

Canadian Railway and Marine World

May, 1918

Tree Planting for Railway Snow Fences.

By W. C. Palmer, North Dakota Agricultural College.

Tree planting is one of the methods of protecting railway cuts from being filled with snow. The snow fence commonly used is expensive and not entirely satisfactory. In a winter of heavy snowfall it often causes more snow to stop in the cut than if there was no protection. When the snow fall is light the snow fence is all right. Part of the Minneapolis, St.

the north and west sides, and three rows on the south and east sides; the outside row of willows, the second and third rows of cottonwoods and boxelder, and the inside row of green ash. Golden, laurel leaved, white and Niobe weeping willows were tried. Of these the laurel leaved proved the hardiest and it is the one that will be used principally in the future. It

of North Dakota and is very hardy. It is shrubby in growth and very much branched, and produces a fruit that is suitable for jelly making. The artemesia dies back each winter, but the stalks remain standing, and a good many of the leaves stay on, so that it furnishes good protection. It is very hardy and does well in very dry and exposed locations. The second row



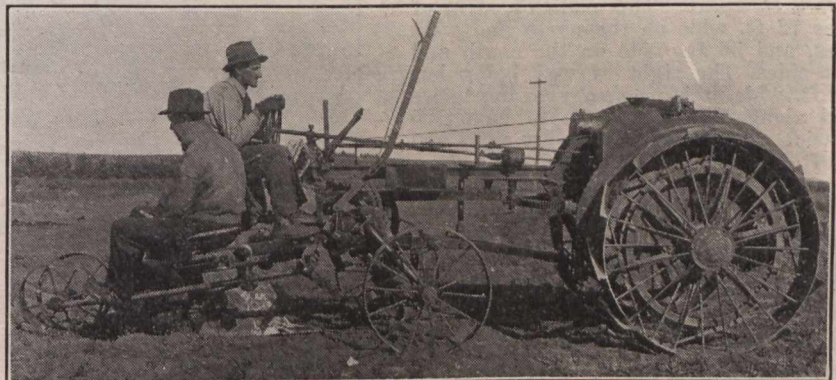
Tree planting on Minneapolis, St. Paul & Sault Ste. Marie Railway.

The left hand illustration shows the method of preparing the right of way for tree planting, by discing the sod. The right hand illustration shows the method of cultivating the trees. The common and the orchard disc are run alternately, the one throws the soil out, and the other throws it in. In this way the soil is kept level.

Paul and Sault Ste. Marie Ry. runs through North Dakota prairies where snow can drift for miles. Cuts in that section need good protection. A few years ago the officials decided to use trees in protecting the cuts, and the planting and care of them was assigned to T. A. Hov-erstad, the company's Agricultural Com-missioner, who has had a good deal of

is also less subject to insect attack. The Niobe weeping willow gives some promise of being valuable in this work, but further trials will be needed to establish its usefulness. The plan of planting, as worked out, now consists of planting eight rows of trees on the north and west sides and six on the south and east sides, the out-side row to be planted with a low grow-

will be planted with green ash or cotton-woods, that will be allowed to grow their full height. The third row will be plant-ed with green ash or boxelder, and the remaining rows will be planted with the laurel leaved willow. These willows will be cut back periodically, one row at a time. The aim is to plant some ever-greens in the second and third rows. For



Tree planting machines on Minneapolis, St. Paul & Sault Ste. Marie Railway.

The left hand illustration shows the planter used originally, drawn by horses. The right hand illustration shows the latest model tree planter, attached to a tractor.

experience in growing trees in southwest-ern and northwestern Minnesota. While tree planting to protect railway cuts is far different from a regular tree planta-tion yet the principles are the same.

The start on the M., St. P. & S. S. M. was made in 1914. Land was prepared and different tree combinations tried. The general plan was to plant four rows on

ing, spreading, branching tree, or shrub, such as the willow, buffalo berry, carra-gana, buckthorn or artemesia. The lau-rel leaved willow will be used the most and will be cut back occasionally. If cut back in the spring, the new shoots will reach a height of from 6 to 7 ft by the autumn, and so furnish protection for the winter. The buffalo berry is a native

North Dakota and Montana the varieties will likely be the ponderosa pine, Black Hills spruce and white spruce.

As the tree planting is to protect cuts, most of it will be on hill tops, hill sides, and ridges, on which the soil is often sandy and gravelly. This means that the trees have to be planted on high dry spots and in the poorer soils, the most

unfavorable conditions for tree growth. The land, if in native prairie sod, is given two years of preparation before the trees are planted. If it has been in crop recently it is given one year of preparation. This might at first seem a loss of time, but it is not, as the preparation given the land stores moisture, and puts the soil in good condition for the trees to make a good start.

A nursery has been started at Drake, N.D., on light sandy soil. The plan is to grow all the seedlings and cuttings needed. Up to the present time a good deal of the stock has been bought from the

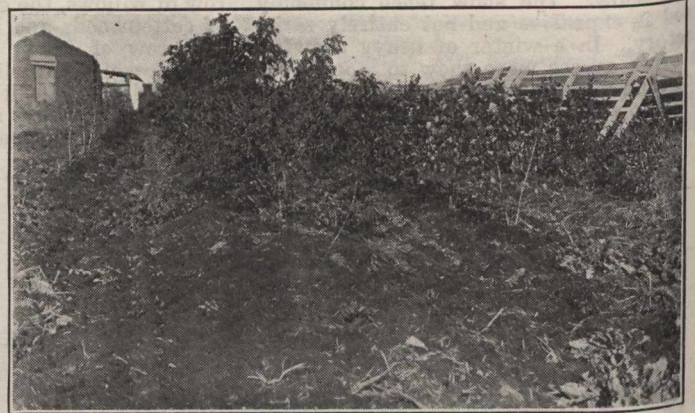
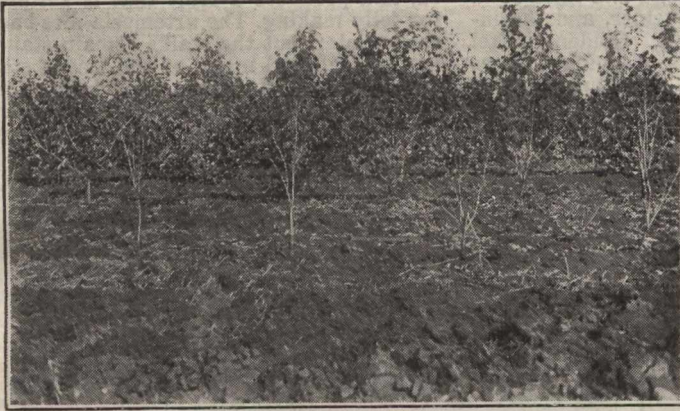
puts them down the desired depth, and to a uniform depth. The machine can be set to open a furrow any depth up to 12 in.

The tree planter is made up of a sub-soil plough, to which two vertically mold boards are attached 6 in. apart. This is the furrow opener, that can be set to open a furrow 12 in. deep. Behind this follow two discs, one on each side, set to throw the soil in so as to fill the furrow. Behind the discs follow two press wheels, set at an angle so as to press the soil firmly about the tree roots. Seats are provided for two men, so that they can

time saver. Horses must be brought to camp, the tractor can be left where the day's work ends. A double crew can be worked on the tractor, in two shifts, in that way securing more work from the equipment.

In 1915, 35,000 trees were planted, in 1916, 75,000 and in 1917 500,000. The land has been prepared along 230 miles of right of way and 250 miles have been planted. The plan is to prepare and plant about 100 miles of right of way each year.

In the timbered sections, Mr. Hoverstad advocates securing the additional right



Trees planted in 1915 on the Minneapolis, St. Paul & Sault Ste. Marie Railway.

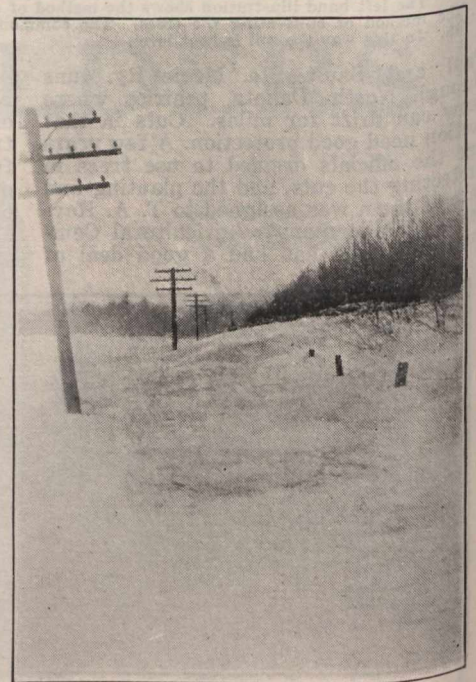
1st row, green ash; 2nd row, boxelder; 3rd row, cottonwood; 4th row, willow. The right hand illustration is from a photograph taken from the track, looking into the trees.

nurseries, but it has not proved so satisfactory as that raised in the nursery at Drake, which has a good deal the same soil and climatic conditions that the trees will have to grow in when set out on the right of way. The trees are dug while dormant, and are stored. They are conveyed in refrigerator cars to the cuts where they are to be planted. In this way it is possible to keep the trees dormant till July. The early planted trees do the best. In planting the trees are carried on motor cars to the cuts where they are to be set out and are heeled in for a day or two, or until needed. Two or three year old stock has been used. That which has been bought has been secured at \$2.50 to \$6.50 per thousand. The trees are planted 3 to 4 ft. apart in rows 8 ft. apart. This makes a strip of trees 72 ft. wide on the north and west sides, and 56 ft. wide on the south and east sides. The right of way being but 100 ft. wide, it is necessary to buy more land along the cuts so as to have 125 ft. wide on the north and west sides and 100 ft. on the south and east sides.

At first the trees were planted by hand, but this proved slow work, and not very satisfactory, as the laborers did not always set the trees deep enough and in case it was dry the dry soil would run into the holes and come into contact with the tree roots. One man would on the average plant 100 trees in a day. The best record made was the planting of 2,000 trees in one day by 12 men. Mr. Hoverstad set about devising a tree planter. The result is a machine with which three men will average from 5,000 to 10,000 trees a day, depending on the size of the places to be planted. The best record was the planting of 13,022 trees in an 8-hour day by three men. The average consumption of gasoline by the tractor is eight gallons a day. Three men will plant as many trees in a day with this machine as 50 to 100 would by hand. The machine planting, in addition to saving labor, puts the trees in contact with moist soil and

drop the trees to be planted into the furrow as it is opened, and the discs and press wheels immediately fill and press the moist soil against the tree roots. The first tree planter made was pulled by horses, but the last one is built on to a

of way before the land is cleared. It is then cheap and has trees growing on it. After the land is cleared the snow will give as much trouble as on the prairie and the land is then expensive and in addition to that trees will have to be



How the trees hold the snow on the Minneapolis, St. Paul and Sault Ste. Marie Ry.

tractor. A larger percentage of trees set out by the tree planter live than of those planted by hand. It was difficult to secure and keep enough men to do the tree planting by hand; the planter has solved this problem too. A good deal of the cultivating is done with the common disc and the orchard disc. They are used alternately, so as to keep the soil level. The weeds in the tree row are taken out by a hoe. The tractor is proving to be a

planted and cared for. In 1918 trees will be planted along some of the company's line in Wisconsin, on right of way that was once wooded.

Tree planting, when properly done, is a more effective protection against snow than the panel fences in common use, and tree planting also costs less. A 16 ft. snow fence panel costs at least \$2.50, and it takes 640 of them to furnish protection for a mile, or a total cost of \$1,600. The

depreciation is 20% a year, or \$320. The cost of setting up and taking down the snow fence is about 20c a panel, or \$128 a mile. Interest at 6% makes \$96 a year, or a total of \$544 as the annual cost per mile for the common snow fence. When the snow fence proves ineffective, as is often the case in winter of heavy snow, the loss in traffic may be more than that, to say nothing of the loss due to the name the railway gets for being blockaded. Planting eight rows on one side of the track and six on the other, will require 25,000 trees for a mile. These at \$5 a thousand will cost \$125. The cost of planting will be less than \$50. These trees will be set out on 15 acres; if the cost of preparation is \$15 an acre it will amount to \$225, or a total of \$400. There will have to be some replanting, and the trees will need to be cultivated for three or

four years and from then on there will need to be some cutting back of them. But such a plantation will offer protection in a winter of the heaviest snow, as well as in a winter of light snow. It will be a permanent affair.

In the prairie regions, tree planting along the right of way furnishes a good demonstration to the farmers as to what can be done in tree growing. Many are planting trees as a result. The tree planting machine is one of the big factors in the success of tree planting. It has cut out the need of big crews, cutting the cost to less than one tenth what it cost to do it by hand. It insures planting the trees the proper depth, and it puts the roots in contact with moist soil and the soil is packed firm about the roots. The machine is not patented, so that anyone can make it. Tree planting when proper-

ly done is one of the cheapest and most effective means of protecting railway cuts from snow

[EDITOR'S NOTE. Canadian Railway and Marine World would like to obtain particulars of tree planting for snow protection on Canadian railways. Conditions on railways in Manitoba, Saskatchewan, and Alberta are very similar to those in Dakota and Minnesota, and it is hoped that some of our readers will send in particulars of anything that has been done. Some facts about tree snow fences on C.P.R. western lines were published in Canadian Railway and Marine World in Sept., 1913, and June, 1917. Later information is now desired. At one time some tree planting for snow fences was done on the Intercolonial Ry. Particulars in regard to this, or to similar work on any other railways, would be acceptable.]

Progress in Locomotive Building and Repairing.

By I. C. NEWMARCH, Superintendent of Shops, New York Central Railroad, Col lington, Ohio.

In thinking over the progress made in locomotive repairing and machine shop practice, I am carried back to my boyhood days, when I started to serve my apprenticeship in the Grand Trunk shops at Montreal. The experience that I received then has been beneficial to me throughout my railway career. When I think of the crude methods and means we employed for handling the different classes of work at that time, I realize the wonderful improvements we have made in machinery of all kinds and in all departments used for manufacturing and repairing locomotives.

In 1885, the majority of our machine shops knew but little about high speed steel, consequently carbon steel was used throughout the world on all machines that required cutting tools. From this it can be realized that the output of the shops was limited to a considerable extent. Tungsten, as an alloy of steel, had been known and used for a long period of time, it having been employed in the Damascus steel, but its actual effect was not known until Robert Mushet, after much experimenting, brought out the Mushet high speed steel. This caused radical changes in treating the crucible steel, and much progress and great improvement has been made along this line up to the present time. Prior to the use of high speed steel, it would take on an average of 18 to 20 hours to turn one pair of locomotive driving wheel tires. In 1885, in some shops, they were able to turn out one pair of driving wheels in nine hours. This gain in time was also true with other machines used in the general machine shop.

In 1900, with high speed steel much improved, the machines in operation were found to be almost useless. The machine builders realized what was required, and consequently, they at once began the building of machines to meet the requirements made necessary by the use of high-speed steel. Wheel lathes, engine lathes, boring mills, planing machines, etc., came on the market and greatly accelerated the output of the shop throughout the different departments. In 1909, we ran a test on a new wheel lathe that we received from the Nile people, and turned 14 pairs of driving wheel tires in 10½ hours. On other improved machines, the output has more than doubled. This is true in the average machine shop. This was all brought about by the use of high speed steel and improved machinery, without

which it would be impossible to build or take care of the heavy motive power that we have in this day and age.

About 1885, air drills, air hammers and air compressors were made and being experimented upon. A comparatively limited number of the drills and hammers were placed in shipyards and boiler shops, but their introduction to railway shops did not occur until some years later. In 1893 a pneumatic tool company was organized and began actively to introduce its hammer in railway shops. The air drills on the market at that time were made in Philadelphia and called the Phoenix rotary air drill. They were light in construction and did not have much power. However, a piston drill was brought out, and at that time was considered almost perfect.

Several companies have come to the front with piston air drills having roller bearings, which are considered strong and durable, and which will meet the requirements of any department. They revolutionized drilling, reaming and tapping in locomotive shops. Previous to the use of air drills, ratchets were used. In many instances flues were rolled by hand. The flue holes were reamed by hand, and in a great many cases all work had to be done by hand. This has all been eliminated by the use of air drills or motors. The pneumatic tools have been the means of reducing the number of men that were usually required to do certain kinds of work to about one third.

The bulldozer and forging machines in our blacksmith department are great labor savers in the way of producing forgings of all kinds. Before these tools came on the market, forgings of all descriptions were made on the anvil. Today, it is only a question of the making and manufacturing of dies to take care of the various kinds of work in our blacksmith shop. In fact, hundreds of forgings, usually made by hand, are turned out on this machine, and the output has been increased one half.

In 1885 the work in our boiler shop was crude compared with the improvements of the present day. At that time, the boilermaker was obliged to do all of his work by hand, such as the removing of side sheets, staybolts, etc. They were cut out with the hammer and chisel. The holes were drilled in the fire box, with ratchets and flat drills. The tapping of staybolts holes and similar work was done by hand. Later on, I recollect that

we had what was known as a flexible shaft which was used for the tapping of staybolts. This has all been changed in every sense of the word. Removing of firebox sheets today is done by the use of the torch, which is also used for cutting off staybolts in quite a number of shops.

The locomotives were being built larger from time to time to the present day, and consequently new methods of handling work became necessary and have been adopted. As the material in boilers is getting heavier, it is necessary to have up to date machinery, such as shears, punches, and rolls. The flanging of today in quite a number of our shops is done by hydraulic pressure. All rivets are driven by hydraulic pressure or with air hammers. This has increased the output in the boiler shop to a great extent.

At one time the welding of flues was done with a charcoal fire. As the flue was heated a man tapped the flue end with a tapper, and when brought to a welding heat, it was welded in a roller machine. The flue was then put back into the fire and swaged with a hand-swaging tool. Today, in quite a number of our shops, flues are welded with electricity, and in other shops they are welded by the use of oil furnaces, and under what is known as a Draper hammer.

In 1908 and 1909, oxweld acetylene welding was adopted for boiler work. This brought about a complete revolution in the method of boiler repairing. By the oxweld acetylene method we are welding all horizontal seams in the fireboxes, doing away with the troublesome leaky seams. Patches of all kinds in the fireboxes are also welded. I believe today that the welding process has been adopted all through the country for many different classes of work throughout the locomotive departments. About the same time electric welding came into vogue. This was used extensively for the same class of work as the oxweld acetylene welding, it being used extensively in the way of flue work, the welding of flues, beads and back flue sheets. By doing this, we get two or three times the amount of mileage from them over the old method of merely prossering and beading flues.

There has also been a radical change in the brake equipment on locomotives. In 1885 we had a vacuum brake. Today, we have a Westinghouse air brake. The makers adopted the 6-in. air pump and with the ET equipment.

A Few Thoughts on the Treatment of Railway Ties.

By Edwin Winfield, Transportation Student, Canadian Pacific Railway.

In Canadian Railway and Marine World for November the writer saw a statement to the effect that it was not considered economical to chemically treat ties until they cost a certain amount. As he has been somewhat interested in the subject, particularly since seeing the experimental plant at the Forest Products Laboratory in Montreal, this statement set up a train of thought which will find expression in this brief analysis of the matter. It is hoped the views presented may prove of interest to the railway community.

It is evident that there is one big question in the matter, and that concerns dollars and cents. We have before us a tie, and what we want to know concerning it is, if the tie were treated before being put in the track, would we be further ahead financially, in the final analysis, than if it were put in untreated? In order to answer this question in such a way that we can feel our answer to be correct and based on good reasoning, we have to make a study of all the contributing factors; then, having done so and summarized the results of our enquiries along different lines, we are in a position to answer it.

Before proceeding, let us examine this treating proposition and see just what the treating is supposed to accomplish and how it does it. It is not supposed to add strength to resist mechanical wear, or make the tie physically stronger; it is supposed to make the tie better able to resist decay. Decay of wood is but the work of bacteria and fungi, which low forms of life, with a few exceptions, are unable to attack the living tree, but certainly thrive on the dead timber. They eat away the wood fibre, and the wood becomes rotten; it has decayed. Heat, air, food and moisture are necessary for the fungus to keep on living. If moisture could be kept out of the wood entirely, the fungus would die, but this is a difficult matter. If a poisonous substance is injected into the wood, the fungus dies. The ideal tie preservative, then, is one wherein a poisonous substance can be made to penetrate far into the wood. Having thus penetrated, it should adhere closely to the wood fibres and cells, act to the exclusion of moisture, and be not easily washed out of the wood, with cost right in proportion to results.

It is well known, particularly to those of us who have made a study of the thing from behind a track shovel or tamping bar, that ties in the track are rendered useless in one of two ways. These are: (1) Failure caused by the tie starting to decay, which softens it and renders its powers of resistance to wear and tear less. (2) Failure caused by wear and tear, as "rail-sawing," re-driving of spikes, splitting, crushing of fibres, etc., without decay having set in.

Our first line of enquiry deals with the causes necessitating the removal of the tie from the track. It will be at once appreciated that there will be many factors contributing to the result of our enquiry along this particular line, among which may be mentioned the kind of ballast, spacing of ties, volume of traffic, drainage, climatic conditions, etc. Just at this point, though, let us assume that in a stretch of track where conditions as above are similar, we have ties made from two or three kinds of wood. On observation, it will likely be found that one kind of

tie has always to be taken out, not because it is smashed and crushed through the effects of the wear and tear of traffic in itself, but because it has become so badly decayed that it could not stand this wear and tear at all. On the other hand, another kind may have a tendency to split and sliver, while quite sound as to decay; a third kind may be so crushed and cut, while not decayed at all, that its removal is imperative.

Suppose a tie which we may designate as tie A, is always found to fail from wear, and it thus fails before decay has set in. Evidently, it would not pay to treat that tie; treating it would not prolong its life, as it is worn out before it decays anyway. But suppose tie B is always found to have its failure due to decay in the first instance. We are not in a position to state that it would pay to treat that tie; we are able to say that it might pay to treat it. On the testimony of the roadmaster and some of the section foremen, it is determined that tie B has an average life of seven years in the piece of track we are considering. Another man comes along and produces facts and figures to show that if that tie had been treated with creosote, it would not have decayed, under identical track conditions, for 14 years. It is agreed though, as the result of experience, that the tie, (thus treated or not) would wear out, under those track conditions, in 12 years, 2 years before it would have to be removed because of decay. It is stated that it would cost to treat the ties, in the quantity we want them, 36c each, and we are then in a position to find out if it would pay to treat the tie as follows, also knowing the untreated tie costs 80c in the track.

There is a hole in the track where a good tie must be placed and a good tie must be kept there. Our object is to keep a good serviceable tie in that hole in the track, forever, at the least expenditure in dollars and cents. In order to find out what tie is going to do the business most economically, there must be considered: (a) First cost of the tie in the track; (b) life of the tie; (c) interest value of money; (d) cost of renewal, assumed equal first cost. Now suppose that, having put in a tie, we start a little sinking fund, such that, when it comes time to renew the tie, the accumulation of our contributions to this little sinking fund will pay for the new tie and the cost of putting it in. The yearly expense attached to keeping that hole in the track properly filled, then, will be, first, the yearly interest on the first cost of the tie, and second, the yearly contribution to this sinking fund. The tie which does the business satisfactorily, and for which this sum is the smallest, will be the best tie to use.

Let S be the first cost of a tie. R the amount of \$1 in one year; if the interest rate is 5%, R equals \$1.05. A be the amount of our annual deposit in the fund. n the number of years the tie lasts.

The yearly interest on first cost is $SR - S$. A is equal to $S \left(\frac{R-1}{R^n-1} \right)$

The total yearly expense, equal to yearly interest on first cost plus the yearly contribution to sinking fund, is $S \left(\frac{R^{n+1}-R^n}{R^n-1} \right)$

and the tie, treated or untreated, for which this sum is a minimum, is the most economical tie. The cost of treating, of course, is figured into the first cost of the tie.

Interest per year = $SR - S$. Amount of 1st payment in sinking fund at end of n years = AR^n ; amount of second payment = AR^{n-1} and so on, and the accumulated amount of all our yearly payments

$$= A \left(\frac{R^n-1}{R-1} \right) \therefore A \left(\frac{R^n-1}{R-1} \right) = S$$

$$\text{or } A = S \left(\frac{R-1}{R^n-1} \right)$$

and total yearly expense = yearly interest + yearly contributions to sinking fund,

$$= SR - S + S \left(\frac{R-1}{R^n-1} \right) = S(R-1) + S \left(\frac{R-1}{R^n-1} \right)$$

$$= \frac{SR^{n+1} - SR^n}{R^n-1} = S \left(\frac{R^{n+1} - R^n}{R^n-1} \right)$$

These calculations, of course, do not take into consideration the changes in price which will doubtless take place between renewals, but on the assumption that increasing values will be approximately proportional, this appears as a good way to investigate the subject as any.

The tie above mentioned costs 80c in the track untreated. It lasts seven years and fails because of decay. It costs 36c to treat it, making its first cost \$1.16. It then lasts 12 years and has to be removed because it is worn out. By making use of the above formula we see that the annual expense of keeping the untreated tie in the track is 13.6c, and the annual expense of keeping the treated tie in the track is 11.6c, and hence it is evident that the treatment of the tie in question would be an economical proposition.

Now suppose that we have another tie, of the same wood, but this time a no. 2 tie, instead of a no. 1. Untreated, its life is seven years, it still being rendered useless through decay, and not wear. At first sight it would appear good business to buy no. 2 ties, but more will have to be used and handled. The creosote treatment, with the same amount of creosote injected per cu. ft. of timber, will keep decay away just as long, but the tie will wear out in nine years. Say the first cost untreated is 70c in the track. If the tie were treated, its first cost would be 70c plus 36c, or \$1.06. The annual expense for keeping the hole in the track filled with untreated ties will be 11.9c, and with treated ties it will be 15.4c, so that it would evidently be poor policy to treat this tie as the no. 1 tie was treated.

Suppose that experience has indicated that the use of suitable tie plates would add two years to the life of such a no. 2 tie; that the tie plates cost 30c a pair, and are worth 20c when the tie is done. Would it be economical to treat such a tie with tie plates on it? The net cost of the plates adds 10c to the first cost of the tie, but the annual interest on the tie plates is 5% of 30c, or 1.5c. First cost untreated is 70c plus 10c, or 80c. Its life untreated is still seven years, as it fails through decay; it might last a little longer because of the tie plates, but once it begins getting rotten, nothing will help it much. The annual expense of keeping the hole in the track filled with untreated ties is 13.6c plus 1.5c, or 15.1c. First cost treated tie is 70c plus 36c, or \$1.16, and annual expense is 14.7c plus 1.5c or 16.2c.

Evidently, it would not be economy. But this degree of treatment will keep the tie from rotting for 14 years; the time it takes to wear it out is only 11 years, and it may be that a treatment which will keep decay away for 11 years can be secured for 26c a tie. The annual expense of the untreated tie, we saw, was 15.1c. First cost of treated tie is 70c plus 10c plus 26c or \$1.06, and the annual expense figures out to 13.4c plus 1.5c or 14.9c, so it seems that it would be a small saving to so treat that class of tie when used with tie plates.

Calculations concerning all kinds of ties can be made as above, the basis of such calculations must be the long experience of practical trackmen, combined with the knowledge of processes, results, and costs of men in the wood preserving business. The difference of a couple of cents as above shown may appear paltry and insignificant, but when the difference amounts to 5c or so on a single tie, and we are considering some millions of ties, the potential value of reasoning along the above lines is evident. The above method of analysis could of course be used as between two kinds of ties, both of which it is intended to use untreated, for example, to chose between a 60c tie good for six years and a 75c tie good for eight years. It may also be combined with considerations of safety and those other factors which go to make up general desirability, in such a case as the question of tie plating on tangents. Ties without plates may, as indicated by experience, be good for five years, and for eight years with them, and the above method of calculation, modified as required, would serve to demonstrate the existence or non-existence of an economy.

The line of enquiry just concluded, then, shows us a good way to calculate as to whether it will be a paying proposition to treat a certain kind of tie which is going to be used under a certain set of conditions, as regards traffic, ballast, drainage, use or non use of tie plates and so on. But in order to thus calculate, we assumed the possession of a lot of information concerning the performance of the tie treated and untreated; our next line of enquiry will deal with the securing of the requisite information upon which to base calculations.

It is evident that the first knowledge that it is necessary to secure concerns the past performances of untreated ties under all the varying track conditions, and it would seem that a systematic series of questions and answers, covered by reports from section foremen to roadmasters, and from roadmasters to the man in charge of the matter, would lay clear the records of different classes of ties. A compact and simple series of questions concerning ties removed from track could be drawn up for each section foreman to answer, through observation, and a summary of these reports, covering the different classes of ties in service, with a striking of averages, would provide the required information. It is clear that better means of determining when each tie that has to be removed was put in the track would have to be provided than at present; also, to the eyes of many, the general impression given by observing an old tie is that it just naturally got decayed, dirty, worn out and generally undesirable and was therefore taken out. A little further examination of parts of the tie, however, will disclose just how far the process of decay was responsible for its failure, if at all, and what part mechanical wear had to play in the matter, and it is probable that the methods of making these

observations would have to be brought to the attention of some. In this country, the greater part of our ties are made from jackpine, cedar, spruce, tamarac, hemlock, fir and oak. It is evident that all of these will not make the same showing or fail from the same causes. It is evident that it will not pay to chemically treat ties which are worn out before decay sets in. It is evident that before it can be intelligently determined just what ties it will pay to treat, we must have all the information obtainable concerning the performance of all kinds of untreated ties under all kinds of conditions, and it seems that a carefully planned and simple systems of reports covering personal observations would supply that information.

The second line of information which it is necessary to secure will deal with the treating processes, costs, methods, degree of treatment, variations of cost and efficiency with degree of treatment, results of different treatments with different woods, under different conditions, and so on—a large order, truly. It would seem that the records of the results of past efforts would have to be collected and systematically arranged to as great an extent as possible; experimental test sections of track, wherein ties of different kinds, treated to varying degrees by different methods, would be the subject of the tests, would apparently be requisite, and the services of expert chemists would be required. Then, having secured information concerning the effect of the treatment of different woods used under differing conditions; having combined this with information concerning the same tie untreated, and having calculated on the basis of our complete information, we are then, and not till then, in a position to say whether, by treating our ties, we are effecting an economy in the interests of the railway and in the interests of the nation.

It is not the intent, in this paper, to discuss the relative efficiency of various methods of chemically preserving ties, but rather to indicate that there is a great deal to be taken into consideration before we can be sure that we are right in applying any of these methods. It may be of interest to state, however, that creosote oil is rapidly taking the place of zinc chloride as the most used preservative—has taken it, rather—and in some cases the two are used in combination. Similar treatment will not benefit different kinds of wood to the same degree; in fact, the age at which the tree was cut, the method and length of time used in seasoning, and the time of year the tree was cut, all have their effect on the internal structure of the cells and fibre of the timber, and therefore on the degree of success attending the chemical treatment. In Europe, it is estimated that over four-fifths of the wooden ties in use are treated with some kind of chemical preservative.

The thing most worthy of notice is that our timber resources are not what they are popularly supposed to be, or anything near it, and that it is in the interests of the community at large that what remains should be conserved as much as possible. But in that attempt to conserve, it is necessary to proceed correctly. The whole thing is a matter of dollars and cents; if by chemically treating a tie which lasts only half as long now as it can be made to last, and if it will pay the railway to do so, it is certainly in the interests of the community at large that this be done. But if by going ahead and indiscriminately treating all ties over a certain value, and thereby throwing

away the cost of the treatment in many cases, the loss is one borne not only by those individuals directly concerned, but through them, by the country at large.

Service Department for Railways Recommended.

L. C. Fritch, formerly General Manager, Eastern Lines, Canadian Northern Ry., Toronto, and now General Manager, Seaboard Air Line Ry., Norfolk, Va., has written the Railway Age Gazette as follows:

For some time I have considered suggesting the creation of a new department on railways, to be known as the "department of service." Service is of paramount importance in an organization and my past experience leads me to believe that if the railways made it the business of some one department to see that service of the highest order was rendered, much criticism directed against the carriers would disappear.

The present organization on most lines does not provide a clearing house where important matters can be sifted and reduced to concrete form for the information of the president and the board of directors. A department with a competent, responsible head, therefore, would fill this need and result in a saving in expense and in added efficiency in service to the public, which cannot be over estimated. After 30 years experience in railway work I am firmly convinced of the need of the further application of business principles to the operation of our railways, and to this end I suggest the creation of a business department the organization and duties of which are outlined as follows:

DEPARTMENT OF SERVICE. Organization.

Executives—

- 1 Vice President.
- 1 Assistant to Vice President.
- 1 Chief clerk.
- 6 Clerks.
- 3 Stenographers.
- 1 File clerk.
- 1 Assistant file clerk.
- 1 Messenger.

16

Inspection Bureau—

- 1 Chief inspector.
- 1 Inspector, maintenance of way.
- 1 Inspector, maintenance of equipment.
- 1 Inspector of transportation.
- 1 Chief clerk.
- 3 Clerks.
- 3 Stenographers.
- 1 File clerk.
- 1 Messenger.

13

Statistical Bureau—

- 1 Statistician.
- 1 Assistant statistician.
- 4 Clerks.
- 3 Stenographers.
- 1 File clerk.

10

Labor Bureau—

- 1 Negotiator.
- 1 Assistant negotiator.
- 1 Clerk.
- 1 Stenographer.

4

Summary—

- 16 Executives.
- 13 Inspection bureau.
- 10 Statistical bureau.
- 4 Labor bureau.

43 Total number of officers and employes.

OUTLINE OF WORK.

1. Expenditure supervision—
 - (a) Allotments to departments and sub-departments on monthly expenditure.
 - (b) Supervision over all new-work expenditures.
 - (c) Audit of vouchers and payrolls.
2. Efficiency methods—
 - (a) Analysis of present practices and methods.
 - (b) Improvements in methods and practices.
 - (c) Reduction in waste and non-essential methods and operations.

3. Vital Statistics—
 - (a) Elimination of all except important statistics.
 - (b) Issue of vital set of statistics to each department and sub-departments.
 - (c) Comparative statistics of other roads.
4. Organization outlines—
 - (a) Establishment of organization and lines in various departments and sub-departments.
 - (b) Co-ordination of organizations in various departments.
 - (c) Co-ordination in all departments.
5. Reports and records—
 - (a) Establishment of standard reports and records.
 - (b) Elimination of unnecessary reports and records.
 - (c) Use of reports and records.
6. Labor adjustments—
 - (a) Analysis of schedules and comparison with other lines.
 - (b) Grievance adjustments.
 - (c) New schedule matters.
7. Analysis of results—
 - (a) Concrete analysis of operating results.
 - (b) Comparative analysis with other lines.
 - (c) Fixed standard to be attained in operation.
8. Foreign relations—
 - (a) Cultivation of friendly relations with connecting lines in all departments.
 - (b) Analysis of methods used on foreign lines.
 - (c) Co-ordination of operation at common points with other lines to eliminate waste.
9. Publicity matters—
 - (a) Determination of extent of advertising and its results.
 - (b) Co-operation with federal, state, municipal and other officers to create friendly relations.
 - (c) Education of the public on railway matters.
10. Recommendations—
 - (a) Resume of past month's operations with comments and explanation.
 - (b) Monthly reports for all departments on program for succeeding month with recommendations on important operating matters.
 - (c) Monthly meetings of heads of departments and sub-departments for general discussion of vital matters relating to company's interests.

Rates on Grain Milled at Montreal in Transit.

The following report by Jas. Hardwell, Chief Traffic Officer, Board of Railway Commissioners, has been adopted by the board as its decision in the matter there-in referred to:—This is an application of the Montreal Board of Trade, on behalf of Ogilvie Flour Mills Co., Dominion Flour Mills Co. and St. Lawrence Flour Mills Co., for the maintenance of the arrangement whereby the C.P.R. carried western grain, either all rail or ex lake, to products destinations on the Intercolonial Ry. via Ste. Rosalie Jct., with the milling in transit privilege at Montreal. The company sought to restrict the arrangement to its own destinations in Quebec and New Brunswick by cutting out Intercolonial stations from Mar. 3, 1917, by supplements to the various tariffs applicable. These cancellations were suspended and necessary provision made by order 25904, Feb. 26, 1917, following the hearing on Feb. 21, 1917, at Ottawa. The tariffs referred to in the order have since been superseded by others to give effect to the judgment of July 17, 1917, in the application of the railway companies for a general increase in rates on grain and grain products east of Fort William, supplementing the judgment in the Eastern rates case.

The stop over or transit charge added to the through rates was 1c per 100 lb. on the all rail grain, whether the products were for domestic consumption, or for export from Halifax, and on the ex lake grain 1c for export and 2c for domestic consumption. By order 26642, Oct. 16, 1917, the last mentioned 2c charge was reduced to 1c, so that this is now the uniform charge so far as the C.P.R. is concerned. The C.P.R. takes the position that this traffic to Intercolonial points is unremunerative, because of the rate division, and the exceptional services necessary to reach the applicants' mills.

As concerns the division of the rate, the Montreal situation is not singular. The eastern arbitraries added to the rates from Fort William, Port McNicoll, or Goderich to Montreal, are for the purpose of striking the through rates; the allocation as between the C.P.R. to Ste. Rosalie Jct. and the Intercolonial is on a percentage basis, so that it is not unusual for the C.P.R. local to Montreal to be shrunk, as explained by Mr. Flintoft, Assistant General Solicitor, C.P.R. The figures are precisely the same whether the grain be milled at Montreal or at any milling point west of Montreal, and Ste. Rosalie Jct. is the common point of transfer to the government line. If, therefore, the line earnings are unremunerative, as

claimed, in connection with the Montreal mills, they must be unremunerative in connection with all the Ontario mills, but no such claim is advanced.

The only feature that differentiates Montreal is the additional service entailed in reaching the mills. These are located on the Lachine Canal north bank siding or branch, built and operated by the Grand Trunk for itself and the C.P.R. under lease from the Crown. The C.P.R. transfers to this siding at Atwater transfer, near its Highlands station. The distance from the transfer to the Ogilvie mill is given as 5.2 miles; the distance to the Dominion mill is somewhat less, but to the other Ogilvie plant at Mill St., where Mr. Black said the bulk of the business was done, it is greater. Mr. Flintoft predicated his distance on a movement of the grain to the Outremont yard, whence to Atwater transfer the distance is stated to be 6.7 miles, making 11.9 miles in all. But the grain, whether all rail or ex lake, moves over the Smiths Falls Division, and if, instead of going directly into Sortin yard, it is taken for operating purposes to Outremont, it does not appeal to me as a movement that should properly be debited to the traffic. The out of line haul between the transfer and the Ogilvie mill, grain in and flour out, is 10.4 miles. The plan gives the distance between the transfer and Sortin as 2 miles each way; but, on the other hand, more or less shunting has to be done at all milling points after the grain gets into the terminal. Mr. Flintoft gave the actual cost of handling cars on the Canal bank branch as \$1.30 a car paid the G.T.R. for the year ended Nov. 30, 1916, or \$2.60 for the double movement. This is no doubt the result of the basis of division of costs of operation and maintenance directed in order 9759, Feb. 17, 1910.

Mr. Flintoft's estimate that three cars are required to ship out the products of two carloads of inward grain has no particular bearing, since it must, if correct, apply everywhere. Undoubtedly, the millers in question necessarily require, from the C.P.R. at least, an unusual service, for which they should be prepared to pay an adequate compensation. The board did not, of course, intend its order 26642 to settle this complaint. By items 122 and 141 of its Special Tariff of Rules and Regulations C.R.C. 3280, the company makes in certain cases an out of line extra charge of 1c a ton per mile, with a minimum as for 20 miles. Applied to the present case, this would give a charge of 1c per 100 lb., in addition to the ordinary mill stop over toll of 1c paid by all tran-

sit millers, and it would not be more even if the Outremont mileage was used. In other words, the transit charge of 2c as desired, would be continued on grain ex lake, milled for domestic consumption, and the charge for export, also for all rail domestic, would be increased from 1c to 2c. This, in my opinion, ought to be satisfactory to all parties.

Mr. Flintoft complained that this traffic was thrown entirely on his company, and I consider there is justice in his complaint. The G.T.R. has no milling in transit arrangement in connection with the Intercolonial, although its local facilities are superior to those of the C.P.R. I mentioned in my memo of Feb. 23, 1917, that the Intercolonial and G.T.R. were negotiating an arrangement and that I expected it would be consummated, but it has not been.

Quebec Public Utilities Act Amended.

The Quebec revised statutes, 1909, article 718, clause C, enacted as follows:—"The words 'public utility' mean every corporation other than a municipal corporation, firm, person or association of persons, the business and operations authority of this province, their lessees, trustees, liquidators or receivers appointed by any court, that now or hereafter own, operate, manage or control any system, works, plant or equipment for the conveyance of telegraph or telephone messages, or for the conveyance of travellers or goods over a railway, street railway or tramway, or for the production, transmission, delivery or furnishing of heat, light or power, either directly or indirectly, to the public."

In 1911, this clause was amended by substituting the word "passengers" for "travellers," and by the addition of "water." The clause was further amended at the legislature's recent session by the insertion, after the word "tramway," of the words "or across or along lakes, rivers or streams."

Flagging Signals on Double Track.

The Board of Railway Commissioners has under consideration the matter of more adequate flagging protection on double tracks and has sent to the railway companies the following draft order which it is proposed to issue in this connection: "On double track, where trains run to the left, a yellow flag on two staffs, or a yellow light 5 ft. above rail level placed to the left side of a track, as seen by an engineer of an approaching train, with a yellow flag, or a yellow light, as a marker, placed on the opposite side of the track to be protected, indicates that the track 3,000 ft. distant is in condition for a speed of but 6 miles an hour, unless otherwise instructed and the speed of trains will be controlled accordingly. A green flag, or a green light, placed beside the track, on the left hand side, as seen by an engineer of an approaching train, at a point beyond the slow track, indicates that full speed may be resumed." Railway companies are asked to file with the board by May 8 any comment they may wish to make thereon.

Freight Train Crews on Electric Railways.—The Board of Railway Commissioners has asked electric railways whether, in the operation of electric freight locomotives, either switching or in road service, the crew consists of two men, the same as one a steam locomotive, or only one man to a locomotive.

Birthdays of Transportation Men in May.

Many happy returns of the day to:

Jas. Bain, General Superintendent, Halifax & South Western Ry., Bridgewater, N.S., born at Pictou, N.S., May 24, 1860.

W. R. Baker, C.V.O., ex-Secretary, C.P.R., Montreal, born at York, Eng., May 25, 1852.

B. A. Bourgeois, Assistant to Comptroller and Treasurer, Canadian Government Railways, Moncton, N.B., born there May 24, 1869.

G. S. Cantlie, ex-General Superintendent of Car Service, C.P.R., Montreal, now in military service with Canadian Expeditionary Force, born at Montreal, May 2, 1867.

B. T. Chappell, Superintendent, Pacific Division, Canadian Northern Ry., Vancouver, B.C., born at Charlottetown, P.E.I., May 1, 1878.

R. Crosby, Car Foreman, Canadian Northern Ry., Moose Jaw, Sask., born at Hawick, Scotland, May 2, 1886.

N. R. DesBrisay, District Passenger Agent, C.P.R., St. John, N.B., born at Minneapolis, Minn., May 18, 1888.

M. Donaldson, M.Can.Soc.C.E., ex-Vice President and General Manager, Grand Trunk Pacific Ry., now of Ottawa, Ont., born near Edinburgh, Scotland, May 1, 1851.

A. E. Duff, ex-District Passenger Agent, G.T.R., Toronto, now of Winnipeg, born at Sherbrooke, Que., May 1, 1872.

G. C. Dunn, Division Engineer, Grand Trunk Pacific Ry., Winnipeg, born at Quebec, May 13, 1862.

M. A. Fullington, A.M.Can.Soc.C.E., ex-Superintendent, Smiths Falls Division, Quebec District, C.P.R., now of R. W. Hunt & Co., Montreal, born at Johnson, Vt., May 12, 1880.

G. E. Graham, General Manager, Dominion Atlantic Ry., Kentville, N.S., born May, 1870.

G. H. Hedge, General Master Mechanic, Western Lines, Canadian Northern Ry., Winnipeg, born at Neath, Wales, May 26, 1865.

G. A. Hoag, Superintendent, Superior District, Ontario Division, Canadian Northern Ry., Hornepayne, born at Walters Falls, May 31, 1866.

J. Irwin, Superintendent, Division 3, Western District, Canadian Northern Ry., Edmonton, Alta., born at Clinton, Ont., May 28, 1866.

S. McElroy, Trainmaster, Canadian Northern Ry., Rainy River, Ont., born at Lindsay, Ont., May 1, 1875.

W. Marshall, Assistant Manager of Telegraphs, C.P.R., Winnipeg, born at Garden Island, Ont., May 18, 1859.

J. N. Murphy, Roadmaster, C.P.R., Brandon, Man., born at Mooretown, Ont., May 10, 1879.

A. V. Redmond, Division Engineer, Transcontinental Division, Canadian Government Railways, Cochrane, Ont., born at Kingston, Ont., May 16, 1879.

A. C. Shaw, Passenger Department, C.P.R., Montreal, born at Detroit, Mich., May 12, 1865.

W. H. Snell, General Passenger Agent, C.P.R., Montreal, born at Palmyra, Neb., May 23, 1872.

C. T. Stanger, District Freight Agent, C.P.R., Saskatoon, Sask., born in Rutland, Eng., May 11, 1887.

W. Stapleton, District Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Bristol, Eng., May 20, 1884.

E. Tiffin, General Western Agent, Canadian Government Railways, Toronto born at Hamilton, Ont., May 5, 1849.

J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K. Wicksteed, B.A.Sc., M.Can.Soc.C.E., Consulting Engineer, Canadian Northern Ry., Toronto, born at Quebec, May 25, 1855.

C. L. Wilson, Assistant Manager, To-

ronto & York Radial Ry., Toronto, and President, Canadian Electric Railway Association, born at Boston, Mass., May 23, 1871.

A. O. Wolff, Resident Engineer, Brownville Division, New Brunswick District, C.P.R., Brownville Jct., Me., born at Copenhagen, Denmark, May 14, 1887.

James Yeo, ex-Roadmaster, Intercolonial Ry., Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

Canadian Pacific Railway's Honor Roll 33.

Acheson, Thos. Stewart	Gen. Agricultural Ag't	Winnipeg	Wounded
Allan, Adam	Billar	Vancouver	Wounded
Anderson, Albert A.	Junior clerk	Vancouver	Killed in action
Anderson, Alex.	Locomotive man	Souris	Wounded
Ashfield, Albert John	Rivet boy	Carleton Place	Wounded
Astwood, Harold Frith	Clerk	Fort William	Wounded
Banks, Robert	car heat and iceman	Toronto	Wounded
Bankcomb, Herbert A.	Stower	Winnipeg Terminals	Wounded
Bassey, Wm. John	Brakeman	Minnedosa	Wounded
Beaumont, Albert G.	Fitter's helper	West Toronto	Gassed
Bennett, George	Brakeman	Moose Jaw	Wounded
Boorman, Hugh Bernard	Engineer	Fort William	Wounded
Boyles, Sidney Chas.	Agent	Romford Junction	Gassed
Brennall, Frederick	Car repairer	Winnipeg	Wounded
Brophy, Frank L. A.	Stenographer	Montreal	Killed in action
Bullock, William A.	Clerk	Angus	Wounded
Burgess, Thomas Herbert	Baggage man	Renfrew	Wounded
Burleigh, James Harold	Towerman	Calgary	Wounded
Bush, Seth	Driller	North Bay	Wounded
Buxton, Ernest	Freight carpenter	West Toronto	Wounded
Campbell, Milton F.	Locomotive fireman	Regina	Wounded
Carey, John Wesley	Trainman	Havelock	Contusion
Chinn, Percy	Clerk	Moose Jaw	Wounded
Cowdery, Fred'k John	Clerk	Calgary	Wounded
Cracknell, Edward	Conductor	Fort William	Wounded
Crocker, George H.	Locomotive fireman	Victoria	Wounded
Cunningham, Chas. Hugh	Stockkeeper	Calgary	Wounded
Dawson, Albert	Boilermaker's apprent.	Brandon	Wounded
Dayton, Fred. Arthur	Wiper	Kamloops	Wounded
Devine, John	Slinger	Angus	Wounded
Dobson, Gordon	Assistant	Thessalon	Killed in action
Donlon, Thos. Patrick	Car checker	Minnedosa	Died of wounds
Ewell, William Ritchie	Clerk	Vancouver	Wounded
Ferguson, Henry Clark	Pipefitter's helper	Winnipeg Shops	Wounded
Ferguson, John Melville	Call boy	Winnipeg	Wounded
Ferris, Albert H.	Clerk	Tillsonburg	Wounded
Field, Horace Sidney	Clerk	Winnipeg	Wounded
Finch, Henry Adams	Clerk	Montreal	Wounded
Ford, Henry	Shed foreman	McAdam Junction	Wounded
Forrest, John Clelland	Clerk	Calgary	Wounded
Forrest, Robert John	Cashier	Coronation	Wounded
Fraser, Philip Geo.	Locomotive fireman	Lambton	Wounded
Gilmour, Duncan J. McK.	Clerk	Calgary	Wounded
Grant, John G. G.	Boilermaker's helper	London	Wounded
Green, Albert	Helper	Angus	Wounded
Green, Albert	Machinist	Angus	Wounded
Green, Henry	Locomotive fireman	Minnedosa	Wounded
Green, Thomas	Brakeman	Moose Jaw	Wounded
Gunderson, Louis	Engineer	Souris	Dead, gas poisoning
Haddleton, William	Car repairer	North Transcona	Wounded
Hale, Jr., Thomas	Wiper	East Calgary	Wounded
Hardie, Joseph	Draftsman	Montreal	Died of wounds
Harland, Hugh Baxter	Trimmer	West Toronto	Killed in action
Harrison, Robert Hampton	Clerk	Montreal	Wounded
Healy, Patrick Joseph	Waiter	Montreal	Wounded
Hood, James	Brakeman	Minnedosa	Wounded
Hunter, Robert N.	Fitter	Nelson	Wounded
Kelly, John	Trainman	Winnipeg	Wounded
Kelly, Walter	Fireman	North Bay	Wounded
Lessard, Louis	Baggage man	Lacombe	Wounded and prisoner
Liggins, Russell T.	Clerk	Brandon	Contusion
Longworth, John W.	Clerk	Saskatoon	Wounded
McCoy, John	Locomotive fireman	Moose Jaw	Wounded
McDonald, John	Foreman	Ogden	Wounded
McElroy, David S.	Laborer	Basswood	Wounded
MacGranachan, Wm.	Apprentice	Ogden Shops	Wounded
Malcolmson, George H.	Gripper	Lethbridge	Gassed
Marsh, John	Engineer	Weyburn West	Wounded
Michie, Victor	Wiper	Calgary	Wounded
Middleton, Ronald	Watchman	Imperial	Gassed
Mills, Clifford Waldon	Pipe fitter's helper	Winnipeg	Wounded
Mowbray, John	Car repairer	Ogden Shops	Wounded
Payne, Oliver	Brakeman	Minnedosa	Wounded
Pederson, Wm. Henry	Clerk	Emerson	Wounded
Peterson, Frank Victor	Stower	North Bay	Wounded
Polyblank, Thomas H.	Apprentice	Winnipeg	Killed in action
Purnell, Walter	Section man	Souris	Killed in action
Raynor, Bertram	Porter	Brandon	Killed in action
Sims, William	Clerk	Chapleau	Wounded
Smith, Robt. Kirby	Operator	Calgary	Gassed
Spencer, Gordon	Trainman	Brandon	Wounded
Stewart, Harry Raymond	Drill boy	Angus	Killed in action
Swinden, Frederick	Wiper	Cranbrook	Killed in action
Tennant, George Harvey	Trainman	Winnipeg	Gas poisoning
Vanalstyne, James Clifford	Assistant agent	Edmonton	Wounded
Vosper, Edward Agar	Clerk	Winnipeg	Wounded
Walton, George Cecil	Floorman	Calgary	Killed in action
Ward, Frederick	Inspector	MacTier	Killed in action
Whitehouse, Walter	Fitter's helper	East Calgary	Wounded
Wilson, Henry	Engineer	Medicine Hat	Wounded
Wright, Murray LeRoy	Locomotive fireman	Winnipeg	Wounded
Zakrinson, Anders	Laborer	Regina Yard	Killed in action

Shown on Honor Lists to Date: Killed 607; Wounded 1,403; Total 2,010.

