

PAGES

MISSING

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ESTABLISHED 1893

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The Canadian Engineer

ESTABLISHED 1893

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TORONTO, CANADA, APRIL 10th, 1908.

A subscriber has for sale bound volumes of the Canadian Engineer for 1893, 1894, and 1895. What are they worth to you?

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CANADIAN CEMENT USERS.

Two meetings are called for Monday, April 20th, at the King Edward Hotel, Toronto, when the question of forming a Canadian Cement Users Association will be taken up. A preliminary meeting is called for 11 a.m., followed by a meeting at 3 p.m. All interested cement men are requested to be present.

PRESERVE THE STREAMS.

Canada has made great boast of her supply of "white coal." Has she not streams and lakes and waterfalls without number? Harness these and we thought we had electric energy at every door. Mr. Breithaupt's paper on "Stream Flow" should cause us to more fully consider this question and ponder whether we have not been too careless of that great heritage—running water.

In the early days of some districts the first task was to clear the land and prepare it for cultivation. The complete removal of the forest and the drainage of large swamp areas was here necessary. But much of our area is not suited for agricultural pursuits, but even here we allowed the lumberman to slash and cut and the forest fire soon followed and swept clean the hillsides and valleys that should have been wooded slopes and wide forest ranges and great storehouses of rain and snow and moisture to feed our rivers.

Yearly, the deforesting went on and yearly the streams ran themselves to death in spring-time. The powerful rivers of March and April became in July and August mere rivulets. Nature's reservoirs had been destroyed, and that which might have been stored-up energy wasted. Many waterfalls that might have been valuable for power purposes because of the great fluctuation in flow of water became valueless.

Some of the injury done in the Western Ontario peninsula may be corrected. All the important rivers of this great district have their sources within a comparatively small area. The reforestation of this area, or certain sections of it, would do something to regulate the run off. This commencement could be followed up in other ways.

The first thing that is required is a systematic survey, and it appears to us that this is one place where the Hydro-Electric Commission might properly employ engineers—it is not near so far afield as producer-gas. The Hydro-Electric Commission is doing good work in arranging for the distribution of power from Niagara, but they will defeat the purpose they were created for if they neglect all others but those dependent on Niagara Falls for power.

Other districts have claims, other municipalities are now receiving electric energy generated by water power, and in not a few cases their plants are becoming unreliable because of the great irregularity in stream flow. If the Government were to make an appropriation to the Hydro-Electric Commission, so that they might employ an engineer to investigate, make surveys, and report for until the people appreciate the necessity of reforestation of the head waters of our streams, grants large enough to be of value cannot readily be secured for such work.

LUMBER PRODUCTION.

A comparison of the lumber-producing States of the American Union shows that since 1899 there have been many changes in their relative rank. Washington, which in 1899 stood sixth, now leads, while Wisconsin, which eight years ago led all others, is now third. In the same period Oregon, Louisiana, Mississippi, Idaho, and California made great strides as lumber-producing States, though Michigan, Wisconsin, Minnesota, Georgia, Kentucky, Tennessee, Missouri, Indiana and Ohio fell off in production anywhere from 29 to 54 per cent.

Last year showed the largest lumber-cut on record in the United States. The enormous quantity of 37,550,736 board

feet was produced and the mill value was \$621,151,388. In addition there were produced 11,858,260,000 singles valued at \$24,155,555, and 3,812,807,000 lath, valued at \$11,499,570. The present annual lumber-cut of the United States approximates 40,000,000,000 feet and the total mill value of the lumber, lath and shingles each year produced is not less than \$700,000,000. These and other statistics pertaining to the wood industry of our neighbors to the south are in the report of the Forester of the United States Department of Agriculture at Washington, D.C.

COST OF ENGLISH ROADS.

The smooth, compact English road is always a source of wonder to a Canadian traveller over them. The English country road is almost as well laid as the Macadam streets of Canadian cities.

The annual report of the County Council of Worcestershire gives some ideas as to the cost. This county has 455,000 inhabitants. The total mileage of the roads maintained by the County Council is 468½ miles, and the net cost per mile for the year ending March 1907 was \$332.89.

Great complaint is made as to the tremendous wear caused by traction engines and motor car traffic.

DOMINION LAND SURVEYORS.

The Board of Examiners for Dominion Land Surveyors will meet in Ottawa, May 4th, for the examination of candidates for admission as articulated pupils, for commissions as Dominion Topographical Surveyors or for certificates as Dominion Topographical Surveyors. Examinations will be held at Ottawa, Toronto, Kingston, and Calgary.

ORDERS OF THE RAILWAY COMMISSIONERS OF CANADA.

Copies of these orders may be secured from the Canadian Engineer for a small fee

4510—March 25—Authorizing the C.P.R. to construct, maintain and operate a branch line to and into the premises of George F. Stephens, Calgary, Alberta.

4511—March 24—Authorizing the G.T.R. to construct, maintain and operate certain railway tracks or sidings adjoining its main line (Chaudiere Junction branch) in the vicinity of Somerset Street, in the city of Ottawa, Province of Ontario, and the connection thereof with the tracks of the C.P.R. (St. Lawrence and Ottawa Railway Co.).

