurer and Manager Robert W. Hunt & Co., Ltd., bureau of inspection, consultations, tests, etc., Montreal. His office will be in the McGill Bld., McGill St., Montreal.

THE CANADIAN FAIRBANKS-MORSE Co. is erecting an office building at the corner of St. Antoine and Ste. Cecile streets, Montreal, with a frontage of 93 ft. 5 ins. on the former street and 144 ft. 5 ins. on the latter street. It will be of reinforced concrete, with brick facings and terra cotta, and will have seven floors and basement. The ground and first floors will be used for combined offices and samples, as well as a retail sales counter. The third floor will be occupied by the head office staff, advertising, purchasing and freight departments. The fourth, fifth and sixth floors will be used for storage of goods, and the top floor equipped for repair shop. With this arrangement, the necessity of having a separate warehouse for storing goods will be done away with and practically the complete Montreal house business of the company will be carried on under one roof. There will be a passenger elevator and two freight elevators.

### Transportation Conventions in 1913.

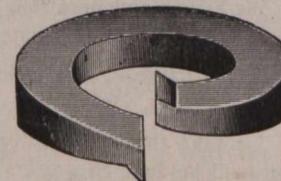
- July 15-18.—International Railway General Foremen's Association, Chicago, Ill.
- July 22-25.—International Railway General Foremen's Association, Chicago, Ill.
- Aug.—Travelling Engineers' Association, Chicago, Ill.
- Aug. 12-15.—Railway Gardening Association, Nashville, Tenn.
- Aug. 18.—International Railroad Master Blacksmiths' Association, Richmond, Va.
- Sept. 8-12.—Roadmasters' and Maintenance of Way Association, Chicago, Ill.
- Sept. 9-12.—Master Car and Locomotive Painters' Association of U.S. and Canada, Ottawa, Ont.
- Oct. 8.—Association of Water Line Accounting Officers, Philadelphia, Pa.
- Oct. 14.—Railway Signal Association, Nashville, Tenn.
- Oct. 14, 15.—American Association of General Passenger and Ticket Agents, Philadelphia, Pa.
- Oct. 21-24.—American Railway Bridge and Building Association, Montreal.
- Nov. 19.—American Railway Association, Chicago, Ill.

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### Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau, J. E. Duval, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday

each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 413 Dorchester St. West, Montreal.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, Counsel, F. King, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, J. S. Blanchet, Quebec.

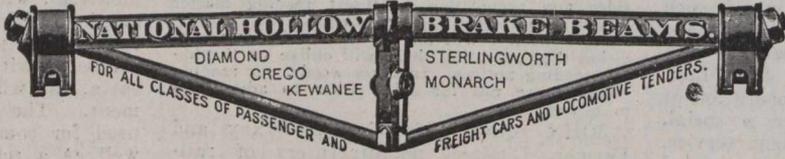
Ship Masters' Association of Canada, H. O. Jackson, 376 Huron street, Toronto.

Shipping Federation of Canada, T. Robb, 526 Board of Trade, Montreal.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.



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June 1st, 1913.

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In pursuance of this policy, the Corporation has appointed Mr. Charles Warnock its Sales Manager, with headquarters, McGill Building, McGill Street, Montreal, P.Q. All communications to our Montreal office will receive prompt attention.

We take this opportunity of thanking you for your orders in the past, and of giving you our assurance that everything will be done to merit a continuance of your support.

Yours faithfully,  
ALGOMA STEEL CORPORATION, Limited.  
(Signed) Sam. Hale, General Manager.