Railway Development, Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta & Great Waterways Ry.—The Alberta Legislature has extended for one year the time within which this railway is to be completed to McMurray.

The Alberta Railways Department report for 1917, shows that of the \$7,400,000 realized by the sale of the guaranteed bonds, \$6,353,658 had been paid over to the company in respect of work completed, and that the "fair original cost" of the line was \$6,121,164.

Replying to a question recently, the Premier informed the Alberta Legislature that, owing to difficulties with the grade on the last 14 miles into McMurray, a definite time could not be fixed for completing the line there. The contractors had promised to get the line into the town as speedily as possible.

Alberta-Hudson Bay Ry.—A deputation waited on the Alberta Government recently and asked a provincial guarantee of bonds towards the construction of this projected railway southwesterly from Calgary. The interests behind this charter are centered in what is known as the Grain Belt Co., of which F. Crandall, Calgary, is the representative, and the proposed route of the railway is northeasterly from Coutts, on the International Boundary between Alberta and Montana, via Medicine Hat, to Hilda, Alta., 175 miles. Mr. Crandall stated that some \$7,000 had been paid in on account of stock subscriptions, which had been expended upon preliminary expenses and surveys; that the farmers along the route of the proposed railway would subscribe \$5,000 a mile, and that they had already pledged themselves to the extent of \$1,000 a mile. The Premier told the deputation that there would be no subsidizing of railways this year; that in the future no subsidy would be granted any company that did not prove the possession of tangible assets, and that up to the present time the A.-H.B. Ry. had not shown the possession of such assets. It was asserted on behalf of the promoters that the construction of the line would not exceed \$12,000 a mile, but the Premier stated that the Alberta Railways Department put the minimum cost at \$20,000 a mile. (June, 1917, pg. 224.)

Calgary & Southwestern Ry.—A press report states that preliminary work for the construction of this newly incorporated company's railway from Calgary to the P. Burns coalfields on Sheep Creek, Alta., will be started June 1. The report also states that a supply of rails has been secured. (April, pg. 146.)

Canada Central Ry.—The Alberta Legislature has extended for a year the time within which the sections for which provincially guaranteed bonds have been issued, are to be completed.

The Alberta Railways Department report for 1917, shows that the proceeds of the guaranteed bonds were \$1,867,530, of which there had been paid over to the company \$1,350,347, while the "fair original cost" is placed at \$1,554,700.

The last pier of the substructure of the bridge across the river at Peace River Landing was reported to have been completed Mar. 26. (April, pg. 146.)

Canadian Niagara Bridge Co.—The provisional directors named in the application to the Dominion Parliament for the incorporation of a company with this title to build a bridge across the Niagara River, from a point between Chippewa and Fort Erie, Ont., to a point in the State of New York, are:—Lord Shaugh-

nessy, Montreal; J. N. Beckley, Rochester, N.Y.; E. S. Cahill, K.C., Hamilton, and W. P. Torrance, Toronto. It is apparent from these names that the bridge is proposed to be built for the Toronto, Hamilton & Buffalo Ry., the New York Central Rd., and the C.P.R. (April, pg. 146.)

Edmonton & South Western Ry.—The Hydro-Electric Power Co., which is developing a water power at the Blue Rapids of the Saskatchewan River, to supply power to Edmonton, Alta., has applied to the city council for an extension of time for the construction of the works. Under the agreement there was to have been expended by June 30, \$1,500,000 upon railway and other construction work; by June 30, 1920, a further sum of \$2,000,000, and the balance of the work was to have been completed by June 30, 1923. The length of line to be built is from 70 to 75 miles. In order to save its guarantee, the company is applying for the extension of time, stating that owing to the shortage of labor, the scarcity and high price of construction supplies, and the attitude of the Dominion Government as to bond issues, the works cannot be proceeded with at present. E. W. Bowers, Chief Engineer, reported that all the work possible to be done without the railway had been done, and that all preliminary work possible for the construction of the railway had been completed. The city council decided, April 10, that the utilities committee look into what had been done and report. (Mar., 1916, pg. 182.)

Edmonton, Dunvegan & British Columbia Ry.—The Alberta Legislature has extended for a year the period within which the sections of the line under construction, and for which provincially guaranteed bonds have been issued, may be completed.

The Alberta Railways Department report for 1917, shows that the proceeds of the guaranteed bonds for the main line were \$7,369,900, and for the Grand Prairie Branch, \$917,040, of which there had been paid over to the company, \$7,018,797 and \$544,806, respectively, the "fair original cost" of the lines being stated as \$8,715,562 and \$810,363.

Application has been made by J. D. McArthur, President, for a subsidy for 425 miles of line. The company has built a line from just outside Edmonton to the Spirit River, 370 miles, with a branch to the Grand Prairie country, 54.8 miles; while its subsidiary line, the Central Canada Ry., has built a line from McLennan to the Peace River, 49.8 miles. A Dominion subsidy was voted in 1910 in aid of the construction of 110 miles of railway from Edmonton towards the Peace River, in favor of the Pacific Northern & Omineca Ry., and it is stated that this subsidy was assigned by the P.N. & O. Ry. to the E.D. & B.C. Ry. Be that as it may, no contract has been entered into with the Dominion Government for the building of that line.

The Edmonton City Council has referred a communication from the company re the operation of gasoline cars on certain of the Edmonton Radial Ry. lines, to the public utilities committee for consideration. It was stated in the letter from W. R. Smith, Chief Engineer, that the company's terminals were situated five miles from First Ave., making passengers lose a good deal of time. The company proposed to make a connection from the Grand Trunk Pacific Ry. to connect its own line to the Edmonton Radial Ry., and to run cars to 100th St. These cars would

be run, not only to connect with trains on the E.D. & B.C. Ry., but would be run over that line to Westlock, mileage 52, to carry milk and other produce into the city. The company would pay either a fixed rental or a rate per passenger carried. As a result of the consideration by the committee, a press report of April 15 states that an arrangement has been made whereby the E.D. & B.C. Ry. trains will run over the Grand Trunk Pacific Ry. tracks to Nelson Ave. and 21st St., where a temporary shelter will be provided for passengers use, and for the transfer of freight. It is proposed to provide a short spur on 121st St. for the E.D. & B.C. Ry. (April, pg. 146.)

Grand Trunk Ry.—We are officially advised that while a proposal for the erection of a new locomotive house at either Brockville or Prescott, Ont., is under consideration, nothing definite has been decided upon. (April, pg. 146.)

Grand Trunk Pacific Ry.—The report of the late Sir Collingwood Schreiber, who was Chief Engineer for the Dominion Government in connection with the construction of this railway, for the year ended Mar. 31, 1917, as published by the Railways Department recently, shows that the total expenditure up to Dec. 31, 1916, on the prairie section, 915 miles, had been \$37,910,534.88, and on the mountain section, 833 miles, had been, \$93,160,195.76, a total of \$131,070,730.64. He estimated the value of the work remaining to be done to comply with the acts of Parliament, the contracts and the specifications, to be \$2,297,500 on the prairie section and \$2,334,385 on the mountain section. (April, pg. 146.)

Hudson Bay Ry.—A letter was read at a meeting of the Yorkton, Sask., Board of Trade, on April 3, from J. F. Reid, M.P., stating the Minister of Railways had made a definite promise that track would be laid this season on the final 90 miles of the line from Pas to Port Nelson, Man. We are, however, officially advised that nothing can be said definitely upon this matter, as it depends entirely upon what supply of steel rails may be available. (Mar., pg. 98.)

Intercolonial Ry.—A press report states that a contract has been let to P. G. Clarke, Summerside, P.E.I., for the erection of an express building at Sackville, N.B., at a cost of \$6,000.

The original station building at Moncton, N.B., used since 1896 as the train make-up office, was partially destroyed by fire April 15. (Mar., pg. 98.)

Kettle Valley Ry.—A press report states that a contract has been let to W. P. Tierney, Vancouver, for building a 14 mile branch from Princeton, to the Copper Mountain, in connection with the opening up of mining operations there by the Canada Copper Co., which is reported to have made a bond issue of \$2,500,000 for development purposes. (Mar., pg. 99.)

Lacombe & Blindman Valley Electric Ry.—The Alberta Legislature has extended to the end of this year the time within which this railway from Lacombe to Rimbey is to be completed. Though called an electric railway, it is not one.

The Alberta Railways Department report shows that the proceeds of the guaranteed issue of bonds for this line realized \$256,659, which was paid over to the company, and that the "fair original" cost of the line was \$408,958. The line is practically entirely graded, track is laid for some miles to beyond Bentley, and a train

service was being maintained up to Mar. 30, when a gasoline-electric car was put on, giving a daily passenger service, while a steam train is used for any additional service that may be required.

Reference was made in this report in the Alberta Legislature recently by the Premier, who is reported to have said that it might be necessary for the government to take over and operate the line, but it would not be a good example of government ownership, on account of the bad financial shape in which the company's affairs were.

W. D. Brown is Chief Engineer of the railway, and H. Warner is engineer in charge on behalf of the Alberta Government.

Logging Ry. on Dean Inlet.—A Vancouver press report states that a logging railway is to be built for the Pacific Mills, Ltd., from Ocean Falls, on Dean Inlet of Portland Canal, inland.

Naas & Skeena River Ry.—The British Columbia Minister of Railways, under the provisions of the B.C. Railway Act, has issued a certificate granting the company an extension of time for a year within which it may start the construction of its projected railway from Nasaga Gulf, or Naas Bay, or other point on Portland Inlet, along the Naas River to the Indian village of Ayance, thence to the Blackwater River Valley, to the outlet of Blackwater Lake by either of alternate routes, and thence to the Skeena River, and up the valley of that fork to its head. J. G. Scott and A. E. Doucet, Quebec, are among those interested. (June, 1917, pg. 225.)

Pacific Great Eastern Ry.—The entire length of the line from Squamish to Clinton, B.C., 167 miles, was reopened for traffic April 8, and a regular service is being maintained. Arrangements are being made by the British Columbia Government for resuming construction on the line, but, until the reports of the engineers who are looking over things have been made and considered, it is not possible to say what will be done.

Arrangements for resuming traffic on the section of the line out of North Vancouver, between Ambleside and Whytecliffe, were completed April 12, and it was reported that it was hoped to restart operations out of North Vancouver by May 10. In order to do this, it is necessary to restore the Capilano bridge, which has given a great deal of trouble since the line was built. Tenders for a temporary bridge were received to April 18, and the Premier stated, April 9, that a permanent bridge would be built as soon as possible. (April, pg. 156.)

Prince Edward Island Ry.—It is said that the Minister of Railways has not reached any definite conclusion upon the question of standardizing the P.E.I. Ry. gauge. While it is contended that the alteration of the present narrow gauge to standard would work out advantageously, particularly since the putting into operation of the car ferry between Port Borden, P.E.I., and Cape Tormentine, N. B., there are a number of other matters which have to be taken into consideration before a decision is reached. Since the possibility of standardization was definitely recognized, the department has authorized the carrying out of betterments which will make the work of standardization easier if it is decided to do it. During the 1916-17 fiscal year, 21,715 new ties were put in, and as has been the case in some previous years, a large proportion of these were of standard length, thus making a certain amount of provision for

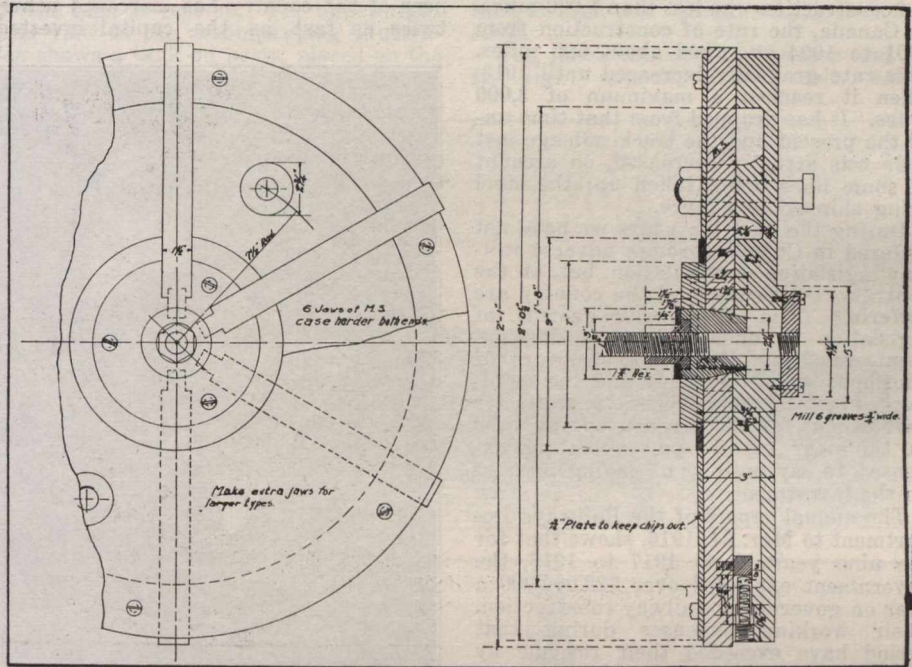
gauge widening; 5½ miles of ditching was done, and 9.2 miles of line were re-ballasted. The work done during the year also included the resurvey of 181 miles of the line. The work to be done during this year, for which a certain provision has been made in the estimates, covers further ditching, some widening of cuts, and other work, which is calculated to be of use in connection with the standardizing of the gauge. (April, pg. 146.)

Quebec & Saguenay Ry.—A press report stated on April 12 that it was expected that track would be laid to Baie St. Paul, Que., by May 31, and that by Aug. 31, track would be laid to Murray Bay, 56 miles from St. Joachim, the starting point. Work for the season has been opened up and quite a number of

made for it in the 1917 estimates. Owing to the scarcity of labor and the high cost of materials, the present is not an opportune time to undertake the work. Construction can be started as soon as a decision to build the branch is made. The votes for this year provide \$150,000 for the construction of this branch. (April, pg. 147.)

Self Centring Chuck for Centring Tires.

The accompanying illustration shows a self centering chuck, which is used at the C.P.R. shops at Ogden, Alta., for centering tires after they have been bored out,



Self Centring Chuck for Centring Tires.

men are being employed. A contract for station end other buildings is reported to have been let. (Jan., pg. 12.)

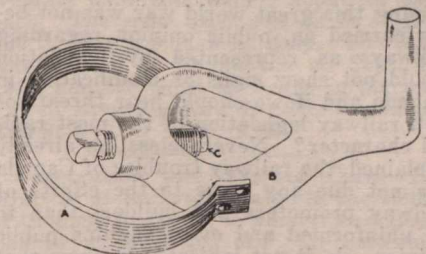
Timiskaming & Northern Ontario Ry. S. B. Clement, Chief Engineer and Superintendent of Maintenance, in his annual report to the Commissioners, refers to the revision of the main line between North Bay and Liskeard. Progress was made on three sections, that between mileage 54 and 55 has been partially completed by the railway's road department forces. Tenders were asked for the revision of the two other sections, mileage 63 to 65.5 and mileage 80.8 to 81.2, and a contract was let to the Port Arthur Construction Co. for the work at a cost of \$58,973.25 on estimate quantities. The contractors experienced great difficulty in obtaining labor, but good progress was made on the first section, and half the grading was completed on the second section during the 1917 construction season. It was expected to have the new pieces of line ready for tracklaying by July 1.

Surveys have been made for a branch line from Swastika, on the main line, to serve the Kirkland Lake gold camp. The location gives a line of 6 miles, passing close to all the producing mines. The country through which it would run is comparatively rough, and as the traffic will probably never be heavy, gradients of 1.5% and curvature up to 12 degrees have been used. The estimated cost of construction at the time the survey was made was \$125,000, and provision was

and grooved on one side, for the mansell ring, so that the second operation of grooving for the mansell ring on the opposite side can be gone on with without loss of time by re-setting. Different length of jaws are used for the different sizes of tires.

A Safety Lathe Dog.

The accompanying illustration shows a means of making the ordinary lathe dog a safety one. A piece of cold-rolled steel A is bent in circular form with its ends flattened. These flattened ends are pro-



vided with holes to receive screws for attachment to the lathe dog B as shown. This steel piece is of such size that the clamping screw C is permitted to clear the opening in the dog which receives the stock.—F. Fruhner in American Machinist.

John G. Sullivan's Presidential Address to the American Railway Engineering Association.

At the opening of the American Railway Engineering Association's convention in Chicago recently, the President, J. G. Sullivan, M.Can.Soc.C.E., Chief Engineer, Western Lines, C.P.R., gave an address, from which the following are extracts:—

A study of the railway situation in the United States for the past 30 years indicates that the boom year for construction was in 1887, when nearly 13,000 miles of new railway were constructed. In the years 1894 to 1897 this rate of construction dropped to less than 2,000 miles a year. From 1900 to 1907 the average was about 5,000 miles per year. It gradually decreased from that time until 1917, when the construction was less than 1,000 miles. In Canada, the rate of construction from 1901 to 1904 averaged about 500 miles. This rate gradually increased until 1913, when it reached a maximum of 3,000 miles. It has dropped from that time until the present and the track mileage last year was actually decreased, on account of some lines being taken up; the steel being shipped to France.

During the past ten years we have not suffered in Canada through adverse railway legislation or regulation, but, on the contrary, the people and the country are suffering from the encouragement of legislation to unnatural rapid development, resulting in the expenditure of enormous sums of money and the building of unnecessary railways; railways that cannot for the present, or any time in the near future, pay operating expenses, to say nothing of paying interest on the investment.

The annual report of the Railways Department to Mar. 31, 1916, shows that for the nine years from 1917 to 1916, the government expended over \$22,000,000 a year on government railway construction. Their working expenses during that period have exceeded their revenue by \$2,000,000, and at present the working expenses are considerably over \$1,000,000 a year greater than the revenue. In addition to this expenditure made directly by the government, the federal and provincial governments have guaranteed the interest on bonds up to between three-quarters of a billion and one billion dollars. During the same period they also granted large sums of money in the way of subsidies to privately owned railways; some provincial governments going so far as to get rich contractors to organize railway companies (tempted no doubt by the bait of profits on construction) to build railways where the present railway companies of Canada could not be tempted to build, even though the bonds might be guaranteed by the government. Would it therefore be any great surprise, if assuming this great world war was not being carried on, public opinion regarding railways as represented by legislation would not show signs of modification in Canada and if we should hear threats of anti railway legislation of the most radical character? Nevertheless, as already explained, the railway troubles of Canada are not due any more to the efforts of railway promoters and builders than to an uninformed and over-sanguine public opinion. Is it not logical to assume that similar boom conditions existed in the United States prior to 1887? Then came the Interstate Commerce Commission; followed by numerous State Commissions. A study of the Interstate Commerce Commission reports shows that, for the past 30 years, probably only for two or three

years did the dividend paid on the stocks of the companies amount to over 5% on the total stock, while for 6 or 7 years, the interest was less than 2%, and that never in that time has over 68% of the stock paid any dividend; while there were years when less than 50% of the railway stock of the United States paid any dividend. These reports also show that the interest on the bonded indebtedness never amounted to 5% and there was always a considerable percentage of bonds which paid no interest. These reports also show that by either comparing the tons of freight handled, or more properly, the tons of freight carried one mile, the business of the country has increased nearly twice as fast as the capital invested.



J. G. Sullivan, M.Can.Soc.C.E.
Chief Engineer, Western Lines, C.P.R., and
ex-President, American Railway Engineering Association.

These reports also show that the number of cars and locomotives in service has not kept pace with the business. We must, of course, take into account, in considering this factor, the increased weight of the individual locomotives and the increased capacity of the cars. These reports also show that the miles of track have not increased anything like the rate of increase in business. More significant is the rate of increase of sidings and yards. The reports do not separate passing sidings from terminal yards and other business yards, but when one considers the necessarily large increase in the mileage of passing sidings required for an increase in business, it is almost self evident that the increase in terminals and business tracks has not kept pace with the business. It may seem strange to you that I should bring up this subject at this time when the "house is on fire" and when the government has stepped in and has asked all hands to lend a hand to put out the fire, making no reference to what has caused the trouble, it only being intimated by a very few discredited radicals that the

railwaymen were to blame for the setting of the fire. It is generally conceded that lack of capital has been the cause of the difficulty and that capital has been frightened away by anti railway legislation and regulation. A great many are apt to blame our governments for this condition, when as a matter of fact, it is you and I, citizens and voters of this country (the responsible parties), who are actually to blame, and it is for this reason that I have brought up the subject and wish to discuss politics. I wish to emphasize that we engineers, as a body, as more to blame than any other class of men, for the reason that we take less interest in politics than any other body.

Another reason why I wish to discuss this subject somewhat further is the fact that if we do not win this war, nothing much matters. If, however, as we all hope, democracy will come out victorious, our responsibilities will be the greater and we must meet those responsibilities with courage and do our duty as men. To make my meaning a little more clear, I will ask you to consider how you railway men would think the railways of the country would be managed if all the offices were filled by office seekers rather than by men chosen on account of their ability and fitness to fill the office. I venture to say that there are very few chief engineers in this room who did not protest at their first promotion to take charge of a location party or a party on construction. I further venture to say, that there is not a locating engineer in this room who at some time did not have the experience of having a rodman or stakeman mistaken for the chief of the party, and I will go further and say that if his party had been a political organization the chances are ten to one that the rodman or stakeman would have been in charge of the party. Only the other day I asked a prominent citizen of a town in Western Canada, how it happened that a certain party had not been elected a member of parliament. His reply was, "The other man had a larger acquaintance and was better known." Every railwayman should realize that his own welfare depends on the welfare of the country and the company for whom he is working, no matter whether he is a section laborer, chief engineer or president, and he should take the same interest in selecting representatives to the legislature who will make laws controlling the actions of the railways, as he would in selecting directors of a railway if he was a stockholder.

In conclusion, let me impress on you the necessity of taking an active interest in politics, not alone in going to the polls and voting for the least objectionable office seeker, but by taking an active interest in choosing the candidates, and, if necessary, sacrificing time and other interests to become officers if called upon to do so, remembering that when this war is over, the responsibility placed on the voters of democracies will be greatly increased and especially so in the United States, where you have gone one step further than democratic Canada, and other less radical democracies, by the fact that you not only elect your legislative bodies, but you also elect your judiciary and executive officers by popular vote. And realize further, that you need honest, intelligent and capable representatives more in times of prosperity than you do in times of adversity. In the meanwhile, let us join hands with the government,

put our shoulders to the wheel and do all in our power to win this war for freedom and democracy. Then after the victory, let us not shirk our duty, but assume the responsibility of self government, making sacrifices where necessary, and thereby making democracy a real success.

The "Mackenzie-Mann" Bugaboo.

Sir Donald Mann has written as follows:—"My attention has been called to the press report of proceedings before the Power Controller, April 18, in which Sir Adam Beck refers to 'the London Electric Co., a Mackenzie-Mann concern,' to 'Toronto Electric Light Co. and other Mackenzie-Mann companies,' and again 'to the power given the Mackenzie-Mann Co. to go on using extra water at Niagara.'

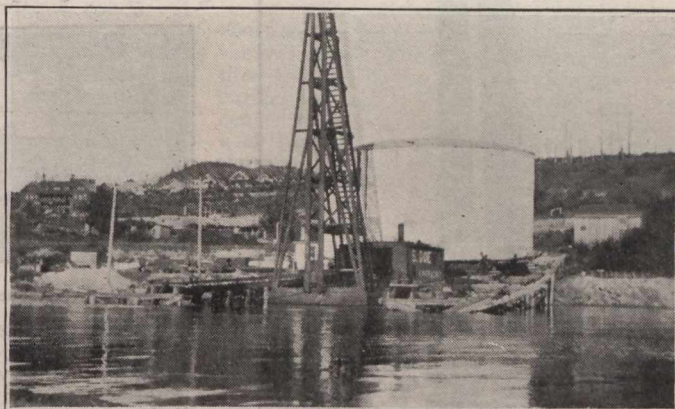
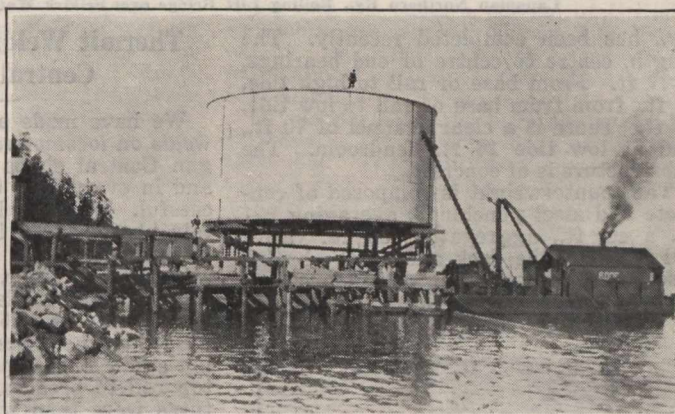
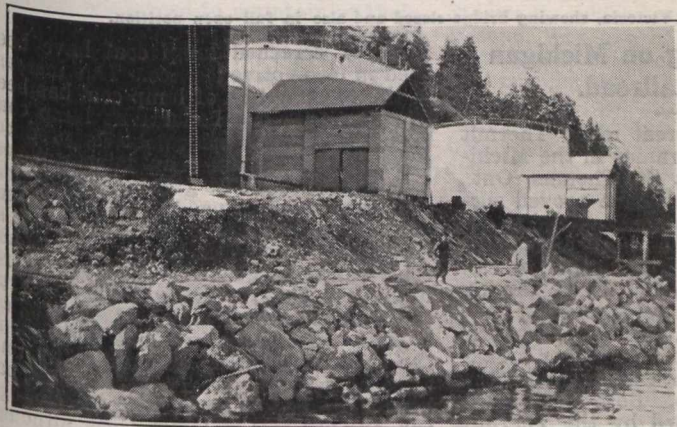
"The use of the name Mackenzie & Mann in this connection is absolutely without justification. Mackenzie, Mann & Co. have no interest, and have never

Unique Transportation of Fuel Oil Tanks in British Columbia.

The removal of three fuel oil tanks from Bamberton, Vancouver Island, to Powell River, on the B.C. mainland, about 120 miles, had some interesting features. At Bamberton the tanks were located on a bank 22 ft. above low water, the range of tide there being 12 ft. In order to get a tank on a scow, 2 trestles, about 100 ft. long and 34 ft. apart, had to be built out in the water, so that a scow 32 ft. wide could get in between the trestles, of which the last 60 ft. were so constructed that the top part, about 10 ft., could be quickly removed and give place on a lower level for the tank to rest on. The upper right hand view in the accompanying illustration shows a tank on posts, placed on the scow, at high tide, and the upper part of

latter place, about 650 ft. from the shore line and 75 ft. above water level, rails had to be put down from the end of the trestles up to the pit, where foundations were made to receive the tanks. Two trucks, about 60 ft. long, with 2 sets of wheels at each end, were placed under the tanks for going up the grade. On the bank, above the foundations, was placed a donkey engine which did the pulling. Two 3-sheaved steel blocks, with 3/4 in. cable, were used for tackle. At this end the trestles were built on a 10 per cent. grade, far enough out in the water to receive the tank at high tide without raising it on the scow.

The tanks are 60 ft. diameter and 30 ft. high; capacity 15,000 bbls. each;



Moving Oil Tanks in British Columbia.

Upper left view, oil tanks on foundations at Bamberton. Upper right view, tank on posts at high tide at Bamberton, with upper part of trestle removed. Lower left view, tank leaving Bamberton in tow. Lower right view, hauling tank up 10% grade at Powell River, over double track railway.

had an interest in the London Electric Light Co., in the Toronto Electric Light Co., in any of the companies developing power at Niagara Falls, or in any of their subsidiaries. Personally I have neither capital holdings nor official position in any of the Niagara companies or their subsidiaries. One would expect from a man occupying Sir Adam's responsible position something more than reliance upon street gossip; in fact, one would expect a careful adherence to facts, certainly in matters such as this where the facts are readily obtainable. I have not followed hydro power matters in Ontario closely enough to know the merits of the controversy, but if the rest of the information which Sir Adam has so freely given to the public is no more accurate, then heaven help the public."

the trestles removed, as mentioned above.

While the tide was high, a new foundation was made to receive the tank when the tide came down to nearly low water. When the tank was landed on this new level, and the scow released, this was taken out from under the tank, the posts removed and cribbing put instead, just so high that when placed under the tank it would lift the same clear of the trestles at the next high tide. This operation had to be repeated three times before a tank could be landed on the deck of the scow. The tanks were moved to the end of the trestle on iron rollers.

At the same time as this work was being performed at Bamberton, another crew built a double trestle and road at Powell River. On account of the long distance the tanks had to be moved at the

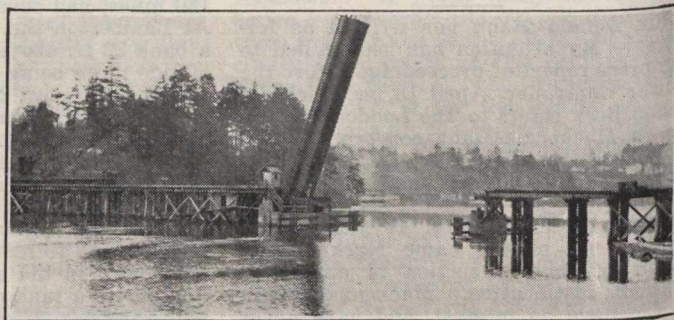
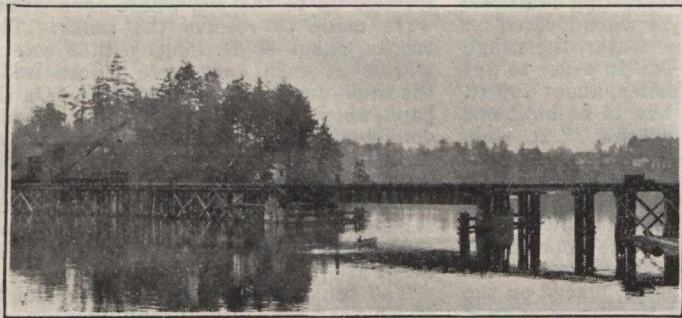
weight, with sills under, about 70 tons each. The scow used was 32 ft. wide x 100 ft. long x 9 ft. 8 in. deep. The work was started at Bamberton on Sept. 10, 1917, and the third tank was in place at Powell River on Nov. 5. The contractor was S. Doe, of Victoria, B.C.

Observation and Private Cars.—The Minister of Railways stated in the House of Commons, Apr. 4, in answer to a question by T. MacNutt, M.P. for Saltcoats, Sask., that no order had been issued to discontinue observation and private cars on transcontinental and other trains, and that the government was not aware that a heavy private car was attached to the rear end of Imperial Limited train 2, at Vancouver, recently, and hauled to some point in Ontario.

Rolling Lift Bridge on Canadian Northern Railway at Victoria.

A single track, deck girder, rolling lift bridge across Selkirk Water, Victoria, B.C., for the Canadian Northern Pacific

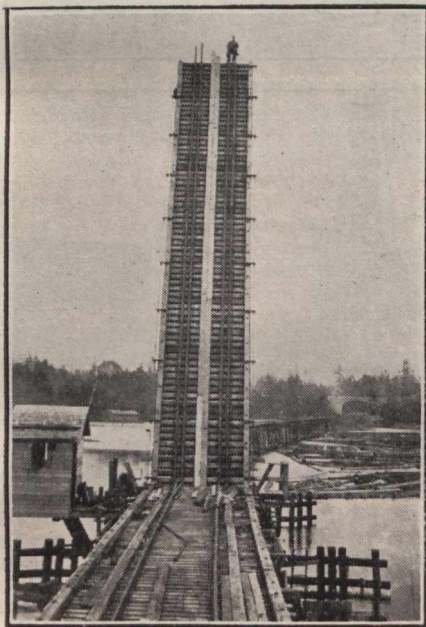
Cook, Resident Engineer, C.N.P.R., Victoria. The cost, including interlocking, was about \$21,000.



Canadian Northern Ry., Rolling Lift Bridge over Selkirk Water, Victoria, showing bridge closed and also in full open position.

Ry., has been completed recently. The length, centre to centre of end bearings, is 77 ft. From base or rail to high tide, 13 ft., from from base of rail to low tide, 23 ft. There is a clear channel of 70 ft., and at low tide 16 ft. headroom. The substructure is of concrete.

The counterweight is composed of concrete and steel punchings, averaging 271 lb. a cu. ft., aggregating 55 cu. yards. All is below the deck and as the bridge rises the counterweight descends slowly to the concrete pit provided. The bridge is operated by hand power and so ar-



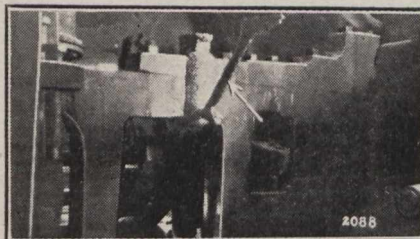
Canadian Northern Ry., Rolling Lift Bridge at Victoria, in full open position.

ranged that an electric motor for operation can be attached when desired. The machinery forms a small percentage of the weight and is considered highly satisfactory. One man can raise or lower the span in about three minutes.

The whole layout is arranged with a view to duplicate the span for second track when required. The bridge was designed in accordance with Dominion Government specification, class heavy loading, under the direction of W. P. Chapman, M.Can.Soc.C.E., Engineer of Bridges, C.N.R., Toronto, by the Scherzer Roller Lift Bridge Co., the erection being done under the supervision of E. F.

Thermit Welding on Michigan Central Railroad.

We have made a great many Thermit welds on locomotive frames in the Michigan Central shops at St. Thomas, Ont., and in every case they have proved successful. While we have endeavored to obtain photographs, it has been difficult to obtain good ones. I would like to call attention, however, to the accompanying illustration of my last weld, made on Nov. 3, on locomotive 7540, which was electric welded on the lower rail, and after breaking again at that point finally caused the top rail to break also. Both these fractures were then welded by the Thermit process, using 125 lb. of Railroad Ther-



Thermit Weld on Locomotive Frame.

mit. This repair was accomplished without keeping the locomotive out of service more than four days.

Another difficult weld which we were called upon to make was on one of our largest freight locomotives, the break being 5 x 14 in., and located just back of the right cylinder. We removed 1 in. from the butt of the main cylinder in order to provide room for a riser. This weld was made six months ago, and has given satisfactory service ever since. We find our Thermit welds not only satisfactory, but money savers as well.

Workmen's Compensation in Alberta.

In connection with the Workmen's Compensation Act passed by the Alberta Legislature, it is stated that by an arrangement with the railway labor unions, it has been decided that the act will not apply to railway employes, but that their case will be dealt with next year.

Government Railway Employes.—The Minister of Railways informed the House of Commons, Mar. 27, that 20,917 persons were on the Canadian Government Railways pay rolls on Dec. 31, 1917, of whom 1,901 were on steamships and car ferries, and 480 were on military service.

Value of Different Sizes of Coal for Locomotives.

Until recently nearly all coal used on locomotives was mine run, i.e., the entire unscreened product of the mines. In the past few years, however, increasing quan-

ties of screened lump coal have been used in locomotive service. This increase in the consumption of lump coal has been due partly to the belief that lump coal, when burned on a locomotive, produces enough more steam than mine run coal to compensate for its greater cost. Special considerations, such as the desire to lessen the amount of smoke formed, have also led in some instances to the use of lump coal, which is generally believed to require less skill in firing than mine run coal. The introduction of mechanical stokers for locomotives has resulted in the use of increasing amounts of various sizes of screenings. Thus far there has been little use of such sizes as egg, egg run, and nut coal on locomotives, although traffic and market conditions occasionally make it feasible and desirable to use them.

The relative values of several sizes of coal for locomotive use have not been well understood, since most laboratory and road tests have been made with mine run, or occasionally with lump coal, and the data are inadequate and conflicting. A series of tests to determine the value of different sizes of coal has been conducted by the University of Illinois Engineering Experiment Station under a cooperative agreement with the International Railway Fuel Association and the U. S. Bureau of Mines. A mikado locomotive, weighing 142 tons, belonging to the B. & R.O. Rd., was used, the tests being made in the locomotive laboratory at Urbana. The results are published in bulletin 101, entitled, "Comparative tests of six sizes of Illinois coal on a mikado locomotive." Copies may be had without charge by addressing the Engineering Experiment Station, Urbana, Illinois.

The Reid Criminal Libel Case.—When this case, which was taken against Sir William D. Reid, formerly President, Reid Newfoundland Co., by a Newfoundland politician, came before the local magistrate at St. John's, Nfld., recently, it was dismissed, as no case was made out. Action was taken subsequently by indictment before the Supreme Court, and at the sittings in April, the grand jury threw out the bill. The Chief Justice, in instructing the grand jury, stated that, if they found that the letter sent by Sir William Reid to Lord Shaughnessy, did not mean what the indictment said it meant, they could not bring in a true bill, but if they found that the words of the letter were libellous in themselves, they could bring in another bill.

Fuel, From a Transportation Standpoint.

By W. M. Neal, Secretary, Canadian Railway Association for National Defence.

No one needs to be reminded of the close and intimate connection between the humble coal pile in his cellar and the pride and comfort of the loftier apartments in his house. We may in the past have treated the coal bin as a mere poor relation or humble servant. We gave it the poorest room in the house. We even hired other people to attend to it, so as not to have to soil our fingers by contact with the fuel problem, but nowadays I think one can observe a much more kindly attitude toward this humble factor in our domestic arrangements. We have been forced as it were, to enter into diplomatic relations with the coal bin and to treat it with consideration and very great respect. The greatest coal bin in Canada is that of the railway companies. Many have seen some of the young mountains of coal which the transportation companies are forced to maintain at their terminal points. There are in Canada over 5,000 locomotives, whose appetites require an average ration of from 100 to 160 lb. of coal for every mile run. The locomotives which draw the passenger trains from Montreal to Toronto burn not less than 16½ tons of bituminous coal. If we allow that the average tender on the average locomotive holds 10 tons of coal, then the requirements of the railways for a single loading of their tenders amount to over 50,000 tons. The total coal consumption of the railways of Canada in the last year for which these are official figures (1916) was 8,995,123 tons, which cost \$27,961,186. This was almost as much as the total Canadian import of bituminous coal and slack in the same year.

But, of course, what the railways themselves consume is only the beginning of the coal problem for the railway managers. Although we imported only about 9,000,000 tons of bituminous coal and slack in 1916, the railways hauled that year 18,122,835 tons. In addition to this they hauled 7,057,628 tons of anthracite coal and 1,772,854 tons of coke. The hauling of fuel both for themselves and the public amounted to approximately 25,000,000 tons, or over one fifth of the total freight tonnage carried by all the railways of Canada that year. It was four times the weight of the ore carried, and twice the weight of the total products of manufacture which were carried by the railways. It required the service of 29,948 trains of 23 cars a train, or the equivalent service for one year of approximately 1,000 freight locomotives and 23,000 freight cars. The weight of bituminous coal carried by the railways runs, as a rule, just a trifle less than the weight of all the grain produced in the Dominion.

I give these figures to impress the extraordinarily intimate connection between the coal situation and the railways of Canada. I cannot refrain from remarking, just in passing, that although coal carrying represents such a great part of railway work, it does not represent a proportionate part of railway earnings. Coal is carried farther in Canada for less money than in any other country in the world. It costs the coal dealer less for the freight on a ton of coal transported 60 miles than to team same ton one mile in Montreal or Toronto. The recent rail rate increases give the railway about 15c a ton more than before on an average anthracite shipment from the mines to Toronto. One hears a great deal about this increase, yet the general increase

of 66 2/3% in teaming costs due to increased price of oats, labor and horse-flesh has scarcely been mentioned in the public press. I intend first of all to outline roughly the machinery of coal distribution in Canada as it existed before the war. It is necessary to divide the country into five districts, according to the fuel situation in each. I will then try to show what each district used, where it obtained its supply and how.

Starting in the east, let us define district 1. It reached from Halifax to, say, Montreal. It was supplied with bituminous coal from the Nova Scotia mines. This coal was distributed partly by rail, by chiefly by boat. In 1913, the last normal year, the Dominion Coal Co. distributed 1,750,000 tons by boat in the St. Lawrence alone, and the Nova Scotia Steel Co. another 500,000 tons. The s.s. *Storstadt*, which sank the *Empress of Ireland*, was one of the fleet of vessels distributing this coal. Very little of it was consumed farther west than Montreal. Nova Scotia and New Brunswick consumed quantities in addition to the St. Lawrence requirements. Much of this, also, before the war, was carried by steamer or by the humbler but more picturesque schooners of this region.

District 2, overlapping district 1 to some extent, reached, say, from Quebec City and towns like Sherbrooke and St. Johns, Que., west to Windsor and Sarnia and north to Sudbury, North Bay and Cochrane, Ont. This was, and is, the great coal importing area of Canada. It is here that the major portion of our anthracite coal was consumed and the chief share of bituminous coal was converted into energy and manufactured goods. It came by three different means, by rail, by water, and by car ferry. The chief rail points from which coal passed directly into Ontario were Black Rock, Victoria Park, Suspension Bridge, Niagara Falls, and Bridgeburg. These are the points we call the Niagara frontier, where special precautions had to be taken this past winter, as I shall describe later on. Another direct rail connection from district 2 to the United States is, of course, at Sault Ste. Marie, but no coal of any account passes there.

Of the car ferry connections the largest are at Sarnia-Port Huron and Windsor-Detroit. A considerable amount of Illinois coal passes there. Much more crosses Lake Erie from Cleveland to Port Stanley; Ashtabula to Port Dover; Ashtabula to Port Burwell; and Lake Ontario from Ogdensburg to Prescott and Charlotte to Cobourg. Practically the only traffic from Port Burwell is empty coal cars south-bound and loaded coal cars north. This one little port accounts for 54 cars of coal a day in good weather.

So much for the direct rail connections in coal schooners and steamboats of a sort plying on Lake Ontario from Oswego to Kingston or Toronto, and on Lake Erie from the American coal ports to the Canadian ports just named. These are the coal-carrying connections between district 2 and the U.S. coal fields. The coal thus received is distributed chiefly from Toronto, Hamilton and London to the rest of the older parts of the province.

In district 3 let us place all the north share of Lake Superior west to the eastern boundary of Manitoba. In this region, Port Arthur and Fort William are the central points. Another port of which little is heard is Jackfish, a C.P.R. point

where this company obtains enough coal by water during the summer to supply the north shore divisions all the year round, without having to burden the line itself by hauling coal via Toronto and Sudbury. The centres of public distribution are the twin cities. Many of the vessels which go north for cargoes of east-bound grain take coal on the up voyage. This coal is scattered westward by the returning empty grain cars from Fort William to Winnipeg. How far west of Winnipeg this movement goes I cannot say definitely, as it depends upon the production and movement of Western coal. There the U.S. coal going up the lakes begins to come in competition with the coal from our western foothills. The greater the production of western coal the farther east it comes.

District 4 might be said to include Winnipeg and the eastern portion of British Columbia, overlapping district 3 to some extent. In its most westerly extension it is fed almost exclusively from the Alberta coal fields.

Of district 5 I need only say a word. It takes in the western slope of British Columbia. The railways there use coal and oil fuel. The supplies of coal were and are from Washington and Nanaimo. The consumption is not large and the problem of distribution is not great.

Such are the outlines of the fuel situation from a transportation viewpoint as it existed before the war. I will now explain the changes which war has brought about in each district.

In district 1, the steamships plying from Sydney to St. John, Halifax, Quebec and Montreal, have, so to speak, enlisted. The distribution of coal from these mines falls entirely, therefore, upon the railways. The 2,000,000 tons distributed by boat in the St. Lawrence are now carried by rail. The schooners on the coasts of Nova Scotia and New Brunswick continue to do their share, but even there the railways have had to assume an extra burden. Eastern Canadian bituminous coal is now moving into district 2 as far as Ottawa and Cornwall. The increased consumption of coal in district 1 has made necessary the use of U.S. coal there, too, which is hauled north via Montreal and then east.

In districts 2 and 3 there have been two changes: a falling off of water carriage of coal on the lakes, and the congestion of the U.S. roads, which made it impossible to send the proper number of coal cars south for coal, on account of the danger that they would be lost down there even before they could be loaded at the mines. The loss of the water carriers was perhaps the more serious of these two considerations. From these three districts a tremendous proportion of the water carriers have disappeared. Practically the entire burden—amounting to 2,000,000 tons or 50,000 carloads for St. Lawrence points alone—has been forced upon the railways. They met this condition by building more coal cars, by converting sand and gravel cars for coal use, by enforcing economy in their own use of coal, by pressing box cars into the coal carrying service, and by trying to move as much coal as possible in the summer when the traffic may take advantage of easier transportation conditions. By a campaign among the big shippers, asking them to accept coal deliveries last summer instead of in the autumn, much good was accomplished. With respect to the danger of

losing our coal cars in the U.S., thousands of tons of coal were worked through the U.S. tangle in returning Canadian "empty" box cars. The use of box cars for coal carrying can only be applied from mines and docks where there are devices for loading and unloading these cars with coal. Fortunately, these devices are already established in the west, i.e., districts 3 and 4, otherwise we should have had a lot of trouble sending to Winnipeg special coal cars instead of using the westbound empty box cars.

I must make special reference to the work done on the Niagara frontier this winter by the administrative committee of the Canadian Railway Association for National Defence. In this work all roads co-operated to the fullest extent. The incoming coal cars at Black Rock, Bridgeburg, Victoria Park, Niagara Falls and Suspension Bridge were forwarded rapidly to Hamilton, Toronto, London and other points, without respect to what road they were routed by. In spite of blizzards and exceptional weather conditions, about 5,000 cars (chiefly coal) were put through in a period of two months over and above what would have been regarded as a normal movement. This meant to the Canadian consumers about 150,000 tons of coal extra.

So much for districts 1, 2 and 3. In district 4, that is, from Winnipeg to the eastern half of British Columbia, the question is being discussed whether the western bituminous mines could not look after the bituminous requirements of that district, while the lignite, being compressed into briquettes, might replace the anthracite. This is a consummation devoutly to be desired and members of the Canadian Railway Association for National Defence have already taken up the question with a view to being ready, as far as transportation is concerned, to make Western Canada, by the winter of 1919-20, as nearly self-sufficient as possible. How far this is possible I cannot even guess, although I may mention some of the factors governing the situation. First, as to production of both bituminous and lignite coal, the mines have never been able to turn out maximum quantities because of labor troubles, as high rates of pay enable men to take time off with impunity, and because of lack of storage facilities for lignite coal. But even with these, much might be done, so far as the railways are concerned, by a concerted effort on the part of the mines, the railways and the public to persuade consumers to place their orders for delivery during the slack months.

Conditions in district 5 have not changed. There is some talk of having the California supply of oil fuel for railway locomotives cut off. This would be very serious for the railways, as the following figures show: Fuel oil consumed in British Columbia, 1917—C.P.R. received 48,763,554 gall. and consumed 46,608,660; Grand Trunk received 6,350,840 gall. and consumed 6,303,500; Esquimalt and Nanaimo used 2,646,400 gall.; Pacific Great Eastern used 1,638,000 gall.

I have described briefly the changed conditions of the Canadian fuel traffic and how the railways have met these changes. Just one word about the special means of internal economy which the railways have undertaken with a view to economizing in their own use of coal. In districts 1 and 2, the coal is poorer in quality, and higher in price, than ever before. This is due to the labor scarcity at the U.S. mines where the product is no longer picked over as it used to be.

First, regarding passenger trains, the Canadian Railway Association for Na-

tional Defence, and the individual railways before the association was formed, have cut off trains whose total yearly mileage would amount to 12,000,000 miles. Assuming an average of 100 lb. of coal per passenger train mile, this means 600,000 tons saved. Parlor and observation cars have been eliminated, except in cases where there are combinations of dining or sleeping cars. Fewer sleeping cars are attached to night trains, thus a greater use of upper berths is made and the wheel resistance of extra cars is done away with. The speed of all trains has been reduced to the point where a maximum of effort is obtained from a given amount of fuel. No train is allowed to run at excessive speed to make up time. This has always been a practice very hard on coal economy. Special trains and the hauling of private cars, except at the request of government officials, have been done away with.

Even more important economies have been made in connection with the freight services. A campaign for heavier loading resulted in a great improvement. For example, in the movement of freight to St. John during Jan., 1918, as compared with Jan., 1917, the average load per car rose from 26.4 tons to 32.3, an increase per car of 5.9 tons. The saving from this improvement on this traffic alone that month was 1,313 cars and over 7,300 tons of coal. There was also a saving of the time of 11 locomotives and 55 locomotive and train men for that month, besides a great many shopmen, yardmen, car checkers, repairmen, etc. The handling of less than carload lots of freight has been so rearranged as to load the cars more heavily. We are thus able to reduce the ratio between net weight and tare weight in any given train. The wheel resistance is lowered. The train is made shorter and can therefore be handled more promptly.

In the actual firing of the locomotives, further economies have been effected in spite of the lower grade of coal available in districts 2 and 3. Expert firemen are sent out to show the less experienced men the best way of dressing the fires.

The old practice of burning worn-out ties on the sides of the railways has been discontinued since the war. In some districts it does not pay to haul these ties to places where the railways can use them. In these cases the farmers alongside the track or the railway trackmen are being given the ties for firewood. The greater proportion of them, however, are taken to the shops and locomotive houses. It was found impossible to saw these ties, owing to the amount of gravel and dirt with which they were impregnated. A device has been made which breaks them into appropriate lengths and they are now used under the boilers.

As a railway man, I take great pride, along with my fellow railway men, in the record which Canadian railways have established, not merely in the handling of fuel, but in the handling of food, munitions and domestic traffic. We have had two exceptionally severe winters. We have had labor shortage. Fuel has been scarce and of low quality. The nature of traffic and the direction of traffic has shifted and changed overnight in a manner sufficient to strain the resourcefulness of even the most alert railroad men in the world. Changes which I have indicated with regard to the movement of coal in Canada apply even with greater force to the movement of other commodities. The Canadian railways have moved hundreds of thousands of soldiers, eastbound and westbound; they have handled 75,000 foreign laborers passing from Vancouver across the continent en route to France.

There have been some difficulties, but on the whole I think there have been fewer railway troubles in Canada since the war than in any other country in the world.

The foregoing paper was read in Toronto recently, at the Canadian Society of Civil Engineers' general professional meeting.

Railway Department Estimates for 1918-1919.

The Railway Department estimates for the year ending Mar. 31, 1919, submitted to the House of Commons recently, contain, among others, the following items chargeable to capital account:—

Canadian Government Railways.	
Construction and betterments, including equipment	\$18,000,000.00
Dartmouth to Deans Branch	30,000.00
To provide car ferry—construction of terminals, etc.	65,000.00
Hudson Bay Ry.—Construction of railway terminals	1,000,000.00
National Transcontinental Ry.—To pay claims for right of way, etc.	250,000.00
Quebec & Saguenay Ry.—Construction	900,000.00
Quebec Bridge.—Construction	700,000.00

The following items are chargeable to income:—

Arbitration and awards	\$ 2,000.00
Board of Railway Commissioners for Canada—Maintenance and operation of, including \$800 for Clyde Leavitt as Chief Fire Inspector	183,850.00
Board of Railway Commissioners for Canada—To pay expenses in connection with cases before	15,000.00
Contribution of Government Railways to McGill University towards the foundation of a school of railway engineering and transportation in general, in connection with Faculty of Applied Science	2,500.00
Contribution of Government Railways to Polytechnic School, Montreal, for advancement of learning in connection with railway engineering and transportation in general	2,500.00
Contribution to International Association of Railways' Congress	97.33
Costs of litigation	3,000.00
Governor General's car, attendance, repairs and alterations to	5,000.00
Miscellaneous works not provided for Surveys and inspections—canals, including salaries and expenses of experts employed temporarily	2,500.00
Surveys and inspections—railways, including salaries and expenses of experts employed temporarily	25,000.00
Expenses in connection with consolidation of Railway Act	40,000.00
Inquiry and report on railway situation of Canada	5,000.00
To provide for audit on behalf of government of any railway company	40,000.00
Loan not exceeding \$7,500,000, repayable on demand, with interest payable half yearly at 6%, to be used to meet expenditure made or indebtedness incurred in paying interest on securities of the Grand Trunk Pacific Ry. or Grand Trunk Pacific Branch Lines Co.; to meet deficit in operation of G.T.P.R. System and for betterments and purchase of equipment; loan to be secured by mortgage upon undertaking of G. T.P.R. Co. containing such terms and conditions as the Governor in council may approve. The disposition of the loan to be subject to the direction of the Governor in council. The company agrees to constitute its board of directors as may be required from time to time by the Governor in council	15,000.00
Loan not exceeding \$25,000,000 repayable on demand with interest half yearly at 6%, to be used to meet expenditures made or indebtedness incurred in paying interest on securities or paying maturing loans of Canadian Northern Ry. Co. or any company included in the Canadian Northern Ry. System, to meet deficit in operation of C.N.R. System and for construction, betterments and the purchase of equipment; said loan to be secured by mortgage upon the undertaking of Canadian Northern Ry. System, containing such terms and conditions as the Governor in council may approve	7,500,000.00
Salary of Board of Railway Commissioners and Secretary	25,000,000.00
	55,000.00

Railway Electrification.

By John Murphy, M.Can.Soc.C.E., Electrical Engineer, Railways and Canals Department, and Board of Railway Commissioners.

Still smarting from the sufferings of two successive winters' fuel shortages, caused by inadequate transportation facilities, we are foregathered to see what can and should be done to prevent, if possible, recurrences of such serious and trying experiences. No argument is required to support the contention that eliminating the need for coal at a considerable distance from the mine is a greater measure of relief, and of true conservation, than increasing mine production and thereby incidentally adding more load to the already overburdened railways. Reducing coal consumption automatically relieves or releases men and apparatus all along the route from the mine to the consumer; it also relieves the route itself from some of its congestion. So eminent an authority as E. W. Rice, President of the American Institute of Electrical Engineers, addressing that body in New York recently, made the following statement:—

"It is really terrifying to realize that 25% of the total amount of coal which we are digging from the earth is burned to operate our steam railways—and burned under such inefficient conditions that an average of at least 6 lb. of coal is required per horsepower hour of work performed. The same amount of coal, burned in a modern central power station, would produce an equivalent of three times that amount of power in the motors of an electric locomotive, even including all the losses of generation and transmission from the power station to the locomotive."

Mr. Rice went on to say that 150,000,000 tons of coal, nearly 25%, of all the coal mined in the U.S., were consumed in steam locomotives last year. Here, in Canada, steam locomotives also did their bit and consumed about 9,000,000 tons; 30% of the 30,000,000 tons of coal imported into and mined in this country. Our 9,000,000 tons cover, I believe, wood and oil consumed on steam locomotives; some 49,000,000 gall. of oil are covered by the Canadian record. But in the U.S. figures, 40,000,000 barrels of oil (15% of the total output) are not included.

The conservation of—the elimination of the necessity for mining—those great quantities of fuel would be secured if all the railways were operated electrically, and if the electrical energy were generated from water power. Modern steam central stations would save from 50 to 66% of the coal now used in steam locomotives if the latter were discarded and electric locomotives used instead. With such possibilities for fuel conservation in sight may we not soon expect to learn that the fuel controllers in both countries have asked the railways, and that the railways managers have asked their engineers: "How many of these millions of tons of coal can you save? When will the good work begin?"

It is said that our fuel shortages were due to a combination of bad weather and inadequate transportation. As we cannot control the weather, our attention and efforts must be directed to the transportation portion of the difficulty. Railway electrification will reduce coal consumption and haulage; it will also greatly improve traffic conditions. Electrification, therefore, seems to be the solution of the problem. Under these circumstances it may not be out of place to recite in general terms what electrification has actually accomplished on some notable railways. Railroadings in the mountains is the most strenuous kind of railway work. The examples which I have chosen cover

mountain sections. The Butte, Anaconda and Pacific Ry., by electrification, increased its ton mileage 35%, and at the same time decreased the number of trains, and its incidental expenses, 25%. The time per trip was decreased 27%. It is said the savings in the first year's operation, after electrification, amounted to 20% of the total cost of electrification. It buys power from water power plants.

On the Norfolk & Western Ry., power is obtained from its own steam station. Twelve electric locomotives have replaced 33 Mallets of the most modern and powerful type. The tonnage has been increased 50%. Electrification obviated the necessity for double tracking. The salvage value of the released steam locomotives was 45% of the cost of electrification. Electric locomotives make eight times as many miles per train minute delay as the steam ones. Their terminal lay overs average 45 minutes and they are double crewed every 24 hours. Pusher locomotive crews have been reduced from 8 steam to 4 electric. Pusher locomotives have been reduced from 7 steam to 2 electric. Steam locomotives used to "fall down" in cold weather—the electrics always "stand up," and are really more efficient in cold weather. At the New York Railroad Club meeting last year the N. & W. electrical engineer stated that "coal wharves, spark pits, water tanks and pumps, as well as roundhouses and turntables, have all disappeared from the electric zone. The track capacity has been doubled. The operating costs have been reduced. From an engineering, an operating and a financial viewpoint the electrification has been a success." Speaking of the value of the regenerative electric braking of the system, he went on to say: "The use of the air brake is practically eliminated; it is only used to stop trains. It is regrettable we are unable to put a dollars and cents value on this great asset; to appreciate it properly, one must have had experience with the difficulties of handling 90-car trains with air." Another official, referring to the same subject, made the following statement:—the 2.4% grade, without ever touching the summit 12 to 20 times every day, down the 2.4% grade, without ever touching the air. We never broke a train in two or slid a wheel. It is done so nicely we wouldn't spill a drop of water out of a glass in the caboose."

The 440 route miles of the Chicago, Milwaukee & St. Paul Ry. which have been electrified will soon be augmented by 450 miles more. Nearly 900 route miles and about 33% in addition for passing tracks, yards, industrial tracks and sidings will soon represent the extent of this great railway electrification. Among the advantages secured by this railway on its electric sections are the following: The cruising radius of each electric locomotive is twice that of the steam locomotive. Subdivisional points, where freight crews and steam locomotives were formerly changed, have been abolished; the passenger crews' runs are now 220 miles, instead of 110. For railway purposes, these stations do not now exist; seven or eight miles of track have been taken up; through freights do not leave the main line track at all; shops and locomotive houses have disappeared along with their staffs, and one electrician replaces the whole old force. An electric locomotive

has made 9,052 miles in one month. Although schedules have been reduced, the electrics have made up more than two and a half times as many minutes as steam locomotives—time which had been lost on other divisions; 29% of electric passenger trains made up time in this manner. On a mileage basis alone, the operating costs of the electrics are less than one-half the steam locomotive costs. Freight traffic increased 40% shortly after electrification—double tracking would have been necessary to handle such increased business under steam operation. An average increase of 22% in freight tonnage per train has taken place. One electric handles about three and a half times as many ton-miles as a steam locomotive; the reduction in times in handling a ton-mile is 30%; faster and heavier trains have accomplished these results, the number of trains has not been increased. About 11½% of the energy used by the railway is returned to the line in the process of regenerative braking and this returned energy helps to haul other trains. While this is a very important item and reduces the power bills, it is only regarded by the management as of secondary importance in comparison with the more safe and easy operation of trains on the grades and the elimination of former delays for changing brake shoes and repairs to brake rigging, when operating with steam locomotives. The electrics maintain their schedules much better than steam locomotives. In three months the electrics only waited for the right of way 254 minutes, while the steam locomotives in a similar period waited 1,910 minutes, or seven and a half times as long. Extra cars on trains only delayed electrics one ninth of the time steam trains were delayed for a similar reason. Cold weather delayed steam trains 445 minutes in the three months under discussion, but the electrics were not delayed a minute; the latter are more efficient in cold weather. Many of the delayed steam trains were double headers—never more than one electric is hitched to a passenger train. An entire suspension of freight service, due to steam locomotives losing their steaming capacity and freezing up, was not an uncommon experience. Electrical energy for the operation of these trains costs considerably less than coal. This latter statement is one of the most interesting in connection with the operation of the C. M. & St. P. Ry. and it is especially interesting because it was made more than a year ago. The foregoing experiences of men who are actually operating large railway electrification projects, show what the electric locomotive is doing every day. As the Vice President of the last mentioned railway said, "Electrification has made us forget that there is a continental divide."

The limitations of the steam locomotive are due to the fact that it is a mobile steam power plant of very limited capacity, compelled to carry its own supply of coal and water, and unable to take advantage of many of the economical refinements of the large modern stationary steam plant. On the other hand, the electric locomotive has no such limitations. It merely acts as a connecting link between efficient gigantic stationary steam or water power plants and the train to which it is connected. A technical paper summed up the situation a short time ago when it

said: "Why continue to haul millions of tons of coal, for and by uneconomical steam locomotives, all over the country, and thus add more loads to the already overburdened railways, when the power which they need so badly can be much more economically and efficiently transmitted to electric locomotives over a wire the size of one's little finger?"

The continual increasing cost of coal and fuel oil will force railway managers to look more and more carefully into railway electrification. Estimates of a few years ago now need revision. Money may be hard to get, but if, at times, fuel cannot be obtained at all, some substitute must be obtained if normal life is to be continued in northern latitudes. A representative of the National City Bank of New York, writing of the period after the war, referred to the stagnation which may ensue in all the great industries now engaged in war work as soon as peace is declared; the multitude of people thus thrown out of work, in addition to the men of the returning armies, would create unbearable conditions unless suitable employment will have been arranged for them in advance. He referred to the economic advantages of railway electrification and was of opinion that this work might solve the whole question if soon taken up with vigor.

The Minister of Public Works, Hon. F. B. Carvell, addressing the Canadian Society of Civil Engineers, Ottawa branch, recently, spoke of the necessity of conserving the energy of our water powers, instead of letting them run to waste, so that this great store of energy might be employed in assisting to build up our own and rebuild other countries when peace comes. How nicely these two ideals, water power development and railway electrification, work together if properly carried out.

With the view of securing something really worthy of presentation to this important meeting, I wrote recently to an eminent engineer, a man of international fame, and recognized as an authority on railway electrification, requesting him to tell me his own views upon this subject. A specialist's opinion, in my opinion, is always very valuable. Here is a short extract from his interesting reply: "Generalization is always dangerous, especially in connection with electrification of railways, where so many factors, such as the physical location, character of loads, the power situation, etc., come in to affect the decision if applied locally." From his sober statement it may be seen that my correspondent is an engineer, not a politician. He proceeded, as follows: ". . . with present equipment prices, the cost is absolutely prohibitive." This opinion, let me point out, is in connection with the proposal to "electrify everything." Do not let it dampen our enthusiasm. Listen to this also and kindly keep it in mind; it is another extract from the address of E. W. Rice, above referred to. He said: "I think we can demonstrate that there is no other way known to us by which the railway problem facing the country can be as quickly and as cheaply solved as by electrification."

While the present fuel shortage questions have made us look to railway electrification for relief, I feel such a project on a large scale can only follow or go hand in hand with power plant development and co-operative operation of power plants. The location of a number of plants at different points—large water power plants and auxiliary steam plants—so situated and inter connected that a failure at one plant or the connections to it will not jeopardize the others or completely cut off and isolate an important railway district is, in my opinion, an essen-

tial feature in connection with any large railway electrification project.

The 99-year contract of the Chicago, Milwaukee & St. Paul Ry. is worthy of more than a moment's attention and consideration in this discussion. That railway has a contract with a power company which has a series of plants stretching across the country parallel to the railway. The railway owns its sub-stations and secondary lines, but is not concerned with the power company's high tension lines or power plants. A reasonable rate for power, arranged between a willing purchaser and a willing seller—a contract, in fact, which each party knows the other will respect—is the basis and the real reason for that great railway electrification. Neither party questions the other's integrity or financial soundness. One delivers the power it has undertaken to supply and the other uses it. The arrangement is ideal in its simplicity and entirely satisfactory to everybody concerned. It will, in my opinion, be necessary to have such attractive power supply situations as those outlined above, backed by abundant supplies of power, in order to foster and encourage early railway electrification work in this country. Railway electrification is, in my opinion, a very pressing financial, economic and engineering problem—a problem worthy of the best attention of the most highly trained and experienced specialists.

The writer wishes to acknowledge his indebtedness and to publicly return his thanks to officials of the railways mentioned, and of the manufacturers of the apparatus referred to, as well as to the technical press, from which much of the material has been gleaned.

The foregoing paper was read before the Canadian Society of Civil Engineer's general progressive meeting in Toronto recently.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1914, 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 the paper have a continuous record of the Board's proceedings. No other paper has done this.

General order 215-C. Apr. 2.—Approving standard freight mileage tariff of Oshawa Ry. C.R.C. 15, effective Apr. 15.

General order 223. Mar. 28.—Amending general order 204, Aug. 11, 1917, to read as follows, 1644 (b). Dangerous explosives, for which a certified and placarded car is prescribed (see paragraph 1661), must not be loaded higher than the car lining. (c). When the lading of a car consists of or includes explosives, the weight of the lading should be distributed so that it will be equalized on each side of the car and over the trucks.

General order 224. Mar. 27.—Amending general order 222, Mar. 19, re oleomargarine, by adding following words, "the said tariffs to become effective Apr. 15, 1918."

General order 225. Apr. 3.—Approving bill of lading issued by U. S. Government for use in respect of all shipments of munitions, war materials and supplies by or on its behalf, or any of its contractors. Notwithstanding provisions of general order 41, July 15, 1909, form approved may be used by all such railway companies, in respect of said shipments.

General order 226. Apr. 4.—Amending general order 199, July 24, 1917, re equipment of locomotives with electric headlights.

General order 227. Apr. 12.—Ordering all railway companies, including Government railways, to advance by one hour standard time used in different zones in which they operate; effective not before 12 o'clock Saturday night, Apr. 13, and not later than 2 a.m. Sunday, Apr. 14, to remain in effect until 2 a.m., Friday, Oct. 31.

27092. Mar. 22.—Recommending to Governor in council for sanction, St. Lawrence & Adirondack Ry. bylaws of Sept., 1915.

27093. Mar. 21.—Authorizing C.P.R. to build extension of siding for Brackman-Ker Milling Co., Calgary, Alta.

27094. Mar. 22.—Authorizing Esquimalt & Nanaimo Ry. to build spur for Acme Shingle Co., Port Alberni, B.C.

27095. Mar. 21.—Relieving Halifax & South Western Ry. from providing further protection at Tannery St., near Bridgewater, N.S.

27096. Mar. 22.—Disallowing express tariffs,—Dominion Supplement 11 to C.R.C. 4418, and Supplement 8 to C.R.C. 4437; Canadian, C.R.C. 1683, 1684, 1685 and 1686, and Supplement 1 to C.R.C. 1527, and Supplement 2 to C.R.C. 1622; Canadian Northern Supplement 1 to C.R.C. 835.

27097. Mar. 26.—Authorizing C.P.R. to divert road allowance on south boundary Sec. 2, Tp. 31, Range 4, west 2nd meridian, Sask.

27098. Mar. 28.—Ordering C.P.R. to rearrange train service at Smiths Falls, Ont., effective by Apr. 8.

27099. Mar. 30.—Relieving Canadian Northern Ry. from providing further protection at highway at St. Michel, Que., mileage 13.1 from Quebec.

27100. Apr. 2.—Approving British Yukon Ry. bylaw 12, authorizing W. H. Wheeler, General Manager, and A. E. Zipf, Traffic Manager, to prepare and issue tariffs.

27101. Apr. 2.—Ordering Canadian Northern Ry. to build farm crossing for R. Toye, Minitonas, Man.

27102. Mar. 30.—Approving Dominion Atlantic Ry. bylaw 14, authorizing F. G. J. Comeau, General Freight Agent, and R. U. Parker, General Passenger Agent, to issue tariffs for freight and passenger traffic.

27103. Mar. 30.—Approving Algoma Central & Hudson Bay Ry. bylaw, authorizing R. S. McCormick, General Superintendent and Chief Engineer, to prepare and issue tariffs of telephone tolls.

27104. Apr. 2.—Authorizing London & Port Stanley Ry. to increase freight and passenger rates. This order is given fully on another page.

27105. Apr. 4.—Authorizing Lake Erie & Northern Ry. to advance freight and passenger rates. This order is given fully on another page.

27106. Apr. 4.—Authorizing London & Lake Erie Ry. & Transportation Co. to advance its freight and passenger rates. This order is given fully on another page.

27107. Apr. 3.—Authorizing G.T.R. to rebuild bridge at Broadway St., Tillsonburg, Ont.

27108. Apr. 3.—Authorizing C.P.R. to build additional tracks across Runnymede Road, Toronto, and to extend existing subway, and divert Ethel Ave.

27109. Apr. 3.—Approving agreement, Mar. 15,

between Bell Telephone Co. and North Wellington Telephone Co.

27110. Apr. 4.—Ordering C.P.R., by Apr. 30, to do the work on Big Creek drain, Tilbury North Tp., Ont., within limits of its right of way, covered by the township engineer's report.

27111. Apr. 5.—Amending orders 24882, Apr. 8, 1916, and 26734, Nov. 12, 1917, re G.T.R. crossing protection at Coteau, Que.

27112. Apr. 4.—Dismissing complain of R. W. Hannah, Toronto, that G.T.R. refuses to apply special mileage tariff rates on potatoes between its stations on shippers' circuitous routing.

27113. Apr. 5.—Establishing collection and delivery limits of express companies in Walkerville, Ont.

27114. Apr. 8.—Ordering Canadian Northern Ry. not to exceed 18 miles an hour on tangents and 12 miles an hour on curves with trains from Lobstick Jct. to Chip Lake, Alta.

27115. Apr. 9.—Authorizing Canadian Northern Ry. to build spur for Seranton Coal Co., Drumheller, Alta.

27116. Apr. 9.—Approving Western Canada Telephone Co.'s bylaw, Mar. 30, re issue of tariffs.

27117. Apr. 9.—Approving London & Port Stanley Ry. standard freight tariff of maximum mileage tolls, C.R.C. 176, and standard passenger tariff, C.R.C. 115, effective Apr. 15.

27118. Apr. 9.—Dismissing application of Canadian Consolidated Rubber Co., Montreal, Good-year Tire & Rubber Co.; Dunlop Tire & Rubber Co., and Gutta Percha & Rubber, Ltd., Toronto, for carload rating on rubber boots, etc., and authorizing corrections in certain classifications.

27119. Apr. 9.—Authorizing C.P.R. to build spur for Canadian Ingersoll-Rand Co., Sherbrooke.

27120. Apr. 9.—Authorizing Canadian Collieries (Dunsmuir), Ltd., to build mining slope under Esquimalt & Nanaimo Ry., at South Wellington, B.C.

27121. Apr. 10.—Approving Lake Erie & Northern Ry. standard freight tariff of maximum mileage tolls C.R.C. 103, and standard passenger tariff C.R.C. 23, effective Apr. 15.

27122. Apr. 11.—Authorizing C.P.R. to build spur for Imperial Oil, Ltd., Calgary, Alta.

27123. Apr. 11.—Authorizing Vancouver, Victoria & Eastern Ry. & Navigation Co. (G.N.R.) to build bridge over Brunette River, New Westminster, B.C.

27124. Apr. 12.—Authorizing Vancouver Power Co. to cross with its tracks the Vancouver, Victoria & Eastern Ry. & Nav. Co.'s tracks in District Lots 2 and 3, Group 2, South Westminster, B.C.

27125. Apr. 11.—Rescinding orders 26865 and 27001, Dec. 26, 1917, and Feb. 18, 1918, re Canadian Northern Ry. train service, Toronto to Nanawane, Ont.

27126. Apr. 12.—Amending order 26972, Feb. 9, re Grand Trunk Pacific Ry. operation of trains between Lobstick Jct. and Chip Lake, Alta.

27127. Apr. 15.—Authorizing Grand Trunk Pacific Brand Lines Co. to build across and divert highway at mileage 107.3, Prince Albert rural municipality, 461, Sask.

27128. Apr. 17.—Ordering C.P.R. to build interchange track with G.T.R. at Guelph, Ont., plan to be submitted by G.P.R. within one week from date, and reserving question of apportionment of cost.

27129. Apr. 16.—Ordering Canadian Northern Ry. to build culvert 14 x 28 in. under spur serving Quaker Oats Co., Neepawa, Man.; to be completed by May 15.

27130. Apr. 19.—Approving clearances at siding for William Davies Co., Don, Toronto.

27131. Apr. 18.—Authorizing Canadian Northern Ry. to build spur for Pointe Anne Quarries, Ltd., Thurlow Tp., Ont., and rescinding order 25767, Dec. 28, 1916.

27132. Apr. 17.—Authorizing G.T.R. to use bridge carrying North Front St., Belleville, Ont., over its main line.

27133. Apr. 16.—Authorizing C.P.R. to divert road allowance on southern boundary of s.w. 1/4 sec. 26, Tp. 40, range 23, west 3rd meridian, Sask.

27134. Apr. 16.—Authorizing G.T.R. to take up portions of sidings on Toronto Harbor Commissioners' property, Ashbridges Bay, serving Canadian Stewart Co., and relay same on locations shown on plan 172, R.Y.E., Jan. 31, 1918.

27135. Apr. 16.—Approving agreement, Apr. 6, between Bell Telephone Co. and Allenford Rural Telephone Co., Bruce and Grey counties, Ont.

27136. Apr. 18.—Ordering Windsor, Essex & Lake Shore Rapid Ry. to move derrails at crossing of Pere Marquette Ry., at Pelton, Ont., so they will be 200 ft. from diamond; signals to points 50 ft. beyond derrails or 250 ft. from diamond; to be completed by June 30.

27137. Apr. 17.—Ordering Canadian Northern Ry. to erect 3rd class station at Sturgis, Sask., to be completed by Oct. 1.

General order 228, Apr. 16.—Amending general order 227, Apr. 12, re change of time (daylight saving) on railways, by substituting "Thursday," Oct. 31, for "Friday," Oct. 31.

Daylight Saving on the Railways.

The United States Director General of Railroads issued the following general order, Mar. 25:—

The American Railway Association's Committee on Transportation, having at the request of the Director General, submitted to report in connection with the federal law to save daylight and to provide standard time for the U.S., which becomes effective on Mar. 31, at 2 a.m., the following instructions, based on such report, are issued:

On Mar. 31, all clocks and watches in train dispatchers' offices, and in all other offices open at that time, must be advanced one hour to indicate 3 a.m.

Employees in every open office must, as soon as the change has been made, compare time with the train dispatcher. Clocks and watches in all offices, at the first opening, at or after the time the change becomes effective, must be advanced to conform to the new standard time, and employees, before assuming duties in such offices, must, after the change is made, compare time with the train dispatcher.

Each railway will issue necessary instructions and arrange for such supervision and check of its employes' watches as to insure that they have been properly changed to conform to the new standard time.

Owing to the varying conditions which will prevail on railways, it is not advisable to issue a uniform rule or order to cover the details involved in the movement of trains at the period the change in standard time becomes effective. Therefore, each railway must adopt such measures as may be necessary to properly

safeguard the movement of its trains on the road at the time of the change.

Canada's Daylight Saving Act.

The following act was passed by the Dominion Parliament early in April and was assented to immediately:

"1. This act may be cited as The Daylight Saving Act, 1918.

"2. During the prescribed period in each year in which this act is in force, the time, for general purposes in Canada, in each province, shall be one hour in advance of the time which under the law of the province is the time prescribed for such province, and, if there is no time so prescribed, of the accepted standard time.

"3. This act shall be in force during the present year for such time as may be prescribed by the Governor in council.

"4. Wherever any expression of time occurs in any statute, order in council, order, regulation, rule or bylaw, or in any deed, time table, notice, advertisement or other document, the fixing of the time with respect to which is within the legislative jurisdiction of the Parliament of Canada, the time mentioned or referred to shall be held during the prescribed period, to be the time as fixed by this act. Provided, that where, in consequence of this act, it is expedient that any time fixed by any bylaw, regulation or other instrument should be adjusted, and such adjustment cannot be effected except after the lapse of a certain interval or on compliance with certain conditions, the Governor in council, may, on the application of the body or person by whom the bylaw, regulation or other instrument was made or is administered, make such adjustment from the time so fixed as in the circumstances may seem to the Governor in council proper.

"5. The Board of Railway Commissioners for Canada shall have power to advance by one hour the standard time used by railway companies, including Government railways, in Canada, for such period as may be prescribed by the said board, and to make such orders as may be necessary for the convenient carrying out of the provisions of this act in so far as railway companies may be affected thereby."

An order in council was passed at Ottawa April 12, providing that the act quoted above shall be in force from April 14, at 2 a.m., to Oct. 31, 1918, at 2 a.m.

The Board of Railway Commissioners passed general order 227, April 12, ordering all railway companies in Canada, including Government railways, to advance by one hour the standard time now observed and used by them in the different zones in which they operate; the said change to become effective on the respective railways and in the said different zones not before 12 o'clock Saturday evening, April 13, and not later than 2 o'clock Sunday morning, April 14, and to remain in force and effect until 2 o'clock on Thursday morning, Oct. 31, 1918.

Parliamentary Railway Committees.—Jos. E. Armstrong, M.P. for East Lambton, Ont., has been elected chairman of the House of Commons Railway Committee, and Senator Blain, chairman of the Senate Railway Committee for the current session. Senator Blain was chairman of the Railway Committee of the House of Commons for several years prior to being called to the Senate in 1917.

The Great North Western Telegraph Co. has opened offices at Little Metis Lighthouse, Thamesville, Ont., and Sylvan Lake, Alta., and has closed its offices at St. Genevieve de Batiscan, Que., and Madoc, Ont.

Closing of United States Railway Freight and Passenger Offices.

The U.S. Director General of Railroads issued the following instructions to the regional directors early in April:—

"Discontinue the separate city freight or passenger offices where the public may be adequately served at the depot. This applies particularly. Consolidate or group all city ticket offices, placing the union office in convenient location, where rental is reasonable, providing sufficient space to properly accommodate the public. Cancel all arrangements with tourists or other similar agencies for solicitation of passengers or sale of tickets. Discontinue all off-line traffic offices.

"Employees released as result of above to be assigned to other duties to the extent possible. Some now employed in off-line offices will be needed by local line to strengthen its traffic forces, in order to properly care for the additional work which will result from the above changes.

"The functions and services formerly performed by the off-line offices in protecting the needs of the public will be incorporated in the offices of the initial lines.

"Separate off-line traffic offices were created by the various transportation interests on account of existing keen competition for passenger and freight traffic, and were practically headquarters for soliciting agents, who were stationed in all commercial districts for the purpose of protecting the interests of the carriers by whom they are employed. Now there is no competition, which eliminates need for solicitation by the individual carriers. The policy is one of efficiency, with all possible retrenchment and economy consistent with protecting the best interests of the public.

"The employes released from their present duties, as a result of this, are to be assigned to other duties as far as possible with the same road. Some now employed in off-line offices will be needed by the local lines to strengthen other traffic forces to properly take care of the additional work entailed upon the initial lines on account of this change. In making this readjustment it is intended to work as little hardship as possible upon the employes concerned. Many of these men have been in the service of their respective lines for long periods and their railroad insurance and pension rights will be protected.

"No community will be deprived of adequate sources of information and advice as to matters connected with passenger and freight service. It will be a necessity for the lines directly serving each locality to see that their offices are manned and equipped to furnish the needed information and advice. This to include the issuance of through bills of lading, quotation of rates, passing reports of cars en route, advice to prospective passengers, and all other necessary information heretofore furnished by the off-line offices."

In accordance with the foregoing instructions, Canadian offices maintained by U.S. railways and the solicitation of business in Canada will be discontinued. At the time of writing, Apr. 26, the situation regarding the closing of all the offices, and the disposition of the various staffs, is not sufficiently clear to enable definite information to be obtained. It was at first thought that U.S. railways, which own, or control, lines in Canada, would be permitted to continue to maintain their offices, but it developed later that the order is intended to apply to all railways.

These offices will therefore be closed on or about Apr. 30, but it is possible that in one or two cases, there will be some little extension of time, to enable some outstanding business matters to be cleared up. It is felt in some quarters that the execution of the order will work considerable hardship on staffs in some cases, and, in many cases will leave the railways with unexpired office leases on their hands, which, under present conditions, are not easy to dispose of.

Canadian Northern Railway Construction, Betterments, Etc.

A Montreal report states that the excavation work yet to be done on the company's tunnel at Montreal can be finished by May 31, and that the remaining track work can be completed within a month thereafter. It is thought likely that things will be ready for running trains through the tunnel into the temporary station on Lagachetiere St. during July.

The Alberta Railways Department's report, presented to the legislature recently, shows that of the \$11,022,000 of bonds authorized to be issued, with the guarantee of the province, for the construction of branch lines, the bonds marketed produced \$8,800,000, of which \$7,658,256 had been paid over to the C.N.R. The provincially guaranteed bonds authorized to be issued in respect of lines to be built by the Canadian Northern Western Ry. amounted to \$11,222,250. The securities marketed realized \$5,437,434, of which \$4,095,046 had been paid over to the company.

A spur line is reported to have been built to the Brule Lake coal fields in Northern Alberta, and a freight and passenger traffic is said to be in operation over it. The coal mines at this point expect, a press report says, to be able to ship 1,000 tons a day by the autumn.

After having been under discussion on several occasions from its first introduction Mar. 19, the British Columbia Legislature, on April 2, passed a resolution stating that the Canadian Northern Pacific Ry. had entered into contracts with the B.C. Government for the construction of certain railways; that the C.N. Ry. owned the entire share capital of the C.N.P. Ry., and that the latter company had made default in carrying out its contracts, and expressed the view that before any payment to the owners of the C.N. Ry. shares be made, the obligations to the province should be fulfilled.

The company's freight sheds on False Creek flats at Vancouver are reported completed, and the local freight staff have taken possession of their offices. The freight yards are connected by inter-switching arrangements with the C.P.R. and the Great Northern Ry. It is expected that the passenger station on the same site will be ready for occupation during July. (April, pg. 143.)

The Board of Railway Commissioners has suspended the Dominion Ex. Co.'s supplementary tariff respecting cartage delivery to customers' premises, of fish, in carloads, from Western Canada. The company contended that the rate from Western Canada was an extremely low one, and that it was never intended to include cartage of carload lots. The previous tariff, including free cartage, is maintained, and it was pointed out that though specific reference was made to the Dominion Ex. Co., all express companies are bound by the judgment.

Traffic Orders by Board of Railway Commissioners.

Increases in Electric Railway Freight and Passenger Rates.

Orders passed by the board, authorizing increases in freight and passenger rates on several electric railways, are given in the electric railway department of this issue on pages 205 and 206.

Transportation of Explosives.

General order 223. Mar. 28. Re general order 204, Aug. 11, 1917, authorizing for the observance of railway companies which accept explosives for carriage, the Revised Regulations for the Transportation of Explosives, as amended and filed by letter dated Dec. 16, from the Chairman of the Canadian Freight Association. Upon reading what is filed on behalf of the Canadian Freight Association, it is ordered that paragraph 1644, (b) and (c), of the said regulations be amended to read as follows:

"1644 (b). Dangerous explosives for which a certified and placarded car is prescribed (see paragraph 1661), must not be loaded higher than the car lining.

"(c) When the lading of a car consists of or includes explosives, the weight of the lading should be distributed so that it will be equalized on each side of the car and over the trucks."

Classification of Oleomargarine.

General order 224. Mar. 27. Re general order 222, Mar. 19, 1918, requiring that tariffs of Pere Marquette Ry. and Canadian Pacific, Grand Trunk, and Canadian Northern Railways, providing for transportation of packing house products, fresh meats, and other articles in pedlar cars, be revised so as to include oleomargarine as a packing house product. Upon reading what is filed on behalf of the Canadian Manufacturers' Association, it is ordered that the said general order be amended by adding the following words thereto, namely: "the said tariffs to become effective April 15, 1918."

Bill of Lading for Munitions.

General order 225. April 3. Re application of Canadian Freight Association, on behalf of all railway companies subject to legislative authority of the Dominion Parliament, Canada, under sec. 340 of the Railway Act, and such other sections as may be applicable thereto, for an order approving the form of bill of lading issued by the United States Government, for use in respect of all shipments of munitions, war materials, and supplies by or on behalf of the said government, or any of its contractors; and providing that, notwithstanding the provisions of general order 41, July 15, 1909, the form herein referred to may be used by all such railway companies in respect of such shipments. Upon reading what is filed in support of the application, and its appearing that the said bill of lading is made subject to the conditions of the bill of lading approved by general order 41, it is ordered that the said form of bill of lading issued by the United States Government be approved, and that, notwithstanding the provisions of general order 41, the form herein approved may be used by all such railway companies in respect of the said shipments of munitions, war materials, and supplies.

Potatoes Circuitously Routed.

27112. Re complaint of R. W. Hannah of Toronto, that the G.T.R. refuses to apply its special mileage tariff rates on potatoes between its stations on shippers' circuitously routing. Upon hearing the complaint at Toronto, Feb. 15, 1918, the complainant and the railway company be-

ing represented at the hearing, the complainant also appearing in person, and what was alleged, it is ordered that the complaint be dismissed.

Classification of Rubber Goods.

27118. April 9. Re application of Canadian Consolidated Rubber Co., Montreal; Goodyear Tire & Rubber Co. of Canada, Toronto; Dunlop Tire & Rubber Goods Co., Toronto; and Gutta Percha & Rubber, Limited, Toronto, for revision of ratings of rubber and rubber articles as they appear in Canadian Freight Classification 16. Upon hearing the application at Ottawa, Nov. 20, 1917, the applicants, Canadian Manufacturers' Association, Canadian Freight Association, Toronto Board of Trade, and the Grand Trunk, Canadian Pacific, and Canadian Northern Railways, being represented; and upon the report and recommendation of the board's Chief Traffic Officer, it is ordered:

That the application for a carload rating on rubber boots, shoes, and socks be refused.

That item 32, page 122, of Canadian Classification 16, be corrected to read as follows:

	L.C.L.	C.L.
"Tires, solid, on reels or spools, burlapped	1	3"

That item 16, page 21, and item 30, page 35, of Supplement 10 to Canadian Freight Classification 16, be corrected to read as follows:

	L.C.L.	C.L.
"Tires, pneumatic, including inner tubes:		
"In bales or bundles, burlapped ..	1½	
"In boxes or crates	1	

"Loose or in packages named c.l. minimum weight 16,000 lb. (see note)

"Note: When shipped loose, must be loaded and unloaded by owners."

And it is further ordered that the changes herein mentioned be made effective in Supplement 11 to Classification 16, now before the board for approval.

Railway Finance, Meetings, Etc.

Algoma Central & Hudson Bay Ry.—The London, Eng., Stock Exchange Committee has ordered the following securities to be quoted in the official list:—A.C. & H.B.R. 1st mortgage 5% 50 year gold bonds, stamped under the scheme of arrangement, in lieu of deposit receipts now quoted; Algoma Central Terminals 5% 1st mortgage 50 year gold bonds, stamped under the scheme of arrangement.

Timiskaming & Northern Ontario Ry. Revenue from passenger traffic for February, \$38,859.36; from freight traffic, \$109,393.20; total revenue, \$148,252.56, against \$37,928.31 passenger traffic; \$99,715.42 freight traffic; \$137,643.73 total revenue for Feb., 1917. Aggregate total revenue for two months ended Feb. 28, \$308,894.28, against \$284,320.04 for same period 1917.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Jan. 21, \$8,626, against \$15,740 for same period 1917.

Railway Lands Patented.—Letters patent were issued in March for Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:

	Acres
Alberta & Great Waterways Ry.....	129.97
Calgary & Edmonton Ry.....	2,874.53
Canadian Northern Ry.....	804.00
Canadian Pacific Ry.....	9.015
Grand Trunk Pacific Branch Lines Co....	5.57
Qu'Appelle, Long Lake & Saskatchewan Rd. & Steamboat Co.....	7,607.66
Total	11,425.045

Transportation Appointments Throughout Canada.

The information under this head, which is gathered almost entirely 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.

Canada Atlantic Transit Co. of United States.—C. A. GORMALY, Commercial Agent, G.T.R., Chicago, Ill., has had his duties extended to include traffic, except bulk grain, via C.A.T. Co., and reports to General Agent, Boston, Mass., on westbound, and to Freight Traffic Manager, Montreal, on eastbound traffic.

H. W. PLOSS, Commercial Agent, G.T.R., Milwaukee, Wis., has had his duties extended to include traffic, except bulk grain, via C.A.T. Co., and reports to General Agent, Boston, Mass., on westbound, and to Freight Traffic Manager, Montreal, on eastbound traffic.

Canada Steamship Lines, Ltd.—N. VAN WYCK, heretofore Freight Claims Agent, Montreal, has been appointed Purchasing Agent, vice Peter Paton, resigned to enter private business. Office, Montreal.

R. V. ROBINSON, heretofore General Freight Agent, Northern Navigation Co., Sarnia, Ont., has been appointed Freight Claims Agent, C. S., Ltd., vice N. Van Wyck. Office, Montreal.

Canadian Government Railways.—M. McLEARN, heretofore Chief Dispatcher, Truro, N.S., has been appointed acting Assistant Superintendent, District 2, Intercolonial Division, vice S. B. Wass, assigned to other duties in engineering department at Moncton, N.B.

S. B. WASS, A.M.Can.Soc.C.E., heretofore Assistant Superintendent, District 2, Intercolonial Division, South Devon, N.B., has been assigned to duties in engineering department, Moncton, N.B.

E. B. ROBB, heretofore Travelling Freight Agent, Montreal, has been appointed Division Freight and Passenger Agent, Transcontinental Division, with territory from O'Brien, Que., to Graham, Ont. Office, Cochrane, Ont.

W. PRIEST has been appointed foreman of passenger car yard, Transcona, Man., vice J. Hughes, who has left the service.

M. IRWIN has been appointed foreman of paint shop, Transcona, Man., vice M. Morrow, who has left the service.

Canadian Northern Ry.—V. DAVIES has been appointed Supervisor, Boarding Car Department, which has been organized for boarding extra gangs on Eastern Lines. Office, Toronto.

P. COTTON has been appointed Inspector, Western Lines, Sleeping, Dining and Parlor Car, Hotel and News Department, with headquarters at Winnipeg.

B. GRIERSON, chief clerk to General Agent, Minneapolis, St. Paul & Sault Ste. Marie Ry., Winnipeg, is reported to have been appointed chief clerk to District Freight Agent, C.N.R., Winnipeg, vice A. Sinclair, transferred to general freight department.

P. McLELLAN has been appointed Trainmaster, Kamloops Jct., B.C., vice P. K. Manahan, assigned to other duties.

Canadian Pacific Ry.—W. WELLS, heretofore Master Mechanic, Schreiber Division, Algoma District, Schreiber, Ont., has been appointed Master Mechanic, Farnham Division, Quebec District, vice L. L. Craig, transferred. Office, Farnham, Que.

H. J. HUMPHREY, heretofore Superintendent, Brownville Division, New Brunswick District, Brownville Jct., Me.,

has been appointed Superintendent, Laurentian Division, Quebec District, vice W. Tansley, transferred. Office, Montreal.
W. E. MCGILL, heretofore Assistant



C. G. Bowker,
General Superintendent, Ontario Lines, Grand
Trunk Railway.



W. R. Davidson,
General Superintendent, Eastern Lines, Grand
Trunk Railway.

Superintendent, Sudbury Division, Algoma District, Sudbury, Ont., has been appointed Assistant Superintendent, Montreal Terminals Division, Quebec District,

vice J. B. Blair, transferred. Office, Montreal.

J. B. BLAIR, heretofore Assistant Superintendent, Montreal Terminals Division, Quebec District, Montreal, has been appointed Superintendent, Farnham Division, Quebec District, vice J. H. Boyle, transferred. Office, Farnham.

E. J. WORTH, heretofore Chief Dispatcher, Laurentian Division, Quebec District, Montreal, has been appointed Night Chief Dispatcher, Smiths Falls Division, Quebec District, Smiths Falls, Ont.

J. FLYNN has been appointed Car Foreman, Smiths Falls, Ont., vice J. A. Leaman, resigned.

K. K. DONNELLY has been appointed Purchasing Agent, Vancouver, B.C., vice J. T. H. Ferguson, deceased.

H. M. S. SPEDDING has been appointed ticket agent, Vancouver wharf, vice J. A. Brown, transferred.

H. M. BEYERS has been appointed City Passenger Agent, Spokane, Wash., vice J. F. Speakman, resigned.

Erie Rd.—In accordance with the recent order of the U.S. Director General of Railroads, the company's Canadian offices were closed Apr. 27. M. MacGREGOR, heretofore General Canadian Agent, Toronto, has been attached temporarily, to the Assistant General Freight Agent's staff at Buffalo, N.Y. G. S. FORSTER, heretofore Contracting Agent, Toronto, has left the service to enter private business in Toronto.

Grand Trunk Ry.—W. R. DAVIDSON, heretofore General Superintendent, Western Lines, Chicago, Ill., has been appointed General Superintendent, Eastern Lines, vice C. G. Bowker, transferred. Office, Montreal.

J. W. FARRELL, heretofore Trainmaster, Districts 1, 2 and 3, Montreal Division, Eastern Lines, Richmond, Que., has been appointed Trainmaster, District 1, Montreal Division, Eastern Lines. Office, Island Pond, Vt. The position of Assistant Trainmaster, Districts 1 and 2, has been abolished.

N. P. NORTH has been appointed Trainmaster, Districts 2 and 3, Montreal Division, Eastern Lines. Office, Richmond, Que.

C. G. BOWKER, heretofore General Superintendent, Eastern Lines, Montreal, has been appointed General Superintendent, Ontario Lines, vice H. E. Whittenberger, transferred. Office, Toronto.

H. E. WHITTENBERGER, heretofore General Superintendent, Ontario Lines, Toronto, has been appointed General Superintendent, Western Lines, vice W. R. Davidson, transferred. Office, Chicago, Ill.

Grand Trunk Pacific Ry.—A. D. CAREY, heretofore Assistant Superintendent, Biggar, Sask., has been appointed Assistant Superintendent between Prince George and Prince Rupert, B.C. Office, Smithers.

Northern Pacific Ry.—J. M. RAPELJE, heretofore General Manager, has been appointed acting Vice President in charge of operation, vice G. T. SLADE, now Major in the U.S. Railway Transportation Corps, who has received indefinite leave of absence.

A. M. BURT, heretofore Chief Engineer, Maintenance of Way, has been appointed acting General Manager, east of Paradise, vice J. M. Rapelje, and his former duties are for the present consolidated with those of the Chief Engineer, H. E. Stevens.

Railway Rolling Stock Orders and Deliveries.

Dominion Government Rolling Stock Orders.

In the House of Commons, on April 9, the Minister of Railways moved: "That it is expedient to provide that during the present war and for one year thereafter, the Minister of Railways and Canals, with the approval of the Governor in council, may acquire engines, cars, rails and other railway equipment and materials, and may sell, lease or otherwise dispose of any such equipment to any Canadian railway company, or companies, upon such terms and conditions as may be approved by the Governor in council, and may defray all expenditure made hereunder out of any unappropriated moneys in the Consolidated Revenue Fund of Canada; and that for the payment in whole or in part of any such equipment the Minister of Finance, with the approval of the Governor in council, may issue equipment notes or other obligations or securities, or may guarantee the principal and interest of any securities issued by any company approved by the Governor in council; and the times and manner of the issue of such securities, and the forms and terms thereof or of any trust deed, lease or other instrument incidental thereto, and the trustees shall be approved by the Governor in council, and the provisions of section 4 of chap. 38 of the statutes of 1907 shall apply to any instrument relating to such equipment executed under the terms hereof, and such securities shall be made payable by instalments, the last instalment to be made payable on or before the expiry of 10 years from the issue thereof and further, to provide that the Minister may transfer to the Canadian Government Railways any equipment so acquired, and in such event there shall be charged to the accounts of the said railways such amounts as may properly be chargeable therefor, and the provisions of the Consolidated Revenue and Audit Act shall, as far as applicable, extend to the accounts and charges incurred hereunder."

In moving the resolution, the Minister said:—"Owing to the government taking over the Canadian Northern Ry. and requiring more equipment for the government railway, and on account of the war, owing to other railways requiring equipment, it is necessary for the government to purchase and finance this equipment. In doing so, we wish to have the power, after purchasing it, to lease or sell it to railways, other than the government railways, that may require further equipment. In purchasing this equipment, we wish to be in the same position as other railways are at present in making such purchases. For instance, other railways, such as the Canadian Pacific, the Canadian Northern and the Grand Trunk, are in a position to issue equipment bonds and in that way not pay the full purchase price of the equipment at the time delivery is made. By issuing equipment bonds they can spread the payment over a term of years. It certainly makes it very difficult for the government to finance the purchase of equipment when it is called upon to pay a very large amount in one year at the present time. For instance, last year the Railways Department ordered 150 locomotives and 6,000 or 7,000 cars. We put the amount in the estimates, and of course we were compelled to pay the amount of the equipment delivered last year. We received the equipment, and we leased portions of it to the Grand Trunk and Canadian Northern

Railways. The C.P.R. got four or five of our large locomotives, and the others went to the Canadian Government Railways. If we had not purchased that equipment, we would have been in a very serious position during last winter, on account of not having sufficient motive power. The other day we had, in order to protect the transportation situation during the coming winter, and for the future, on account of the heavy movement of troops and so on, to give orders for a very large quantity of locomotives, cars and other railway equipment. We had to order 100,000 tons of rails that will cost \$5,000,000 or \$6,000,000. We want to be in a position to pay for the equipment and then transfer it to other railways by sale or lease. The purchase of the items that come under the bill to be based on this resolution will be all done in the regular way by tender and order in council, and any lease or sale will be done by order in council in the usual way."

After considerable discussion, during which several members, most of them opponents of the government, objected to giving the power asked, for more than one year, or for a greater expenditure than \$50,000,000, the Minister agreed to strike out of the third line of the resolution as printed above, the words "war and for one year thereafter" and to substitute the words "fiscal year"; also to add in the seventh line of the resolution as printed above, after the word "materials," the words "to an amount not exceeding fifty million dollars." The effect of the change is that the authorization for the purchase of locomotives, cars, rails, and other railway equipment and material, is limited to the current fiscal year, and to an amount not exceeding \$50,000,000. The resolution, as amended, was carried, and the Minister immediately introduced a bill based thereon, which was read a first time and was passed by the House of Commons on April 12.

In the course of the discussion above referred to, the Minister gave particulars of orders he had placed for rolling stock this year, which confirmed the information in regard to the same as published in Canadian Railway and Marine World for March and April, and which is recapitulated further on with some additional information with which we have since been supplied officially. The Minister, in speaking of the distribution of the rolling stock ordered, said:—"There will be a small amount for the Canadian Government Railways, which, of course, include the National Transcontinental between Moncton and Winnipeg, as well as the Intercolonial and Prince Edward Island Railways. The largest portion of it, however, is for the Canadian Northern and Grand Trunk. Seventy five of the locomotives ordered are for the Grand Trunk. Last year we purchased 100 or 150 locomotives, and the Grand Trunk got 45 or 47 of them. So that we are really providing equipment for the Grand Trunk."

In answer to a question as to further purchases of rolling stock, the Minister said:—"Outside of what I have read, the only equipment that I contemplate purchasing is as follows: A requisition has been made on me for 10 or 15 snow ploughs, which might probably cost \$100,000. I have been urged by the Canadian Railway Association for National Defence, the organization representing all the railways in Canada, to purchase 100 tourist cars. At present, speaking from memory, there are probably 600 or 700

cars owned by all the railways in Canada that are available for the transport of troops to and from the seaboard, and I have been discussing the proposed purchase of 100 additional cars with Sir George Bury, of the Canadian Pacific, with a view to ascertaining if we cannot get along without any more equipment of the kind. We have also been asked to purchase 19 baggage cars to be used in connection with the movement of troop trains to and fro, and it may be requisite to acquire a few more things of that kind."

Details of Dominion Government Orders.

Following is a complete list of the rolling stock ordered by the government this year, as originally published in Canadian Railway and Marine World in March and April, with additional information of further orders placed, dates for delivery and as to its distribution between the Canadian Government Railways, Canadian Northern Ry. and Grand Trunk Ry. These are the first complete details of these orders published and may be relied on, as the greatest care has been exercised in their compilation, and the figures have been checked by the Railways Department officials.

Canadian Car & Foundry Co., Montreal, 5,000, forty-ton, standard, steel frame, single sheathed, box cars, \$2,750 each, \$13,750,000. For Canadian Northern Ry. Delivery to began three months from date of order and to be completed by Sept. 30.

Canadian Car & Foundry Co., Montreal, 300 thirty-ton stock cars, with steel draft arms, \$2,271 each, \$681,300. Air brakes and couplers to be supplied by the government. For Canadian Northern Ry. Delivery to be completed by Aug. 1.

The Canadian Car & Foundry Co., 250 standard, all wood, refrigerator cars, with metal draft arms, \$4,097 each, \$1,024,250. Of these 100 are for Canadian Government Railways and 150 for Canadian Northern.

Eastern Car Co., New Glasgow, N.S., 750 steel, underframe, 41-ft., 40-ton, flat cars, \$2,370.40 each, \$1,777,800. Of these 250 are for Canadian Government Railways and 500 for Canadian Northern. Delivery to start by June 15 and to be made at rate of 10 cars a day.

Eastern Car Co., 650, fifty-ton, enterprise composite coal cars, \$3,179.50 each, \$2,066,675. Of these 400 are for Canadian Government Railways and 250 for Canadian Northern. Delivery to start by June 15 and to be made at rate of 10 cars a day.

Hart-Otis Car Co., 200 all wood ballast cars, with side and centre dump, \$3,125 each, \$625,000. For Canadian Government Railways. The Hart-Otis Car Co. to commence delivery during June and complete it before July 31.

Hart-Otis Car Co., Montreal, 250 all wood ballast cars, with side dump only, \$3,040 each, \$760,000. For Canadian Northern Ry.

National Steel Car Co., Hamilton, Ont., 1,000, forty-ton steel frame box cars, \$2,750 each, \$2,750,000. For Canadian Northern Ry. Delivery to be completed by Sept. 15.

Pressed Steel Car Co., New York, 25 tank cars, 8,000 imp. gal., with 50-ton trucks, etc., for general service, \$3,926 each, f.o.b. Pittsburg District, \$98,150. For Canadian Government Railways.

Pressed Steel Car Co., New York, 25 tank cars, 8,000 imp. gal., with 50-ton trucks, for water service, \$3,770 each.

Canadian Railway AND Marine World

ESTABLISHED 1898.

Devoted to Steam and Electric Railway, Marine, Express, and Telegraph, also Railway and Canal Contractors' Interests.
Official Organ of various Canadian Transportation Associations.

Published on the first of each month.

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 Editors

JOHN KEIR AND DONALD F. KEIR

United States Business Representative,
A. FENTON WALKER, 143 Liberty St., New York

Member of
Canadian Press Association,
Associated Business Papers,
Audit Bureau of Circulation.

Authorized by the Postmaster General for Canada,
for transmission as second class matter.
Entered as second class matter, July 25, 1913, at the
Postoffice at Buffalo, N.Y., under the Act of Congress
of March 3, 1879.

SUBSCRIPTION PRICE, including postage any-
where, \$2 a year.

SINGLE COPIES, 20 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.

NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by
the 10th of the month preceding the date of publication.

TORONTO, CANADA, MAY, 1918.

PRINCIPAL CONTENTS.

American Railway Engineering Association...	188
Appointments, Transportation	197
Birthdays of Transportation Men	185
Board of Railway Commissioners,— Orders by, Summaries of	194
Traffic Orders	196
Canadian Northern Ry., Construction, Etc.	196
Rolling Lift Bridge at Victoria, B.C.	190
Canadian Pacific Ry. Honor Roll	185
Electric Railway Department	204 to 214
Answers to Questions	209
Edmonton Radial Ry. Fares	206
Finance, Meetings, Etc.	214
Freight and Passenger Rate Increases Authorized	204
Levis County Ry. Snow Fighting	208
London St. Ry. Passenger Fares	211
New Brunswick Power Co., Increased Rate Application	207
Report	210
Nipissing Central Ry. Report	210
Nova Scotia Tramways & Power Co., Report Projects, Construction, Etc.	209
Toronto Ry. Dividend Reduction	211
Winnipeg Electric Ry., Motor Buses	206
New Street Car	207
Report	205
Express Companies, Among the	211
Fuel, From a Transportation Standpoint	203
Locomotive Building and Repairing	191
Mainly About Railway People	181
Marine Department	202
Cargo Vessels for Dominion Government	215 to 228
Coast, Lake and River Officers for 1918	226
Estimates for 1918-19	222
Shipbuilding in Canada for British Govern- ment	227, 228
Concrete,—in United States	220
Dominion Government Policy	225
General Notes	215
Steam and Sailing Under Construction in Canada	219
Timber Derrick Gantry for Shipbuilding	218
Railway Department Estimates	221
Railway Development	192
Railway Electrification	186
Railway Earnings	193
Railway Finance, Meetings, Etc.	201
Railway Rolling Stock Orders and Deliveries ..	196
Railway Service Department Recommended ..	198
Railway Snow Fences, Tree Planting for	183
Rates on Grain Milled in Transit	179
Telegraph, Telephone and Cable Matters	182
Transportation Men, Engineers, Etc., in the War	184, 203

f.o.b. Pittsburg District, \$94,250. For Canadian Northern Ry.

The Pressed Steel Car Co. is to begin delivery within 150 working days of settlement of all terms, and to continue at average rate of three cars per working day thereafter.

Pullman Co., Chicago, 14 sleeping cars, \$35,890 each, f.o.b. Chicago, \$502,460. For Canadian Government Railways. Delivery in June and July.

Pullman Co., Chicago, 7 dining cars, \$34,100 each, f.o.b. Chicago, \$238,700. For Canadian Government Railways. Delivery in June and July.

Pullman Co., Chicago, 15 second hand parlor cars, \$3,000 each, \$45,000. Of these 11 are to be delivered f.o.b. tracks, Buffalo, N.Y., and 4 f.o.b. tracks, Chicago. Ten of them are to be converted into express refrigerator cars for carrying fruit and fish on Canadian Government Railways, and 5 are to be converted into baggage cars for Canadian Northern Ry.

Canadian Locomotive Co., Kingston, Ont., 6 six-wheel 0-6-0 switching locomotives, equipped with Schmidt superheater, 251,000 lb. in working order, \$41,000 each, \$246,000. For Intercolonial Division, Canadian Government Railways. Delivery f. o. b. C.G.R. tracks, Montreal.

Canadian Locomotive Co., Kingston, Ont., 4 ten-wheel 4-6-0 locomotives, equipped with Schmidt superheater, 162,000 lb. in working order, with tender, 3 1/2 ft. gauge, \$34,020 each, \$136,080. For Prince Edward Island Division, Canadian Government Railways. Delivery in June, f.o.b. C.G.R. tracks, Montreal.

Canadian Locomotive Co., Kingston, Ont., 60 Mikado freight locomotives, \$62,000 each, \$3,720,000. Of these, 10 are for Canadian Government Railways, 40 for the Grand Trunk and 10 for the Grand Trunk Pacific.

Canadian Locomotive Co., Kingston, Ont., 10 switching locomotives, \$40,500 each, \$405,000. For Canadian Northern Ry.

Delivery of the Canadian Locomotive Co.'s order for Mikados and switchers is to commence July 1 and be completed not later than Dec. 31.

Montreal Locomotive Works, Montreal, 50 consolidation freight locomotives, \$58,000 each, \$2,900,000. For Canadian Northern Ry.

Montreal Locomotive Works, Montreal, 30 Pacific passenger locomotives, \$60,000 each, \$1,800,000. For Canadian Government Railways.

Delivery of the Montreal Locomotive Works orders is to be made at the rate of 30 locomotives a month, beginning Sept. 1, and to be completed by Dec. 31.

Summary of Orders Placed by Dominion Government.

Canadian Car & Foundry Co.	Price each.	Total.
5,000 box cars	\$2,750.00	\$13,750,000
300 stock cars	2,271.00	681,300
250 refrigerator cars	4,097.00	1,024,250
Eastern Car Co.		
750 flat cars	2,370.40	1,777,800
650 coal cars	3,179.50	2,066,675
Hart-Otis Car Co.		
200 ballast cars	3,125.00	625,000
250 ballast cars	3,040.00	760,000
National Steel Car Co.		
1,000 box cars	2,750.00	2,750,000
Pressed Steel Car Co.		
25 tank cars	3,926.00	98,150
25 tank cars	3,770.00	94,250
Pullman Co.		
14 sleeping cars	35,890.00	502,460
7 dining cars	34,100.00	238,700
15 parlor cars (second hand)	3,000.00	45,000
Canadian Locomotive Co.		
6 switching locomotives	41,000.00	246,000
4 narrow gauge locomotives	34,020.00	136,080
60 mikado locomotives	62,000.00	3,720,000
10 switching locomotives	40,500.00	405,000

Montreal Locomotive Works.		
50 consolidated locomotives	58,000.00	2,900,000
50 Pacific locomotives	60,000.00	1,800,000
		\$33,620,665

It is probable that tenders will be asked for at once for from 20 to 30 snow ploughs for the Canadian Government and Canadian Northern Railways. Nothing is being done at present about the 100 tourist cars and 19 baggage cars which the Minister of Railways spoke of in the House of Commons on April 9.

General Railway Rolling Stock Notes.

Canadian Government Railways have received 13 mikado type locomotives from Canadian Locomotive Co.

The C.P.R. has received 4 decapod locomotives from its Angus shops, Montreal.

The C.P.R. has ordered 100 steel under-frame box cars from its Angus shops, Montreal.

The Canadian Northern Ry. has received 373 steel frame box cars from National Steel Car Co. These are a portion of an order placed with the company by the Dominion Government for 1,000 cars, 500 of which have been assigned to the C.N.R.

The Canadian Northern Ry.'s wooden stock cars, of which 300 have been ordered by the Dominion Government, as mentioned in our last issue, will have cast steel draft arms, and will be the same as those now under construction by the Canadian Car & Foundry Co., details of which have been given in a previous issue.

The G.T.R. has already received 37 mikado locomotives and is to get 5 more out of the order given by the Dominion Government last year to Canadian Locomotive Co. The G.T.R. will also get 40 more and the G.T.P.R. will get 10 out of the order for 60 given the Canadian Locomotive Co. recently. It is not yet announced whether they will be leased or sold to the G.T.R.

The 250 refrigerator cars which the Dominion Government has ordered from Canadian Car & Foundry Co., as mentioned in our last issue, will have the following general dimensions:—

Length over end sills	36 ft.
Trucks, centre to centre	26 ft.
Width over sheathing	9 ft. 1 3/4 in.
Top of rail to top of running board	13 ft.
Length inside	35 ft. 2 in.
Width inside	8 ft. 2 3/4 in.
Capacity	30 tons
Meat racks and brine tanks	4 at each end
Bolsters, brake beams and couplers	Simplex
Draft Springs	Class E

The Canadian Car & Foundry Co.'s annual report, dated April 15, says: "The combined order books of your company and its subsidiaries, at the date of writing, show a total value of unfilled orders aggregating \$36,500,000. For the first time in several years your directors are able to state that over 75% of this value represents orders for the regular and normal products of the car equipment industry. If unforeseen conditions and contingencies beyond your management's control do not arise, your present order book assures continuous and profitable operations during 1918."

The Canadian Northern Ry.'s 5,000 box cars, 40 tons capacity, which the Dominion Government has ordered from Canadian Car & Foundry Co., will be of the steel frame type, inside sheathed, and similar to the 5,000 now being built by the company for the government, details of which were given in July, 1917, issue, except that the centre sills will be reinforced with a 1/4 in. cover plate running from end sill to end sill, and they will also be equipped with a cast steel buffing block, instead of deadwood as previously used.

Some further refinements in construction will also be made with a view to facilitating better maintenance. A new type of brake is to be applied to the cars of this order, providing for the adjustment of cylinder travel at floating lever fulcrum. This system having proved satisfactory, has been adopted as standard by the government. McCord journal boxes, twin spring draft rigging, Simplex brake beams, couplers and truck bolsters, are amongst the specialties to be applied.

The Canadian Northern Ry.'s 1,000 steel frame box cars, which the Dominion Government has ordered from National Steel Car Co., as mentioned in our last issue, will have the following general dimensions:—

Capacity	80,000 lb.
Length inside	8 ft. 6½ in.
Height, floor to bottom of carline, at side.....	7 ft. 11½ in.

Width of side door opening.....	7 ft. 8 7/16 in.
Length between end sills.....	36 ft. 11½ in.
Width over side sills.....	8 ft. 9½ in.
Height, rail to top of brake mast.....	13 ft. 10¼ in.
Height, rail to top of running board.....	13 ft. 4¾ in.
Height, rail to centre of coupler.....	2 ft. 10½ in.
Height, sill to bottom of side plate.....
.....	7 ft. 10 3/16 in.
Height, top of rail to eaves.....	12 ft. 7 11/16 in.
Width over eaves.....	9 ft. 3½ in.
Centre to centre of body bolster.....	26 ft. 10 in.
Couplers.....	Steel, 5 x 7 shank, 8½ butt
Draft springs.....	M.C.B. class G
Journal boxes.....	McCord
Journal bearings.....	M.C.B. brass, 5 x 9
Journal bearing wedges.....	Cast steel
Truck bolsters.....	Simplex
Wheels.....	Cast iron, 33 in.

The G.T.R., as stated in Canadian Railway and Marine World for March, is having twenty-five 060 type switching locomotives built at its Point St. Charles shops, Montreal. They will have a total weight, including the tender, of 298,060 lb., and a tractive power of 34,398 lb. The

diameter of the boiler at the front end will be 68 9/16 in. and at the dome course 76 in. The boilers will give the following heating surfaces:—Firebox 168 sq. ft., tubes and flues 1,836.5 sq. ft., total 2,004.5 sq. ft., the grate area being 50.62 sq. ft. They will be fitted with Schmidt superheaters, having 28 units. Power reverse gear will be applied, the driving and total wheel base will be 11 ft. 6 in., total wheel base of locomotive and tender coupled 45 ft. 11½ in., and total length of locomotive and tender overall 62 ft. 5½ in. The cylinders will have a diameter of 21 and 26 in. stroke, with 51 in. driving wheels, and the working pressure will be 180 lb. per sq. in. The total weight on the driving wheels of engine will be 170,000 lb., and the tender, with a water capacity of 6,000 gall. and 10 tons of coal, will weigh 128,060 lb.

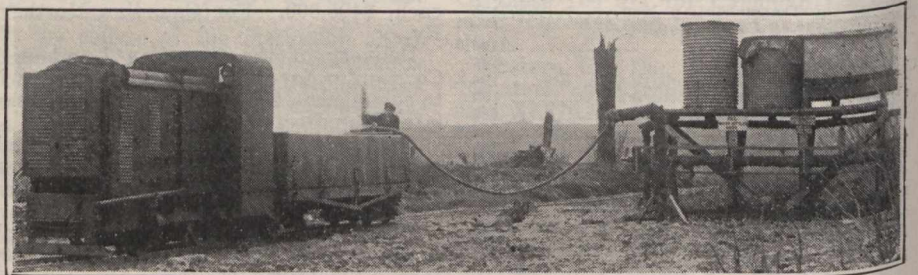
Canadian Transportation Men, Engineers, Etc. in the War.

Canadian Railway and Marine World is desirous of publishing all the information possible about the war work of Canadian transportation men, engineers, etc., and invites its readers to send in information for use in this connection. No doubt a large number of our readers receive many letters from the front, etc., extracts from which would prove of interest in these columns. We should be glad to be favored in this respect.

Canadian Railway Troops in Action.—Sir Robert Borden read in the House of Commons, April 2, the following dispatch from the war correspondents' headquarters in France, dated Mar. 28:—"Fighting, digging, blowing up roads and bridges, Canadian railway troops have been worthily keeping up the traditions of Ypres and Vimy. A majority of the battalions were in the battle area and close to that heroic British line that gave but never broke. They fought at Gouzeaucourt and a good majority of them are old soldiers. One company of an Ontario battalion whirled into the fight at Ham with a veteran British division and stayed with them two days, fighting every inch of ground. Another railway battalion rescued three heavy howitzers, repairing their broken line and loading the big guns on trucks when the British infantry were holding back the Huns only a few hundred yards away. In Peronne sector, another battalion, after getting all its equipment and rolling stock away, organized ambulance trains on what tracks were left, carrying out wounded. When the last locomotive and night cars came through, the track had to be mended seven times in less than an hour. One company of Canadian railway troops of a battalion that fought with the U.S. troops at Court put up a wonderful fight to rescue a big railway howitzer. They patched up the shell shattered line with any material at hand, got it over a quarter of a mile when broken rails spread and the task seemed hopeless. They bumped the 20-ton truck over ties for another hundred yards and found themselves alongside an old engineers' dump. The line ahead was torn and twisted and there were no rails to be had. Canadian railway builders started to construct line with heavy dugout timbers from the dump. The big gun was hauled another 150 yards towards safety when the Huns were sighted almost upon them. The battery commander reluctantly decided to blow up the great howitzer. He gave the railway men ten minutes to construct some kind of line to take the locomotive

out and then destroyed his big pet. As the retiring infantry came up the gun crew and Canadians piled on the locomotive and steamed away through a hail of German bullets to safety. In no place where we had to retire were railway lines and bridges left intact. All the first day from Arras to Ham the battalion was running back rolling stock and blowing up the line. In many places they were doing their work of destruction with U.S. engineers and more than once little companies of both found themselves alongside each other in the fighting line. When their own part of the work was cleared the majority of companies were gathered in under command of their own Canadian brigadier and day and night they continued to give effective assistance in other directions. 'And when they are wanted,' declares one Canadian colonel who has

Operating Companies at this point and large yards with immense quantities of both standard and narrow gauge rolling stock. Of the latter all the Huns obtained were two derelict light railway locomotives and about a dozen trucks. Bridges over the Nord Canal were all destroyed. Miles of sidings in the valley at Ypres were mined and rendered completely useless. Repair shops, after lathes and other machinery had been taken away on the last trains, were burned and even the dugouts destroyed. A delicate compliment is paid to the Canadian railway destruction troops in German communique on Thursday. It says: 'Our railway troops are now coping with traffic behind the front and are working ceaselessly, on the reconstruction of destroyed railways.' That means to make the lines fairly effective."



On the Western Battle Front.

A large water tank being filled within shell range. The tank is pulled up the line by the armored tractor, and is a great improvement on the old time water waggon drawn by horses. The Canadian corps front is a mass of light railways. They have done away with the slow horse transports. From Canadian official photograph loaned by C.P.R.

commanded troops in the line, 'they will be there, also ready to do their bit with rifle and machine gun.'"

The second dispatch was from London, dated April 1:—"Canadian officers who were acting as town majors in places like Ypres, Royalcourt and Bus had exciting experiences before they retired. Their duty was to see that all stores which could not be moved were destroyed, and they spent their last evening in their respective centres blowing up what little ammunition was left, and obliterating canteens that might yield supplies for advancing Huns. They came out with the last of the British troops and gave a graphic story of how complete was the destruction of roads, bridges and railways which might have been of use to the enemy. Ypres was one of the largest railway centres in the sector. In addition to the Canadian Railway Construction Battalion, there were Canadian Railway

Decorations for Railway Troops.—On March 18 an interesting ceremony took place at the 13th Canadian Light Railway Operating Co.'s camp in France, when the officer commanding, Capt. R. McKillop, formerly Division Superintendent, C.P.R., Montreal, presented a number of men with ribbons for decorations awarded recently. The men receiving the ribbons were:—Regimental Sergeant-Major W. R. Spencer, formerly Chief Dispatcher, Canadian Government Railways, Cochrane, Ont., and son of Geo. Spencer, Chief Operating Officer, Board of Railway Commissioners, Ottawa, who was awarded the meritorious service medal for strict devotion to duty in the field. The military medal for saving government railway equipment, under shell fire, while on duty, was awarded to Company Sergeant-Major John Bloomfield, formerly conductor, G.T.R., Belleville, Ont.; Sapper J. M. Vallyly, formerly fireman, Canadian Northern Ry.

Trenton, Ont.; and Sapper Jas. McK. Baker, formerly fireman, G.T.R., Sarnia, Ont. Corporal Angus Probert, formerly baggage man, Canadian Government Railways, Truro, N.S., was complimented for being mentioned by Sir Douglas Haig in dispatches Nov 7, 1917, for conspicuous work in the field.

The G.T.R. Employes' Patriotic Association, up to Dec. 31, 1917, contributed \$15,000 to the Toronto Patriotic Fund; \$3,093 for motor ambulances; \$2,226 for Christmas boxes for enlisted employes; \$1,750 to the Tobacco Fund; \$2,500 to the British Red Cross, and several other smaller amounts for various objects. The fund has a balance in hand of \$1,197.

The Timiskaming & Northern Ontario Railwaymen's Patriotic Association, up to Dec. 31, 1917, had contributed \$20,133.00 to the Canadian Red Cross; \$25,133.39 to the Canadian Patriotic Fund, and \$13,765.16 direct to enlisted employes.

PERSONAL NOTES.

Lieut. H. L. Atto, 5th Canadian Mounted Rifles, who received the Military Cross recently, and was mentioned in dispatches, was formerly chief clerk in the Superintendent's office, Dominion Express Co., Montreal.

F. L. C. Bond, formerly Division Engineer, G.T.R., Montreal, is now a Major in Company C, 10th Battalion, Canadian Railway Troops, on overseas service.

Lieut. A. O. L. Cameron, Aurora, Ont., of the Canadian Railway Troops, was awarded the Military Cross recently for work in maintaining light railway lines under shell fire. He relaid the tracks continually under heavy shell fire, and kept them repaired and in working order throughout the operations, setting an example of devotion to duty to his men.

Capt. A. H. Cowie, M.C., who was awarded a bar to the Military Cross recently, is a son of H. J. Cowie, European Agent, Canada Steamship Lines, Ltd., Liverpool, Eng. He joined the Canadian Expeditionary Force in the early stages of the war, prior to which he was engaged in engineering in Montreal.

Bruce W. Erb, for eight years Advertising Manager for T. McAvity & Sons, St. John, N.B., has enlisted in the Canadian Engineers, as a sapper, and is now training at St. Johns, Que.

Lieut. Andrew S. Fraser, of the Royal Field Artillery, who was reported about the middle of April as having been wounded and in a hospital at Rouen, France, is a son of Mrs. H. J. Fraser, of Ottawa, and a nephew of Jas. D. Fraser, director and Secretary-Treasurer, Ottawa Electric Ry. Having taken the first year's engineering course at McGill University, Montreal, he took a course at the Royal Military College, Kingston, Ont., and was gazetted as a lieutenant in the Royal Field Artillery, July 17, 1917. He went to England Sept. 1, 1917, and crossed to the European continent at the end of Dec., 1917. He has been removed to England to convalesce.

C. E. Goodman, who has been on Canadian Railway and Marine World's staff, as a business representative, for some time, during which he travelled over the entire Dominion, from Nova Scotia to British Columbia, has enlisted in the 1st Tank Battalion, and is now training at Ottawa, preparatory to going overseas.

Corporal Geo. K. Hudson, 13th Canadian Light Railway Operating Co., who was killed in action in France, Mar. 28, was the eldest son of T. C. Hudson, Master Mechanic, Canadian Northern Ry.,

Joliette, Que. He was born at Carleton Place, Ont., Sept. 10, 1897, and at the time of his enlistment, Feb. 28, 1917, was in the Canadian Northern Ry. mechanical department at Quebec. He left Canada in April, 1917, with the Skilled Railway Corps under Capt. McKillop.

Col. C. W. McLean, D.S.O., son of Major-General H. H. McLean, K.C., M.P., formerly President, St. John Ry., St. John, N.B., has been awarded two bars to his Distinguished Service Order, for services while in command of the 9th Scottish Division. He was specially mentioned in dispatches by Field Marshal Sir Douglas Haig.

Major C. V. McLean, of the Royal Artillery, son of Brig. Gen. H. H. McLean, K.C., M.P. for Royal, N.B., and formerly President, St. John Ry., is reported as wounded.

Lieut. J. D. McMurray, Vancouver, B. C., of the Canadian Railway Troops, was awarded the Military Cross recently for his conduct during very heavy enemy shell fire, when he accomplished the laying of 800 ft. of light railway. He personally took a train through a heavy barrage and enabled material to reach the work, and by his inspiring example and fearless devotion to duty he held his men together and finished most important work.

Engineer-Commander C. H. Oxlade, R.N.R., who was lost recently, when his armed trawler was sunk, was formerly chief officer of the C.P.R. s.s. Empress of India, and was well known in Vancouver, B.C.

W. J. D. Reed-Lewis, while on light railway construction, during the operations round Cambrai last autumn, as a lieutenant in the 6th Canadian Railway Troops, did work that brought special mention from headquarters, and he has been promoted to captain. He was employed as a civil engineer on the Hudson Bay Ry., and having taken his wife and young family to Barrie, Ont., where Mrs. Lewis came from, he went overseas, his efficient work in France resulting in his being seconded to the Imperial headquarters staff.

Lieut. W. R. Spencer, formerly Chief Dispatcher, Canadian Government Railways, Cochrane, Ont., son of George Spencer, Chief Operating Officer, Board of Railway Commissioners, Ottawa, who is Regimental Sergeant-Major, 13th Canadian Light Railway Operating Co., which has been operating a unit of light railways in France, has been awarded the meritorious service medal, in recognition of valuable service rendered in the field.

American Railway Engineering Association.—Following is a list of officials elected for the current year, at the association's recent annual meeting:—President, C. A. Morse, Chief Engineer, Chicago, Rock Island & Pacific Ry., Chicago; Vice President, H. R. Safford, Chief Engineer, G.T.R., Montreal; Treasurer, G. H. Bremner, Interstate Commerce Commission; Secretary, E. H. Fritch, Chicago; directors—J. L. Campbell, Chief Engineer, El Paso & Southwestern Ry.; E. A. Frink, Principal Assistant Engineer, Seaboard Air Line Ry.; E. H. Lee, Chief Engineer, Chicago & Western Indiana Rd.; nominating committee—J. E. Crawford, Chief Engineer, Norfolk & Western Ry.; H. T. Douglas, Jr., Chief Engineer, Chicago & Alton Ry.; J. V. Hanna, Chief Engineer, Kansas City Terminal Ry.; J. B. Jenkins, now on military service; J. E. Willoughby, Chief Engineer, Atlantic Coast Line Rd.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those of 1916, from July 1, 1917:

	Gross		Net	
	Earnings	Expenses	Earnings	Decrease
July	\$3,844,900	\$2,940,000	\$ 904,900	\$ 292,500
Aug.	3,405,200	2,812,000	593,200	478,800
Sept.	3,341,700	2,915,800	1,924,000	306,700
Oct.	3,941,600	3,350,500	591,100	629,200
Nov.	4,050,200	3,295,500	754,700	495,300
Dec.	3,273,200	3,207,900	65,300	758,500
Jan.	2,715,300	3,290,300	x575,000	1,057,100
Feb.	2,691,000	3,171,400	x480,400	588,600
	\$27,263,100	\$24,983,400	\$2,279,700	\$4,606,700
Incr	\$ 440,400	\$5,047,100		
Decr			\$4,606,700	
	x Deficit.			

Approximate earnings for March, \$3,436,300, and for three weeks ended Apr. 21, \$2,766,700, against \$3,273,200 and \$2,381,400 for same periods 1917.

Canadian Pacific Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, and increases or decreases, compared with those of 1917, from Jan. 1, 1918:

	Gross		Net	
	Earnings	Expenses	Earnings	Decrease
Jan.	\$10,789,818	\$9,621,824	\$1,167,993	\$1,263,485
Feb.	9,574,302	8,983,404	590,898	1,396,151
	\$20,364,120	\$18,605,228	\$1,758,891	\$2,658,636
Inc.	\$1,121,535	\$3,770,171		
Dec.			\$ 2,658,636	

Approximate earnings for March, \$12,265,000, and for three weeks ended Apr. 21, \$8,935,000, against \$11,692,000 and \$8,371,000 for same periods 1917.

Grand Trunk Railway Earnings.

Subject to audit, the accounts for 1917 show the following results, compared with those for 1916:

	1917.	1916.
Gross receipts	\$10,725,500	\$9,819,700
Working expenses	9,002,900	7,228,000
Net receipts	\$1,722,600	\$2,591,700
Balance of income from rentals and hire of equipment	68,000	62,400
Total net revenue	\$1,790,600	\$2,654,100
Net revenue charges, less credits	1,496,700	*1,914,600
Balance	\$293,900	\$739,500
Grand Trunk Western Ry.	Dr.95,200	Cr.119,200
Detroit, Grand Haven & Milwaukee Ry.	Dr.143,600	Dr.40,200
Toledo, Saginaw & Muskegon Ry.	Dr.28,800	Dr.16,200
Surplus	\$26,300	\$802,300

*Including special allocation of \$400,000 for contingencies.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from Jan. 1 to Mar. 31:—	1918.	1917.	Decrease
G.T.R.	\$10,304,506	\$10,836,188	\$531,682
G.T.W.R.	1,921,780	1,989,536	67,756
D.G.H. & M.R.	666,567	716,177	49,610
Totals	\$12,892,853	\$13,541,901	\$649,048

Approximate earnings for three weeks ended Apr. 21, \$4,132,801, against \$3,403,918 for same period 1917.

Grand Trunk Pacific Ry. Earnings.

Approximate receipts for March, \$600,430, against \$405,695 for March, 1917; aggregate receipts from Jan. 1 to Mar. 31, \$1,505,025, against \$1,031,315 for same period 1917.

Quebec Bridge Commission.—An Ottawa press report of April 26 stated that C. N. Monsarrat, Chairman of the commission, was there arranging for the transfer of the commission's office from Montreal to Ottawa, where the commission's work will be wound up, which will probably take about a year. It also stated that in addition to working on the commission, Mr. Monsarrat had been appointed a consulting engineer to the Railways Department.

Mainly About Railway People Throughout Canada.

Jno. Gray, Freight Agent, G.T.R., Toronto, who died there recently, left an estate of \$11,550, to his widow.

Joseph H. Meglemry, Assistant General Freight Agent, Michigan Central Rd., Buffalo, N.Y., died there, Apr. 2.

R. Home Smith, Toronto, who is President, Mexico North Western Ry., has also been elected President, Buffalo, Lockport & Rochester Ry.

Hayter Reed, formerly Manager in Chief of Hotels, C.P.R., who has been in England since Nov., 1917, is expected in Canada shortly. Mrs. Reed is at Dinard, France.

Jas. Flintoft, for years Sheriff of Lambton County, who died at Sarnia, Ont., April 5, aged 76, was the father of E. P. Flintoft, Assistant General Solicitor, C.P.R., Montreal.

Geo. McLaren Brown, European Manager, C.P.R., London, Eng., has, according to a press dispatch, been appointed Assistant Director General of Movements and Railways, at the War Office, with the rank of colonel.

Mrs. A. E. Stevens, wife of the General Superintendent, C.P.R., Moose Jaw, Sask., died at Los Angeles, Calif., April 17, of pneumonia, while on a trip with her husband. Their eldest son, Flight Lieut. Alex. Stevens, is at the front.

C. W. Mitchell, who is spoken of in a press dispatch as "one of the few surviving engineers who were engaged on the first survey for the C.P.R. along the Fraser River Valley and in the mountains," died at Vancouver, B.C., Apr. 15; aged 64. He was born at Newcastle, N.B.

S. P. Howard, formerly General Freight Agent, Eastern Lines, C.P.R., Montreal, has been awarded \$40,000, as damages against J. Findlay, for wrongful dissolution of a partnership. He retired from C.P.R. service May 31, 1910, after 28 years service, and entered the real estate business with Mr. Findlay.

H. Rindal, who has been elected a member of the Canadian Society of Civil Engineers, was born at Tyvold, Norway, Nov. 1, 1879. He was for some time in service with the Norwegian Government Railways, and the Pennsylvania Rd., and entered C.P.R. service in 1903, since when he has been, to 1905, Resident Engineer; 1905 to 1907, Assistant Division Engineer; since 1910, Engineer, British Columbia District, Vancouver.

Frederick A. Rutherford, whose appointment as Inspector of Transportation, G.T.R., Montreal, was announced in our last issue, was born at Parkhill, Ont., Sept. 16, 1877, and entered G.T.R. service, Jan. 18, 1894, since when he has been, to July, 1894, assistant to agent, Aylmer, Ont.; July, 1894, to July, 1900, telegraph operator, various points; July, 1900, to Jan., 1908, dispatcher, London, Ont.; Jan., 1908, to Mar., 1914, Chief Dispatcher, London, and Stratford, Ont.; Mar., 1914, to June, 1917, Trainmaster, Battle Creek, Mich.; June, 1917, to Feb. 1, 1918, Trainmaster, Durand, Mich.

Sir Collingwood Schreiber, K.C.M.G., General Consulting Engineer to Dominion Government, whose death was announced in our last issue, left an estate valued at \$144,331, made up as follows: Household goods and furniture, \$3,000; life insurance, \$16,443.21; stocks, \$10,313.75; bonds, \$104,565.12; cash on hand, \$800; cash in bank, \$1,209.11; real estate, \$8,000. The

widow is left the furniture, etc., \$70,000 is left a trust company to be invested, the interest to be paid half yearly to the widow until her death or second marriage. The rest of the estate is to be divided among his four married daughters, who were also made residuary legatees.

John Flynn, who has been appointed Car Foreman, C.P.R., Smiths Falls, Ont., was born Dec. 5, 1867, and entered railway service in June, 1887, since when he has been, to 1900, Car Foreman, G.T.R., Little York, Ont.; 1900 to June, 1910, Car Foreman, Brock St. Shops, G.T.R., Toronto; June to Dec. 31, 1910, Car Foreman, Grand Trunk Pacific Ry., Transcona, Man.; Dec. 31, 1910, to Oct., 1913, Car Foreman, G.T.P.R., Edson, Alta.; Dec., 1913, to Feb., 1914, Car Foreman, Cana-



H. E. Whittenberger,
General Superintendent, Western Lines, Grand
Trunk Railway.

dian Northern Ry., Rosedale, Toronto; Apr. to Aug., 1914, carpenter, C.P.R., London, Ont.; Aug., 1914, to Apr., 1917, Car Foreman, C.P.R., White River, Ont.; Apr., 1917, to Mar. 30, 1918, carpenter, G.T.R., Windsor, Ont.

W. R. Davidson, who has been appointed General Superintendent, Eastern Lines, G.T.R., Montreal, was born at Everton, Mo., Nov. 8, 1871, and entered railway service in Jan., 1890, since when he has been, to July, 1901, operator, Missouri Pacific Ry., at various points; July, 1901, to Mar., 1904, dispatcher, same road, Wichita, Kan.; Mar. to Oct., 1904, Chief Dispatcher, same road, Wichita, Kan.; Oct., 1904, to Mar., 1911, Trainmaster, same road, Wichita, Kan.; Mar., 1911, to Feb., 1913, Trainmaster, G.T.R., London, Ont.; Feb., 1913, to Mar., 1916, Superintendent, G.T.R., London, Ont.; Mar., 1916, to Sept., 1917, Superintendent, G.T.R., Detroit, Mich.; Sept., 1917, to May 1, 1918, General Superintendent, Western Lines, G.T.R., Chicago, Ill.

John Lambert Abell, whose appointment as Chief Dispatcher, Sudbury Division, Algoma District, C.P.R., was an-

nounced in our last issue, was born at Morganfield, Ky., Oct. 3, 1884, and entered railway service in Apr., 1902, since when he has been, to Oct., 1904, agent and operator, Illinois Central Rd., Louisville, Ky.; Nov., 1904, to Dec., 1908, agent, operator and dispatcher, Northern Pacific Ry., Jamestown, N.D.; Jan., 1909, to Aug., 1911, dispatcher, Wabash Rd., Moberly, Mo.; Aug., 1911, to Apr., 1916, dispatcher, C.P.R., Medicine Hat, Calgary, and Edmonton, Alta.; Apr., 1916, to June, 1917, Chief Dispatcher, C.P.R., Medicine Hat, Alta.; June to Sept., 1917, Chief Dispatcher, C.P.R., Winnipeg; Dec., 1917, to Mar. 12, 1918, Night Chief Dispatcher, C.P.R., Smiths Falls, Ont.

H. E. Whittenberger, who has been appointed General Superintendent, Western Lines, G.T.R., Chicago, Ill., was born at Peru, Ind., Nov. 9, 1869, and entered transportation service in 1885, since when he has been, 1885 to Feb., 1887, various positions, Wabash Rd.; Feb., 1897, to May, 1902, Trainmaster, Middle Division, G.T.R.; May, 1902, to Sept., 1904, Superintendent, Denver & Rio Grande Ry.; Sept., 1904, to Jan., 1906, Superintendent, Cincinnati, Hamilton & Dayton Rd., Indianapolis, Ind.; Jan., 1906, to Sept. 30, 1907, Superintendent, Kansas City & Southern Rd.; Sept. 30, 1907, to Oct. 17, 1912, Superintendent, Eastern Division, G.T.R., Montreal; Oct. 17, 1912, to Jan. 14, 1913, Superintendent, Middle Division, G.T.R., Toronto; Jan. 14, 1913, to May 1, 1918, General Superintendent, Ontario Lines, G.T.R., Toronto.

Andrew Meade Adams, whose appointment as Local Freight Agent, G.T.R., Toronto, was announced in a recent issue, was born at London, Ont., Dec. 31, 1870, and entered G.T.R. service June 7, 1886, since when he has been, to Mar., 1898, in various positions in the local freight office, London, Ont.; Apr., 1898, to Aug., 1900, assistant accountant, Superintendent's office, Toronto; Aug., 1900, to Mar., 1904, chief clerk, General Roadmaster's office, Toronto; Mar. to Aug., 1904, Freight and Passenger Agent, Central Vermont Ry., Norwich, Conn.; Aug. to Nov., 1904, Freight and Passenger Agent, C.V.R., Montpelier, Vt.; Nov., 1904, to Apr., 1905, Freight Agent, C.V.R., St. Albans, Vt.; Apr., 1905, to Apr., 1908, chief clerk, General Roadmaster's office, G.T.R., Toronto; Apr., 1908, to Feb., 1912, chief clerk, local freight office, Toronto; Feb., 1912, to Feb., 1913, chief accountant, local freight office, Toronto; Feb., 1913, to Feb., 1918, Local Freight Agent, Hamilton, Ont.

C. G. Bowker, who has been appointed General Superintendent, Ontario Lines, G.T.R., Toronto, was born at Medford, N.J., Apr. 21, 1871, and entered railway service in May, 1888, since when he has been, to Oct., 1890, operator, Philadelphia & Reading Rd.; Oct., 1890, to 1893, operator, New England Division, same road; 1898 to 1897, in charge of telegraph lines and electrical service, Buffalo Division, Lehigh Valley Rd., Buffalo, N.Y.; May, 1900, to Feb., 1902, train dispatcher, G.T.R., London, Ont.; Feb., 1902, to Nov., 1905, train dispatcher, G.T.R., Durand, Mich.; Nov., 1905, to May, 1907, Chief Train Dispatcher, G.T.R., Stratford, Ont.; May, 1907, to Sept., 1909, Trainmaster, G.T.R., Stratford, Ont.; Sept., 1909, to May 13, 1911, Assistant Superintendent, Middle Division, G.T.R., London, Ont.; May 12, 1911, to Jan., 1913, Joint Superintendent, G.T.R. and Wabash Rd., St. Thomas, Ont.; Jan., 1913, to May 1, 1918, General Super-

intendent, Eastern Lines, G.T.R., Montreal.

Andrew Aitken, who is acting as Traffic Manager, Reconstruction Committee, Halifax, N.S., was born at Decewsville, Ont., Oct. 12, 1872, and entered railway service in July, 1890, since when he has been, to July, 1896, freight checker, baggage master, switch tender and draw-bridge tender, G.T.R., Merritton, Ont.; July, 1896, to Aug., 1897, brakeman, G.T.R., London, Ont.; Aug., 1897, to Jan., 1898, brakeman, G.T.R., Niagara Falls, Ont.; Jan. to Mar. 8, 1898, yard helper, yard foreman and yardmaster, C.P.R., Vancouver, B.C.; Mar. 8, 1898, to Nov. 13, 1912, General Yardmaster, C.P.R., Vancouver, B.C.; July 22, 1913, to July 1, 1914, Yardmaster, C.P.R., North Toronto, Ont.; July 1, 1914, to May 1, 1917, General Yardmaster, C.P.R., Toronto; May 1 to Oct. 15, 1917, Traffic Manager during construction of aviation camps at Armour Heights and Leaside, Toronto; Oct. 15 to Nov. 29, 1917, General Yardmaster, C.P.R., Toronto; Nov. 29 to Dec. 13, 1917, Assistant Superintendent, Toronto Terminal Division, Ontario District, C.P.R., Toronto.

W. H. Winterrowd, A.M.Can.Soc.C.E., whose appointment as Chief Mechanical Engineer, C.P.R., Montreal, was announced in our last issue, was born at Hope, Ind., Apr. 2, 1884, and educated at Shelbyville, Ind., and Purdue University, whence he graduated with the degree of B.S. in 1907. He entered railway service in 1905, since when he has been, to 1906, blacksmith's helper, Lake Erie & Western Ry., Lima, Ohio; 1906 to 1907, air brake and car repair man, Western Lines, Pennsylvania Rd., Dennison, Ohio; 1907 to 1908, special apprentice, Lake Shore & Michigan Southern Ry., Elkhart, Ind.; 1908 to 1909, Roundhouse Foreman, Lake Erie, Alliance & Wheeling Ry., Alliance, Ohio; 1909 to 1910, Night Roundhouse Foreman, Lake Shore & Michigan Southern Ry., Youngstown, Ohio; 1910, Roundhouse Foreman, same road, Cleveland, Ohio; 1910 to Sept., 1912, Assistant to Mechanical Engineer, same road, Cleveland, Ohio; Sept., 1912, to May, 1915, Mechanical Engineer, Angus locomotive shops, C.P.R., Montreal; May, 1915, to Apr. 1, 1918, Assistant to Chief Mechanical Engineer, C.P.R., Montreal.

John McMartin, M.P. for Glengarry, Ont., who died at Montreal, April 12, aged 48, after being in poor health for a year, was born in Charlottenburg Tp., Ont., and went to the western states at an early age. He began by working for two years in a lumber camp; next he went with the Ontonaga & Brylie River Rd., and became foreman of the construction gang. In 1883 he entered C.P.R. employ as Superintendent of Construction on the Lake Superior section, and remained until 1885, when he went to the Rocky Mountain division, and from there to Leadville, Col. He had a subcontract on Hell Gate division of the Colorado Midland Ry., and remained there until 1887. In 1889 he had a contract on the Denver & Rio Grande Rd. through Price Canon, and in 1891 took a contract on the Great Northern Rd. in Montana; in 1892, in Washington; in 1893, on Nakusp & Slovan Ry. in British Columbia; in 1895, on Parry Sound Ry., also on the Tillsonburg & Pacific Ry. In 1897 he went into mining business, and had a contract on the Crow's Nest Ry. in 1898, and contracts in order on the Columbia & Western Ry., the Kootenay Valley Ry., the Algoma Central, the Lindsay & Port Burwell Ry., the C.P.R. Sudbury branch. In 1904 he became interested in the La Rose mine, and shortly after

in the Hollinger and other mining interests in Cobalt. He was Vice President of the Hollinger Mines, Vice President and director of Canadian Mining Finance Co., President of Princess Realty Co., President of Labrador Pulp & Lumber Co., President of Motherlode Sheep Creek Mining Co. of British Columbia, and was connected with many other Canadian corporations.

Charles F. Sise, Chairman of the board of directors, Bell Telephone Co. of Canada, who died at Montreal, Apr. 9, was born at Portsmouth, N.H., Sept. 27, 1834. On the completion of his school life, he took to sea, his father being a merchant and shipowner, and he qualified as a master before reaching 21. He subsequently commanded several vessels in the Atlantic, Pacific and Australian trades, and later took charge of his father's shipping and cotton business at New Orleans and Mobile. During the civil war, he acted as secretary to Jefferson Davis, and also



W. H. Winterrowd, A.M.Can.Soc.C.E.,
Chief Mechanical Engineer, Canadian Pacific
Railway.

engaged in blockade running. After the war, he took charge of his father's business in Liverpool, Eng., and later returned to the U.S. and engaged in the insurance business at Boston, Mass. While there, he became associated with others who were financially interested in A. Graham Bell's telephone patents, and after the formation of the telephone company in the U.S., he came to Canada in 1879 to amalgamate the various telephone companies, which eventually led to the formation of the Bell Telephone Co. of Canada, which was incorporated in 1880, with head office at Toronto, and which was later moved to Montreal. He was appointed Managing Director, and in May, 1890, was elected President, holding that position until Feb., 1915, when he retired on account of age, but remained as Chairman of the Board. In addition to the Bell Telephone Co., he was associated with numerous other concerns, industrial, manufacturing and financial, among them being, the Wire & Cable Co., Northern Electric Co., North American Telegraph Co., Canadian Westinghouse Co., Sincennes-McNarhton Line, Nova Scotia Telephone Co., New Brunswick Telephone Co., etc. He is sur-

vived by three sons, E. F. Sise, Managing Director, Wire & Cable Co.; C. F. Sise, General Manager, Bell Telephone Co., and Paul F. Sise, Vice President and General Manager, Northern Electric Co.

Telegraph, Telephone and Cable Matters.

H. Hulatt, Manager of Telegraphs, G.T.R. and Grand Trunk Pacific Ry., returned to Montreal recently, after a trip of inspection over the western lines. While in Winnipeg, a meeting of G.T.R. telegraph officials was held, when a number of subjects concerning the efficiency of the service, co-operation, etc., were discussed.

D. Adams, local manager, Great North Western Telegraph Co., London, Ont., has retired from active service. He entered telegraph service in 1869, with the Montreal Telegraph Co., at Montreal, and was afterwards transferred to Sackville, N.B., where all Canadian cables were handled. He moved to London in the seventies, and subsequently, was for five years with the Western Union Telegraph Co., in New York; for one year with the American Union Telegraph Co. in Cleveland, Ohio, and one year with the Western Union Telegraph Co. in Chicago, Ill., returning to London with the Great North Western Telegraph Co.

Among the Express Companies.

R. J. Hardy, heretofore agent, American Ex. Co., Crysler, Ont., has been appointed agent at Russell, Ont.

J. H. Greig has been appointed acting route agent, Dominion Ex. Co., St. John, N.B., vice W. M. Johnston, transferred.

W. M. Johnston, heretofore route agent, Dominion Ex. Co., St. John, N.B., has been appointed route agent at Montreal.

G. Laroux, heretofore at Santa Clara, N.Y., has been appointed agent, American Ex. Co., Crysler, Ont., vice R. J. Hardy, transferred.

Mrs. Boswell, widow of the late J. A. Boswell, at one time Superintendent of the Dominion Ex. Co. at Montreal, died at Hamilton, Ont., April 5, aged 75. The funeral took place from the house of her son in law, W. H. Burr, Traffic Manager, Dominion Ex. Co., Toronto.

The Interstate Commerce Commission has ordered American Ex. Co. and Great Northern Ex. Co. to refund \$162.58, and American Ex. Co. and Northern Ex. Co. to refund \$469.42, with interest, to Bright Emery Co., Winnipeg; and American Ex. Co. and Great Northern Ex. Co. to refund \$77 with interest to Pioneer Fruit Co., Brandon, Man., in connection with overcharges on fruit shipped from Hood River, Ore., to Winnipeg and Brandon respectively, in 1914.

The Canadian Express Co.'s annual meeting was held at Montreal, April 19, H. G. Kelley, Chairman of the Board, presiding. The company's experience has been similar to that of all other transportation companies in recent years, viz., rapidly rising expenses due to higher wages and cost of supplies and materials. Mr. Kelley therefore intimated that if the high character of the service is to be maintained, it may be necessary to ask the Board of Railway Commissioners to approve some increases in rates. The directors for the current year are:—H. G. Kelley, Chairman of Board; John Pullen, President; Frank Scott, Secretary-Treasurer; W. H. Biggar, K.C., J. E. Dalrymple, U. E. Gillen, Hugh Paton.

Electric Railway Department

Increases in Electric Railway Freight and Passenger Rates Authorized by Board of Railway Commissioners.

The Chief Railway Commissioner, Sir Henry Drayton, gave the following judgment, Mar. 28, on the London & Port Stanley Ry.'s application for authority to increase its standard passenger tariff from 2½c a mile to 3c a mile, and its standard freight mileage tariff by 15%.

The application in this case really involves the extension of the advances allowed by the board on the application of railways operated by steam for a general advance in rates to the electric lines. No electric railway was party to that application, and the board's judgment did not deal with rates on electric lines as such. And this for very good reasons; not only was no application made for an increase, but one of the greatest items of increased cost, viz., the item of coal, is entirely lacking in electric railways operated with hydraulic power. The present applicant operates with hydro power. Some of the electric railway companies have, since the recent advance was allowed the steam lines, filed tariffs making similar advances in their rates. These tariffs have been disallowed by the board, until the necessities of the electric lines were established.

The London & Port Stanley Ry. has since filed its application, and has submitted data reflecting its increased costs and the effect that the increased cost schedule has had upon its operations. No other electric railway line in eastern territory has, as yet, submitted to the board evidence on which an increase of rates could be justified. While the London & Port Stanley Ry. does not apply on behalf of itself and all other electric railway companies, that company, operating, as it does, in a densely populated part of the province, and being without unprofitable mileage, confining its operations between terminals already developed, could well be taken as an electric line which should show, in the highest degree, having regard to the character of its equipment, the economies of electric railway operation.

The Manager and Treasurer of the company, which is operated for the City of London by a commission, has filed statements showing the increase in the rate of wages of conductors, motormen, and train men, as between July 1, 1915, and Jan. 1, 1918, amounting to an average increase of 32.421%. Increases approximating a similar percentage advance are shown to be typical and applicable to most of the employees. Comparative prices of supplies as filed by the L. & P.S.R. show a state of affairs practically the same as the exhibits filed by the steam railway companies in their case, the percentage increase being very heavy, in some instances, for example, rails, running as high as 166.363%.

The London Commission, however, shows that it has in the past earned its fixed charges on the old rates, but it is insisted by it that the city is entitled to a greater return than ¼ of 1% dividend on the monies invested in the electrification scheme. On the face of it, as it occurs to me, the monies that are invested in the electrification scheme are already earning interest at the rate of 5½%, that interest being charged on the bonds issued for the change to electricity. It is, of course, true that the city, as a city, nets

nothing out of the 5½% thus paid, and that, as far as its revenue is concerned, in view of the liabilities it has assumed, the point taken by Treasurer Richards, may perhaps be well taken. The cost of the change, however, from steam to electrification, cannot well be looked upon as the whole cost of the road. The London Commission's statement, submitted in support of this phase of the application, says:—"The cost of the road previous to electrification is placed by the city at \$1,169,118.52 on Dec. 31, 1914, and the rental received by the city is the return it receives on this old investment. The agreement between the city and the London Commission fixed this rental at \$20,000 for the first 10 years, \$25,000 for the next 20 years, \$30,000 for the next 20 years, \$40,000 for the next 20 years, and \$50,000 for the next 29 years."

The rental reserved for the first ten years gives a return of less than 2% on the original cost. In considering what a fair return on the line's operations would be, it would certainly not be unfair to the public to place the amount of capital on which the commission operating for the city ought to earn a return, at \$1,759,507. I arrive at this amount by accepting the cost returned by the commission of electrification, and which amounts to \$1,174,948, and by cutting the cost of the road to the city, previous to electrification, in two, although I have no doubt that as a matter of fact the cost returned by the city is perfectly correct. Making, however, this large and arbitrary reduction in capital account, there is still no doubt that on the evidence submitted by the applicant, it is entitled to the same measure of relief the steam roads have obtained. In order to properly carry an investment of this amount, the railway ought to earn approximately \$130,000 over and above operating expenses and taxes. Not only have rents and capital charges to be carried, but the plant has to be, in part, from time to time renewed, and the increased demands of traffic met. This ought to be done without the undue inflation of capital charges, by the exclusive use of new capital.

It is true that so far as the passenger equipment of the road is concerned, and its electrification, the standard is high, but it is also true that the company is able to carry on, by reason of its peculiar position, a relatively large freight business, having regard to its total operations, with the use of but four freight cars. It is obvious that such a condition as this may at any time change, and the company be compelled to acquire more freight equipment. The company's whole earnings for the year ended Dec., 1916, are returned as \$316,886.68. These figures do not include any revenue from Stanley Park, that being a matter entirely unconnected with either the direct revenue or the expenses of the railway function. The company's total operating expenses for the same period were \$186,554, leaving a balance, available for capital account and replacement fund, of \$130,332. The taxes paid by the company for the year were \$6,647, leaving the company with \$123,685. As a result, it is perfectly clear that the rates charged by the L. & P.S.R. in 1916 were not excessive. The year's

operations left the road, under the basis that I think to be fair, merely in a proper position. The rates, of course, in 1917 were the same as in 1916; but, in 1917, as a result of increased expenses, the net result was materially decreased. In 1917, the gross receipts were \$318,034, an amount slightly in excess of the gross of 1916. The expenses, however, increased from \$186,554 to \$220,227, leaving a net balance of \$97,807, to cover capital charges and taxes, as against \$130,332 in 1916. The net result of the year's operations, had the company continued to pay taxes to the different municipalities in which it operates, and assuming that the rate of taxation and amount of assessment had not been increased, would have resulted in a balance available for capital charges and replacement fund of \$91,160, against \$123,685 for 1916, involving a loss from the previous year's operation of \$32,525. The London Commission states that as a public utility it does not now pay taxes.

The London Commission's figures, dealing with capital charges and surpluses, call for an annual capital charge made up of 5.5% for interest on the cost of electrification, 1.8% for sinking fund, and the \$20,000 rental payable to the city for the first 10 years. While the basis of a changeable rent, or any rent, as such, is not a basis which can be adopted for the purpose of rate computation, the London Commission's figures quite closely approximate the above results. These figures show a reduction in the company's surplus, which is obtained after deducting capital charges (5.5% interest, 1.8% sinking fund, and rent) and operating costs, in the following manner, the figures being given for half-year periods, so as to aid in making comparisons:—

The surplus for Jan.-June, 1916, is reported as	\$18,984
The surplus for July-Dec., 1916, is reported as	28,497
Making a total surplus for 1916 of ..	\$47,481
For Jan.-June, 1917, a deficit is reported of	\$ 4,450
For July-Dec., 1917, a surplus is reported of	20,865

 Making a net surplus for 1917 of .. \$16,415

As a result, as computed by the London Commission, the company's net fell off \$31,016, a reduction of 66%. The surplus of 1917 was arrived at without the deduction of any taxes. These taxes should be deducted, in order to arrive at a proper comparison of the earnings of the two years. Amounting as the taxes did, for the year previous, to \$6,647, had taxes been paid, the surplus in 1917 would have been but \$9,768, resulting in a reduction in surplus of \$37,663, or over 75%. The London Commission also advises that its operations, including fixed charges, resulted in a deficit for Jan., 1918, of \$6,941, and for Feb., 1918, of \$6,066, making a total deficit for the two months of \$13,007. The statements filed in support of the application show that Mar., April, May, and June, 1917, gave a surplus of \$3,469, while a total deficit of \$4,450 was returned for the six months period. As a result the deficit for Jan. and Feb., 1917, was \$7,919. The increased cost schedule is again indicated in the fact, that for the two poor months of this year the de-

feit of \$7,919 for 1917 is increased by \$5,088 in 1918.

Accepting, as I do, the submissions made by the London Commission, it is clear that the company's rates are insufficient to properly cover the costs of operation under the conditions of today. Although the London Commission is not under the heavy burden of increased coal costs, but enjoys the full benefit of electrification, the results of operation under today's conditions are such that relief must be afforded, and it requires relief to the full extent that relief has been accorded the steam roads. The London Commission, however, in some instances applies for greater advances than those allowed the steam roads. In passenger rates, the application asks for an increase in the standard passenger tariff from 2½ to 3c a mile. The steam roads have been allowed to increase their passenger rates by 15%, while the London Commission's request is for 20%. Rightly or wrongly, it has always been considered that the carriage of passengers on electric railways, just so soon as a proper density of traffic can be maintained, is much cheaper than on steam roads. The L. & P.S.R. enjoys large gross earnings, greater per mile than those of any similar railway in Ontario. While the standard passenger tariffs in eastern territory were, before the recent advance, 3c a mile, as a rule the electric rate was lower. Besides the London & Port Stanley, the Montreal & Southern Counties, the Montreal Park & Island, the Montreal Terminal, the London & Lake Erie, the Brantford Municipal, and the Chatham, Wallaceburg & Lake Erie Railways may be instanced as companies operating under standard passenger tariffs of 2½c. The Hamilton Radial operates under a standard tariff of but 2c a mile. It may also be noted that, if the applicants were now operating under the Ontario statute, their rates under that act, instead of being increased, would have to be reduced from 2½c to 2c a mile. Under the circumstances, and in the absence of any special hearings, I would maintain the present spread between the standard passenger tariffs on steam and electric roads and only allow an increase of 15% in the companies' tariffs.

The London Commission also asks for a special increase of coal rates. The application on this point reads:—"We make application for permission to increase the rates on coal, bituminous and cannel, from Port Stanley to all points on the L. & P.S.R. (London, Somerset, Westminster, Glanworth, Yarmouth, Whites and St. Thomas) from 50c. a net ton to 75c. a net ton. Our reasons for making this request are the same as those given in our application for permission to increase our standard passenger and freight tariffs. Without repeating same, we wish to have this application supported by the statements attached to the above application. The 75c rate is slightly under the rate that would have been effective to these points, had various rates and increases allowed to steam roads been maintained. That is, the old rate of 58c plus Sept., 1916, increase of 15%, plus Mar., 1918, increase of 15c, 79c. The tonnage affected on the basis of 1917 business is 8,773 tons to St. Thomas, and 11,995 tons to London."

The board allowed a flat increase of 15c a ton in the steam roads' coal tariffs. The claim made by the London Commission as to the rate charged for the carriage of coal before the electrification of the L. & P.S.R. is correct, but the general basis of coal rates was changed by the board in the eastern rates case of 1916. In so far as the operation of the L. & P.S.R.

by the Pere Marquette Rd. is concerned, the tariffs of that railway provided for the payment of 58c a ton from Port Stanley, both to London and St. Thomas. After the electrification of the road, the London Commission made a large cut in the coal rate from Port Stanley to St. Thomas, taking 23c off the rate. It also made a cut in the rate to London, reducing it by 8c. As a result, coal was then carried to St. Thomas for 35c and to London for 50c a ton.

The question which the board had before it in 1916, was, of course, the rates charged on coal by the large systems which carried the very great bulk of the traffic. The rates were regrouped, and coal ex Black Rock, consigned to points west of group 1 (which consisted of points on the Niagara River) carried a blanket rate of 44c a ton. The longest haul under this blanket is 20 miles. The mileage from Port Stanley to St. Thomas is 11 miles, and the reduced rate of 35c put in by the London Commission for that haul would fall within the distance covered by the 44c blanket rate. The next group, ex Black Rock, covers movements up to 50 miles, and these rates were fixed by the board at 55c a ton. Both these rates included the 10% increase which the board allowed. As a result, on distances up to 20 miles, and past the Niagara River, steam roads now obtain on their coal haul from Black Rock, adding the 15c a ton allowed recently, a return of 59c a ton; and for hauls up to 50 miles, 70c a ton.

The eastern rates case judgment was issued in June, 1916, and on Aug. 1, 1916, the London Commission raised the rate to St. Thomas to 50c a ton, or 6c over the Black Rock 20 mile blanket rate. As a result of the adjustment made by the London Commission, after the judgment in the eastern rates case, a rate was left which certainly could not be described as unduly low, having regard to the rates fixed by the board in the eastern rates case, on the movement of coal from Black Rock. Similarly, the rate on coal from Black Rock to London was fixed in the eastern rates case at 99c a ton for a haul of 127 miles. The rate on coal allowed by the board from Detroit to London, under the same judgment, was 72c a ton, the haul here being 112 miles, resulting in a charge of 0.643c per ton mile. The longer the haul, of course, the lower the per ton mile ought to be. Bearing this qualification in mind, the London Commission's rate to St. Thomas secures a gross of 4.54c a ton per mile, and to London 1.23c a ton per mile.

The coal increases asked by the London Commission amount to 50% increase on the present rates. If the London Commission is held down to the increase allowed to steam lines, of 15c a net ton, that increase would amount to 30% on the short hauls that are here involved; and, in view of the London Commission's short mileage, this percentage increase is not weighted down by long hauls involving rates of \$1 and upwards, as in the case of the large systems. It is inevitable that a flat increase benefits the company with the short mileage, such as the L. & P.S.R., much more than the larger systems, while conversely percentage increases produce greater results to the large systems with long hauls. Taking everything into consideration, I am of the opinion that the L. & P.S.R. is entitled to a flat increase of 15c a ton. An increase in rate of 25c, would create rates entirely out of line with other rates. A 75c rate for the 11 mile haul to St. Thomas, or for the 29 mile haul to London, would certainly be excessive, as compared with the G.

T.R. rate, as increased, of 87c for the 112 mile haul from Detroit to London, after making every allowance for the fact that the movement to London on the G.T.R. is one of the longest hauls under a blanket rate.

It is usual to hold hearings before taking any action on an application such as this. In the present instance, however, I am convinced that none need be held. The absolute necessity of greater railway earnings, although seriously challenged at the time the board took action in the case of the steam roads, is now practically generally admitted. The whole question was most exhaustively argued and considered in the main case. Increased costs are common, of course, in the United States as well as in Canada. While having no bearing on the propriety of the board's action, in the main case, in the appeal from the board's judgment to the Governor in council, allegations were made that the Interstate Commerce Commission had taken no such action on similar applications which had been made by United States carriers prior to the application to this board. It may be noted that similar increases have since been allowed in U.S. territory. Many of the cost factors now alleged by the applicant have been already passed upon in the former case. As a matter of fact, the only matter of advanced costs not on common ground is the question of coal and the fact that the applicant, by the use of hydraulic electricity, has escaped the added cost of coal. The figures and statements of the L. & P.S.R., however, make absolutely clear its necessity for more revenue, assuming always that the railway is to be treated as a commercial venture, and to be maintained without loss to the London ratepayers, either in connection with its operations, or what, in the long run, is much worse, depletion of the property assets, owing to undue economies and scamped maintenance. On the case they have made out, as I see it, the London commissioners would have been derelict in their duty as trustees had the application not been made.

The increases awarded are but temporary—they only apply while the present abnormal and excessive costs prevail. I would, therefore, act upon the application without the delays that are incident to hearings. Similar relief will be extended to any other electric line that satisfies the board that its operation and financial condition are such as to require relief.

Orders Passed by the Board.

The Board of Railway Commissioners has passed the following orders affecting electric railway rates:—

Lake Erie & Northern Ry. 27,105, April 4. Authorizing L.E. & N.R. to advance its freight rates 15%, and its passenger rates from 2½c a mile to 2¾c, advances not to become effective before April 15.

Lake Erie & Northern Ry.—27,121, April 10. Approving L.E. & N.R. Standard Freight Tariff of Maximum Mileage Tolls C.R.C. 103, and Standard Passenger Tariff C.R.C. 23, filed on basis permitted by board in order 27,105, April 4, to become effective April 15.

London & Lake Erie Ry. & Transportation Co. 27,106, April 4. Authorizing L. & L.E.R. & T. Co. to advance its freight rates 15%, its passenger rates from 2½c a mile to 2¾c; and its bituminous and cannel coal rates by 15c a ton, increases to become effective April 15.

London & Port Stanley Ry. 27,104, April 2. Authorizing L. & P.S.R. to in-

crease its standard freight mileage tariff by 15%, its standard passenger tariff basis from 2½c a mile to 2%; its bituminous and cannel coal rates by 15c a ton, increases to become effective April 15.

London & Port Stanley Ry.—27,117. Approving L. & P.S.R. Standard Freight Tariff of Maximum Mileage Tolls C.R.C. 176, and Standard Passenger Tariff C.R.C. 115, naming maximum fare per mile, filed on basis permitted by board in order 21,704, April 2, to become effective April 15.

Oshawa Ry. General order 215C, April 4. Approving Oshawa Ry.'s standard freight mileage tariff, C.R.C. 15, to become effective Apr. 15, it having been filed on the basis permitted by the board in general order 213, Dec. 26, 1917.

Applications for authority to increase freight and passenger rates have also been made to the board, by the Hamilton Radial Ry., Montreal & Southern Counties Ry., Quebec Ry., Light & Power Co., Chatham, Wallaceburg & Lake Erie Ry., and Hull Electric Co. The British Columbia Electric Ry. has applied for authority to advance freight rates on two of its subsidiaries, the Vancouver & Lulu Island Ry. and Vancouver, Fraser Valley & Southern Ry. The Windsor, Essex & Lake Shore Rapid Ry. has applied for authority to increase its freight rates.

The Winnipeg Electric Railway's New Street Car.

The new type of street car which the company is placing in service in Winnipeg, we are officially advised, embodies several new features and modifications of the older types which experience has demonstrated are advantageous for the city's lines. The first of the new cars has been delivered and has been given a trial, which has proved satisfactory. The first and most noticeable feature is that the car has a lower body than the older type, thus making only one step necessary to enter. In order to effect this improvement, a new style of truck had to be planned which, it is claimed, will admit of smoother and more economical operation. The single step is hinged, and is operated in connection with the door, so that when the door is closed the step is folded against the side of the truck, and when the doors are opened the step drops down ready for the use of passengers. The step is covered with a lead anti-slip tread as an additional factor of safety for passengers. A signal lamp is fitted before the motorman, which comes into operation when the doors of the car are closed, so that until this operation is completed the motorman is without orders to go ahead. A signal bell for emergency use is also provided. Passengers can make their exit by the front, as well as by the rear—the car being of the p.a.y.e. type—the front exit door being in charge of the motorman. The passenger passes through a door separating the body of the car from the front vestibule, and then out by the exit door. The vestibule is divided by a glass partition, thus providing protection from the weather for the motorman and permitting him a free view for operating the exit door. The car is heated by electricity, the heating duct running under the seats, and a fan provides for the proper circulation of heat. The floor is double, and the general fittings and upholstery of the car are thoroughly modern. The conductors' and motormen's compartments are also heated. The car

is provided with adequate brake power and other safety devices which have been asked for by the employees.

The Toronto Railway Co's Dividend Reduction.

The following circular has been issued to shareholders:—Regretfully the directors have to announce that the company's best interests make it necessary that the rate of dividend be reduced from 8 to 4%. This action will be to you, as it is to the directors, a matter of deep regret, and therefore it has been deemed advisable to place the situation briefly but completely before the shareholders.

The street railway, like every other business, has been subjected to an abnormal increase in cost of producing its service—as a result of war conditions. During the coming year, the company is required to make payments in excess of last year, as follows: Municipal and provincial taxes, \$40,000; business profits tax (Dominion Government), \$40,000; increase in cost of material based upon last year's operation, about \$200,000, a total of \$280,000. These items, as will be seen, are charges over which the company has no control. No human foresight, no superior ability, on the part of the management, could have prevented or mitigated these charges.

Further, under the terms of an arbitration held under the Dominion Act, in reference to industrial disputes, the company is obliged to pay out additional wages to the amount of about \$600,000 a year. Needless to say, your management protested with all its might against the unwarranted payment of this increase in wages, which, according to the evidence the company produced, was unjustifiable—but without avail. Unfortunately for the shareholders, these are war times.

Adding to the total contained in the above table, the amount represented by increased wages, it will be seen that the company is required to face an expenditure of possibly \$880,000 in excess of normal charges. While it is confidently expected that a portion of this extra burden will be made up out of increased revenues (fortunately our revenues are increasing in substantial amounts), it is not expected that the whole amount will be cared for in this way, and a reduction in dividends thus becomes the only way in which the company's resources could be husbanded.

While the street railway is like other businesses in being compelled to face extra war costs, it is unlike other businesses in being unable to pass the burden, or a part of it, upon the consumer. We are compelled to fulfill the terms of our contract (under which rates of fares are definitely fixed) with the city—in spite of the abnormal conditions to which the country and its economic interests are subjected, while we are economizing wherever economy is possible, we are providing the best service within our power, a service which the candid opinion of American experts says is one of the best given, under war conditions, on the North American continent.

There is admittedly little consolation to be derived from the fact that others are equally suffering from the war, and yet the fact that many companies engaged in producing public and quasi-public services have been compelled to reduce their dividends, and in some cases cut them off entirely, is not without significance. Naturally these reductions have affected stock values, the Toronto Ry.'s stock as well as others. Deplorable as is

the decline in the selling price of the company's stock, it must not be forgotten that it is not out of sympathy with the general share market which does not today adequately represent intrinsic worth.

It is with pleasure that we announce that last year, after paying all expenses, the Toronto Power Co. had a surplus of \$900,000 and the Toronto Electric Light Co. a surplus of \$75,000, both companies being subsidiaries of the Toronto Ry. Co. Of the moneys so derived, about \$700,000 was devoted in reduction of the bonded indebtedness of the Toronto Power Co. (under the trust agreements) and the balance is being expended from time to time in increasing the facilities of these companies, and providing for their greater earning powers in the future.

Edmonton Radial Railway Fares.

The proposed amendment to City of Edmonton's charter, authorizing it to collect fares on the straight zone principle, was not authorized by the Alberta Legislature, but after considerable discussion the following section was adopted: "Notwithstanding anything to the contrary whatsoever, the city is hereby declared to have and it shall have the power and authority to charge such tolls and fares on its tramway lines as shall from time to time be fixed by its council, provided that such fares are uniform throughout the city."

Among the reasons given for the necessity of having the proposal amended as has been done, was the fact that the E.R. Ry. operates also in Strathcona, and that the agreements between the original cities of Strathcona and Edmonton provided that the fare at Strathcona should not be more than 5c.

Acting on the new powers, the city's street railway committee made the following recommendations, which were considered at a meeting of the city council, April 9:—"Transfers to be issued only between 6 and 9 a.m. and 5 and 8 p.m. A 10c fare between 11:15 p.m. and the time when cars cease running at night. Six tickets for 25c, good between 5 and 8 a.m. School children, 10 tickets for 25c. Street railway to be supplied with electric energy at cost. Otherwise the 5c fare to remain in force as before."

In the course of the discussion, Superintendent Moir stated that 186,000 more passengers were carried during the first three months of this year than during the same period of 1917, and that about 3,000 children's fares were collected daily.

The following alternative proposal was submitted by Alderman Martin:—"Children 2½c, but such tickets not to be used between 9:30 and 11:15 a.m., and after 5 p.m. Labor tickets 4 1/6c, or 6 for 25c. Ordinary tickets, 6¼c—that is, 4 for 25c, or cash fares 7c. Ten cent fares after 11:15 p.m." Further discussion of the matter was adjourned until the new legislation becomes operative.

Snow Removal at Toronto.—The City of Toronto obtained judgment against the Toronto Ry., Apr. 13, on a claim of \$14,391.47 for the removal of snow from the streets where it had been cleared from the company's tracks. The claim was made in Nov., 1915, and the judgment carries costs, and interest, from the date of the original writ, with a stay of 15 days. The company contends that under its agreement with the city, it is not called upon to remove the snow from the streets, but merely to remove it from the track allowance. The company has appealed against the judgment.

Motor Buses for Winnipeg Electric Railway.

The Winnipeg Electric Ry. has arranged for the operation of motor busses on certain streets supplementary to its electric car lines. The proposed route for the busses is from Sherbrook St., along Westminster Ave. to Lipton St., along Lipton St. to Portage Ave., and return to starting point. Transfers will be given on the busses which will carry the passengers east or west on the Portage Ave. cars, or north and south on the Sherbrook

New Brunswick Power Co. Asks Increased Rates.

The New Brunswick Power Co., operating the St. John Railway, has petitioned the N. B. Legislature for authority to increase its electric railway fares, gas and electric current rates, and has had the following bill introduced in the legislature:—

“Whereas, owing to the increased cost of operating the plant of the New Brunswick Power Co., owing to the price of coal and other supplies and materials used

on the investment in the company's property. Be it therefore enacted by the Lieutenant-Governor and Legislative Assembly as follows:

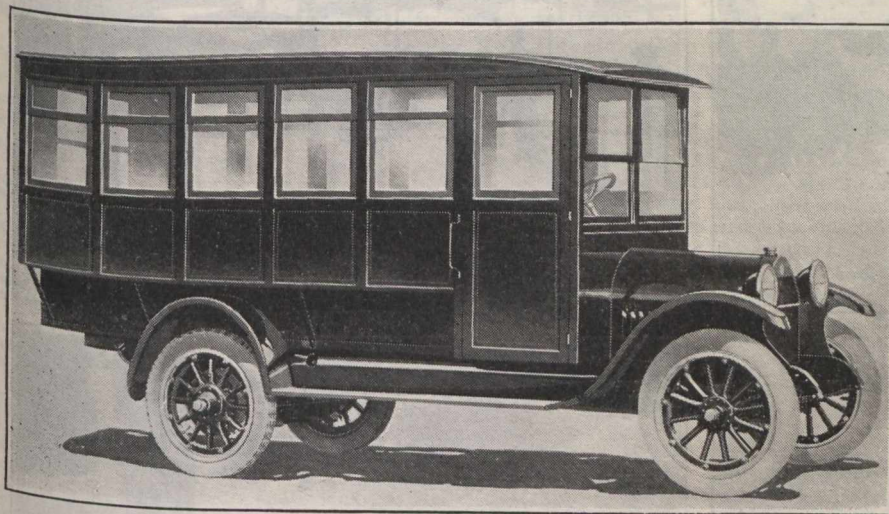
“The obligation of the company to sell 25 tickets good over its lines of street railway for \$1, and 6 tickets for 25c, and to charge a cash fare of 5c is hereby abolished, and instead the company is hereby permitted to charge a cash fare of 6c per passenger. The obligation of the company to grant free transfers is hereby abolished and the company is hereby permitted to charge 1c for each transfer.

“The maximum price the company may charge for gas for heating and illuminating purposes is hereby increased to \$2 per 1,000 ft.

“The maximum rate for electric current for power and light supplied by the company is hereby abolished and instead the company may charge not exceeding the rates heretofore charged by the Saint John Ry. Co. for power and light.

“Said rates hereby permitted may be charged by the company during the continuance of the present high prices, consequent on the present war and the consequent relative depreciation of the value of the money received by the company for its services.

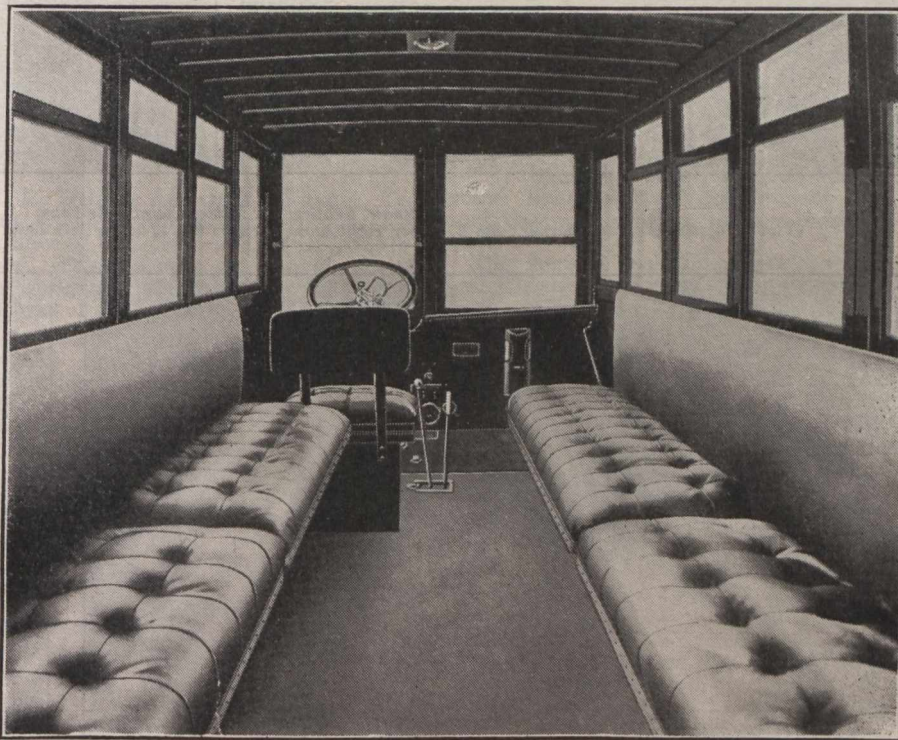
“The Lieutenant-Governor in council, on the application of the directors of the company, may, if satisfied that the cost of coal or other operating expenses has increased to such an extent as to render a further increase in fare or rate necessary may grant such further increase in fare or rate and permit the same to con-



Motor Omnibus, Winnipeg Electric Railway.

St. cars, and passengers on the street cars will be given transfers to the busses. It is probable that other routes will be selected and developed at a later period. No announcement has been made as to the number of busses to be put in service, but a Winnipeg press report states that four motor busses were delivered to the company April 4, and that the service on the route indicated will be started May 1.

The busses are being built at Walkerville, Ont., and are described as being 16 passenger capacity. The entrance is by the right front door only, the door being controlled by the driver through the operation of a lever directly in front of his seat. The door has no handle, thus passengers cannot open it to enter or leave the car. The fare box is placed just inside the entrance. The seats run along the sides of the car and are broad with leather upholstered spring cushion seats and curved back rests, and there is ample space between the two seats. The windows being sliding, provide for ample ventilation; electric push buttons for signaling are provided and two dome lights provide for lighting the bus at nights.



Motor Omnibus, Winnipeg Electric Railway.

Street Railway Fares in Moncton.—The Moncton Tramways, Electricity & Gas Co. has applied to the Moncton, N.B., City Council for permission to increase the fares charged on the electric railway. The line is being operated at a loss, and the management states that until the revenues meet operating expenses it will be impossible to do anything to improve the system. The company asks power to charge a straight 5c fare, and to be placed under the Public Utilities Commission's control. The council decided to ask the company to set out in detail it reasons for asking for the increase.

The Lethbridge Municipal Ry. is reported to be arranging to employ women conductors in order to release men for agricultural work.

by the company being more than double, the company has petitioned the legislature praying that the rates fixed by legislation that such company may charge be increased during the period of the war and the present high prices; and whereas, it appears that in many cases the rate the company is by law permitted to charge is less than the company's actual cost of operating, and it is desirable that a temporary increase be granted to the company to enable it to receive the actual cost of operating and a reasonable return

whilest such increased operating cost obtains.

“The Lieutenant-Governor in council may appoint an experienced person qualified to pass upon such matters, to report as to the advisability of granting such increase in rate as in the last section provided, and may act upon the report so made. The expenses of such report shall be paid by the company.”

A deputation of St. John citizens waited on the legislature's committee, April 16, and objected to the increases proposed.

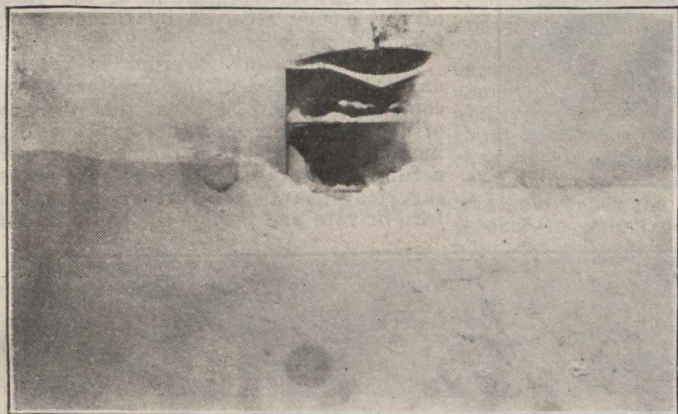
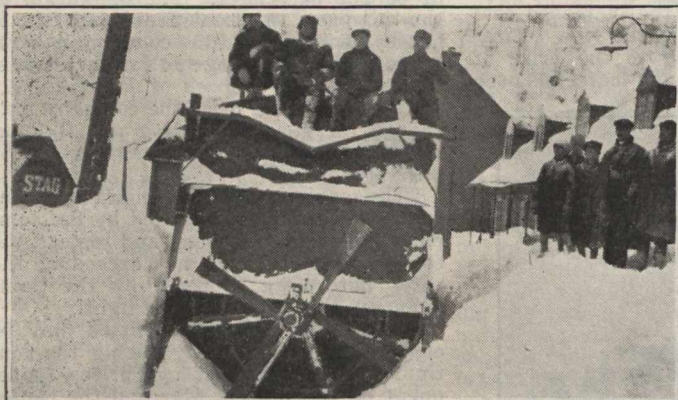
Snow Fighting on Levis County Railway.

Levis, Que., is one of the worst, if not the worst, snow districts in Canada, and this winter the fall has been 20 in. heavier than usual, being 120 in., against an average of 100 in. The first snow fall came on Nov. 22, 1917, and the storms were

One block of houses had their chimneys swept off.

The Levis County Ry.'s 300 h.p. rotary plough started out during the afternoon of Feb. 15 to open up the company's lines. By evening, the St. Joseph Division, which

with the crew on top. It also shows the snow cutting blades in front and the delivery paddles behind the blades. These paddles deliver the snow some 15 ft. through a funnel in the side of the plough, and it can be delivered on either side. The



Snow fighting on Levis County Railway. Fig. 1, upper left hand corner; fig. 2, upper right hand corner; fig. 3, lower left hand corner; fig. 4, lower right hand corner.



Snow fighting on Levis County Railway. Fig. 5, left, fig. 6 right.

continuous through December, accompanied by extreme cold. There were no thaws during the whole period, so that the snow accumulated to a great height. The worst storm of the season started on the evening of Feb. 14, and continued for 24 hours, accompanied by high winds. The drifts ran as high as 18 ft. on the railway track. Snow slides occurred from the top of the cliff, along the Quebec Bridge Division, which completely buried several houses and moved some of them.

serves the dry docks, was opened and cars were running as usual. The upper town, Levis Division, was opened during the night, and on the morning of Feb. 16, the plough started on its long trip to the Quebec Bridge, 7 miles. It had to face some very heavy drifts and snow slides, and it was on this division that the accompanying views were taken. Half the line was open by evening and the remainder by noon on Feb. 17.

Fig. 1 shows plough in 10 ft. of snow,

block of houses on the right were buried and moved by the slide.

Fig. 2 shows plough in a snow slide about 9 ft. deep. The snow in these slides was packed very hard and was more difficult for the plough to get through than the drifts. The crew is shown shovelling down the height of snow to help the plough.

Fig. 3 shows the plough working in a 10 ft. drift, the snow being delivered on the right hand side.

Fig. 4 shows the plough backed up out of a cut, to enable the photographer to obtain a view of the cut, which is 18 ft. high.

Fig. 5 shows the same cut after the plough had got through. The road for teams is on the right hand side of the picture.

Fig. 6 shows a car in one of the cuts. A team can be seen driving along on the right.

We are indebted to H. E. Weyman, Manager Levis County Ry., for the foregoing information and photographs.

Detroit United Railway Report.

Following is a comparative statement of earnings and income for the calendar years 1917 and 1916, as presented at the annual meeting recently:—

Gross earnings—	1917.	1916.
Passenger	\$16,370,239.64	\$15,069,980.64
Express	1,000,869.16	907,771.90
Mail	11,748.16	11,823.08
Special car	45,083.03	47,088.59
Gross earnings from operation	\$17,427,939.99	\$16,036,669.21
Operating expenses	13,259,790.85	11,215,802.20
Net earnings from operation	\$ 4,168,149.14	\$ 4,820,867.01
Other income	411,737.29	351,334.79
Gross income less operating expenses	\$ 4,579,886.43	\$ 5,172,201.80
Interest on funded and floating debts and taxes	2,404,355.68	2,291,409.67
Net income before providing for depreciation or contingencies	\$ 2,175,530.75	\$ 2,880,792.13
Deduct credited to depreciation reserve \$	800,000.00	800,000.00
Deduct credited to reserve for taxes	150,000.00	
Dividends paid	1,118,750.00	843,750.00
Together	\$ 2,068,750.00	\$ 1,643,750.00
Balance transferred to surplus account	106,780.75	1,237,042.13

The company owns and operates the Sandwich, Windsor & Amherstburg Ry. in Canada, 41.37 miles, the figures for which are included in the above and are not given separately.

T. H. McCauley on the Street Railway Outlook.

T. H. McCauley, Superintendent, Calgary Municipal Ry., in Vancouver recently, after an extended trip in the United States, where he examined a number of street railway systems, is reported to have said:—"All street car systems are running cars according to established customs, charging a fare which is the same as years ago, while maintenance and supplies have increased 100%. With the obstacles of the present, the street railway lines which try to maintain service under old fares are bound to find it impossible to keep on as a business proposition unless some changes are made. All through the U. S. traction companies are fares forced to ask and are asking that fares be increased to 6c. This is due largely to the fact that the privately owned automobile competition is becoming such a strong factor that ultimately street cars will be unable to exist because increasing fares will encourage people to buy still more automobiles. In Calgary our records show that in good weather the private automobiles represent a loss to us of \$300 a day. This does not refer to jitney competition, but to the fact that an increasing proportion of the people are driving their own cars."

Answers and Questions on Electric Railway Topics.

Following are answers to a number of questions on electric railway topics, sent to the American Electric Railway Association's question box, by Canadian electric railway officials:—

Saving Oil and Waste.—What methods do member companies employ to extract the oil in waste removed from axle bearings, and clean and renovate for further use the waste after the oil has been extracted?

W. R. McRae, Master Mechanic, Toronto Ry., Toronto.—Both cotton and wool waste are cleaned in a steam driven centrifugal cleaner, manufactured by the Canadian Oil & Waste Saving Machine Co., Brockville, Ont. Lubricant removed from wool waste is reclaimed by filtration and used in car journals only. Waste is reclaimed by filtration and used in car journals only. Waste is dried by spreading on wire frames over dry heaters (sun dried during summer season), and teased before being put in soaking tanks.

Oil allowances.—Have any member companies established standards governing the amount of oil used in axle bearings, i.e., the quantity measured, and if so what amounts are allowed for the different sizes of axles?

W. R. McRae, Master Mechanic, Toronto Ry., Toronto.—Axle journal bearings are lubricated on a time basis; all journal bearings one size; oilers instructed as to quantity of oil used.

Clearance at Milk Platforms.—What clearance do member companies maintain between milk stands and the centre of high speed main tracks, if these stands are located 8 ft. or more from centre of track? Do any members use any device to make it more convenient for the train crew to handle cans from stand to car, and if so, what?

C. L. Wilson, Assistant Manager, Toronto & York Radial Ry., Toronto.—A clearance of 8 ft. from centre line is maintained. Express cars are provided with steel gangway laid from floor of car to platform of milk stand.

Car Construction.—Is it possible to construct and operate economically a combination car that will be as attractive to the riding public as the well known open car?

F. L. Hubbard, Assistant to the General Manager, Toronto Ry., Toronto.—This cannot be answered intelligently in the space available, but if the people making the enquiry would write to our Master Car Builder, they could perhaps ascertain something to their advantage, as we have operated convertible cars for years, which possessed the advantages of open cars in the summer and closed cars in the winter.

Checking of Freight.—What plan does your company follow to ensure proper receipt of freight shipments at destination; are original shipments checked on station platform, or are all shipments checked into freight cars, or do you have a different plan?

C. L. Wilson, Assistant Manager, Toronto & York Radial Ry.—Shipments are checked into car, either from freight trucks or station platforms, and re-checked when unloading at destination by train crews.

Wear of Trolley Wire.—Will a trolley shoe, with 24 lbs. tension on an electric car, operated at high speed, wear the wire more than a 6 in. trolley wheel, with 45 lb. tension, used on the same car? We

have tried shoes on this system and they gave the best results, but the line department claimed that they wore the wire unduly; there was certainly less trouble with poles.

W. R. McRae, Master Mechanic, Toronto Ry.—From observations, I am convinced that a hard polished steel contact shoe operated at the lighter pressure will give better results, trolley wire wear included, than will the wheel at a greater pressure, especially when operated in districts that have a great deal of rain, or moisture on the wire.

Flange Wear on Steam and Trolley Cars.—Although it is not the case with wheels on steam road cars, fully 40% of wheels on trolley cars are worn with a thin flange on one wheel and a full flange on one wheel; what is the cause?

W. R. McRae, Master Mechanic, Toronto Ry.—Car wheels used on steam roads are not driver wheels, as is the case of wheels on traction cars. For that reason the flange condition does not exist to any extent.

Nova Scotia Tramways & Power Co.

Following are extracts from the company's first annual report for the calendar year 1917:—

The organization of the company was effected on Jan. 7, 1917, for the purpose of taking over and operating the Halifax Electric Tramway Co., Ltd., and also of acquiring the Gaspereaux properties with the object of developing an hydro-electric plant thereon. The Halifax Electric Tramway Co. and the Gaspereaux properties were duly transferred to this company, in conformity with the agreements entered into; but owing to the unprecedented increase in the cost of labor and materials, and the extreme difficulty of securing same, the directors deemed it prudent to temporarily defer the carrying out of the project in reference to the proposed hydro-electric development until such time as conditions became more normal.

The general conditions that have prevailed during the first year of the company's history are unlike any ever before encountered, and the abnormal advance in the cost of labor and materials has had its effect upon the operating expenses; and the difficulty of obtaining an adequate number of efficient employes has also tended to retard the progress which would be expected under ordinary conditions. The appalling disaster which befell the city of Halifax on Dec. 6 proved to be a severe blow to the company. The general upsetting of conditions in the city interfered to a great extent with the company's business, and had the effect of very materially curtailing the revenue during December, as well as increasing operating expenses. Very extensive damage was done to the company's property, and while the actual cost of repairing all the damage sustained cannot be ascertained at this time, it is estimated by the officials that it will be in the vicinity of \$60,000. A number of the employes sustained injuries as a result of the disaster, and one inspector, one conductor and two motormen lost their lives, three of these being on duty at the time. Great difficulty has been experienced in obtaining the requisite number of competent employes to carry on operations, and in an effort to overcome this difficulty women conductors have been employed on the cars with reasonable success.

The tramway gross earnings show the average increase for the year, and it is anticipated that the same ratio of increase

will be maintained during 1918. Operating expenses have increased in a greater ratio than the earnings; but under the prevailing conditions, the directors consider that the results attained should be

deemed satisfactory.

The street railway passenger receipts were \$413,341.92, against \$388,494.05. Passengers carried, 9,534,162; car mileage, 1,371,334.

New Brunswick Power Co's Annual Report.

Following are extracts from the first annual report, presented at the annual meeting in St. John, N.B., recently:—

The statement presented covers 10 months from Mar. 1, 1917, when the company commenced operations. The total operating revenue was \$569,200.40, and the total operating expenses \$424,893.65, leaving a gross income of \$144,306.75. Adding to this the net revenue from non operating departments, such as the Eastern Electric Co., amounting to \$21,553.76, makes for the year a gross income of \$165,860.51 available for the payment of bond interest and preferred dividends. Of this \$74,344.49 was paid in bond and other interest. The dividends on preferred stock paid for the nine months amounted to \$70,875, and accrued dividends for October \$7,875, leaving a surplus of \$12,766.02.

During the year the company made extensive additions to its plant. In the power house it spent \$72,112.24, very materially increasing its boiler capacity, thus enabling it to generate a larger amount of current. In the railway department it spent \$14,543.18 on new equipment, and \$11,803.09 for replacement of special work, etc. In addition to these figures, a considerable sum was spent in improving the tracks by using arc welding machines and rail grinder, building up the cupped ends of rails and welding the joints, which secured a smooth road-bed and easier riding for street car patrons. This work will be continued during 1918. Additions and extensions were also made in the electric and gas departments, amounting to \$24,476.95.

Shareholders will undoubtedly have noticed with some apprehension the company's application for relief in regard to its gas, railway and electric rates made recently before the Public Utilities Commission. In common with other operating companies of this character in America, this company is facing a situation which requires the undivided attention of the directors and the hearty co-operation of all shareholders in order to preserve the property intact against increasing costs. Those who are familiar with the taking over of the St. John Ry. Co. by the N.B. P. Co. will remember that in doing so the new company was obliged by law to put into effect a schedule of lighting rates considerably lower than old rates then prevailing. It was impossible at that time to tell accurately what decrease in the company's net revenue these new rates would result in, but after operating eight months under the new rates, the directors find that the decrease in revenue, resulting from these rates, will total \$58,000 a year.

The second and still more serious problem we are facing is that of coal. Up to Dec. 31st, 1917, we were able to buy our coal delivered in our power house at \$3.50 a ton and delivered at gas works \$4.20. On Jan. 1, 1918, however, the coal companies increased the price \$3.65 a ton, so that now it costs \$7.20 in the power house and \$7.95 at the gas works. With a gross consumption last year of 22,522 tons, it will be seen that we are facing a net increase in the cost of coal for the coming year of \$82,000. We regret that we are

unable to make a contract for our coal supply for a longer period than one month, and the estimate given is based on last year's consumption and the supposition that we will not have to meet any further advance.

In addition to this we were, last summer, obliged in all fairness to inaugurate a general increase in the rate of wages to all employees, which on a yearly basis will total \$40,000. In view of the continued increased cost of living and the necessity of retaining with the company the high standard of labor which we have with us, the question of still further increasing the rate of pay to all employees must be given serious consideration. It will be seen from these three items alone that a substantial increase of revenue will be necessary to take the place of these additional expenditures which we will be facing in full force during the coming twelve months. There are many other items of increased cost which enter into the operating of a property of this character, notably the cost of materials necessary for the maintenance of our plant.

The directors had under contemplation at the time of the purchase of the St. John Railway property, the construction and development of water powers on lands owned by your company in the vicinity of St. John. Owing, however, to the extraordinary demand for money due to war loans, and the fact that the American market, from which we had anticipated obtaining our funds, was practically closed a month after our taking over the property, by the U.S. going into the war, your directors had to forego temporarily this part of the development of your property. We have, however, at present under consideration a plan which may enable us to carry on the construction of our water powers, but at the present time no definite statement can be made. A great deal of the company's future depends upon the fairness and breadth of vision possessed by those who will have the determining of whether or not the company, under extraordinary war conditions, shall receive fair treatment in regard to increase in rates. Unless some measure of relief is accorded through this channel, and through the development of your water powers, we will undoubtedly be faced with the serious possibility of inability to pay our preferred dividends. If this condition comes about it will hamper the company for many years in the securing of additional capital for its necessary development work, necessary not only in the interests of the company, but in the best interests of the city as well.

Railway receipts	\$260,054.53
Light and power earnings	242,659.23
Gas earnings	66,486.64
Merchandise and non-operating income	21,553.76
Operating expenses	\$590,754.16
Interest on bonds	\$424,893.65
Other interest	72,916.68
Net earnings to surplus account	1,427.81
	91,516.02

Dividends paid to Dec. 1	\$590,754.16
Dividends accrued for December	70,875.00
Transferred to profit and loss	7,875.09
	12,766.02

Profit for year after providing for interest on bonds and all charges.....\$ 91,516.02

The directors were re-elected, as fol-

lows:—L. R. Ross, President; F. R. Taylor, H. P. Robinson, W. E. McGregor, P. W. Thomson, R. B. Emerson, L. C. Gerry.

Nipissing Central Railway Annual Report.

Following are extracts from the annual report of this railway for the year ended Oct. 31, 1917, issued by the Timiskaming & Northern Ontario Ry. Commission, which operates it for the Ontario Government:—

Assets.	
Cost of road	\$308,095.21
Cost of equipment	65,585.07
Townsite property, North Cotuit	240,861.45
Working assets	29,878.22
Deferred debit items	8,750.50
Value of franchise	141,393.32
	\$794,053.77
Liabilities.	
Capital stock	\$530,000.00
Advance from T. & N. O. Ry.	247,639.50
Working liabilities	15,246.88
Deferred credit items	6.10
Profit and loss balance	1,161.29
	\$794,053.77
Receipts and Expenditures.	
Transportation revenue	\$93,331.73
Non-transportation revenue	2,115.75
	\$95,447.48
Total operating revenue	
Maintenance of way and structures	\$15,717.59
Maintenance of equipment	12,484.13
Power	17,481.46
Conducting transportation	26,568.09
Traffic	293.60
Transportation for investment	
Cr.	7,717.86
	\$80,256.75
Total operating expenses	
Net operating revenue	\$15,189.75
Other income	268.59
	\$15,458.34
Total income	10,825.77
Deductions from income	
Net	\$4,532.57

Compared with the year ended Oct. 31, 1916, transportation revenue decreased \$15,605.61, and the other than transportation revenue increased \$655.14, while the expenditures increased \$5,523.10, giving a decrease in net income of \$20,473.57. The other income decreased \$231.36, and there was a decrease of \$3,140.05 in the deductions from income, the net result showing a decrease of \$17,564.88 against the year ended Oct. 31, 1916. The T. & N.O. Ry. Commission was paid \$2,000 out of profit and loss.

Traffic Statistics.	
Passenger car hours	23,459
Passenger car miles	240,850
Total passengers carried	1,207,399
Average daily receipts	\$255.74
Average receipts per car hour—passenger	\$8.40
Average receipts per car mile—passenger, cents	\$0.33
Earnings per passenger, cents	\$0.06

The Toronto Transportation Commission for the current year consists of the Mayor, T. L. Church, Chairman; R. C. Harris, Commissioner of Works, Vice Chairman; T. Bradshaw, Commissioner of Finance; W. Johnston, City Solicitor; Cousins, Manager, Toronto Harbor Commission, and H. H. Couzens, Manager, Toronto Hydro Electric System. As mentioned in our last issue, plans and specifications for the building of cars and car shops have been mentioned, but nothing will be done in the matter until a report on the subject is made by R. C. Harris and T. Bradshaw.

Montreal Tramways Co. Wages.—A press dispatch from Montreal, Apr. 24, stated that the company's employees are asking for increases in wages of from 10 to 11c an hour, according to length of service. It is stated that the matter will probably be taken up by the recently appointed tramways commission.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford Municipal Ry.—The Brantford, Ont., City Council was petitioned April 10, to extend the B.M. Ry. to the Terrace Hill district, as had been promised from time to time. (Mar., pg. 117.)

Calgary Municipal Ry.—The Calgary, Alta., Municipal Ry. is reported to have let a contract to the Birnie Lumber Co. for the supply of 10,000 ties for replacement purposes, at 85c each. (Mar., pg. 117.)

Grand River Ry.—Owing to exceptionally high water on the Grand River this spring, the company's tracks along the river in Hespeler, Ont., could not be used for some little time. A press report states that the tracks are to be moved away from the river. Surveys are said to have been completed which will do away with a number of curves, and give a practically straight route. The line referred to is part of the line long known as the Galt, Preston & Hespeler St. Ry.

Guelph Radial Ry.—We are officially advised that it is proposed to relay about 2,000 ft. of track on Dundas Road, Guelph, Ont., with 80 lb. T rails, with gas weld bonds, on concrete foundations. A. H. Foster is Manager.

Lake Erie & Northern Ry.—M. W. Kirkwood, General Manager, and other officials were in Simcoe, Ont., April 4, in consultation with the town council respecting the approach to the station and other matters which have been unsettled since the line was opened from Brantford to Port Dover. (Sept., 1917, pg. 368.)

London & Port Stanley Ry.—The Ontario Legislature has authorized the City of London to pass a bylaw to raise \$131,000 upon 30 year debentures to pay for the construction and equipment of buildings and works completed, and the construction of other works by the London Railway Commission, which operates the London & Port Stanley Ry. The act also authorizes the passage of a bylaw by the city council to raise \$7,000 by bylaw to pay for the construction of a switch and bridge in connection, for the L. & P.S. Ry. Neither of these bylaws requires the ratepayers' assent. (Mar., pg. 117.)

The Montreal & Southern Counties Ry.'s application for permission to lay an extra set of car tracks on McGill St., Montreal, so as to improve terminal facilities, and permit of the more expeditious handling of the cars serving the south shore, was refused by the city commissioners, April 17. (April, pg. 164.)

The Nipissing Central Ry. Co., which is owned by the Province of Ontario and operated by the Timiskaming & Northern Ontario Ry. Commission, is asking the Dominion Parliament to extend for five years the time within which it may build a line from Latchford, Ont., to the Grand Trunk Pacific Ry. near the Matagami River, Que.; from Latchford along the Montreal River, to the G.T. Pacific Ry., in Ontario; from Latchford southerly to Timagami station; an extension of the present line from Liskeard westerly to meet the last mentioned line; a line from Liskeard to Charlton; a line from the first mentioned line, starting at Wendego Lake, westerly to the T. & N.O. Ry., and a branch line from the first mentioned line, starting in Casey Tp., to North Timiskaming, on the Des Quinze River. (April, pg. 164.)

Ottawa Electric Ry.—It does not appear that the Dominion Government has reached any decision as to when it will

proceed with the erection of the new bridge at Chaudiere Falls, Ottawa, but it is expected that the work will be gone on with during the summer. When this is settled, the O.E. Ry. can proceed with its plans for providing a service across the bridge. (Feb., pg. 77.)

The Western Power Co. of Canada owns about five miles of railway along the Stave River, near Vancouver, B.C., which was built by its predecessor, the Western Canada Power Co., and controls the Burrard, Westminster & Boundary Ry. and Navigation Co., which has a Dominion charter to build a system of electric railways with New Westminster as the centre point. The Dominion Parliament is being asked to authorize the Western Power Co. to operate the railway built by the Western Canada Power Co. as fully and as effectually as that company was authorized to do by the provisions of its act of incorporation of 1910. (Oct., 1916, pg. 424.)

Winnipeg Electric Ry.—We are officially advised that the company proposes to instal automatic electric track switching devices. Orders have been placed for a sufficient number for installation at the most congested points on the company's line. If the devices prove satisfactory in operation, they will be adopted as a permanent improvement. Other improvements have been considered, but definite steps for their adoption have not been announced. (Sept., 1917, pg. 368.)

London Street Railway Passenger Fares.

The London St. Ry.'s application for permission to increase its passenger fares, as published in Canadian Railway and Marine World for March, was considered by the city's finance committee on April 11, when President C. Currie and Manager C. B. King represented the company. The mayor decidedly opposed the application and recommended the company to cut down operating expenses. One alderman suggested that the company should default in its obligation to the bondholders, to redeem \$35,000 of its bonds during each of the last ten years of its franchise, and said to the company's officials present: "Your funeral is our holiday." It was decided finally to ask the company to furnish detailed statements for several years past, and the committee's feeling seemed to be to submit the matter to a vote of the people. In the meantime the company will probably act on the mayor's suggestion, to reduce operating expenses and will curtail the present service. At a city council meeting held subsequent to the committee meeting referred to above, a committee was appointed to look into the company's assessment, with a view to increasing it.

In connection with its application, the company has been carrying on an advertising campaign in the local papers, discussing the whole matter in a fair and moderate spirit. Starting out with the statement that, while under the agreement the company is bound by the fare schedule fixed in 1895, which was then considered reasonable and gave profit; the fare is the same today, while the company has to meet expenses on the 1918 basis; it is shown that the company can give and the city get the best service only by co-operation between the two interests. The next point taken is that better track, better cars and better service are required, but that in order to get them the company must have a larger income than is produced by the present average fare

of 4c. It is then shown that an increased fare is necessary, because the cost of all material required for railway construction, maintenance and operation has largely increased since 1895, many things having advanced from 50 to 380% since 1914; while wages, which ran from 12½c to 15c an hour, have increased to from 23c to 28c, and may have to be further increased. The final argument is that money invested in the line is entitled to a return. The cost of the line is said to have been \$1,466,348.44 cash, raised about one half by bonds, and the remainder by stock. It is pointed out that the London & Port Stanley Ry. has to pay 5½% for its bonds, although it has the credit of the city behind it, in addition to its own. The London St. Ry. pays 5% on its bonds, while the shareholders have received an average of 5½% since 1895, including a stock dividend. All surplus earnings, which might have been divided among the stock holders, have gone into the line, and it is necessary to maintain the line in an "even moderate state of efficiency" to pay interest on a considerable floating indebtedness.

Winnipeg Electric Railway's Annual Report.

The references to this company's annual report in Canadian Railway and Marine World for April were made from a press report, which was not altogether correct. The printed report, which had not been received, has since come to hand, and shows that the decrease in net income for 1917 was \$151,621.80, instead of \$91,621.80, as stated in the press report. Following are extracts from the official report:—

The net income, on the same method of accounting, shows a decrease of \$151,621.80 compared with 1916, notwithstanding the fact that the gross revenues for 1917 show an increase of \$27,840.20 over 1916. This is a disappointing statement, but so long as the materials required by the company in its operations continue to increase in price, and demands for increased rates of wages to employes predicated on higher cost of living have to be met, and the jitney question remains unsettled, no substantial improvement in net income can be expected. The directors believe, however, that the sentiment of the citizens of Winnipeg is favorable to a permanent settlement of the vexed question, and it will be the duty of the board to endeavor during the present year to so adjust any outstanding differences between the city and the company that the jitney and other matters may be speedily and satisfactorily arranged to all interests concerned. General business conditions in Winnipeg are improving, and if a satisfactory adjustment of the jitney question is reached at an early date, arrangements will be made to carry out certain improvements in the physical properties which have engaged the directors' attention for some time.

Hull Electric Co. Wages.—Employes of the Hull Electric Co., which operates an electric railway between Ottawa, Ont., and Hull and Aylmer, Que., have applied for a board of conciliation in connection with wages. G. D. Kelly, barrister, Ottawa, will represent the company.

An Ottawa Electric Ry. official is reported to have said that the company is prepared to deal with the question of having women conductors, if the state of the labor market should render such a step advisable.

The Montreal Tramways Commission.

The Quebec Government has appointed the three members of the administrative commission which is to exercise control over the Montreal Tramways Co., under its new franchise, as detailed in Canadian Railway and Marine World for March, pg. 110. The appointees are: Jos. F. Saint-Cyr, Judge of the Court of Sessions, President; L. A. Herdt, D.Sc., E.E., Professor of Electrical Engineering, McGill University; and J. S. Archibald, architect, all of Montreal. The salaries are, for the President, \$7,500 a year, and for the two other commissioners, \$6,000 a year each. These salaries are to be paid by the company, which will also pay the salaries of the staff engaged by the commission and all other expenses that are reasonable. The commission is authorized to engage experts at the company's expense, provided the charges are not exorbitant. If they are so considered, the company can appeal to the Quebec Public Utilities Commission to have the expenses revised.

The Toronto Railway Penalized for Car Shortage.

On the application of the City of Toronto, for the Ontario Railway and Municipal Board to enforce its order on the Toronto Ry. for the supply of additional cars, which was referred to in our last issue, the board ordered on April 19 that the company pay to the city \$24,000, being \$1,000 a day, from Mar. 26, when the act referred to below was passed, until the date of the board's order, in default of providing 100 additional cars, as ordered by the board. A stay of seven days was granted to allow the company to appeal.

The date by which the 100 cars had to be in operation, according to the board's original order, was Jan. 1, 1918, but the board pointed out some little time ago that it had not the power to inflict penalties. At the city's instance, a bill was introduced in the early part of the Ontario Legislature's recent session, providing that in default of the company complying with the board's order, the company should pay the city \$500 a day from Jan. 1, 1918, for each car supplied by the company less than the number agreed in the order, such penalty to continue in force from day to day until the full number of cars called for by the order had been put in operation. This bill was withdrawn at the government's request and a bill to amend the Ontario Railway Act was introduced by the Attorney General, containing, among others, the following clauses:—

"4. The Ontario Railway Act is amended by adding the following as section 262a:

"262a. (1) The Board, for the purpose of enforcing compliance with any order heretofore or hereafter made by it, requiring any railway company operating a railway or street railway in whole or in part upon or along a highway under agreement with a municipal corporation, to furnish additional cars or equipment for its service, in addition to any other powers possessed by it, may order such company to pay to the corporation of the municipality in which the company so operates, a penalty not exceeding \$1,000 a day, for non compliance with any such order;

"(2) An appeal from any such order or from the refusal by the board to make an order, shall lie to the Appellate Division

of the Supreme Court of Ontario at the instance of either the said corporation or the said company as fully in all respects as from the judgment of a judge at the trial of an action in the Supreme Court; and the judgment of the said Appellate Division shall be final and binding, and no further appeal shall be allowed;

"(3) Notice of such appeal may be given within ten days after the date of the order of the board, or of the refusal of the board to make an order, and the appeal shall be set down for hearing as provided by Rules of Court."

Mainly About Electric Railway People.

F. L. Butler has been appointed Transportation Engineer, Winnipeg Electric Ry.

S. S. Oliver has been appointed Chief of Stores, Quebec Ry., Light & Power Co., Quebec, Que., vice H. G. Bosse, promoted.



S. S. Anderson,
General Manager, Sandwich, Windsor & Amherstburg Railway.

J. J. Newell has been appointed Electrical Superintendent, British Columbia Electric Ry., Vancouver, vice W. H. Fraser, resigned.

H. G. Bosse, heretofore Chief of Stores, has been appointed Comptroller, Quebec Ry., Light & Power Co., Quebec, Que., vice H. K. Tennant, resigned.

W. G. Ross, Vice President, Dominion Park Co., Montreal, has been elected President, succeeding H. A. Dorsey, deceased. Mr. Ross is a director of the Montreal Tramways Co., and President of the Montreal Harbor Commission.

Thos. H. Smallman, Vice President, London St. Ry., died at London, Ont., Apr. 16, after a short illness, of pneumonia. He was born at Parsonstown, Tipperary, Ireland, in 1840, and came to Canada about 60 years ago, and was for a time a conductor on the old London & Port Stanley Ry. He was connected with several industrial, insurance and financial

companies, and was a member of the executive committee of the Canadian Manufacturers' Association.

R. Home Smith, of Toronto, has been elected President of the Buffalo, Lockport & Rochester Ry., the head office of which is at Rochester, N.Y. R. C. Vaughan, Assistant to Third Vice President, Canadian Northern Ry., and E. F. Seixas, Manager, Niagara, St. Catharines & Toronto Ry., are also directors.

H. N. Kittson, of Hamilton, Ont., who was appointed a member of the Ontario Railway and Municipal Board, when it was organized, in June, 1906, resigned last year, his resignation having been accepted by the Ontario Government June 5, 1917, although this fact was only made public recently. An unconfirmed press dispatch says that G. C. Wilson, M.P. for Wentworth, has been offered the position vacated by Mr. Kittson, and that he will accept it at the end of the Dominion Parliament's present session.

Sidney Smith Anderson, whose appointment as General Manager, Sandwich, Windsor & Amherstburg Ry., Windsor, Ont., was announced in our last issue, was born at Windsor, Ont., Apr. 14, 1881. From Oct., 1897, to Jan., 1898, he acted as wireman's helper, Clark Electric Co., Detroit, Mich.; Nov., 1898, to May, 1900, in test department, Royal Electric Co., Montreal; May, 1900, to Aug., 1901, student's course, Westinghouse Electric & Manufacturing Co., Pittsburg, Pa.; May, 1902, to 1908, foreman, Light Department, Sandwich, Windsor & Amherstburg Ry., Windsor, Ont.; 1908 to 1915, Superintendent, Light and Power, same company; 1915 to Mar. 27, 1918, Assistant to General Manager, same company.

Charles Johnson, Engineer, Toronto & York Radial Ry., who has been elected a member of the Canadian Society of Civil Engineers, was born at Mildmay, Ont., June 13, 1881, and entered railway service in 1904, and for 6 months of that year, was chainman, rodman and instrument man, Canadian Northern Ry.; 1905 to 1910, Resident Engineer, same road, Parry Sound, Sudbury and Toronto; 1910 to 1911, Assistant Division Engineer, same road, East Toronto; 1911 to 1912, Division Engineer, Ottawa, Ont., to Portage du Fort, Que.; 1912 to 1914, Division Engineer of Construction, same road, North Bay, Ont.; 1914 to 1917, Assistant Engineer, Toronto-Hamilton Highway, and since 1917, Engineer, Toronto & York Radial Ry.

Allan H. Royce, Vice President, Toronto Suburban Ry., who died at Southern Pines, North Carolina, Apr. 15, aged 50, of Bright's disease, was a member of the firm of Royce, Henderson & Boyd, barristers, etc., Toronto, and was solicitor for the Toronto Suburban Ry. for many years. He also did a good deal of other legal work at different times for Canadian Northern Ry., and allied interests and for the C.P.R. He was also solicitor for the Rolls Royce Co. of England, builders of automobiles, airplane engines, etc., being closely related to some members of that company, and he represented it in negotiations with the U.S. Government. He was the first Secretary-Treasurer of the Canadian St. Ry. Association, having been elected at the inaugural meeting in Montreal, Dec. 20, 1904, retaining the position until July 31, 1907, when he resigned. He had been in poor health for several years and went south for a portion of each winter. He was a brother of Lt.-Col. Geo. C. Royce, General Manager, Toronto Suburban Ry., who was with him when he died, and brought his body to Toronto for burial.

Electric Railway Notes Throughout Canada.

The Nipissing Central Ry. is contemplating buying two interurban car bodies.

Winnipeg Electric Ry. employes put in a demand on April 16 for a 10% all round increase of pay.

The Montreal Tramways Co.'s employes sent a deputation to the management April 17, to ask for an increase of wages. Consideration was promised.

The Hull Electric Co. has ordered one double truck steel sweeper, 46 ft. long over all, equipped with brooms and ploughs for double end operation, from Ottawa Car Manufacturing Co.

It is suggested, from Whitby, Ont., that the portion of the Toronto Eastern Ry., partially built between Whitby, Bowmanville and Oshawa, be completed and operated by automobiles with flanged wheels.

A coal oil stove in an electric locomotive on the Grand River Ry. in the C.P.R. yards at Galt, Ont., exploded April 7, setting fire to the locomotive and practically destroying it. The locomotive will be rebuilt.

A number of electric railway companies throughout Canada are aiding the Dominion and provincial governments' food saving campaign by carrying special advertising inside and outside their cars free.

Several of the municipalities interested have decided that they will not oppose the British Columbia Electric Ry's application to the Board of Railway Commissioners for authority to increase the rates charged for freight on its lines.

The "skip stop" policy is being advocated as a means of effecting a saving in the cost of operating the Regina Municipal Ry. It is stated that there are 15 or 16 blocks to the mile in Regina, and the cars stop at every one of them, even during rush hours.

The New Brunswick Legislature has changed the rule of the road, diverting traffic to the right, instead of to the left, which latter is still the custom in Great Britain. This will necessitate some changes in the construction of street cars operated in the province.

Regina Municipal Ry. Sunday traveling is increasing, according to a report made to the street railway committee, April 15. For the three months ended Mar. 31, the surplus earnings over revenue for Sunday traffic were \$402.29, against \$28.98 for the same period in 1917.

The Toronto Civic Ry., by Apr. 5, had five of the 13 double truck cars which were ordered last year, in service on its lines. It is expected that the last car of the order will be in service during July. The car bodies are being built outside and the equipment is being assembled at the railway's car barns in Toronto.

The Regina, Sask., City Council, on April 3, directed the increasing by 10% of the wages of all men in the employ of its street railway department who were in receipt of less than \$1,500 a year. Commissioner Thornton explained that in addition the men in the different classes had been advanced six months, which gave a further increase.

The Edmonton Radial Ry. has arranged to run a special car in connection with the arrival and departure of all the Edmonton, Dunvegan & British Columbia Ry. regular trains, and a special car and trailer to deal with the passenger and milk traffic brought in three times a week

by the gas car service on the E.D. & B.C. R. to and from Westlock.

City Commissioner Thornton is reported to have informed the Regina, Sask., street railway committee on April 10, that the only solution of the street railway financial problem is the operation of one-man cars, and he asked that the council give serious consideration to the question of applying to the Saskatchewan Legislature for power to operate them.

The Montreal Tramways Co. has entered into an additional contract with the Montreal Light, Heat & Power Co., to supply 6,000 k.w. for its peak load, for 18 months from Apr. 1. This power will be delivered at Hochelaga, William St. and St. Denis stations, and the company expects to be able to economize in coal consumption to the extent of 25,000 tons.

The Toronto Ry. Co.'s adjourned special meeting of shareholders was held Apr. 4, to pass a bylaw to increase the number of directors by two. The meeting was originally called for Feb. 26, but was adjourned, owing to the required number of shares not being represented. At the Apr. 4 meeting the bylaw was passed authorizing the number of directors to be increased from 7 to 9.

The Moose Jaw Electric Ry. is asking the Moose Jaw, Sask., City Council for some financial concessions. The company has not been able to earn a dividend for the past four years, and in addition to taxes, amounting to about \$2,000 a year, under the terms of the franchise, the mileage payment of \$1,000 a mile for single track, with \$500 a mile for second track, comes into effect.

The Calgary, Alta., City Council and employes of the Calgary Municipal Ry. are discussing a new wage schedule. A joint committee of aldermen and the commissioners has offered a 48c maximum scale, to be retroactive to Jan. 1, with a seven hour day for all spare men. There are a number of details about which there is considerable difference of opinion, but an agreement was expected to be reached by April 30.

As a result of the increased fare schedule recently put in force on the Regina, Sask., Municipal Ry., the city commissioners estimate that the deficit for this year on the operation of the line will be \$46,824.82. The estimated deficit for 1917 was \$55,874.76 and the actual deficit was \$63,898.99. The estimates for this year provide for an increase of \$10,000 in the cost of operation and of \$27,000 in the revenues. The income up to the present shows an increase of 2½%.

The British Columbia Electric Ry. completed the 21st year of its existence April 3. Since April 3, 1897, the company has expended approximately \$46,000,000 upon its various power, lighting and electric railway undertakings in and around Vancouver, New Westminster and Victoria.

British Columbia Electric Ry. conductors and motormen sent a deputation to the British Columbia Government to urge their objections to any proposal to introduce one-man cars into the province.

The Quebec Ry., Light & Power Co. is stated by W. J. Lynch, General Manager, to have suffered considerable loss recently on account of the rioting in that city. Apart from the damage to several passenger cars, there was material loss of revenue, owing to the cessation of the car service on certain routes, by order of the authorities, and also through a falling off

of patronage during the trouble. The company is said to be making a claim against the Militia Department for compensation for losses sustained by the stoppage of traffic in different parts of the city, and for rental of certain of its buildings which were occupied by troops.

The Regina, Sask., City Council had under consideration on April 3, a special report from the street railway committee upon the railway situation. The committee recommends that the office of Superintendent be abolished, and a traffic manager be appointed to look after the operation of cars, and that a head clerk be appointed to look after the office work. The Superintendent's salary is \$2,250 a year, and the two officers to be appointed would each be paid less than that amount. The report dealt with a number of other matters, and as Commissioner Thornton had some further information, the report was referred back to the committee for further consideration.

On an application for a betterment of the service on the Toronto & York Radial Ry., Scarboro Division, the Vice Chairman of the Ontario Railway and Municipal Board stated that the board could not make any order unless there was some agreement between the company and the city regarding the portion of the line within the city limits. The Toronto Works Commissioner said that the company was operating that portion of the line pending the completion of an arrangement. C. L. Wilson, Assistant Manager, T. & Y.R.R., stated that six cars were being operated, and another four would be out on shortly. The company lost some cars in the recent fire at its Scarboro barns.

The Quebec Public Utilities Commission is reported to have decided that it would not be advisable at present to compel the Montreal Tramways Co., and other companies having wire and cable lines carried on poles on Montreal streets, to transfer them to the conduit system provided by the city. The reason for this decision is said to have been the high cost of the materials required and of labor, while it is also suggested that even if the transfer were made, the service could not be improved, the only advantage being the clearing of the streets from poles and wires. The area which the city desired to have cleared is enclosed by Notre Dame, St. Lawrence, Craig and McGill streets and Victoria Square. The city's conduit system was completed in 1915.

Winnipeg City Council has, under the terms of recent provincial legislation, passed by a vote of 12 to 5, a resolution authorizing the preparation of a bylaw to prohibit the operation of jitneys in the city, the prohibition to begin May 1, and for an agreement with the Winnipeg Electric Ry. in connection with improvements to be made in the service as a result of the prohibition of jitney traffic. The agreement has been prepared and was discussed at meetings of the council on April 11 and 15, when further discussion was adjourned. The principal point of division is a section reading: "The company agrees with the city that it will not at any time apply for an increase in the fares for carrying passengers on its system." The matter came up at a meeting of the city council, April 19, at which it was reported that neither side would recede from the position taken up upon the agreement as a whole is to stand or the fare question. It is stated that fall by the fate of this section.

Sir Henry Drayton, Power Controller, has issued an order for the London Electric Co., which closed down its plant Apr. 1, to restart power production to supply 1,000 h.p. for the London St. Ry. The London Electric Co. some time ago decided to go out of business, leaving the field to the local hydro electric commission. Owing to the extraordinary demands for power at present, it has been considered advisable to utilize all available power plants. The hydro electric commission being relieved of supplying power for the London St. Ry., is required to take over the customers formerly supplied with light by the company, and if it has any surplus power available, it is to supply it to the London St. Ry., the London Electric Co. merely making good any deficiency.

The British Columbia Electric Ry. Employees Magazine, made its appearance at Vancouver April 1. At present the magazine, which is to be issued monthly, is being circulated among the employees of the British Columbia Electric Ry. and Vancouver Gas Co., engaged in the offices, the power plant, substation operators and agents in Vancouver and the mainland territory. Later on it will be circulated among the conductors, motormen and linemen, and the Victoria employes of all classes. The idea of having an office paper originated with the executive committee of the office association, and was taken up with the management, with the result that the company placed the magazine at the disposal of the employes "in which to print news and exchange views on current affairs about the company." The April issue is introductory, one-fourth of the space being taken up with a sketch of the company's history, three pages are given over to news and the rest is miscellaneous matter.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and allied companies:—

	Jan. 1918	Jan. 1917	7 mths. to Jan. 31, 1918	7 mths. to Jan. 31, 1917
Gross	\$559,569	\$493,315	\$3,483,229	\$3,158,700
Expenses	388,407	362,836	2,712,270	2,488,515
Net	171,162	130,479	770,959	670,185

Cape Breton Electric Co.—

	Feb. 1918	Feb. 1917	2 months to Feb. 28, 1918	2 months to Feb. 28, 1917
Gross	\$36,294.55	\$32,010.16	\$77,722.78	\$70,591.17
Exp	28,999.16	19,445.02	62,255.81	42,654.01
Net	7,295.39	12,565.14	15,466.97	27,937.16

London & Lake Erie Ry. & Transportation Co.—It is reported from London, Ont., that the question of the city purchasing the whole or part of this electric railway will be reopened shortly.

London Street Railway.—

	Mar. 1918	Mar. 1917	3 mths. to Mar. 31, 1918	3 mths. to Mar. 31, 1917
Gross	\$38,320.41	\$35,705.10	\$108,240.62	\$101,661.83
Net	10,583.20	9,955.47	27,215.04	28,846.05
Exp.	27,737.21	25,749.63	81,025.58	72,725.77

Regina Municipal Ry.—

	1918.	1917.
Receipts for March	\$22,490.93	\$21,175.27
Passengers carried	453,592	477,553

Toronto Ry., Toronto & York Radial Ry., and allied companies:—

	Jan., 1918	Jan., 1917
Gross	\$1,068,319	\$1,002,469
Expenses	590,657	531,668
Net	477,662	470,801

Winnipeg Electric Ry. and allied companies:—

	Jan., 1918	Jan., 1917
Gross	\$334,642	\$319,945
Expenses	255,850	231,423
Net	78,792	88,522

The net for January, after deducting fixed charges, was \$21,208.81. The gross earnings for February were \$298,208.81. The gross earnings for February were \$298,898.63; net after operation, \$71,402-.95; surplus after fixed charges, \$15,557.97.

Hamilton Street Railway Wages.

Some weeks ago, the Hamilton Street Railway's conductors and motormen applied for an increase in wages, and for certain other concessions. All the points at issue were settled, by negotiation between the company and the men, except the rate of wages, which the company offered to submit to arbitration. This offer was accepted by the men and application was made to the Minister of Labor for a conciliation and investigation board, the company selecting as its representative S. F. Washington, K.C., of Hamilton, and the men W. D. Robbins, Secretary, Toronto St. Ry. Employees Union, and one of the Toronto city controllers. County Judge Livingston, of Welland, was selected as the third arbitrator.

The wages heretofore in effect are: 1st year, 22c an hour; 2nd year, 24c; 3rd year and after, 28c, with a war bonus of 2c in addition.

The rates asked by the men are: 1st six months, 36c; 2nd six months, 38c; 2nd year and after, 42c.

We are advised that the arbitrators, on Apr. 25, unanimously agreed to recommend a settlement at following rates:—1st year, 30c.; 2nd year, 34c.; 3rd year and after, 37c. The men accepted the award at a mass meeting that evening.

Misrepresentations about Cleveland Electric Railway Fares Corrected.

The electric railways of New York State special committee on ways and means to obtain additional revenue has issued the following circular:—"A number of newspapers, in commenting upon the New York Court of Appeals' decision in the 6c fare case, have referred to fares in Cleveland, Ohio, as demonstrating that service can be given for 3c, with an additional charge of 1c for a transfer. The committee believes that this statement should be denied wherever it appears. The fare in Cleveland today is 4c, with a 1c charge for a transfer, no rebate, and there is every prospect that this rate will be further increased. It should also be remembered that this low fare does not apply to the entire system, and that in some instances fares as high as 8c are charged.

"The increased cost of operation has hit Cleveland as it has every other electric railway system, and fares have been increased three times since Nov., 1917. Fares in Cleveland are regulated by what is known as the 'interest' fund, into which goes all receipts remaining after operating expenses, maintenance, depreciation and taxes are paid. When this fund exceeds \$700,000, the fares are automatically lowered; when it drops below \$300,000, they are automatically increased. In Nov., 1917, they fell below \$300,000 in the fund and in spite of two increases in fare, in March of this year, it had fallen to \$120,000, necessitating still another increase. It is the opinion of those informed as to the situation that this latest increase will still prove insufficient and that a further advance will be necessary."

Legislation Respecting Passing of Electric Railway Cars.

The Motor Vehicles Act, Revised Statutes of Ontario, 1914, chap. 207, as amended by the Motor Vehicles Amendment Act, 1916, chap. 47, provides as follows:

"15. When a motor vehicle meets or overtakes a street car, or a car of an electric railway, which is operated in or near the centre of the travelled portion of the highway, which is stationary for the purpose of taking on or discharging passengers, the motor vehicle shall not pass the car, or approach nearer than 6 ft. measured back or forward from the rear or front end, as the case may be, of the car, on the side on which passengers are getting on or off, until such passengers have got on or got safely to the side of the street as the case may be."

The Ontario Legislature, at its recent session, added the following to the Motor Vehicles Act:—

"15a. No person in charge of a motor car, or the car of an electric railway operated in or near the centre of the travelled portion of the highway, which is stationary or in motion, shall pass on the left hand side of such car, having reference to the direction in which such car is travelling."

Sandwich, Windsor & Amherstburg Ry. Wages.—As stated in Canadian Railway and Marine World for April, a board of conciliation was appointed to consider disputes between the Sandwich, Windsor & Amherstburg Ry. and its employes. The board, which consisted of M. G. Campbell, chairman; E. G. Henderson, representing the company; and F. C. Kirby, representing the men, has reported recommending an advance in wages of 7c an hour, making them as follows: First six months 35c, second 6 months 37c, 2nd year 38c, 3rd year and afterwards 40c. An additional allowance of 1c an hour, exclusive of overtime, is to be paid all classes of conductors and motormen in lieu of uniforms. Caps and badges are to be supplied free by the company, and all men to be in suitable uniform, clean and tidy when on duty. A Windsor press dispatch says the board refused the men's demands for recognition of their union.

London St. Ry. Wages.—The London St. Ry. employes applied to the company at the end of March for an increase in wages. A London press dispatch says that the increase asked is about 10c an hour, that the present wages of conductors and motormen range from 23c to 28c an hour, and that the increases asked would make them range from 32c to 38c. Other concessions were also asked. The management pointed out to a deputation of the men, that if it had paid for 1917 a dividend of \$19,124.40, which would have been a just charge against earnings, there would have been a deficit of \$24,827.60 on the year's operations, and that it was not in a position to pay higher wages. The matter is still unsettled.

Electric Railway Fares in Quebec. Canadian Railway and Marine World for April contained particulars of the Quebec Ry., Light & Power Co.'s application to the Quebec City Council, for permission to increase its street railway fares and gas rates. The application was read at a city council meeting on Mar. 15 and was referred to the finance committee. Owing to the committee's time being considerably taken up with changes in taxation and preparation of the estimates for the ensuing year, it will probably be taken up by the committee early in May.

Marine Department

The Minister of Marine's Explanation of the Dominion Government's Shipbuilding Programme.

In the House of Commons, on April 4, when the Naval Service estimates were being considered, Mr. Lemieux, M.P. for Maisonneuve, asked the Minister of Marine, Mr. Ballantyne, to give particulars as to the programme for naval construction in Canada. In replying, the Minister said:

The Government's programme is not for naval ships, but for mercantile marine ships. During the past year, there has been a certain type of naval ship built at various yards in Montreal and throughout Canada for the Imperial Government and also for the Canadian Government. I do not think it would be right for me to enter into details as regards the type of naval ships that have been so built, or as regards those that are under construction. Suffice it to say that I am very glad to make known that all the war vessels which have been built in the various yards of Canada, including that of Canadian Vickers, Ltd. at Montreal, have been constructed equally as well as they could have been in the old country, or in any other land.

At present there are 14 shipyards for building steel ships in Canada. If all of these yards were unoccupied at present and were all engaged building, for the Canadian Government, the standard type of steel ships, the annual tonnage output would be 250,000 tons. When I had the honor of being called to the portfolio of Marine and Fisheries and Naval Service, I found that the Dominion Government was advancing money through the Imperial Munitions Board, under the direct management of Sir Joseph Flavelle, to keep all of the steel shipyards in Canada fully occupied in building ships for the mother country. It seemed to me, and also to the government when I brought the matter to its attention, that the time was opportune for Canada to embark upon the building of steel ships, as a national, permanent policy, and, after giving the matter very careful consideration for some months, and working out a comprehensive programme on good, sound, business lines, I brought the proposal before my colleagues in the government, and it was unanimously decided, that after the Imperial Munitions Board contracts were completed, all the berths in all the shipyards of Canada which are building steel ships would be utilized to the full in building steel vessels for the Canadian Government.

Our programme is that, as these berths become vacant and the Imperial Government ships are completed, they are taken up by the Canadian Government. At present we are having two ships built by Canadian Vickers, Ltd., of Montreal, one of 8,100 tons d.w. capacity, an 11-knot ship; and another of 4,350 tons. I have every hope that this autumn both of these vessels will be put in commission for the Canadian Government. It will be the first time in the history of Canada that sea going vessels as large as the two I have referred to have been built in Canada, by Canadian money, and owned by the Canadian Government; and I am very glad to know that members on both sides of the House join in favoring the policy that the Canadian Government is undertaking in the building, permanently, of steel vessels to keep the present yards

going. I hope a little later on, as the finances of the country become less strained, that the appropriation which is allotted to my department for building steel ships will be very much greater than it is at present. In addition to the two ships that are being built by the Canadian Vickers for the Canadian Government, another ship of about 5,000 tons is being built by the Wallace Shipyards at North Vancouver. Another vessel of 3,550 tons is being built by the Collingwood Shipbuilding Co. at Collingwood, Ont. Vessels that are being built in the yards on the great lakes are necessarily limited, as to size and tonnage, so as to conform to the depth of water in the canals. Ships that are being built in any of the yards on the great lakes cannot draw more than 14 ft.



Hon. C. C. Ballantyne, M.P.
Minister of Marine and Fisheries.

of water, which necessarily needs a limitation as to size in the case of these vessels.

The ships are ordered at so much a ton. I do not believe, and neither does the government, in having ships built on a percentage basis. I would not like the House to think that I accept the first price that is given to me by any of these shipbuilders, at so much per ton for a completed ship, according to the design, blue prints and specifications of the government, for I certainly do not. In the department we have some very able men. Mr. Duguid, the Naval Architect, is a man who has had a splendid training, extending over many years in some of the largest shipyards in England. We also have expert men possessing a thorough knowledge of marine boilers and marine engines, as well as many expert draftsmen.

There are three different types of Can-

adian ships under construction: The 8,000 tonner, the 5,000 tonner, and the smaller sized ship of 3,550 tons. The technical officers of my department estimate what the cost of a ship will be. We also ascertain what a similar ship—a vessel of the same design, class and tonnage—is being built for in the United States and in Great Britain. With this information from both the countries referred to, and our own estimated cost, we have a very excellent check on Canadian shipbuilders, which prevents them charging us an unfair or unreasonable price for the vessel to be constructed. These vessels are built at so much per completed ton according to the specifications and plans of the Marine Department.

As the berths to which I have alluded become vacant from time to time they will be immediately taken up by the Canadian Government, and the existing steel shipbuilding plants throughout Canada will be occupied to their full capacity. I cannot state how many ships are being built by the Imperial Munitions Board at present, but the Prime Minister gave that information to the House on the opening day of Parliament. (This was published in Canadian Railway and Marine World in March and our information was confirmed by Sir Robert Borden in the House of Commons on Mar. 19.) The Canadian Government and the Department of Marine have absolutely nothing at all to do with the Imperial Munitions Board, so far as relates to our shipbuilding programme, and any ships that the latter has ordered are for Imperial account. The duty of the Imperial Munitions Board is to see that they are finished and paid for; and the Canadian Government assumes no responsibility for any of the ships that are under construction at present for the Imperial Munitions Board.

One of the first difficulties that confronted me when considering the adoption of a permanent shipbuilding policy, was that of steel ship's plates. There is no duty on ship's plates coming into Canada. There has not been, and there is not at present, a rolling mill in Canada for the manufacture of these plates. If Canada is to become a shipbuilding nation, as I see no reason why she should not, it is necessary for her to be self contained in so far as concerns all the material that is required for building these mercantile ships; and one of the first things that I set about to try and obtain for Canada was a large plate mill, so that all the plates required for the ships that we are now building, and I hope also for a very much larger programme later on, would be made in our own country. I took the matter up with the large steel manufacturers. I did not confine myself to the manufacturers in this country, but also went to the U.S. steel companies, and asked them what kind of proposition they could place before the Canadian Government in order that we would secure what steel plates we required here. After several months of negotiations with the several steel companies in Canada and in the U.S., the best and most favorable proposition I could get, and the one that was accepted by my colleagues, was that of the Dominion Iron & Steel Company, of Sydney, N.S. There being no duty on

ship's plates, we could not expect any large industry, either in Canada or in the U.S., to come to this country and undertake the erection of a plant for rolling ship's plates, that would involve at least \$5,000,000 capital expenditure, without any protection whatever. These are not days when the policy of protection need be discussed, and as we are more concerned with the prosecution of the war than with tariff matters, I did not raise the tariff question with my colleagues at all, nor do I intend to do so in this house. We went about the task in another manner, which I hope will receive the unanimous approval of the house. In brief, the contract that I have concluded with the Dominion Iron & Steel Co. was made on the following basis: The Dominion Government has guaranteed to the company that they will have a minimum tonnage of 50,000 tons of ship plates a year, extending over five years, making in all a total of 250,000 tons. The price per 100 lb. for the moment is \$4.15. The safeguarding of the public interest, so far as the price is concerned, from time to time, has been arranged on the following basis: Ship plates are made from steel ingots, which in turn are made from pig iron, the pig iron being produced from iron ore. The Dominion Iron & Steel Co. own and operate within British territory facilities to produce all the raw materials that I have just mentioned as being required for the rolling of ship's plates. We have taken, as a basis to adjust this price every six months, the price per ton of steel ingots. The price at the time the contract was entered into for steel ingots was \$25.50 a ton. The price of plates to start with is \$4.15 per 100 lb., based on an ingot price of \$25.50 a ton. These prices were agreed upon after long weeks of negotiation, and I was accused, in a friendly way perhaps, by President Workman, of the Dominion Iron & Steel Co. of driving too hard a bargain with it on behalf of the people of Canada. I do not think that is exactly so, because I consider the contract we have entered into is eminently fair to the company as it is also fair Canada. The mill will take about 15 months to be erected, and Mr. Workman estimates that it will cost about \$5,000,000. The government does not put up one cent of money for the erection of this mill. The government was pressed to advance this money, but I declined to make such a recommendation to my colleagues, because I considered that the Dominion Iron & Steel Co. is strong enough to put up the \$5,000,000 required for the plant, and I, therefore, recommended to my colleagues that we do not advance the money. Accordingly, the company is going to erect this plant at its own cost.

The company claims that within 12 to 15 months it will be turning out all the ship plates that Canada may require. The company estimates that the capacity of the mill will be 150,000 tons of plate a year. In addition to ship plate, it is estimated that there are about 50,000 tons of other plate, such as boiler plate, used in Canada yearly. There is no duty on boiler plate, nor on ship plate. This mill will be a new national industry for Canada, and not only will it turn out the ship plates which we shall require here, and and which, I think, even with the existing yards we have, will run something like 75,000 tons a year, but there is no reason why the Dominion Iron & Steel Co. should not be able to get orders for, if not the whole, at least a part of the 50,000 tons of plate used for other purposes than for ships.

To follow along the policy of safeguard-

ing the public interest so that we shall not be paying too much for ship plate, after the mill has run for six months, turning out the plate, the price of the plate will be determined on the fluctuating price for steel ingots, based on a price of \$25.50 a ton. We were also able to arrange with the company, also with a great deal of reluctance on its part, that no matter how high the price of steel ingots goes, in no event will the price of steel plate cost the government any higher price than \$4.25 per 100 lb. If the price of steel ingot drops over a period of six months, the price of plate will be lowered accordingly. We are not going to take the company's say-so as at what its cost the company's say-so as to what its cost tract that the government shall send expert accountants, whom we shall name, to go over the company's books and costs, and if the price of steel ingots has fallen during the period of six months they will see to it that the government gets a proportionate reduction in the price of steel plates. Those are the essential points in the contract into which we are about to enter. The further particulars will be known when the order in council is laid upon the table.

There is another clause in the contract into which we are about to enter, viz., that on all the plant and machinery that the Dominion Iron & Steel Co. will require to import into Canada for the ship plate mill they will pay duty, and that duty will afterwards be refunded. The government is making only two concessions: first, we are guaranteeing 250,000 tonnage for five years, and secondly, we are remitting the duty on the machinery and material the company will require to bring in for its mill. In order that the ships which the government is ordering shall not cost too much money, I am happy to be able to say that through the splendid support of the British and Canadian War Missions at Washington, and through the generosity of the U.S. Government, we have been able to buy 80,000 tons of steel plate in the U.S. on very favorable terms, at a price as low as the U.S. shipbuilders are paying. This amount will keep our plants operating during the balance of 1918 and during the whole of 1919, so that our supply of steel plate is assured until such a time as Canada is able to roll her own plate.

I was glad to hear Mr. Lemieux commend the government for embarking on this policy. I will not weary the house by emphasizing the necessity for ships, for we all know to our sorrow the great loss of tonnage that occurs daily, not only to the British Empire, but to all the allies and to neutral countries as well, through the operations of German submarines. It follows that the countries that are well supplied with ships after the war will progress more rapidly than the countries which are short of ships. The ships which are being built by the Imperial Munitions Board, and are being financed by Canada, will not be under the Dominion Government's control, but are being built for the Imperial authorities, to be owned and operated by them as they see fit. But the ships that Canada is building now, and the ships she will build in the future, will be absolutely owned and controlled by Canada and will be used in the most effective way for the prosecution of the war. We hope also to use these ships for carrying the products of our fields, mines and forests across the seas to the various countries with which I hope Canada will later be doing a large export trade. Without the ships, Canada would be in a very unfortunate position. Almost daily I am

receiving requests from various interests in this country for ships; the people are almost begging for them. We require ships for our coal trade, we require ships to carry farm products, and we shall require ships to work in conjunction with the government-owned transcontinental railways. No definite railway policy has been worked out, and I merely mention the railways in connection with the steamship services. Canada already owns the Canadian Government Railways and the Canadian Northern Ry., and there may come a time when she will want ships on the Great Lakes and on the Atlantic and Pacific oceans, to act as feeders for the national transcontinental railway system. I have no hesitation in saying that in my opinion this policy that Canada has embarked on with regard to the building of ships is a wise and safe one. Not only will the ships be under the government's control, to be operated by it as it sees fit, but if necessary they can be rented or sold, and there are many other things that we could do with them, so I consider our policy is a very safe one in the national interest.

Mr. Lemieux said something about neutral ships. The Canadian Government, of course, is confining its efforts entirely to ships of Canadian registry. We intend to keep our yards busy with Canadian registered ships only—ships for the Canadian Government. A large number of wooden ships have been built by the Imperial Munitions Board for the Imperial authorities, but it is not the intention of the Canadian Government to have any wooden ships built. I am not prepared to express any opinion for or against wooden ships, except that with the money available for shipbuilding in Canada at present it seemed to the government the wisest policy to invest that money in steel ships only. The wooden shipbuilding yards in different parts of Canada have many opportunities at present for building wooden ships. While they cannot build wooden ships for the Dominion Government, they have every opportunity of building wooden ships for private interests for Canadian registry, and some of the yards are now working on very large orders for wooden ships for allied and neutral countries.

Mr. Lemieux spoke, also, of the necessity of retaining the skilled and technical workers required for building ships in Canada. Everybody is agreed—this House, the people of Canada and of the British Empire, and all our allies—as to the necessity for ships, ships, and more ships, and although the operation of the Military Service Act does not come under my jurisdiction, I can say that the representations that have been made, and which will be made in the future, to the proper tribunals for the exemption of these men, will be given every consideration, and care will be taken to safeguard the interests of this country and of the Empire by seeing that the necessary number of men are retained in the shipyards to carry out the Dominion Government's programme.

E. G. Power, M.P. for Quebec South, said that as the representative of a constituency which at one time was the centre of the wooden shipbuilding industry in Canada, and before giving his cordial approval to the government's plan of steel shipbuilding, he would like to be informed whether the Minister has made a full investigation into the possibilities of reviving the wooden shipbuilding industry, and whether or not experts had given it as their considered opinion that wooden ships could not be used to increase the world's

tonnage with the same good effect as steel ships.

The Minister said in reply:—The government and I, as the Minister charged with the responsibility of seeing that the government's shipbuilding programme is carried out, looked very carefully into that question, but the government's policy being only to keep the steel shipbuilding yards in Canada busy, our financial ability will not permit us to go beyond that. Mr. Power will agree that, as a business proposition, and as a national proposition, bearing in mind that these ships are being built not for today only, but for the future, it is a wiser policy for Canada to put her money into steel shipbuilding than to put it into wooden ships. I am not saying anything derogatory to wooden ships, but the speed of a wooden ship is very much less than that of a steel ship, her carrying capacity is less, and the wooden ship is debarred from the submarine zone, because her speed, being so slow, she presents a very much better target for submarine torpedoes. But the latter argument is not the one that caused the government to go in for steel shipbuilding. The other arguments which I have presented carried more weight.

The member for Queens and Shelburne, N.S., Mr. W. S. Fielding, said:—I think the Government should be congratulated upon giving its attention just now to steel shipbuilding, which of course does not necessarily imply that the government lacks appreciation of the importance of wooden shipbuilding. My own judgment is that we do not need any particular stimulus for wooden shipbuilding in our country. It is an art with which many of our people are quite familiar. I do not know whether there is a revival in the ancient city of Quebec of the great art of wooden shipbuilding, but in the Maritime Provinces there is a very large measure of activity all along our coast. In my own constituency several wooden ships are being built. I am afraid the conflict between iron and wood and steel was settled some years ago, when, in the age of progress through which we were passing, the fact had to be recognized that the wooden ship must give way to the iron ship, and the iron ship in turn must give way to the steel ship, and by and by we will return to those conditions, when the large wooden ships will hardly have much chance in competition with the large steel ships. There has been in the past, and I believe there will be in the future, quite a demand for wooden ships, and I believe the conditions that will exist at the close of the war, and for some years afterwards will be such that there will be large opportunity for the wooden shipbuilders of the country to engage in their enterprise. So that I feel that, in giving the preference to steel shipbuilding, as the Minister is doing, there is no danger of any industry being done to the wooden shipbuilding industry. I believe that industry will flourish for some years to come without any particular aid from the government. Steel shipbuilding is, in a measure, a new industry here. It has been carried on in a small way, but owing to the very fact that the Minister has stated: that we had no plate mill in the country, we could not expect to engage in the enterprise in a very large way.

The Minister added: While at present I regret that there are no steel shipbuilding yards in the Maritime Provinces, and while our programme is limited to the amount of the expenditure we can afford to allocate for shipbuilding, I have been giving a lot of attention during the last few weeks, and so have my colleagues, to

the question of having a large steel shipbuilding industry located somewhere in the Maritime Provinces, so that steel ships may be made there, as well as in other parts of the Dominion.

In answer to a question by Mr. Lemieux as to whether there would not also be rolling mills at Montreal, the Minister said: There is no reason why rolling mills should be confined to any one particular province, but it is not an attractive business proposition at present. There are not many financiers, or industrial men, in this country who want to put \$5,000,000, or even \$3,000,000, into a plant that has absolutely no protection whatever. If any other group of financiers wishes to enter into the rolling of ships' plates, either in Montreal or in any other part of Canada, I will not say that the government will give them the same assistance that we have found it necessary to give the Dominion Iron & Steel Co.—I think members will agree that it was necessary to do that to get the first mill started—but if any other group of financiers wish to start into the rolling of ships' plates without any duty, the government will be very pleased indeed to see them do it.

Jos. Read, M.P. for Prince Edward Island, said: I had the pleasure of visiting British Columbia recently, and while there went through one of the shipyards that the Minister stated he has given a contract to, the Wallace Shipyards at North Vancouver. I saw there the most marvellous development of shipbuilding that can possibly be found in the world. I stood in that shipyard and saw the workmen moulding the plates for the building of ships. One of the most intricate pieces of work in connection with shipbuilding is the making of the bilge plates of a steel ship. Four men were handling that plate. Not a blow was being struck, not a bit of human muscle was being exercised, no brawn was being used except in simply moving the plate along to receive the pressure that was coming from the mountain that stood within view of the very men that were handling the plate. There they were, drawing energy from "white coal" which was generated from a mountain lake, and they were moulding that plate into that intricate shape, ready to put on the ship's bottom, without using a mallet, a chisel, or a maul. It was a marvellous thing, and it showed that the people of British Columbia, at any rate, have all the necessary elements to compete with anything in the world in the building of ships. I found that not only were they moulding plates by means of electrical energy, but they were cutting off their great beams with an instrument just like a pencil, following a line, cutting off great beams, 6 in. square, with a jet of electric flame, and the acetylene gas that is used in connection with it. All the riveting and that sort of thing is being done by the same power. There is no doubt in the world that we can build ships in Canada. We built them before. There was a time in my history, in the early sixties, I think, when Canada—little undeveloped Canada—stood second, or, at any rate, third, among the whole of the nations of the earth in point of tonnage. And, during those years the men who went down to the sea in ships from the Maritime Provinces and the Province of Quebec were second to no men in the world. They were first. Very few sailors amongst them, because they were not very long at the business, but they developed to such a marvellous extent into officers that one would think they were all precocious boys. I have seen young men, taken out of the green woods in

Prince Edward Island, in two years time become masters of square rigged ships in the foreign service; they were the greatest successes that any country ever produced. Anything that the Minister can do to build up a mercantile navy I am sure will be to the interest of Canada as a whole, as well as to the interest of those centres which have the good fortune to have the industry established amongst them.

Mr. Johnstone, M.P., asked the Minister if he was experiencing any difficulty in getting shipbuilders in Canada to accept contracts. A gentleman of prominence in marine circles had stated that shipbuilders were not accepting contracts from the Government as readily as they might on account of the exacting terms of the contracts.

The Minister replied:—It has not come to my notice that we have had any difficulty at all in placing orders for steel ships in Canada. Whenever the berths become vacant, we find the shipbuilders eager and anxious for business. It has not been brought to my notice that there is any condition such as Mr. Johnstone has mentioned.

The Algoma Central Steamship Line, Sault Ste. Marie, Ont., has purchased the s.s. William S. Mack, recently owned by the Lake Erie Transportation Co., Cleveland, Ohio, and has had her name changed to Home Smith. She was built at Lorain, Ohio, in 1901, on the channel system, with steel tank top where no ceilings are fitted, 3 watertight bulkheads, 2 non-watertight bulkheads, steel boiler house, and steam pump wells, and is equipped with electric light. The propelling machinery consists of triple expansion engine with cylinders 20, 33½ and 55 in. diam. by 40 in. stroke, 1,000 i.h.p. at 80 r.p.m., supplied with steam by 2 Scotch boilers 12 ft. 10 in. by 13 ft. at 175 lb. Her dimensions are: length 346 ft., breadth 48 ft., depth 28 ft.; tonnage, 3,720 gross, 2,785 register.

Regulations re Outturns of Grain Cargoes.—Up to the time of writing, Apr. 22, no announcement has been made as to the Grain Commission's regulations governing allowances for the regulation of overages and shortages in grain cargoes, for the current season. The regulations in force last year provided for a fixed contribution of one-sixth of a bushel per thousand by the loading elevator, and a quarter of a bushel per thousand by the vessel, and on this basis, the unloading elevator assumed the risk of shortage and took any surplus that might occur. Some protest was made by the elevators this year, but after a general consideration of the matter, it was decided to leave it with the Grain Commission, and regulations are being devised to meet the situation.

U.S. Vessel Building on Great Lakes. A Cleveland, Ohio, press dispatch states that the U.S. Emergency Fleet Corporation has ordered from the American Shipbuilding Co., 66 steamships for salt water service, for delivery in 1919, at an estimated cost of \$50,000,000; the vessels to be of full Welland Canal size, but 60 of them to have a somewhat greater depth of hold. The dimensions are given as follows: length 261 ft., breadth 45¼ ft., depth of six, 22.5 ft., and of the balance, 28 ft. 2 in.; tonnage, deadweight, six of 3,500 tons, sixty of 4,200 tons.

Pilotage Tender for Halifax.—The Marine Department is on the look out for a pilotage tender for Halifax Harbor, N.S., the purchase of which was recommended recently by the commission which investigated pilotage conditions there.

Steam and Sailing Ships Under Construction Throughout Canada.

Following are particulars of shipbuilding reported in progress at Jan. 31. The figures given in each case represent the gross tonnage.

Steamships, Atlantic Coast.

Canadian Vickers, Ltd., Montreal, 2 cargo steamers, 8,200, steel; 1 dredge, 2,360, steel; 7 trawlers, 1,750, steel; 15 drifters, 1,875, wood.

Davie Shipbuilding & Repairing Co., Levis, Que.—1 car ferry, 5,000, steel.

Dowling & Stoddart, Port Clyde, N.S.—1 gas boat, 27, wood.

Grant & Horne, St. John, N.B.—1 cargo steamer, 2,800, wood.

Joseph Matte, St. Methot, Que.—1 tug, 18, wood.

Marine Construction Co. of Canada, Ltd., St. John, N.B.—1 auxiliary schooner, 750, wood.

John McLean & Co., Halifax, N.S.—1 tug, 320, wood.

Nova Scotia Steel & Coal Co., New Glasgow, N.S.—1 cargo steamer, 3,000, steel.

Quebec Shipbuilding & Repairing Co., St. Laurent, Que.—2 cargo steamers, 2,600, wood.

Quinlan & Robertson, Quebec, Que.—4 cargo steamers, 6,400, wood.

Total, Atlantic coast—12 steel, 20,310 tons; 26 wood, 14,790 tons. Grand total, 38 steamships, 35,100 tons.

Steamships, Great Lakes.

British-American Shipbuilding Co., Welland, Ont.—2 cargo steamers, 4,700, steel.

Canadian Allis-Chalmers, Ltd., Bridgeburg, Ont.—4 cargo steamers, 9,600, steel.

Collingwood Shipbuilding Co., Collingwood, Ont.—3 cargo steamers, 7,200, steel.

Great Lakes Dredging Co., Fort William, Ont.—1 cargo steamer, 1,700, wood.

Midland Shipbuilding Co., Midland, Ont.—3 cargo steamers, 6,000, wood.

Polson Iron Works, Ltd., Toronto—7 cargo steamers, 16,450, steel; 10 trawlers, 2,640, steel.

Port Arthur Shipbuilding Co., Port Arthur, Ont.—6 cargo steamers, 12,091, steel; 6 trawlers, 1,530, steel.

Thor Iron Works, Ltd., Toronto, Ont.—1 cargo steamer, 2,347, steel; 2 trawlers, 540, steel.

Toronto Shipbuilding Co., Toronto—2 cargo steamers, 6,000, wood.

Total, Great Lakes—41 steel, 57,188 tons; 6 wood, 13,700 tons. Grand total, 47 steamships, 70,888 tons.

Steamships, Pacific Coast.

Cameron-Genoa Mills Shipbuilders, Ltd., Victoria, B.C.—4 cargo steamers, 6,800, wood.

J. Coughlan & Sons, Vancouver, B.C.—2 cargo steamers, 11,500, steel.

Foundation Co., Victoria, B.C.—3 cargo steamers, 6,300, wood.

William Lyall Shipbuilding Co., Vancouver, B.C.—4 cargo steamers, 6,800, wood.

New Westminster Construction Co., New Westminster, B.C.—4 cargo steamers, 6,800, wood.

Pacific Construction Co., Port Coquitlam, B.C.—2 cargo steamers, 5,000, wood.

Wallace Shipyards, Ltd., North Vancouver, B.C.—4 cargo steamers, 17,500, steel; 1 freight and passenger steamer, 5,500, steel.

Western Canada Shipyards, Ltd., Vancouver, B.C.—3 cargo steamers, 3,900, wood.

Total, Pacific coast—7 steel, 34,500 tons; 20 wood, 35,600 tons. Grand total, 27 steamships, 70,100 tons.

Wooden Sailing Schooners, Atlantic Coast

Acadia Shipbuilding Co., Saulnierville, N.S.—One, 400 tons.

Allan & Fraser, Fraserville, N.S.—One, 350 tons.

Annapolis Shipping Co., Annapolis Royal, N.S.—Two, 900 tons.

Beazley Bros., Weymouth, N.S.—One, 400 tons.

Moise Belliveau, Church Point, N.S.—One, 450 tons.

T. K. Bentley, Advocate Harbor, N.S.—One, 511 tons.

Fidele Boudreau, Church Point, N.S.—One, 350 tons.

Hilaire Boudreau, Church Point, N.S.—One, 300 tons.

Bridgewater Shipbuilding Co., Bridgewater, N.S.—One, 400 tons.

Smith Canning, Port Greville, N.S.—One, 350 tons.

Chester Basin Shipbuilders, Ltd., Chester Basin, N.S.—One, 650 tons.

Clare Shipbuilding Co., Meteghan, N.S.—One, 400 tons.

G. M. Cochrane, Fox River, N.S.—One, 450 tons.

A. H. Comeau, Meteghan River, N.S.—One, 400 tons.

Comeauville Shipping Co., Comeauville, N.S.—One, 450 tons.

G. A. Cox, Shelburne, N.S.—One, 322 tons.

Dowling & Stoddart, Port Clyde, N.S.—One, 300 tons.

Eastern Shipbuilding Co., Ship Harbor, N.S.—One, 300 tons.

H. Elderkin & Co., Port Greville, N.S.—One, 750 tons.

Ernst Shipbuilding Co., Mahone Bay, N.S.—One, 350 tons.

Falmouth Shipbuilding & Transportation Co., Windsor, N.S.—One, 405 tons.

Fauquier & Porter, Hantsport, N.S.—Two, 850 tons.

Foley Bros., Hantsport, N.S.—Two.

Thos. German, Meteghan, N.S.—One, 350 tons.

Han'inson Shipping Co., Belliveau Cove, N.S.—Two, 750 tons.

D. Huntley, Scott's Bay, N.S.—One, 500 tons.

W. R. Huntley, Parrsboro, N.S.—Two, 650 tons.

J. W. Kirkpatrick, West Advocate, N.S.—One, 350 tons.

Lewis Shipbuilding Co., Sheet Harbor, N.S.—One, 675 tons.

B. N. Melanson, Gilbert's Cove, N.S.—One, 200 tons.

H. McAloney, Canning, N.S.—One, 350 tons.

Jos. McGill Shipping & Transportation Co., Shelburne, N.S.—Two, 395 tons.

W. C. McKay & Son, Shelburne, N.S.—One, 140 tons.

McKean & Rodding, Ltd., Dartmouth, N.S.—One, 375 tons.

McLean & McKay, Economy, N.S.—One, 350 tons.

Archibald McKenzie, River John, N.S.—One, 600 tons.

Chas. McLellan, River John, N.S.—One, 100 tons.

Chas. McNeil, New Glasgow, N.S.—Two, 800 tons.

W. A. Naugler, La Have, N.S.—One, 350 tons.

Noel Shipbuilding Co., Noel, N.S.—One, 425 tons.

Nova Scotia Shipbuilding Co., Liverpool, N.S.—Two, 875 tons.

O. O'Brien, Noel, N.S.—One, 325 tons.

Mortimer Parsons, Cheverie, N.S.—One, 425 tons.

J. N. Pugsley, Diligent River, N.S.—One, 500 tons.

J. N. Rafuse & Co., Conquerall Bank, N.S.—One, 350 tons; Salmon River, N.S.—one, 325 tons.

S. Robichaud, Meteghan, N.S.—One, 400 tons.

St. Martin's Shipbuilding Co., St. Martin's, N.B.—One, 450 tons.

S. Salter, Parrsboro, N.S.—One, 200 tons.

Greene Scott, Minasville, N.S.—One, 73 tons.

Shelburne Shipbuilders, Ltd., Shelburne, N.S.—Two, 749 tons.

J. W. Smith, Hillsburn, N.S.—One, 479 tons.

W. K. Smith, Plympton, N.S.—One, 200 tons.

Smith & Rhuland, Lunenburg, N.S.—Two, 256 tons.

S. J. Foley, Fox River, N.S.—One, 425 tons.

Southern Salvage Co., Liverpool, N.S.—One, 185 tons.

B. L. Tucker, Bass River, N.S.—One, 350 tons.

F. K. Warren, Grosses Coques, N.S.—One, 350 tons.

Warren, Rice & Co., Weymouth, N.S.—One, 300 tons.

C. T. White & Son, Sussex, N.B.—Three, 1,360 tons.

Total, Atlantic coast, 72 schooners of 28,850 gross tons.

Summary.

	No.	Tons.
Steel steamships.	No.	Tons.
Atlantic Coast	12	20,310
Great Lakes	41	57,188
Pacific Coast	7	34,000
	60	111,998
Wooden steamships.	No.	Tons.
Atlantic Coast	20	14,790
Great Lakes	6	13,750
Pacific Coast	20	35,600
	52	64,140
Steel steamships	60	111,998
Wooden steamships	52	64,140
Wooden schooners	72	28,850
	184	204,988

Halifax Disaster Manslaughter Charges.

As mentioned in previous issues, in connection with the Halifax disaster in December last, A. Lemedec and F. Mackey, master and pilot respectively of the s.s. Mont Blanc, together with Commander F. Wyatt, R.N.R., Chief Examining Officer of the port, were arrested, charged with having caused the death of a number of persons. Capt. Lemedec and pilot Mackey were released subsequently on writs of habeas corpus, the former leaving the country, and further indictment of the latter was refused. The case against Commander Wyatt, who was suspended from his duties soon after the disaster, came before the criminal court, Apr. 17, on the specific charge of having caused the death of Wm. Hayes, pilot of the s.s. Imo, the jury returning a verdict of not guilty, his acquittal following. In charging the jury, Mr. Justice Russell stated that there was absolutely nothing, so far as the law was concerned, on which a verdict of guilty could be brought in.

Prince Edward Island Car Ferry.—A Charlottetown correspondent writes: The car ferry steamship Prince Edward Island has been in operation this winter on the Borden-Tormentine route and has given continuous service. She has not missed a trip in the severest winter known for a quarter of a century. She has been rigidly put to the test and has never failed.

General Shipbuilding Notes Throughout Canada.

The Anglo-Newfoundland Development Co., Botwood, Nfld., is reported to be building two 3 masted auxiliary powered schooners of 450 tons each, equipped with engines of 150 h.p. This company is one of the Harmsworth interests, and is mainly concerned with the manufacture of paper for the Harmsworth controlled newspapers in England, though a considerable portion of its make is being sent to the United States.

British-American Shipbuilding & Engineering Co., Vancouver, B.C.—A press report stated early in April, that within a month, work would be commenced on eight shipways, provided the Dominion Government would undertake certain dredging along the Kitsilano Reserve foreshore. It is reported that the company has reached an agreement with the harbor commission regarding the land to be leased on the western end of the reserve, and that plans have been approved by the local authorities. These plans show 8 building slips, machine shops, blacksmith shop, mould lofts, etc. It is announced, as mentioned in our last issue, that the company is arranging to build 20 steamships of a composite type, but no indication is given as to whom they are intended for. S. Matheson is President. We are officially advised that the company has been granted an export permit to build 20 wooden cargo steamships for Norwegian registry.

Canadian Car & Foundry Co.—J. M. Smith, at one time connected with the Collingwood Shipbuilding Co., and latterly with Tidewater Shipbuilders, Ltd., Three Rivers, Que., has been appointed Superintendent of the Canadian Car & Foundry Co.'s shipbuilding department at Fort William. As previously stated in Canadian Railway and Marine World, the company has a contract for 12 mine sweepers, for the French Government, of which the following are the chief dimensions:—length over all 143 ft., length between perpendiculars 135 ft., breadth moulded 22½ ft., depth moulded to main deck 13¾ ft., depth moulded to quarter deck 14¾ ft., displacement loaded 630 tons, freeboard (Lloyd's) 15 ins.

The Canadian Car & Foundry Co.'s annual report, dated April 15, says:—"Some months ago we were asked to co-operate with the Manitowoc Shipbuilding Co., of Manitowoc, Wisconsin, in the manufacture of 12 mine sweepers for the French Government. After careful investigation by shipbuilding experts, your directors became convinced that at our Fort William works we possessed the necessary machinery and facilities for the fabrication of ship parts, as well as an excellent water frontage, and it was estimated that an assembling plant and launching facilities for the class of boat proposed could be built and installed for approximately \$200,000. Your directors entered into negotiations with the official representatives of the French Government, and were finally offered a contract for the 12 mine sweepers, completely equipped, at a satisfactory price; liberal terms of payment were agreed upon, and advance payments arranged to provide the necessary capital and inventory requirements, and the contract was accepted. It is believed that this initial order will yield a profit, after charging against earnings the entire cost of the additional installation. An agreement has been made with the Manitowoc Shipbuilding Co., whereby we secure its co-operation and supervision, and work

on the project has commenced. Shipbuilding in Canada has attractive possibilities, and the successful initiation of the shipbuilding industry at our plant at Fort William will be of considerable advantage, especially in the event of a later depression in car building work."

Collingwood Shipbuilding Co., Collingwood, Ont.—The disagreements between the company and its employes have been adjusted. The board of conciliation appointed, viz., H. P. Hill, Ottawa, Chairman; Capt. J. B. Foote, Toronto, for the company, and F. Bancroft, Toronto, for the men, heard the complaints, and during the hearing, it was agreed that the parties concerned would settle the matters in dispute between themselves.

A press report from St. John, N.B., states that the Collingwood Shipbuilding Co. is interested in the establishment of a steel shipbuilding plant at Courtenay Bay, St. John. One of the company's officials states that nothing is known about this at Collingwood.

J. Coughlan & Sons, Vancouver.—A Vancouver press dispatch of April 21 said that the Dominion Government's refusal of permission to Vancouver steel shipbuilding yards to proceed with new contracts for vessels of a standard type of 8,800 tons each for allied nations, and the issuance of orders by the Imperial Munitions Board at Ottawa for making structural alterations in the vessels already nearing completion, might result in a halt in operations at the Coughlan ship yards. As previously stated in Canadian Railway and Marine World, J. Coughlan & Sons have orders from the Imperial Munitions Board for building 9 steel steamships of 8,800 tons each for the British Government, one of which has been launched, and they are not likely to have any vacant berths during this year, but expect to have some vacant early next year, when the Marine Department will be prepared to give them contracts for building steel steamships of 8,800 tons capacity, if satisfactory terms can be arranged. In regard to changes in the structural alterations of the vessels under order by the Imperial Munitions Board, we are officially informed that no material changes have been made from the original plans and specifications.

Halifax, N.S.—An unconfirmed report says that J. W. Norcross, Vice President and Managing Director, Canada Steamship Lines, Ltd., Montreal, is interested in a project to establish a steel shipbuilding plant at Halifax and to take the floating dry dock from Montreal there.

Wm. Lyall Shipbuilding Co., Vancouver, B.C.—It is stated that the company, in addition to the wooden steamships which it is building for the British Government, has commenced the first of six vessels which it intends building for its own account, and expects to have completed by September.

T. H. Macdonald, Meteghan, N.S., launched the schooner Rebecca L. Macdonald recently, and she subsequently loaded cargo at St. John, N.B., for South Africa, after which she will sail to New York. She is 186 between perpendiculars, 36 ft. wide, with 16 ft. hold, and is said to be the largest vessel launched from a Bay of Fundy yard for several years. The masts are 91 ft. long by 22 in. diam., of Oregon pine, and the topmasts are 50 ft. long, of native spruce. She is equipped with electric light, and has a 12 h.p. upright gasoline engine, for handling the sails, pumps, etc.

Jos. McGill Shipbuilding & Transportation Co., Ltd., Shelburne, N.S., launched a schooner of 150 tons at the end of March, which was named James and Stanley. She is owned by Samuel Harris, Ltd., of Newfoundland.

The keel is reported to have been laid for a three masted schooner of about 200 tons.

Nova Scotia Shipbuilding & Transportation Co., Liverpool, N.S.—The second of the two schooners under construction by this company recently, was launched at the end of March. She was built for Peter Yee Wing & Co., Sydney, Australia. Her dimensions are: keel 118 ft., beam 33 ft., hold 12 ft.

The Port Hope, Ont., Town Council and Board of Trade, have been discussing the possibility of getting a steel shipbuilding plant established there.

Prince Rupert, B.C.—A Vancouver syndicate is said to be negotiating for a lease of the Grand Trunk Pacific Railway floating drydock.

J. N. Rafuse & Sons, Conquerall Bank, N.S.—Work is reported to have been commenced on the building of a second schooner in W. J. Foley's yard at Salmon River, N.S., similar to the schooner Industrial, the launching of which was mentioned in our March issue. The dimensions of that vessel are: length 113 ft., breadth 30 ft., depth 11½ ft.

Standard Shipbuilding Co., Ltd., Vancouver, B.C.—Reports from Vancouver, as mentioned in our last issue, credit this company with having concluded contracts with the British Ministry of Shipping for 10 composite steamships, and that a representative of the company was in London, Eng., with the plans for the final approval of the authorities there. No confirmation of this can be obtained. Up to the present all shipbuilding orders placed in the Dominion on behalf of the British Government have been handled by the Imperial Munitions Board, and the board has not placed such an order, nor had any negotiations with that end in view.

St. John, N.B.—A proposition is said to have been made to the New Brunswick Government, by J. B. Craven, New York, and T. A. Duff, Toronto, for the establishment of a steel shipbuilding plant at Courtenay Bay, St. John. It is stated that a company is prepared to go ahead with the work on a large scale, immediately, if adequate support is given by the provincial government.

Taylor Engineering Co., Vancouver, B.C., is reported to have been awarded a contract for the design and construction of a 4,500 ton floating dry dock. It is not stated where the dock will be located on completion. W. T. Donnelly, New York, who designed the dock and harbor works at Prince Rupert, B.C., is stated to have been engaged for the designing of the dock, the dimensions of which are mentioned as follows: length over all 352 ft., length of wings 300 ft., width over all 100 ft., width between wings 80 ft. It is said it will be designed to take a draft of 20 ft., 4 ft. keel blocks, and will be arranged so that its lifting power can be increased to 7,500 tons, when the length of the dock will be increased to 445 ft.

We have been advised that the company is building a wooden cargo steamship for coast service, with 300 tons deadweight capacity. She will be equipped with engine of 160 h.p., and will be built to class

A1 at Lloyd's. The cost will be about \$90,000. The vessel is intended for operation between Seattle, Wash., and northern B.C. ports. Several small boats are under construction at the company's plant, and the building of two reinforced concrete seagoing barges, with capacity of about 1,200 tons each, is under construction.

P. A. Therriault, Belliveau Cove, N.S., launched the schooner Charles Therriault, of 339 tons, early in April. Arrangements have been completed for laying the keel of a similar vessel, and the work is proceeding.

Steamships Under Construction for British Government.

The s.s. *Alaska*, built by J. Coughlan & Sons, Vancouver, B.C., was originally intended for Norwegian registry, but while on the ways, was taken over for the British Government. The launch took place Jan. 19, and she is expected to be ready for sea by the end of May. The officers have arrived in Vancouver to take over the vessel. She is to be operated by Furness, Withy & Co., on behalf of the British Government.

Edgard Fitzgerald, C.B.E., Assistant to Chairman, Imperial Munitions Board, left Ottawa for Vancouver and Victoria, B.C., early in April and is expected to return early in May.

Foundation Co., Victoria, B.C., launched its second wooden hull for the Imperial Munitions Board, Apr. 11, the name adopted being *War Massett*. This hull was ready for launching in March, but some delay was necessary owing to the non-arrival of fittings.

Wm. Lyall Shipbuilding Co., Vancouver, B.C.—The second of the wooden steamship hulls built by this company for the British Government was launched Apr. 10, and named *War Caribou*. She was at once taken to the Ogden Point assembly plant to have her machinery installed. The remaining four hulls, of this order, are reported to be well advanced. At least one of the four was expected to be ready for launching before the end of April, and another one early in May. Of the last two of the order, one is planked and caulking is proceeding, and the other is more than 25% planked.

New Westminster Construction & Engineering Co., New Westminster, B.C.—It is announced that the four vessels under construction for the Imperial Munitions Board at the company's Poplar Island yard, will be completed early in September. Local representations are being made to the board, in the hope of having the machinery installed at New Westminster, instead of having the hulls towed to Ogden Point, Victoria, where the board has equipped a large assembly plant. The first of these hulls was launched Apr. 11, and named *War Comox*.

Pacific Construction Co., Port Coquitlam, B.C., launched a wooden hull for the Imperial Munitions Board, Apr. 13, when she was named *War Tyee*. This made the fourth launch along the B.C. coast in one week.

Port Arthur Shipbuilding Co., Port Arthur, Ont.—The s.s. *War Isis* was launched at these yards, Apr. 3, for the British Government. This is one of 6 steel steamships of 3,400 tons d.w. capacity, ordered by the Imperial Munitions Board from the company. Keel plates were immediately laid in the vacant berth

for another similar vessel of full Welland Canal size.

Western Canada Shipyards, Ltd., Vancouver, B.C.—The wooden hull of the s.s. *War Selkirk*, the launching of which was mentioned in our last issue, was taken to the Ogden Point assembly plant early in April, for the installation of her machinery.

Launchings of Steamships.—Following are particulars of steamships ordered by the Imperial Munitions Board for the British Government, and which had been launched up to April 15, giving in each case the date of the launching, the name of the steamship, the name of the builder and the deadweight tonnage:—

Steel Steamships.		Tonnage.
May 18, 1917—	War Dog—Wallace Shipyards Ltd., North Vancouver, B.C.	4,500
July 9, 1917—	War Wasp—Nova Scotia Steel Steel & Coal Co., New Glasgow, N.S.	1,800
Aug. 19, 1917—	War Fish—Port Arthur Shipbuilding Co., Port Arthur, Ont.	4,300
Nov. 3, 1917—	War Dance—Port Arthur Shipbuilding Co., Port Arthur, Ont.	3,400
Mar. 16, 1918—	War Camp—J. Coughlan & Sons, Vancouver, B.C.	8,800
Mar. 23, 1918—	War Power—Wallace Shipyards, Ltd., North Vancouver, B.C.	4,600
Apr. 3, 1918—	War Isis—Port Arthur Shipbuilding Co., Port Arthur, Ont.	3,400
		30,800
Wooden Steamships.		
Dec. 19, 1917—	War Songhee—Foundation Co., Victoria, B.C.	3,800
Jan. 4, 1918—	War Nootka—Western Canada Shipyards, Vancouver, B.C.	3,080
Jan. 24, 1918—	War Yukon—Cameron-Genoa Mills, Ltd., Victoria, B.C.	3,080
Feb. 16, 1918—	War Puget—Wm. Lyall Shipbuilding Co., Vancouver, B.C.	3,080
Mar. 6, 1918—	War Selkirk—Western Canada Shipyards, Vancouver, B.C.	3,080
Apr. 10, 1918—	War Caribou—Wm. Lyall Shipbuilding Co., Vancouver, B.C.	3,080
Apr. 11, 1918—	War Comox—New Westminster Construction & Engineering Co., New Westminster, B.C.	3,080
Apr. 11, 1918—	War Massett—Foundation Co., Victoria, B.C.	3,080
Apr. 13, 1918—	War Tyee—Pacific Construction Co., Coquitlam, B.C.	3,080
		27,720
Total tonnage of 16 steel and wooden steamships launched, 58,520.		

"News" That is Not News.—A periodical published in Montreal, which modestly asserts that it has "definitely established itself as the representative of the shipbuilding industry in this country," had the following in its April issue:—

"Vancouver, B.C.—The Standard Shipbuilding Co. has just secured contracts from the Imperial Munitions Board for 10 composite steamers. A site is now being prepared for the plant at Ruskin, where the Stave River joins the Fraser, and at least half a dozen keels are expected to be laid this month. The company has a location at Ruskin, with more than 2,000 ft. of frontage on the river, and has a saw-mill already in operation. The ships to be built under the present contract will be 281 ft. long over all, with a dead weight capacity of 3,500 tons and a speed of 10 knots. They will have reinforced steel keelsons and knees, instead of the natural wood knees of Douglas fir. The company controls 150,000,000 ft. of this timber close to the plant."

Canadian Railway and Marine World had no advice of any such contracts having been let by the Imperial Munitions Board and felt convinced they had not been; but so that there might be no doubt about the matter, we communicated with the board and were advised on April 16 that no contracts had been given by the board to the Standard Shipbuilding Co. Canadian Railway and Marine World's information from month to month as to orders placed for shipbuilding is complete, official and reliable, and is not made up of unverified press dispatches or reports.

Ice Conditions on the Great Lakes.

The following final bulletin regarding ice conditions on the Great Lakes, was issued by the U.S. Weather Bureau, Apr. 23:—

In Lake Superior the ice fields at the extreme west end moved out Apr. 22, and the Duluth entry is free of ice. A few fields are reported over the central portion, but they offer no serious obstacle to navigation. At Whitefish Point fields in the lake are moving in and out with the winds, and on Apr. 22 were moving in and withdrawing on the short west of the point. The bay is partly opened, and it is not anticipated there will be much difficulty for the two steamers off Whitefish Point in making the passage.

St. Marys River is open, and a tug made the round trip to Detour.

In Green Bay the ice has moved out. No ice is reported to Lake Michigan, except near Northport and around Beaver Island. The straits are now open and no ice is reported.

In Lake Huron the fields are confined to the southern portion. From Harbor Beach to Port Huron the fields are extensive, but are moving with the wind. The ice is heavy but honeycombing rapidly.

St. Clair River is blockaded from just below Port Huron to Lake St. Clair, and ice is reported packed so that it reaches the bottom of the river in places.

In Lake Erie ice fields are confined to the south shore from Ashtabula to near Dunkirk, but the ice is broken and soft. No ice is reported near Buffalo.

In Lake Ontario fields are reported from off Rochester to east of Oswego, but they are breaking up and will offer no great resistance to navigation.

Shipbuilding Wages on the Pacific Coast.

According to a press dispatch from Vancouver, B.C., the commission appointed to go into the question of wages in the shipbuilding trade at the Pacific coast, has reported that the men are entitled to an increase of 10% dating from Feb. 1. The commission consisted of Mr. Justice Murphy, Chairman; J. H. Tonkin, representing employers, and G. J. Kelly, the men. It is stated that minority reports have also been sent in by the two last mentioned.

The report, it is said, recommends that 10% increases be granted, provided the men are willing to work 48 hours a week on straight time, excepting during June, July and August, and that they accept certain regulations governing the classes of labor. In regard to wages paid men working on steel steamships for the Imperial Munitions Board, the statement is made that the men can appeal to the board, which would be morally obliged to revise the wage schedule in accordance with that which the commission decides must be put in force in the wooden shipyards in the province, and to see that the firms concerned did not suffer financially.

It is also said that it is recommended that laborers shall be paid \$3.85 for an 8 hour day, excepting during June, July and August; that the demand for 10% on night shifts cannot be allowed, and that the men must do a full day's work for a full day's pay.

Several vessels arrived at Sault Ste. Marie, Apr. 23, upbound light, but were compelled to remain there on account of heavy gales and snow.

Timber Derrick Gantry Crane for Ship Erection.

Present time high speed ship construction calls for erection cranes of special design. One form of these, which has been doing successful work, is the timber derrick gantry used at one of the prominent wooden ship plants. This crane is particularly worth note, in spite of its simplicity, because it was so worked out as to permit of rapid construction from standard materials that could be procured readily.

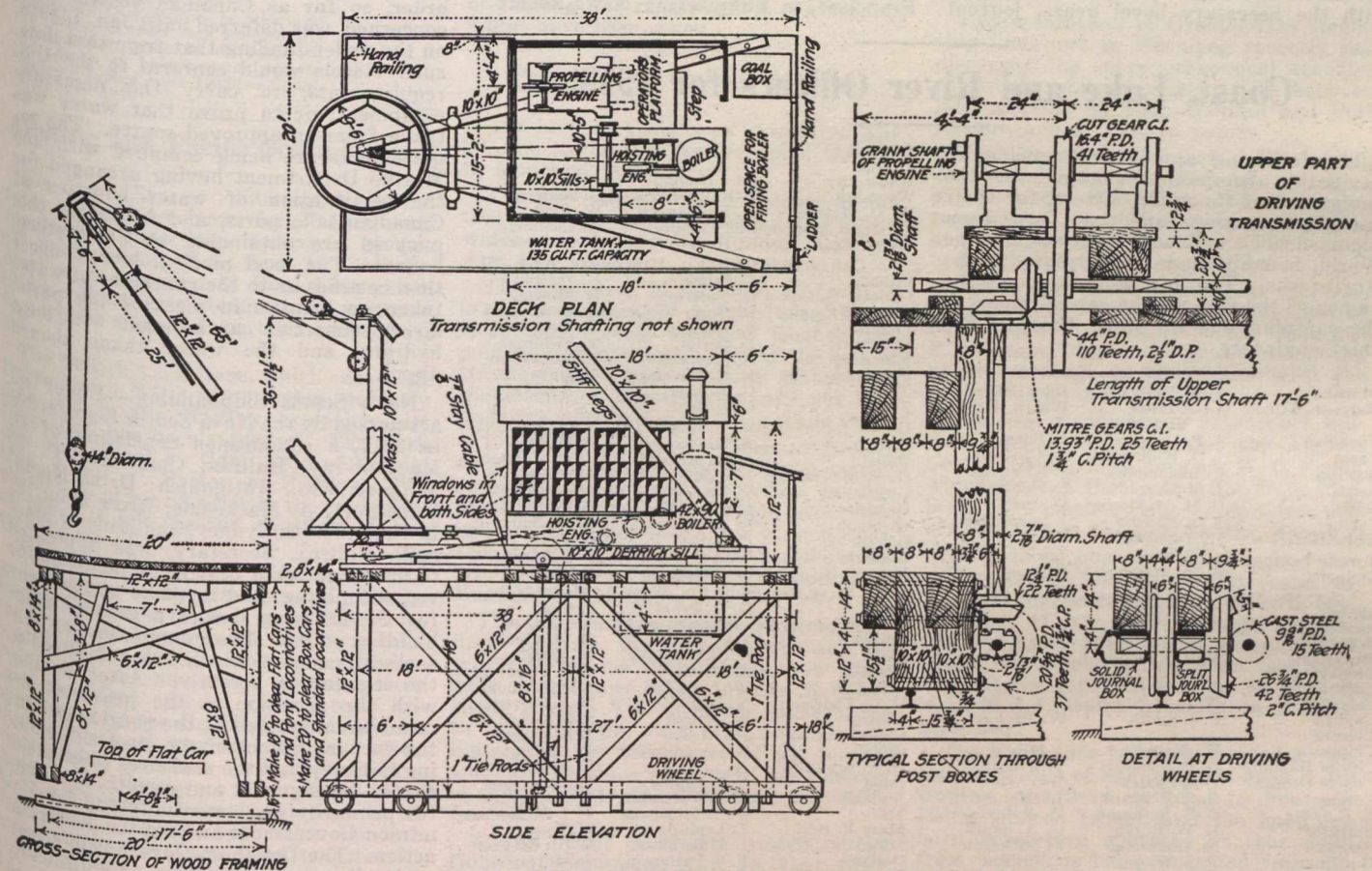
The high speed shipyards all have a number of shipways side by side, on which the ships are erected. Commonly, ways are built by driving wood or concrete piling into the ground, and capping and planking the top of the piling, to make a platform sloping toward the bay

frame may weigh as much as 10 tons. The crane shown has a safe margin over this maximum.

While the derrick gantry is not a new type, its adaptation to shipbuilding is a novelty. Under the old method of ship construction, with housed-in ways, there was provided a row of high columns between the ways, on which bridge cranes traveled back and forth over the ship, handling material to its place. The derrick gantry as used here is an excellent type of machine where the climatic conditions permit much work in the open. No high buildings are required, and the space between ways is kept clear at all times for handling bulky material. A railway track may be built between the ways, the

Wheels, gears, shafting	7,200 lb.
Bolts, tie-rods, nuts	1,600 lb.
Woodwork (except derrick and water tank)	57,050 lb.
Water tank, half filled	5,392 lb.
Total	113,742 lb.

The bracing of the gantry was designed with regard to all the various conditions of working of the crane. The heavy plank floor, not only provides a foundation for the machinery, but acts as horizontal bracing to take up the twisting strains which exist when the load is swung from side to side, and distributes them to the entire supporting structure of the gantry. The diagonal cross-bracing must be heavy enough so that when the crane load is applied at one end of the structure the



Ten-Ton Derrick Gantry, Built of Stock Material, and Equipment for Ship Erection.

on which the shell of the ship is built, stern toward the water, and from which it is launched. The ways may have a slope of $\frac{1}{8}$ in. to 1 in. per foot; some shipbuilders prefer more slope than others. The spacing of adjacent ways set in the centre is fixed to suit the size of ships to be constructed. At the shipyard referred to the spacing ranges from 77 to 95 ft. This leaves a narrow space between the ships that are being erected, that is not adequate for storing and handling the material that is to go into the ship. It is the duty of the gantry crane to pick up this material from a point back of the ways, and carry it down between the ways to a proper location, then swing the material around to one side and over the ship.

In the new type of wooden ships brought into prominence by the war the chief assembling item is the crossframe, which is built up of a number of pieces of wood, each sawed to shape, pinned together by trenails. One assembled cross-

crane saddling it. Finally, the crane is one that can be built quickly and is of minimum cost.

The selection of wood as material for the main part of the cranes was dictated primarily by the desire for quick construction. In addition there was a gain in stability against overturning, as compared with steel. Wood is looked upon as being a light material, but when cost is taken into consideration the argument is in favor of wood. The wood in this crane costs $1\frac{1}{2}$ c. a lb., framed in place.

The greatest load which the gantry crane will lift, when the boom is swung at right angles to the track, and the crane hook is 40 ft. from the centre of the mast, is a little over 14 tons. Its working capacity, fixed at 10 tons, leaves a margin of about 4 tons. The approximate total weight of the entire gantry crane is as follows:—

Operator's house	8,500 lb.
Stiffleg derrick, complete	16,600 lb.
Hoisting engine	14,000 lb.
Propelling engine	3,400 lb.

overturning effect will be transmitted to the whole length of the gantry and utilize the weight of the hoisting engine to prevent the gantry from tipping over.

The strains which develop in the stifflegs of the derrick are much greater when the stifflegs are set at an acute angle than when set at 90° . As designed they are adequate for the service required. They are supplemented, however, by two stay cables fitted with turnbuckles, which pass from the masthead to the side of the platform at about mid-length.

The water tank, placed under the deck and to one side, is of such size and distance from the centre that it just counterbalances the propelling engine. The effect is that the gantry has exactly the same resistance to overturning to right or left, and therefore has equal lifting capacity and equal safety.

Steam power was decided on for several reasons. Steam is reliable, is independent of live wires between shipways, and is elastic in starting and stopping.

heavy loads, with minimum shock to the transmission machinery; and, what is more important than anything else, the necessary equipment could be purchased in the shortest possible time.

The main hoisting engine is a 7 1/2 x 10 in. reversing type, with three shafts. One drum handles the load line, another the boom falls, and a pair of drums on the forward shaft swing the boom. The propelling engine, which drives the crane up and down between the ways, is 7 x 10 in. 2-cylinder reversing, the crankshaft being geared direct to the upper transmission shafting. The arrangement of the engines is such that the operator can reach any lever from one position, and all machinery is in view and readily accessible.

The propelling transmission system consists of a top horizontal shaft, 2 vertical shafts and 2 lower longitudinal shafts, with the necessary bevel gears, journal

boxes, etc., to make a complete working unit. Four of the 8 wheels are driven. At 200 r.p.m. engine speed the gantry travels 100 ft. a min. The accompanying detail sketches show some of the most important items in the transmission. The transmission shafting is fastened to the frame timbers in a particularly simple manner. Rigid boxes are used throughout. Great care was taken in construction to align the shafting perfectly.

This type of gantry crane is not limited to the construction of wooden ships. It can be used equally well for steel ship work. Other arrangements of crane are possible. Similar machines have been built with two derricks, one serving one ship, and the other serving the opposite. The one shown herewith probably represents the maximum combination of simplicity, universal adaptability, low cost and quick construction.—M. J. Welch, San Francisco, in Engineering News-Record.

Table listing ferry companies and their personnel: WALKERVILLE AND DETROIT FERRY CO., WALKERVILLE, ONT.; WEST VANCOUVER MUNICIPAL FERRIES, VANCOUVER, B.C.; WINDSOR AND PELEE ISLAND STEAMSHIP CO., PELEE ISLAND, ONT.

Water Supply on Great Lakes Vessels. With regard to the U.S. order for the equipment of vessels operating on the Great Lakes, with the means of purifying water for drinking purposes, which went into effect Jan. 1, 1917, and which applied to vessels of Dominion register calling at U.S. ports, no special regulations have been devised for Canadian vessels at present. On Canadian representations, the order, so far as Canadian vessels were concerned, was deferred until Jan. 1, 1918, on the understanding that from that date, such vessels would conform to the U.S. requirements, to carry the necessary equipment, or to prove that water was taken from an approved source. The requirements are being complied with, the Marine Department having arranged for the certification of water supplies at Canadian lake ports, and forms for this purpose are obtainable at all customs houses. The local medical health officer then certifies as to the character of water taken on board. In most of the ports, direct connection can be made with local hydrants and the water taken aboard direct.

Nova Scotia Shipbuilding.—Under an act passed by the Nova Scotia Legislature in 1917, a commission consisting of D. Macgillivray, Halifax, Chairman; C. F. Melsaac, K.C., Antigonish; D. E. North, Hantsport; A. Mackenzie, River John; F. L. Kelly, North Sydney, and Murray Macneill, Halifax, Secretary, was appointed to investigate the province's facilities for vessel building, and to make suggestions for the carrying out of a general shipbuilding policy. The commission has presented its report, which was submitted to the legislature recently. After dealing with the situation in the province, the commission arrived at the conclusion that the encouragement of the steel shipbuilding industry, and the measures to be taken for its development and growth, is a matter primarily and essentially for the Dominion Government and not for provincial action. The Dominion Government's general policy on shipbuilding, as outlined by the Minister of Marine in the House of Commons recently, will be found on another page in this issue.

Traffic Regulation at Sault Ste. Marie Canals.—The Dominion Marine Association is considering a suggestion made by the Lake Carriers' Association, that a patrol boat be provided in the St. Marys River to govern downbound vessels and to direct them to certain locks. It is suggested that the boat be maintained jointly by the two associations and that all owners agree to submit their vessels to the patrol's control.

The Imo-Mont Blanc Collision.—Judgment was delivered in the Admiralty Court at Halifax, N.S., recently, in the actions between the owners of the steamships Imo and Mont Blanc, in connection with the Halifax explosion in Dec., 1917, each party suing the other for \$2,000,000. It was decided that the Mont Blanc was solely to blame for the collision, and that the damage would be assessed in the usual manner.

Coast, Lake and River Officers for 1918.

The following appointments made by navigation companies engaged in the navigation of Canadian waters, for their various steamships and tugs, have been reported to Canadian Railway and Marine World, in addition to those given in the April issue. The first column shows the names of the vessels, the second, those of the captains, and the third, those of the chief engineers.

Table listing appointments for various companies: BASSETT STEAMSHIP CO., TORONTO; BRITISH YUKON NAVIGATION CO., WHITE HORSE; BUTLER FREIGHTING AND TOWING CO., VICTORIA, B.C.; CANADA STEAMSHIP LINES LTD., MONTREAL; NIAGARA FERRY AND TRANSPORTATION CO., BUFFALO, N.Y.; NORTHERN TRADING CO., EDMONTON, ALTA.; NORTH VANCOUVER FERRY CO., VANCOUVER, B.C.; OSWEGO NAVIGATION CO., MONTREAL; UNION STEAMSHIP CO. OF BRITISH COLUMBIA, VANCOUVER, B.C.

Table listing appointments for various companies: GREAT LAKES TRANSPORTATION CO., MIDLAND, ONT.; LA HAVE STEAMSHIP CO., WEST LA HAVE, N.S.; MONTREAL TRANSPORTATION CO., MONTREAL; NIAGARA FERRY AND TRANSPORTATION CO., BUFFALO, N.Y.; NORTHERN TRADING CO., EDMONTON, ALTA.; NORTH VANCOUVER FERRY CO., VANCOUVER, B.C.; OSWEGO NAVIGATION CO., MONTREAL; UNION STEAMSHIP CO. OF BRITISH COLUMBIA, VANCOUVER, B.C.

Canal Estimates for 1918-1919.

The Railways and Canals Department's estimates for the year ending Mar. 31, 1919, submitted to the House of Commons recently, contain, among others, the following items, chargeable to capital:—

Welland Ship Canal, construction ..	\$ 1,860,000.00
Rideau Canal, towards construction of bridge at Pretoria Ave., Ottawa ..	8,000.00
Trent Canal, construction ..	500,000.00

The following items are chargeable to income:—

Chambly Canal, renewing, in concrete, top of wharf, St. Johns ..	\$9,200.00
Carillon and Grenville Canal, protection walls, Lake St. Francis ..	2,000.00
Rebuilding lower entrance pier ..	9,740.00
Lachine Canal, dredging ..	15,000.00
Ontario St. Lawrence Canal, improvements ..	43,000.00
St. Peter's Canal, improvements ..	4,000.00
Trent Canal, improvements ..	57,000.00
Welland Canal, heavy repairs ..	35,000.00

The following item its chargeable to collection of revenue:—

Compassionate allowance to widow of R. Wiggins, who was accidentally electrocuted while in discharge of his duties as bridgmaster, on the Bascule bridge, over Lachine Canal, July 16, 1917 ..	2,000.00
--	----------

Atlantic and Pacific Ocean Marine.

The s.s. City of Wilmington, bound from a southern port for France, was reported to have been destroyed by fire off Sable Island, N.S., Apr. 15. All the crew were reported to have been taken off by a Norwegian steamship, in response to wireless signals from the burning vessel.

The British s.s. Curaca, which sank near Dartmouth, N.S., after being severely damaged in the Halifax explosion last December, has been refloated. The work was carried out by Capt. Reid of Sarnia, Ont., and J. P. Porter, of Halifax. The vessel was at pier 8 prior to the explosion, of which it felt the full effect, 44 of her crew being killed.

The C.P.R. steamships Empress of Asia and Empress of Russia, operating on the Pacific Ocean, have been requisitioned by the Dominion Government, and have been placed at the British Government's disposal, and all advertised sailings have been cancelled. These vessels were requisitioned by the British Government on the outbreak of war in 1914, and after considerable service in transporting troops, etc., they were released in 1916. At that time they were on the register of the United Kingdom, but within the last few months they have been transferred to the Canadian register, with Vancouver, B.C., as their home port.

Maritime Provinces and Newfoundland.

It is reported that the Dominion Government s.s. Aranmore is to run between Yarmouth and Boston, owing to the Eastern Steamship Corporation's s.s. Governor Cobb having been requisitioned by the U.S. Government.

The Island Tug. Co., Charlottetown, P. E.I., is negotiating for the sale of its business and vessels, and does not anticipate operating this year. It owns the s.s. Harland, built at Shelburne, N.S., in 1908, screw driven by engine of 33 n.h.p., and of the following dimensions: length 113 ft., breadth 27 ft., depth 6.7 ft.; tonnage, 352 gross, 217 register; and the steam tugs Fred M. Batt, and Islander.

The s.s. Acadien, formerly Senlac, which was lost during a gale, about Feb. 20, and which was reported to have been

towed to a Newfoundland port, which however was not correct, was located early in April, about five miles east of Flat Island, Placentia Bay, Nfld. Both anchors were out and her stem was under water, while the stern was well out of the water. Apparently she is not broken up, and divers are to be sent to inspect her with a view to salvage. She was sold recently by C. Brister & Son, to French owners, and was on her way to St. Pierre, Miquelon, when overwhelmed by heavy seas. It is stated that some of the crew, including the engineers, left the vessel in one of the boats and were picked up by a Newfoundland vessel, the captain and the remainder of the crew staying with the vessel, and losing their lives. It is also stated that the vessel must have drifted a considerable distance after the portion of the crew left her, and that if there had been anyone on board capable of running and repairing the engines, she might have been saved.

Province of Quebec Marine.

The Lachine Canal was unwatered Apr. 23, and navigation was resumed through to Montreal, Apr. 29.

The first vessel to enter Quebec harbor this season was the schooner Florida, which sailed in from Ile aux Coudres, Apr. 4.

The Quebec & Levis Ferry Co. will, it is reported, probably remove its s.s. North from the service between Quebec and points along the north side of the Isle of Orleans, this year, as it is stated that the Dominion Government will not continue the subsidy for carrying mails there.

The Gaspé & Baie des Chaleurs Steamship Co., which has operated the steamships Gaspesien and Percésien on the lower St. Lawrence for some years, will not run any steamships this year, its vessels having gone into other service overseas. The s.s. Percésien was sunk near England in February.

The Marine Department received tenders, Apr. 29, for the purchase and removal of the s.s. Montmagny, now lying sunk near Crane Island in the St. Lawrence River. The tenderer must agree to commence the work of removal immediately on the acceptance of his tender, and must continue same until the removal is completed to the Department's satisfaction.

The Minister of Marine stated in the House of Commons, Apr. 18, that since Nov. 1, 1916, the Quebec Harbor Commissioners had sold grain boat no. 1 to the St. Lawrence Navigation Corporation for \$100,000, and dredge no. 1 to Compagnie Generale d'Enterprises Publiques, for \$185,000. He also stated that they had not purchased any steamboats or dredges since that date.

It was reported recently that no appointment of a harbor master at Quebec would be made for the present, to fill the vacancy caused by the death of Capt. J. A. Murray, who lost his life in the Halifax explosion in December, 1917, as owing to the fact that the vessels entering and leaving the harbor are under the jurisdiction of the Naval Authorities, such appointment would not be necessary. It was announced later, that Capt. McGough has been appointed acting harbor master there.

Charters for coal traffic for about 600,000 tons for the head of Lake Superior, were reported closed at Cleveland, Ohio, Apr. 12, at 48c, the established rate.

Ontario and the Great Lakes.

Water was let into the Cornwall Canal, Apr. 22, and navigation was permitted through it the following day.

The C.P.R. steamship service on the Great Lakes, will commence May 2, between Owen Sound and Fort William, and June 1 between Port McNicoll and Fort William.

The Minister of Railways and Canals has intimated that the lower end of the Trent Canal will be open for general use, May 1, and that the canal, as far up as Washago, will be open by June 1.

The Public Works Department received tenders, Apr. 22, for the use of the tug Hercules during the summer, she not being required by the department. She has been berthed at Midland, Ont., during the winter.

Representatives of Great Lakes steamship lines met in Winnipeg recently and discussed the more economical transfer of freight and passenger traffic between lake and rail at Fort William and Port Arthur, and at eastern points.

The Department of Public Works will receive tenders to May 2, for the purchase of the dredge P.W.D. no. 114, the steam tug St. Paul, and three dump scows, lying at Burlington Bay, Hamilton. The sale of each is subject to an upset price.

Action has been entered at Toronto, against A. B. Mackay, Hamilton, Ont., by F. R. Johnson, Port Colborne, Ont., and P. Bonham, Montreal, for an accounting of all earnings in connection with the operations of the s.s. Sarnor.

The first steamship to enter Fort William harbor this year was the Algoma Central Steamship Line's s.s. W. C. Franz, which arrived there, Apr. 25, from Midland. The master, Capt. Jordan, was presented with a silk hat, by the Board of Trade.

The United States s.s. Harvester arrived at Port McNicoll, Apr. 21, with 609,000 bush. of oats, from Chicago, Ill., thus opening the water borne grain season, about two weeks earlier than last year. The master reported that no ice was in sight in the Straits, Lake Huron or Georgian Bay.

The lighthouse formerly located on the southeast side of Snake Island bank, Lake Ontario, has been removed to Fourmile Point, Simcoe Island, and the hand fog horn heretofore operated at that point from a shed, is being operated from the lighthouse, and is being used to answer signals from vessels in the vicinity during thick weather.

A. McFee & Co.'s claim against the Montreal Transportation Co., for \$31,000 for the loss of 40,000 bush. of wheat through the wreck of a barge in the Cornwall canal, Oct. 30, 1913, was dismissed at Montreal, Apr. 7, on the ground that the wreck was due to the dangers of navigation, for which the transportation company was not liable.

The Minister of Public Works, in reply to a deputation, Apr. 9, relative to the development of Port Dover, Ont., harbor, is reported to have stated that everything that was necessary will be done for the adequate development of the harbor. An amount had, he said, been included in the supplementary estimates, to repair the damage caused by storms.

The Foundation Co., New York, is reported to have acquired the Reid Wrecking Co.'s business and plant at Port Huron, Mich., and to be making extensive alterations there. It is said that the dry

dock is being lengthened to 625 ft., and that keels for 10 steel trawlers are being said, it being the intention to have the vessels completed before the close of navigation next winter.

An order in council has been passed cancelling the regulations governing the Prescott and Ogdensburg ferry service, owing to the largely increased cost of operation and scarcity of fuel, and substituting new regulations permitting increased rates for passengers, vehicles and animals. The service is given by the Prescott & Ogdensburg Ferry Co.'s s.s. Miss Vandenburg.

Imperial Oil, Ltd., has acquired the s.s. Kaministiquia from the Western Navigation Co., Fort William, and has changed its name to Westoil. She was built at Wallsend-on-Tyne, Eng., in 1909, of steel, with 4 watertight bulkheads, and steel boiler house. The propelling machinery consists of triple expansion engines, with cylinders 20½, 33 and 54 in. diam. by 36 in. stroke, 1,156 i.h.p. at 76 r.p.m., and supplied with steam by 2 Scotch boilers 13½ ft. by 10½ ft. at 180 lb. Her dimensions are: length 250 ft., breadth 43 ft., depth 25 ft.; tonnage, 2,172 gross, 1,401 register.

The Public Works Department did considerable dredging at Port Burwell, Port Stanley and Rondeau, on Lake Erie, during 1917. At Port Burwell it was done to 15.6 ft., at the south end of the breakwater, 18 ft. to the south end of the harbor entrance piers, and from 16.7 to 23 ft. to the car ferry slip. At Port Stanley, to 23 ft. at the south end of the west breakwater, to 22 ft. to the south end of the harbor piers, and to 22 ft. to the foot of George St. At Rondeau, to 19 ft. in the east half of the channel between the harbor entrance piers, and to 19 ft. in the Lake Erie Coal Co.'s dock, all below zero of the gauge, which is 571.8 ft. above mean tide at New York.

British Columbia and Pacific Coast.

The Grand Trunk Pacific Coast Steamship Co. is reported to have removed its accounting department from Vancouver to Prince Rupert.

The Coastwise Steamship & Barge Co., Vancouver, is reported to have purchased the British steamship Marmon, for its ore service between Alaska, British Columbia and Puget Sound ports.

The Naval Service Department received tenders Apr. 20, for the purchase of the schooner Naden as she lay at New Westminster, B.C. Her dimensions are: length 80 ft., breadth 20.1 ft., depth 8.6 ft.; tonnage 100.29 gross, 88.35 register.

A notice has been issued warning small craft, and boats generally, that they must be careful to go alongside the examination vessel on entering Esquimalt harbor, and not to pass without having actually stopped and received permission to proceed.

An order in council has been passed defining the harbor of Port Alberni, as, all navigable waters of Alberni Canal and of harbors, inlets, rivers, etc., falling into it, inside, or north of a line across the mouth of the canal, southeast, astronomically from the extreme of Nob Point.

The auxiliary powered schooner Margaret Haney, owned by Canada West Coast Navigation Co., which sailed from Vancouver last year with a cargo of lumber for Bombay, India, is reported to be engaged in transporting supplies to allied troops in Mesopotamia, sailing to a point near the junction of the Euphrates and Tigris Rivers.

The C.P.R. s.s. Tees, while on her route between Vancouver, Victoria and the west coast of Vancouver Island, Apr. 4, struck Zero Rock, near Sidney, and sank. She was built at Thornaby on Tees, Eng., in 1893, and was equipped with engine of 95 n.h.p., driving a screw. Her dimensions were: length 165 ft., breadth 26 ft., depth 10.8 ft.; tonnage, 679 gross, 441 register.

The management of Canada West Coast Navigation Co., which owns nine auxiliary powered schooners, is reported to have been transferred from H. W. Brown & Co., Ltd., Vancouver, B.C., to Jas. W. Ellwell & Co., 17 State St., New York. It is stated that H. W. Brown & Co. will continue to manage the auxiliary schooner Malahat, and that H. W. Brown will take personal charge of his interests in Cameron-Genoa Mills Shipbuilders, Ltd., until the vessels under construction by that company for the Imperial Munitions Board, are completed.

Motor Ships on the Pacific.—The motor ship Janet Carruthers, owned by Canada West Coast Navigation Co., and chartered to Australia with lumber, arrived at Adelaide recently in a disabled condition, due to very heavy weather, and with a salvage claim against her, of \$10,000. She sailed from Vancouver in Sept., 1917, and was compelled to put into Honolulu with a broken shaft and cracked engine cylinders, stated to be due to negligence, possibly through ignorance of the workings of the engine. As repairs could not be made there, the propellers were disconnected and the voyage was continued under sail, but she was again compelled to put into another port for further repairs due to heavy weather. The company's motor ship Jessie Norcross, which arrived at Vancouver recently, on her return trip from Australia, encountered heavy weather and squalls, it being necessary to cut away some sails to prevent her from being capsized.

Dominion Government Dredge Galveston.—The Marine Department received tenders Apr. 8, for the purchase of the dredge Galveston, and it has been sold. We are advised that the purchaser intends to convert it into a cargo steamship for Atlantic service. The dredge was built in Germany in 1904, and is equipped with two suction pumps of the Dutch type, the propelling machinery consisting of triple expansion engines with cylinders 15, 24 and 39 in. diam. by 34 in. stroke, supplied with steam by 2 Scotch boilers 13¾ ft. diam. by 11 ft. long, at 180 lb. working pressure. The propellers are solid, 4 bladed, 8 ft. 4 in. diam. by 10 ft. pitch. The hopper has a capacity of 1,500 cu. yds., and the loaded draft is 14¾ ft. aft and 13 ft. 1 in. forward. The dimensions are: length 223 ft., breadth 39 ft., depth 15½ ft.; tonnage, 1,332 gross, 838 net.

Toronto Harbor.—The Minister of Public Works stated in the House of Commons, Apr. 24, in regard to the work in Toronto harbor, that after making a careful personal inspection, he came to the conclusion that the only work that should be proceeded with during the war, is the completion of the ship channel through Ashbridge Bay, so that the munition factories established and to be established there, can be served. In regard to the western breakwater, he maintained that the additional expenditure of \$3,000,000, in order to complete it, is not justifiable under present conditions. The department's engineers, he stated, had been consulted, and they were of the opinion that no serious damage would result to the work already done, by deferring the completion.

Mainly About Marine People.

N. W. Van Wyck, heretofore Freight Claims Agent, has been appointed Purchasing Agent, Canada Steamship Lines, Ltd., Montreal, vice Peter Paton, who has resigned to engage in private business.

J. B. Brophy, M. Can. Soc. C. E., who died at Cornwall, Ont., April 1, from pneumonia, had been in the Railways and Canals Department service for many years, on the Trent Canal, at Trenton, Ont., then on the St. Peter's Canal, at St. Peter's, N.S., and latterly on the Cornwall Canal, at Cornwall, Ont.

Peter Paton, Purchasing Agent, Canada Steamship Lines, Montreal, has resigned, to become President of MacKenzie, Milne & Co., Ltd., hardware and oil well supplies, Sarnia, Ont., having bought out the interests of C. & M. MacKenzie and D. Milne. It is his intention to develop the company's ship chandlery business. The company has bought the metallic life boat building business of Watt & Son, Collingwood, and will add this line to its others.

Reginald Beaumont, whose appointment as Superintendent in charge of operation, Grand Trunk Pacific Coast Steamship Co., Prince Rupert, B.C., was announced in a recent issue, was born in Norfolk, Eng., Aug. 7, 1877, and entered transportation service in May, 1893, since when he has been, to May, 1900, clerk, Beaver Line, Montreal; May, 1901, to June, 1904, assistant, Muskoka Lakes Navigation and Hotel Co., Gravenhurst, Ont.; June, 1904, to Dec., 1906, purser, Northern Navigation Co., Sarnia, Ont.; Apr., 1907, to Aug., 1909, Travelling Freight and Passenger Agent, Northern Navigation Co., and G. T.R., Sarnia, Ont.; Sept., 1909, to Feb., 1910, General Agent, Northern Navigation Co., Port Arthur, Ont.; Mar., 1910, to Feb., 1918, Assistant to Manager, Grand Trunk Pacific Coast Steamship Co., Vancouver, B.C.

The Lancaster Tugboat Co., Ltd., has been incorporated under the New Brunswick Companies Act, with \$20,000 capital and office at Lancaster, N.B., to carry on a general tugboat business, and to own and operate steam and other vessels and conduct a general navigation business. The incorporators are: J. A. and A. L. Gregory, J. D. and L. B. Mitchell, Lancaster, N.B.

Men on Government Vessels.—The Minister of Railways informed the House of Commons recently that 19 men were employed on vessels engaged in quarantine service. Two vessels of the service were laid up in Louise basin, Quebec, with one watchman in charge at Dec. 31, 1917. These men were engaged by the Department of Agriculture. The Marine and Fisheries Department employed 427 men for its work at the same date. It was not considered advisable to give any information as to the number of men engaged in the naval service.

Concrete Shipbuilding in the U.S.—It is reported that the Cleveland Builders Supply Co. will erect a shipbuilding yard at Cleveland, Ohio, for the exclusive construction of concrete ships, barges, etc. The size of the vessels to be built will be the limit of the Welland Canal, and it is expected to turn out four vessels a month.

Steamer Eric W., Ltd., has been incorporated under the Quebec Companies Act, with \$10,000 capital and office at Quebec, to own and operate steam and other vessels and to carry on a general navigation business. The incorporators are W. Q. Stobo, H. C. Thorn, C. St. J. Griffis, H. G. deGuise and L. H. Cote, Quebec.

Concrete Shipbuilding for United States Government.

The U.S. Shipping Board decided some little time ago to begin the construction of large ocean going self propelled concrete ships. Following a long investigation by the U. S. Bureau of Standards and Shipping Board, the latter body on Dec. 27, 1917, formed a Department of Concrete Ship Construction, which has already developed a considerable organization. This organization, which is being built up around the one started by the Bureau of Standards, is studying the problems of concrete ship design, is checking over such designs as are submitted to it by outside engineers and has recommended and had approved by the board the letting of several contracts for the construction of concrete ships.

A corps of designers is engaged in the development of a standard design for a reinforced concrete ship of approximately 3,500 tons deadweight cargo carrying capacity. In this study an original investigation is being made into the moments

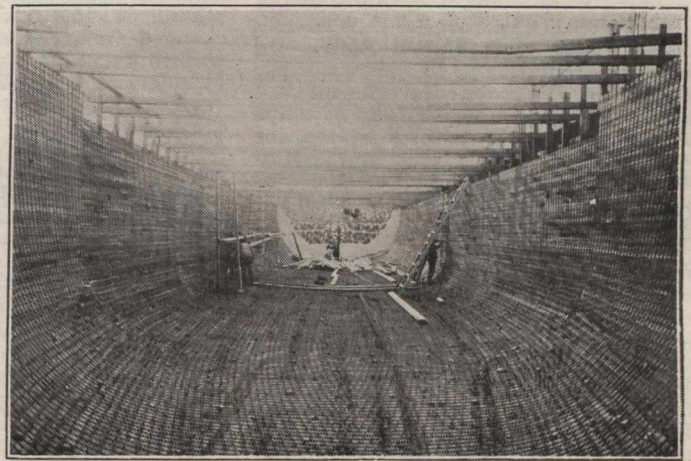
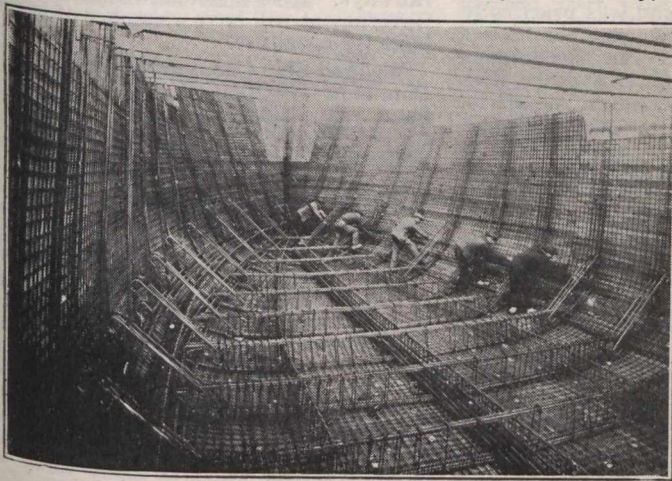
will all be in the nature of experiments, and upon their success or failure will depend the future of the government's concrete ship construction.

The design of all but the 7,500 ton ship is such that the boilers, machinery and wooden ship can be used. Such fittings will be available for installation when the concrete hulls are launched. The Shipping Board has let contracts to a number of well established plants and yards at which the assembling and fitting out of the wooden ships is to be done. These yards are convenient to the yards where the concrete hulls are to be made, and those hulls will be towed to the fitting out yards as soon as launched, there to be completed for service.

In addition to the work set forth above, the board is conducting a number of tests, under the direction of the Bureau of Standards. It is also co-operating with the U. S. Steamboat Inspection Service and Lloyd's Registry, both of which bodies

of steel, and after launching, she drew 9¼ ft. forward and 10¼ ft. aft. It is announced that she will be equipped with triple expansion engine of 1,750 h.p., supplied with steam by Scotch boilers. Oil fuel will be used, and she will carry about 30 days' supply. Her loaded speed is calculated at 10 knots an hour. She is expected to be ready for her trials early in May.

The Lusitania Case.—The Cunard Steamship Co. is applying to the Admiralty Branch of the Federal Court of New York, to be relieved of all liability in damage suits for \$6,000,000, or to have its liability limited, in connection with the loss of the s.s. Lusitania, which was torpedoed and sunk with great loss of life, by Germans. The company contends that the loss of the vessel was not due to negligence on its part, but was the wanton act of the common enemy. It is well to note that evidence given by A. M. Chalmers,



Concrete Vessel Construction. Working on the Interior of a Hull.

to which an ocean going vessel is subjected, as a result of which the stresses are analyzed and the design made. The complete drawings and specifications for this ship were completed early in March, at which time bids will be asked from certain selected contractors. This same designing force is also supervising the design of the ships already contracted for. The board requires that plans and specifications for all such contracts must be approved before construction is started. It is reported that satisfactory progress is being made in this work. In addition the board considers any design submitted by others persons, although so far no complete design for a reinforced concrete ship has been submitted. Many suggestions as to details, however, have proved useful to the designing force.

Three contracts have been let, to the Liberty Shipbuilding Co., Boston; the Fougner American Steel Concrete Shipbuilding Co., New York, and the Ferro Concrete Shipbuilding Corporation, New York. All three contracts are provisionally for a number of ships, but are contingent upon the seaworthiness and satisfactory character of the first ship built, which building will be under the direction of the Shipping Board. A fourth contract is under negotiation with the firm building the 5,000 ton ship at San Francisco, which is to be a 7,500 ton vessel, by far the largest concrete ship ever attempted. The board's present programme, therefore, contemplates the construction of five large concrete ships of different design. They

have detailed engineers to co-operate with and assist the board. An officer of the Bureau of Lighthouses is also giving some co-operative service. It is expected, too, that the question of concrete barges for harbor and inland waterway transport will soon be taken up with the various governmental bureaus concerned with that work. The Department of Concrete Ship Construction is under the direction of J. O. Heyworth, of the U. S. Emergency Fleet Corporation. Every effort is being made to expedite the work sufficiently to put the experimental ships in the water at the beginning of warm weather, so that should they prove successful, quantity production can be well under way by the middle of summer.

The U.S. Shipping Board announces that the President has approved an appropriation of \$50,000,000 for the acquisition or establishment of plants suitable for concrete shipbuilding, or for the extension of such plants, and for the cost of construction of concrete ships. The board has planned for the construction of three launching ways for three 3,500 ton vessels, and if these are successful, ways for the 7,500 ton type will be arranged. Work is reported to have been started at the plant at Wilmington, N.C.

The reinforced concrete vessel which was under construction at San Francisco, Cal., by private interests, was launched during March, and named Faith. Her dimensions are: length between perpendiculars 320 ft., beam 45 ft., moulded depth 31 ft. The stem and stern port are

Assistant Pier Superintendent of the company at New York, showed that he superintended the loading of the vessel, and that no explosives were taken on board. It was also stated that the allegations that the vessel carried guns, ammunition and troops, had been withdrawn, so that the matter is being fought out as to whether the sinking of the vessel was a wanton act of the common enemy, or whether the company was guilty of con-

U.S. Lake Vessels Requisitioned for Ocean Service.—The U.S. Government is reported to have requisitioned the following lake steamships for ocean service:—City of South Haven, steel, 232 x 40 x 16 ft., 1,719 tons gross, owned by Chicago & South Haven Steamship Co., Chicago, Ill.; Manitou, steel, 275 x 42 x 24½ ft., 2,944 tons gross, owned by Northern Michigan Transportation Co., Chicago; Puritan, steel, 260 x 40 x 24½ ft., 1,762 tons gross, owned by Graham & Morton Transportation Co., Benton Harbor, Mich.; Theodore Roosevelt, steel, 264 x 40 x 16 ft., 1,955 tons gross, owned by Indiana Transportation Co., Chicago, Ill.; and Virginia, steel, 269 x 38 x 24 ft., 1,606 tons gross, owned by Goodrich Transportation Co., Chicago. These vessels were engaged chiefly in traffic to summer resorts.

Tide Tables for Nelson, Hudson Bay, and tidal data for Hudson Strait and James Bay, for the 1918 season, have been issued in pamphlet form by the Naval Service's tidal and current survey at Ottawa.

Cargo Steamship Building for Dominion Government.

Orders for Steamships.—Up to April 24 no further orders had been placed by the Marine Department for cargo steamships. In addition to those mentioned in Canadian Railway and Marine World for April, viz.: Canadian Vickers Ltd., one of 4,300 tons and one of 8,100 tons; Collingwood Shipbuilding Co., one of 3,750 tons, and Wallace Shipyards, Ltd., North Vancouver, one of 4,300 tons, the tonnage stated in each case being dead weight capacity. Other orders will be placed as the steel shipbuilding companies notify the department that they will have berths available. Among the first will probably be the Collingwood Shipbuilding Co., which stated recently that it would have two berths available in May, and which has already been given an order for one steamship, as above stated, and Canadian Allis-Chalmers, Ltd., which stated recently that it would have one berth available in June. All the department's contracts are being placed at a price per ton for completed vessels, and it is said that the prices range about \$200 a ton d.w.

Steel Plates from United States.—In answer to a question as to what price per 100 lb. the Dominion Government had agreed to pay for 80,000 tons of ships plates bought in the United States, for use in building ships in Canada, the Minister of Marine stated in the House of Commons, Apr. 15, the price as \$3.25 per 100 lb., base, f.o.b. mills.

Victoria Machinery Depot, Ltd., Victoria, B.C.—The Vancouver World stated recently that this company had been offered contracts by the Dominion Government to build 3 steel steamships of 5,100 tons each, and that it declined the offer. The same paper credited C. G. V. Spratt, of the Victoria company, with saying:—"To begin with, we are offered the same terms to construct ships of 5,100 tons as are offered to contractors in the east on vessels of 8,800 tons, that is, \$200 a ton. Everyone knows that it costs much less to build the additional thousands of tons, proportionately, than it does to build those below that. We have to bring all our steel plates from the east and pay heavy freight rates on them. We are not allowed anything additional for this. Then again there is the plant to think of. We would have to expend between \$500,000 and \$1,000,000 in getting machinery and getting the yard in running order. Another thing that we have been forced to take into consideration is the undependable state of the labor market. Even if the Dominion Government was willing to protect us, as the U.S. protects government ship contractors, against possible increase in wages, it would, perhaps, tempt us to reconsider our decision. I am not saying that it would, but it would certainly help to clear the way for our accepting the contracts."

On enquiry at Ottawa on April 24, Canadian Railway and Marine World was informed that the Victoria company had not been offered any contracts. A representative of the company visited Ottawa a short time ago, was shown the plans and specifications for the 5,100 and 8,100 ton vessels, and was told that if the company wished to submit an offer, it might do so, but up to the date mentioned no offer had been received. We are also informed that no price was mentioned by the department officials, as an offer in any way.

Wallace Shipyards, Ltd., North Vancouver, B.C.—Some details were given in

our last issue of the steel cargo steamship which the Dominion Government has ordered from this company. As stated, it will be of the single deck type, with poop bridge and fore-castle, straight stem and elliptical stern, 5 watertight bulkheads, single screw triple expansion engines, 2 Scotch boilers, 180 lb. working pressure with forced draft. Other particulars are as follows:—

Length between perpendiculars.....	320 ft.
Breadth moulded	44 ft.
Depth moulded	25 ft.
Draft loaded	21 ft. 2 in.
Deadweight carrying capacity.....	4,300 tons
Sea speed loaded.....	11 knots

The Great Lakes Transportation Co., Midland, Ont., has purchased the s.s. Oceanica, formerly owned by the Tonawanda Iron & Steel Co., Tonawanda, N.Y., and intends operating her between Lake Erie ports and Montreal. The hull of the vessel is of oak, and she was built at West Bay City, Mich., in 1881. She has diagonal strapping on the frames, steel boiler house, steel arches, bow sheathed for ice, windlass between decks with no efficient bulkhead abaft same, and was practically rebuilt in 1913, when her name was changed from Sevona. She is equipped with fore and aft compound engines, with cylinders 27 and 50 in. diam. by 40 in. stroke, 600 i.h.p. at 40 r.p.m., and supplied with steam by 2 boilers of the fire-box type, 9 ft. diam. by 16 ft. long, at 95 lb. working pressure. Her dimensions are: length 263 ft., breadth 37 1/4 ft., depth 21 ft.; tonnage, 1,490 gross, 1,241 register, and she has capacity for 2,600 tons of coal. The company is said to be negotiating for another vessel.

Notice to Ocean Navigators.—Masters of vessels are warned to keep clear of all convoys which they may meet or overtake; the practice of cutting through a convoy is not permissible. Any merchant vessel entering a United Kingdom port must display her name in white letters on a black board, on the side on which she is approaching the examination steamer, and at such other times and in such manner as may be directed by the port authorities. Vessels under 500 tons gross shall display one such sign in the vicinity of the bridge, and vessels over 500 tons gross shall display two such signs, one in the vicinity of the bridge, and the other in the next most conspicuous position over the side. This does not relieve the vessel of the necessity of complying with Board of Trade requirements as to proper equipment of signal flags.

Boiler Inspection Regulations.—As the result of an interview with the Marine Department by a Dominion Marine Association deputation, the Steamboat Inspection Board's provisions regarding the pressure under which boilers made in the U.S. are allowed to be operated in Canadian vessels, have been modified, so that such boilers need not be run under an unnecessarily low pressure, on account of an old rule which placed a penalty on them on account of the absence of inspection by a Dominion officer during construction. A certain latitude was allowed upon application, but the strict rule meant that a number of U.S. made boilers were being used in Canada under a limited steam pressure and consequent disadvantage both as to speed and safety in difficult weather.

Buoy Steamships for Maritime Provinces.—The estimates submitted to the House of Commons recently, contain an item of \$300,000, for two steamships for buoy purposes in the Maritime Provinces. Plans have not yet been prepared for them

and it has not been decided when tenders for construction will be asked. The vessels will be designed especially for carrying and placing buoys, and will replace the C.G.S. Montmagny, which sank in the St. Lawrence River, near Crane Island, and the C.G.S. Simcoe, which foundered off the Magdalen Islands.

The Montreal, Ottawa & Georgian Bay Canal Co.'s application for an extension of time within which it may commence and complete its undertaking, came before the House of Commons, Apr. 18, and met with considerable opposition. Consideration was postponed, with a view to drafting a clause which would make certain that there would be no further increase in the government's moral liability in connection with the project.

The New York State Barge Canal system has been taken over by the U.S. Director of Railways, and will, it is stated, be operated under the direction of G. A. Tomlinson, Duluth, Minn. Other canal systems will, it is expected, be similarly dealt with, and the whole operated with a view to relieving traffic on the railways. It is announced that the U.S. Government will have a number of barges built for canal use.

Welland Ship Canal Construction.—The Dominion Government's estimates for the fiscal year ending Mar. 21, 1919, provide for \$1,860,000 for construction on the Welland Ship Canal. Canadian Railway and Marine World is officially advised that this is to settle up claims the contractors have against the government, and not for the continuance of the work, which is closed down until after the war.

U.S. Government Great Lakes Service. It is announced that the Director General of U.S. railways has ordered the establishment of a Great Lakes steamship line between Milwaukee, Chicago and Buffalo, with the object of relieving the railways of considerable through traffic. He is also stated to have assigned seven steamships to the service, which is likely to be extended and more vessels added.

Maximum Vessel Loading.—On representations from the British Food Controller, vessels trading with United Kingdom ports will be allowed to load ships' stores in excess of the voyage requirements, provided they conform to the regulations of the shipowners' provision pool. This will enable all available store accommodation, including staterooms, where practicable, to carry food supplies.

Shipbuilding in Japan.—It is announced that approximately 331,300 tons of shipping will be launched in Japan during this year. This, it is stated, will be disposed of as follows: for Great Britain, 148,000 tons; for France, 23,000 tons; for Italy, 5,600 tons; for service between Japan, U.S., Russia and British territories, 16,700 tons; for probable sale to allied countries, 87,000 tons.

U.S. Ship Deliveries and Launchings in March.—The U.S. Shipping Board states the deliveries and launchings for March as follows:—Deliveries, 21 vessels, 166,700 tons deadweight; launchings, 6 contract steel vessels, 51,650 tons deadweight, 21 requisitioned vessels, 149,630 tons deadweight; 9 others wood and composite, 31,500 tons deadweight.

Vessel Insurance on the Great Lakes. A press report states that the Great Lakes Protective Association will carry 25% of the insurance on the vessels owned by its membership, the initial rate of contribution for the year being fixed at 3% as last year. The valuation of steel vessels has been advanced \$5 a ton, making it \$56 a ton.

Harbor, River and Graving Dock Estimates for 1918-1919.

The Public Works Department's estimates for the year end Mar. 31, 1919, submitted to the House of Commons recently, contain, among others, the following items chargeable to capital:—

HARBORS AND RIVERS.	
St. John Harbor, improvements	\$ 250,000.00
Quebec Harbor, Champlain dry dock	355,000.00
Quebec Harbor, River St. Charles, improvements to navigation	15,000.00
Toronto harbor, improvements	550,000.00
Port Arthur and Fort William, harbor and river improvements	350,000.00
Vancouver harbor, improvements	150,000.00
Victoria harbor, improvements	166,000.00
	\$1,836,000.00

The following public works items (Marine Department) are chargeable to capital:—

River St. Lawrence, ship channel	\$ 478,000.50
To provide for construction and completion of dredging plant on St. Lawrence River from Montreal to Father Point	163,900.00
For converting six ship channel tugs for salt water service	50,000.00
	\$691,900.00

The following items are chargeable to income:—

NOVA SCOTIA.	
Barrington's Cove, Sydney Mines, partial reconstruction of wharf	\$ 1,100.00
Battery Point, breakwater repairs and reconstruction	3,100.00
Breen's Pond, repairs to breakwater	1,050.00
Burlington, repairs to wharf	1,200.00
Cow Bay (Port Morien), repairs to breakwater	5,600.00
Cribbin's Point, repairs to and reconstruction of wharf	1,800.00
Devil's Island, repairs to breakwater	1,300.00
Digby Pier, renewals	5,000.00
East River, improvements	10,000.00
Eatonville, repairs to breakwater	2,500.00
Felzen South, repairs to breakwater	1,100.00
Five Islands, repairs to wharf	600.00
Freeport, repairs to breakwater	1,500.00
French Village, repairs to wharf	1,000.00
Great Village, repairs to wharf	700.00
Harbors and rivers generally, repairs and improvements	60,000.00
Harbor au Bouche, repairs to wharf	700.00
Jamesville, completion of breakwater	2,000.00
Kelly's Cove, repairs to wharf and breakwater	1,700.00
L'Ardoise, repairs to breakwater	1,800.00
Maitland, repairs to wharf	1,100.00
Malagash, repairs to wharf	1,000.00
Margaree harbor, repairs and improvements	10,900.00
Margaretville, repairs to breakwater	3,000.00
McKay's Point (Judique), repairs and renewals to breakwater	4,500.00
McNair's Cove, repairs to breakwater	2,800.00
Mosher's Bay, repairs to breakwater	1,300.00
Farrsboro, repairs to beach protection	1,000.00
Petite Riviere, repairs to breakwater	740.00
Portuguese Cove, repairs to breakwater	1,320.00
Ross' Ferry, repairs to wharf	750.00
Round Hill, repairs to wharf	2,000.00
South Ingonish, to repair and reconstruct beach protection	1,900.00
Sydney Harbor, repairs to quarantine wharf	850.00
	\$136,910.00

PRINCE EDWARD ISLAND.	
Harbors and rivers generally, repairs and improvements	\$ 14,000.00
Miminigash Harbor, repairs to breakwaters	2,000.00
Souris, to repair and strengthen breakwater	35,000.00
Summerside, repairs to breakwater	750.00
Ignish, repairs to breakwaters	1,000.00
Victoria, repairs to pier	1,500.00
Wood Islands, repairs to breakwaters	2,100.00
	\$56,350.00

NEW BRUNSWICK.	
Back Bay, wharf repairs and improvements	\$ 3,500.00
Cape Bald, repairs to breakwater pier	3,100.00
Dorchester, wharf improvements	800.00
Fort Dufferin, reconstruction of breakwork	18,000.00
Grand Anse, repairs to breakwater and pier	750.00
Harbors and rivers generally, repairs and improvements	40,000.00
Neguac, repairs to wharf	3,000.00
Ribbucto Beach, breakwater repairs and improvements	800.00
Shediac, repairs to wharf	1,400.00

Shippigan Gully, repairs to breakwater and breastworks	3,500.00
St. John River and tributaries, to provide for full and final contribution to local Government, not to exceed one-half cost of certain wharfs built by it in tidal waters	5,923.99
	\$80,773.99

QUEBEC.	
Anse aux Gascons, repairs to wharf	\$ 10,600.00
Baie St. Paul, repairs to wharf	600.00
Chicoutimi, repairs to wharf	2,000.00
Cross Point, repairs to wharf	2,000.00
East Templeton, repairs to wharf	925.00
Graham, reconstruction of wharf	1,700.00
Harbors and rivers generally, repairs and improvements	75,000.00
Kamouraska, repairs to wharf	1,200.00
Laprairie, protection works, maintenance and repairs	20,000.00
Les Eboulements, repairs to wharf	900.00
Matane, repairs to breakwater	1,000.00
Murray Bay, repairs and improvements to wharf	2,000.00
Pointe a Elie, repairs to breakwater, wharf	1,200.00
Rimouski, harbor improvements	100,000.00
Rimouski wharf, water supply	6,000.00
River du Loup (en bas), repairs to wharf	1,500.00
Riviere Ouelle, repairs and improvements to wharf	1,500.00
Sabrevois, repairs to wharf	600.00
St. Alphonse, repairs to wharf	2,100.00
St. Godfroy, repairs to wharf	1,000.00
St. Irene, repairs to wharf	850.00
St. Johns, reconstruction of booms	1,300.00
St. Laurent, Island of Orleans, repairs to wharf	2,700.00
Three Rivers, repairs to wharf	2,000.00
Yamaska, reconstruction of dam	1,500.00
	\$240,175.00

ONTARIO.	
Bayfield, repairs to pier	\$ 4,000.00
Blind River, repairs to wharf	1,000.00
Burlington channel, repairs to wharf	1,000.00
Cobourg, repairs to Langevin pier	40,000.00
French River dams, repairs and maintenance	3,000.00
Jennings and Ross in connection with contract for construction of substructure of Big Chaudiere dam	5,800.00
Goderich, repairs to lumber dock	3,000.00
Grand Bend, repairs to piers	1,000.00
Harbors and rivers generally, repairs and improvements	65,000.00
Kingston, maintenance and operation of combined roadway wharf and bridges	8,500.00
Port Bruce, repairs to pier	2,100.00
Port Burwell, repairs to piers	14,600.00
Port Colborne, repairs to breakwaters	7,400.00
Port Hope, harbor improvements	2,000.00
Port Stanley, harbor improvements	77,000.00
Rondeau Harbor, repairs to piers and placing of riprap	4,000.00
Saugeen River, Southampton, repairs to piers	4,000.00
Sheguindah, repairs to wharf	1,000.00
Southampton, repairs to breakwaters	1,800.00
Sturgeon Falls, repairs to wharf	875.00
Thessalon, repairs to wharf	1,000.00
Wellington, in final settlement of claims of McFarlane, Pratt, Hanley, Ltd., in connection with contract for harbor improvements	3,240.00
Wendover, repairs to wharf	1,000.00
	\$252,315.00

MANITOBA.	
Harbors and rivers generally, repairs and improvements	\$ 15,000.00
Little Pembina River, diversion into Pelican Lake	15,500.00
Red River, repairs to channel protection work	3,000.00
	\$33,500.00

SASKATCHEWAN AND ALBERTA.	
Harbors and rivers generally, repairs and improvements	\$ 20,000.00

BRITISH COLUMBIA.	
Fraser River (lower), improvements	\$ 21,500.00
Goose Bay, repairs to wharf	1,000.00
Harbors and rivers generally, repairs and improvements	75,000.00
Prince Rupert quarantine station, repairs to wharf	2,000.00
Tofino, repairs to wharf	1,600.00
Victoria harbor, repairs to wharf	4,500.00
Williams Head quarantine station, improvements and repairs	13,200.00
	\$118,800.00

GENERALLY.	
Harbors and rivers, generally	\$ 30,000.00
DREDGING.	
New dredging plant, Ontario and Quebec	\$ 6,000.00

Dredging, Maritime Provinces	200,000.00
Dredging, Ontario and Quebec	200,000.00
Dredging, Manitoba, Saskatchewan and Alberta	64,000.00
Dredging, British Columbia	250,000.00
	\$720,000.00

SLIDES AND BOOMS.	
Gatineau River, new boom	\$ 11,000.00
Slides and booms generally	5,000.00
	\$16,000.00

The following Public Works Department items are chargeable to collection of revenue:—

SLIDES AND BOOMS.	
Upper Ottawa Improvement Co.'s yearly allowance for logs passed through Chenaux Boom	\$ 1,800.00
Gatineau River, annual allowance for the use of Gilmour & Hughson's boom at Cascades	600.00
Ottawa District, slides and booms, etc.	43,500.00
Saguenay District, booms, piers, etc.	8,000.00
	\$53,900.00

GRAVING DOCKS.	
Champlain graving dock	\$ 20,000.00
Levis graving dock	27,300.00
Esquimalt graving dock	21,000.00
	\$68,300.00

HARBOR AND RIVER WORKS, ETC.	
Burlington channel bridge	\$ 5,800.00
Montreal River, dam at Latchford	3,000.00
River Yamaska lock and dam	2,500.00
Riviere du Lievre lock and dam	3,500.00
St. Andrew's Rapids lock and dam, Red River, Man.	20,700.00
Selkirk, Man., repair slip	5,200.00

MISCELLANEOUS.	
Maintenance and operation of water storage dams on Ottawa River and tributaries, surveys in connection therewith, and settlement of land damages	\$ 125,000.00
Dry docks generally, inspection, etc.	4,000.00
For operation and maintenance of inspection boats	15,000.00
Gratuity to Capt. Barney Freeman, who was seriously injured while at work in government shipyard at Selkirk	2,000.00
River gauging and metering	24,000.00
To pay Western Dry Dock & Shipbuilding Co., Port Arthur, a portion of fifth payment of subsidy due upon completion of work covered by agreement, notwithstanding that the work is not completed	35,641.50

AUTHORIZED BY STATUTE.	
Collingwood dry dock No. 1	15,000.00
Collingwood dry dock No. 2	9,208.96
Montreal floating dock	105,000.00

Naval Service Estimates for 1918-1919.

The estimates for the year ending Mar. 31, 1919, submitted to the House of Commons recently, contain, among others, the following items:—

Naval Service, to provide for the maintenance and upkeep of ships, Naval College, dockyards at Halifax and Esquimalt, and Royal Naval Canadian Volunteer Reserve	\$ 600,000.00
Fisheries Protection Service, to provide for repairs and maintenance of fisheries protection steamships	300,000.00
Hydrographic Survey	215,000.00
Radiotelegraph Service, to provide for building and maintenance of wireless stations	225,000.00
Tidal Service, to provide for maintenance of tidal stations and surveying steamers	25,000.00
Patrol of northern waters of Canada	40,000.00
Life saving stations, including rewards for saving life	100,000.00
Royal Naval College of Canada, restoration	25,000.00
	\$1,530,000.00

Marine Department Estimates for 1918-1919.

The estimates for the year ending Mar. 31, 1919, submitted to the House of Commons recently, contain, among others, the following items:—

LIGHTHOUSE AND COAST SERVICE.	
Agencies, rents and contingencies	\$ 178,000.00
Salaries and allowances to lightkeepers	485,000.00

Maintenance and repairs to light-houses	700,000.00
Construction of lighthouses and aids to navigation, including apparatus, submarine signals, and providing suitable boats for carrying on construction work	400,000.00
Signal service	60,000.00
Administration of pilotage and maintenance and repairs to steamship Eureka	56,300.00
Maintenance and repairs to wharfs Breaking ice in Thunder Bay and Lake Superior and other points deemed advisable for good of navigation	40,000.00
To pay pension of \$300 each per annum to retired pilots	9,300.00
To provide telephones at different points throughout the Dominion in connection with aids to navigation	500.00
Allowance to harbor master at Amherstburg, for supervision of lights and buoys in St. Clair River, Detroit River, Lake Erie, and other services during navigation	400.00
	<hr/>
	\$1,939,500.00

OCEAN AND RIVER SERVICE.	
Maintenance and repairs to Dominion steamships and ice breakers	\$ 1,500,000.00
Examiners of masters and mates	16,500.00
Investigations into wrecks	12,300.00
Expenses of schools of navigation ..	8,000.00
Registration of shipping	3,000.00
Removal of obstructions in navigable waters	5,000.00
Inspection of live stock shipments ..	3,000.00
To continue subsidy for wrecking plants, Quebec, Maritime Provinces and British Columbia	35,000.00
Unforeseen expenses	5,000.00
Amount required for two boilers for C.G.S. Montcalm	60,000.00
Amount required for two steamships for buoy service in Maritime Provinces ..	300,000.00
	<hr/>
MISCELLANEOUS.	
Compassionate allowances to the widows, or fathers, or mothers, or dependents of the captain and members of the crew of the C. G. S. Simeco, who lost their lives when that vessel foundered in the Gulf of St. Lawrence, Dec., 1917	\$ 61,500.00

Mail Subsidies and Steamship Subventions for 1918-1919.

The estimates for the year ending Mar. 31, 1919, submitted to the House of Commons recently, contain, among others, the following items:—

ATLANTIC OCEAN, STEAM SERVICES.	
Between Canadian Atlantic ports and Australia and New Zealand	\$ 70,000.00
Between Canada and Great Britain ..	400,000.00
Between Canada and Newfoundland ..	70,000.00
Between Canada and the West Indies or South America, or both	250,666.66
Between Canada and South Africa ..	73,000.00
PACIFIC OCEAN.	
Between Canada and Australia or New Zealand or both, on Pacific Ocean	180,509.00
Between Canada, China and Japan ..	253,333.34
Between Prince Rupert, B.C., and Queen Charlotte Islands	21,000.00
Between Victoria and San Francisco ..	3,000.00
Between Victoria, Vancouver way ports and Skagway	12,500.00
Between Victoria and West Coast Vancouver Island	5,000.00
Between Vancouver and northern ports of British Columbia	16,800.00
LOCAL STEAM SERVICES.	
Between Baddeck and Iona, N.S.	5,825.00
Between Charlottetown, Victoria and Holliday's Wharf, P.E.I.	2,500.00
Between Froude's Point and Lockeport, N.S.	600.00
Between Grand Manan and the mainland of N.B.	10,000.00
Between Halifax, Canso and Guysboro, N.S.	5,000.00
Between Halifax and Newfoundland via Cape Breton ports	10,000.00
Between Halifax, Mahone Bay, Tancook Islands and La Have River ports ..	4,000.00
Between Halifax and Spry Bay and ports in Cape Breton	4,000.00
Between Halifax, South Cape Breton and Bras d'Or Lake ports	6,000.00
Between Halifax and west coast Cape Breton, calling at way ports	4,000.00
Between Halifax and Sherbrooke	2,000.00
And between the mainland and the Magdalen Islands ..	18,000.00
Between Mulgrave and Canso	6,500.00
Between Mulgrave and Guysboro, calling at intermediate ports	5,500.00
Between Newcastle, Neguac and Escuminac, calling at all intermediate points on Miramichi River and Miramichi Bay ..	2,500.00
Between Pelee Island and mainland ..	8,000.00
Between Petit de Grat and Intercolonial Ry. terminus at Mulgrave ..	7,000.00
On Petitodiac River between Moncton and way ports, and a port or ports on west coast of Cumberland County ..	2,500.00
From opening to closing of navigation in 1918, between Pictou, Mulgrave and Cheticamp ..	7,500.00
From opening to closing of navigation in 1918, between Port Mulgrave, St. Peter's, Irish Cove and Marble Mountain and other ports on Bras d'Or Lakes ..	6,500.00
During 1918, between Quebec and Harrington, calling at ports and places along northern shore of the River St. Lawrence between such terminals ..	28,000.00
Between Quebec and Gaspe Basin, touching at intermediate ports ..	8,500.00

Between River du Loup, Tadoussac and other north shore ports	6,000.00
Between St. John, N.B., and ports in Cumberland Basin	3,000.00
Between St. John, N.B., and Bridgetown ..	2,500.00
Between St. John, N.B., and Digby ..	20,000.00
Between St. John, N.B., Digby, Annapolis and Granville, viz., along west coast of Annapolis Basin ..	2,000.00
Between St. John, N.B., and ports on Bay of Fundy and Minas Basin, and Margareville, N.S.	8,000.00
Between St. John, Westport and Yarmouth and other way ports	10,000.00
During year 1918 between St. Stephen, N.B., Ste. Croix River points, Deer Island, Campobello and inner islands, Passamaquoddy Bay and L'Etete or Back Bay	6,000.00
During season of 1918, between Sydney and Bay St. Lawrence, calling at way ports	6,000.00
During season of 1918 between Sydney and Whycocomag ..	3,000.00
From Sydney, N.S., around east coast of Cape Breton to Hastings and return to Sydney via Bras d'Or Lakes ..	5,500.00
Expenses in connection with supervision of subsidized steamship services ..	3,000.00
	<hr/>
	\$1,585,234.00
AUTHORIZED BY STATUTE.	
Canada, China and Japan	\$ 121,666.55
Canada and France	200,000.00
	<hr/>
	\$321,666.55

Jurisdiction Over Coastwise and Great Lakes Vessels.

In introducing a bill to amend the Railway Act, into the House of Commons, Apr. 4, J. E. Armstrong, M.P. for East Lambton, who is chairman of the Railway Committee, said:—

"This bill is similar to the one I introduced in 1915. The legislation is along the same line as that which I have asked Parliament during the last five years, to bring into force. It is for the purpose of bringing the boats engaged on our inland waters and our coastwise trade under the control of the Board of Railway Commissioners. The railways are compelled to file their tolls, rates and tariff agreements with the board, and they are also compelled to do this with regard to boats connected with the railways. I firmly believe it would be in the public interest, not only to compel the boats on our inland waters and along the coast to file their tariff rates with the board, but to bring them under the board's absolute control. There are on the Canadian register 8,500 vessels, with some 45,000 employees. In view of the fact that these vessels are allowed to make use of our rivers, harbors, docks and canals free of

charge, in which improvements the people of this country have invested over \$350,000,000. I think members will readily agree that it would be in the public interest for Parliament to have control over these."

When this matter was brought up last year, and it was proposed to embody a similar provision in the Consolidated Railway Act, the committee, after strong and general opposition, in which the Dominion Marine Association and the leading boards of trade took part, struck out the provision objected to, but the bill did not become law, as Parliament adjourned before final action could be taken. It is probable that the Consolidated Railway Act, which has been before the Senate, will be sent back to the House of Commons for further amendment, when another attempt may be made to incorporate the objectionable provision in the act. It is, however, expected that there will be little, if any, time for a fair discussion of the question, and that no action will be taken in view of the opposition of last year.

Decision in a Vessel Partnership Case.

At Toronto, April 10, Mr. Justice Rose gave judgment in the non-jury assize court in favor of Capt. James B. Foote, of Toronto, who had instituted a suit against A. B. Mackay, of Hamilton, Ont., for a declaration that he had a 5% interest in the two former lake steamships, the Turret Chief and the Algonquin, and for an accounting of profits, both vessels figuring in war sales.

The Turret Chief was wrecked in the storm that swept the great lakes in the autumn of 1913 and was abandoned by the owners to the underwriters, who subsequently released her and took her to Port Arthur, Ont. Foote claimed that Mackay and he bought the vessel from the underwriters for \$8,500, made repairs and thereafter sent her with a cargo from Chicago to Leith, Scotland, where the vessel was sold for £30,250.

In Dec., 1915, the Algonquin was purchased from the Port Colborne & St. Lawrence Navigation Co., for \$80,000. Foote claimed that his profits from the first sale, or some of them, remained in the Algonquin, which was sold to interests affiliated with the Nova Scotia Steel Co. and engaged in coastwise trade in the Lower St. Lawrence until the autumn of 1916, when she was again sold to New York interests, and on her first voyage thereafter was sunk by a German submarine off the Irish coast.

The Tunisie-Cabotia Collision.—Cross actions for damages were heard in the Admiralty Court, Montreal, recently, arising out of the collision between the Belgian steamship Tunisie and Canada Shipping Co.'s s.s. Cabotia, near Windmill Point, Montreal harbor, Oct. 28, 1917. The court found that the s.s. Cabotia was entirely at fault and gave judgment accordingly, leaving the assessment of damages to the Registrar of the Court. The result of the Wreck Commissioner's enquiry into the causes of the casualty, as published in Canadian Railway and Marine World for Dec., 1917, showed that the master of the s.s. Cabotia, was needlessly daring and showed bad judgment and recklessness, and that he violated the port's bylaws in obstructing navigation, and his certificate was suspended for six months from Nov. 10, 1917. The master and officers of the s.s. Tunisie were exonerated from all blame.

Turning Vessels in the River at Fort William.

In pursuance of a resolution passed at the Dominion Marine Association's annual meeting recently, a committee had an interview with the Deputy Minister of Marine at Ottawa on Mar. 7 and as a result an order in council was passed Mar. 14, cancelling sec 15 of the special regulations for the Fort William, Ont., harbor, and substituting the following section therefor:—

"Steam vessels not exceeding 200 tons gross may turn in any part of the Kaministikwia River, McKellar channel or Mission channel, under their own power, excepting in the immediate vicinity of any bridge crossing those rivers or channels. Steam vessels exceeding 200 tons gross are prohibited from turning in the local harbor, excepting at the turning basins constructed for that purpose at West Fort, above the G.T.P. Ry. bridge, at the confluence of the Kaministikwia River with Mission channel, at the confluence of the Kaministikwia River with McKellar channel and at the G.T.P.R. turning basin near the mouth of Mission channel; provided that steam vessels exceeding 200 tons gross, but not exceeding 330 ft. long may turn in the section of the Kaministikwia River lying between the bend above the C.P.R. elevator D and the westerly limit of the G.T.P.R. rail dock and in the section of the river lying between C.P.R. slip 1 and elevator C, but the turning of such vessels in those sections of the river shall not take place without the use of a tug, unless sanctioned by the harbor master."

Naval Patrol Boats and Mine Sweepers. Mr. Sinclair asked the following questions in the House of Commons on April 10:— How many naval patrol boats and mine sweepers of all classes were ordered on Government account in 1916 and 1917? How many have been delivered to date? What is the speed of these boats? If various, specify? Are they constructed of wood or steel? What service are they intended for? What has been the total expenditure to date? How many officers and men are employed in this branch of the service? The Minister of Marine stated in reply, that as the information asked was of a confidential nature, it was not considered advisable in the public interests to publish it.

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.

The Northern Electric Co., Montreal. has been appointed exclusive agent for Canada and Newfoundland, for the Drew Electric & Manufacturing Co., Indianapolis, Indiana, manufacturers of electric light, power and gas materials.

Independent Pneumatic Tool Co.—F. J. Hurley, who travelled for the company's New York office for several years, died at East Orange, N.J., Mar. 10, aged 29, from Hodgkins disease, from which he had suffered for some time.

Canada Foundries & Forgings, Ltd., Welland, Ont., has issued an illustrated booklet, "Craft of the Hammersmith," dealing with the art of forging, and with heat treatment, and referring among other things to heavy marine and locomotive parts.

Berry Bros., Inc.—M. F. Enrich, who was with the Glidden Co. for 28 years, having risen from the bottom to the position of assistant to Mr. Glidden, has been appointed Assistant General Manager for Berry Bros., varnish manufacturers, Detroit, Mich., and Walkerville, Ont.

The Canuck Supply Co.'s manufacturing subsidiary, the Spartan Machine Company, Ltd., Montreal, is making a considerable addition to its existing plant, in order to manufacture railway and mechanical devices and supplies. J. Bruce Robb, who served with the P.P.C.L. Infantry, and was invalided home to Canada early in the war, has been able to take up work again with the Canuck Supply Co. and is taking over the territory formerly attended to by E. L. Foley, who volunteered some three months ago and is now on military service.

Consolidated Equipment Co., Ltd., was incorporated recently under the Dominion Companies Act, with an authorized capital of \$25,000, and office at Montreal. The officers are: Herbert Ewan, President; J. W. Coleman, Vice President and Treasurer; and H. B. Duke, Secretary. The company announces that it represents the following, among others:—Murphy Lines, including Imperial Appliance Co. and Standard Railway Equipment Co.; Nathan Mfg. Co., lubricators and injectors; Brown & Co., stay and engine bolt irons; R. W. Young Mfg. Co., electric turntable tractors; Standard Paint & Varnish Co.,

Windsor, Ont.; Spencer Otis Co., Chicago; Bako Macoo Co., union renewable fuses; Howe locomotive bell ringer.

T. McAvity & Sons, Ltd., St. John, N. B., have issued an illustrated catalogue of McAvity marine specialties, to pass British Admiralty, Lloyd's, and Imperial Munitions Board's specifications, including valves, cocks, water columns, water gauges, side or port lights, ventilating posts, steam whistles, gauges, plugs, brass and copper pipes and tubes, gongs, signal and binnacle bells, bell pulls, crank, chain and leaders, ships' pumps, deck pumps, deck plates, ships' rudder braces, dumb braces, dovetails, brass and lead figures, letters and water marks, sounding leads, steering wheel caps, diamonds and stars, bushings, marine hardware, cordage, galvanized wire rope, chains, bolt, scupper and sheathing nails, ship and boat spikes, steel and brass wooden screws, tackle blocks, shipbuilders tools, mallets, caulking irons, augers, pulley blocks, jack screws, etc.

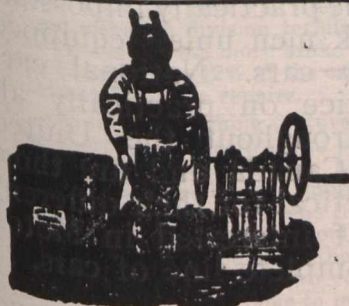
Transportation Associations, Clubs, Etc.

- The names of persons given below are those of the secretaries unless otherwise stated:
- Canadian Car Service Bureau—W. J. Collins, Manager, 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, 805 Boyd Block, 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.
 - Dominion Marine Association—F. King, Counsel, Kingston, Ont.
 - Canadian Ticket Agents' Association—E. de la Hooke, London, Ont.
 - Canadian Society of Civil Engineers—F. S. Keitn, 176 Mansfield St., Montreal.
 - 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 Street West, Toronto.
 - Express Traffic Association of Canada—C. N. Ham, Montreal.
 - Great Lakes and St. Lawrence River Rate Committee—James Morrison, Montreal.
 - Hydro-Electric Railway Association of Ontario—T. J. Hannigan, Guelph, Ont.
 - International Water Lines Passenger Association—M. R. Nelson, New York.
 - Niagara Frontier Summer Rate Committee—James Morrison, Montreal.
 - Quebec Transportation Club—A. F. Dion, Quebec.
 - Railway Association for National Defence—W. M. Neal, Montreal.
 - Shipping Federation of Canada—Thos. Robb, Manager, 42 St. Sacramento Street, Montreal.
 - Ship Masters' Association of Canada—Capt. E. Wells, 45 St. John Street, Halifax, N.S.
 - Toronto Transportation Club—W. A. Gray, 143 Yonge Street, Toronto.
 - Transportation Club of Vancouver—H. W. Schofield, 553 Church Street, Vancouver, B.C.

Steamer For Sale

Twin Screw, Steel Hull "Steamer Oiseau," now operating on Ottawa River from Pembroke. Length 120 ft. Beam 22 ft. 8 in. Gross tonnage 148. Horse power of engines 250 each. Fully equipped with Electric Light Plant, Life Belts, Buoys, etc. For further particulars apply to

PEMBROKE TRANSPORTATION COMPANY, LIMITED,
Pembroke, Ontario.



JOHN DATE

Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith

13-15 Concord St., Montreal



Capital Authorized.....\$10,000,000
Capital Paid up.....7,000,000
Reserve Fund.....7,000,000

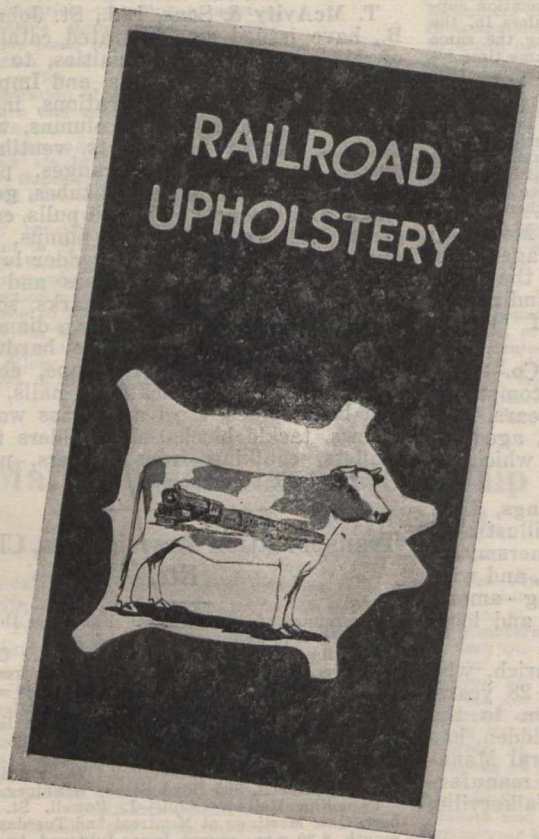
Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the World.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.



Get This Booklet

It gives up-to-date facts on Railroad Upholstery problems and the experience of one of the foremost railroad men in the country with



It is full of interesting and valuable information for Purchasing Agents, Superintendents of Motive Power, Master Mechanics, Shop Foremen, Car Upholsterers, Car Builders and Officials interested in Railway Equipment.

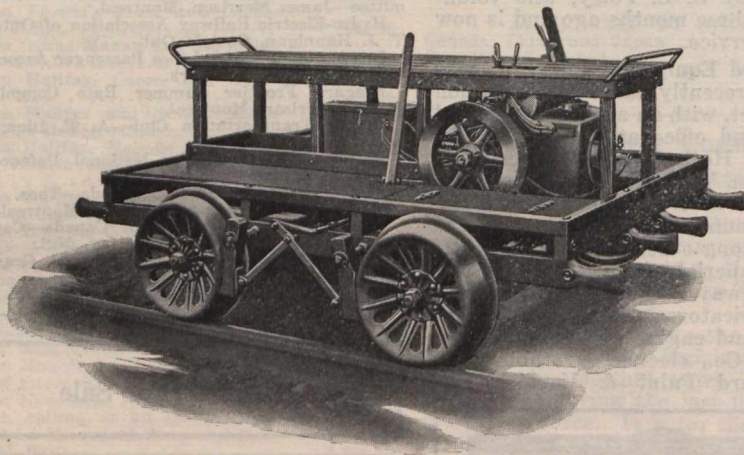
Booklet will be sent promptly to all persons requesting it of

Wendell & MacDuffie Co.

Railway Dept. Representatives Du Pont Fabrikoid Co.

61 Broadway, New York

National Railway Motor Cars



Railway motor cars have come to stay. The days of the old pump car are numbered. A motor car is the biggest labor and time saver that has ever been put into service in the Maintenance-of-Way Dept. It has become practically impossible to hire track men unless equipped with motor cars. National cars are in service on practically all railways throughout the United States and Canada and are thoroughly practical for their different purposes. If interested in Motor

Cars send for our catalog describing and illustrating our complete line of cars.

We are also the manufacturers of the famous "Casey Jones" hand car engine which is furnished complete with all necessary equipment for the converting of a standard hand car or push car into a motor car. Thousands in service throughout the United States and Canada.

Northwestern Motor Co. ⁹⁰⁰ SPRING STREET Eau Claire, Wis., U.S.A.