4512—March 25—Authorizing Windsor, Essex and Lake Shore Rapid Railway Co. to deviate a portion of its located line of railway through a part of the township of Gosfield South, the township of Mersea and the township of Leamington, Ont.

4513—March 25—Authorizing the C.P.R. to open for the carriage of traffic that portion of its Pheasant Hills branch from Lanigan to Asquith, Sask.

4514—March 25—Authorizing the Arthabaska Water and Power Co. to place and maintain for through conduits to carry a 2,300 volt power line under the track of the G.T.R. at a point near Victoriaville, P.Q.

4515—Feb. 29—Extending until June 1st, 1908, the time fixed authorizing the use of contracts, conditions, by-laws, and regulations of the Canadian Express and Dominion Express Companies.

4516—March 25—Authorizing the C.P.R. to construct its railway across the highways between Lots 20 and 21, Con. 9, mile 15.58, and between Con. 9 and 10, mile 17.3, in the township of Vaughan, county of York, Ontario.

4517—Feb. 29—Extending until June 1st, 1908, time within which contracts, conditions, by-laws, regulations, declarations, and notices should continue in use by the National and American Express Companies, and have effect.

4518—Feb. 29—Extending until June 1st, 1908, the time within which forms of contract of the Pacific Express Co. may be used.

4519—March 24—Authorizing the C.P.R. to construct its railway across twenty-six road allowances on its Pheasant Hills branch, mile 332 and mile 358, from Saskatoon westerly.

4520—Feb. 29—Extending until June 1st, 1908, the time within which the United States and Great Northern Express Companies may use their forms of contracts, conditions, by-laws, regulations, declarations, and notices.

4521—March 25—Extending until June 1st, 1908, the time within which the Maritime Express Co., Limited, may continue to use its form of freight and money order receipt.

4522—March 25—Authorizing the C.P.R. to construct a spur to and into the premises of the Ideal Fence Co., Limited, Winnipeg, Man.

4523—March 25—Authorizing the C.P.R. to construct a spur across Huron Street, in the city of Toronto, Ont., rescinding Order No. 4413, dated the 6th of March, 1908.

4524—March 25—Authorizing the C.P.R. to construct its railway upon and across St. Patrick Street, in the city of Montreal, in the building of a spur to the premises of T. Prefontaine & Co.

4525—March 25—Authorizing the Bell Telephone Co. to erect its wires over the tracks of the Michigan Central Railroad at public crossing quarter miles west of Melbourne Station, Ontario.

4526—March 24—Authorizing G.T.P. Railway Co. to construct its railway across fifty-four highways in the Province of Saskatchewan, from mile 49.197 to mile 100.298.

4527—March 26—Authorizing the C.P.R. to construct spur to the premises of the Western Canada Cement and Coal Co., Limited, Kananaskis, Alberta.

4528—March 26—Authorizing C.P.R. to construct a bridge at mile 35.6 on its Esquimalt and Nanaimo branch.

4529—March 26—Approving revised location of C.P.R., Crow's Nest branch, from mile 94 to 110, being from a point in Section 21, Township 9, Range 19, west of the 4th meridian, through and to a point in the town of Lethbridge, Alta.

4530—March 26—Authorizing the C.P.R. to construct spur to the premises of the Ellison Milling and Elevator Co., Lethbridge, Alta.

4531—March 26—Approving location of G.T.P. Company's station in the north-west quarter of Section 12, the south-west quarter of Section 13, and the east half of the south-east quarter of Section 14, Township 38, Range 19, west 3rd meridian, Saskatchewan.

4532—March 26—Approving location of G.T.P. Railway Company's station in Sections 25 and 26, Township 19, Range 32, west of the 1st meridian, Saskatchewan.

4533—March 25—Authorizing railways in Canada, subject to the jurisdiction of the Board, to issue to the secretaries of the Railroad Branches of the Y.M.C.A. located on their lines, of which its employees are members, and for their household effects, free transportation or reduced rates over its railway, when the said secretaries are travelling in connection with their secretarial duties, or are being transferred by the said Association.

4534—March 26—Authorizing Montreal and Southern counties Railway Company to construct its railway across Front Street, St. Lambert, P.Q.

4535—Dec. 9, 1907—Authorizing G.T.R. Company to construct, maintain and operate a branch line of railway at or near the town of St. Lambert, Quebec, to connect the second and fourth districts of its railway, between St. Lambert and Brosseau Junction, about seventeen hundred feet south of the southern boundary, St. Lambert, P.Q.; thence northerly and westerly through a portion of the parish of St. Antoine de Longueuil and the town of St. Lambert, across Second Street, Hickson Avenue, Edison Avenue and First Street to a point on its railway near the easterly entrance of the Victoria Jubilee Bridge.

(Continued on Page 263.)

RIVER REGULATION, WITH SPECIAL REFERENCE TO THE ONTARIO PENINSULA AND TO THE GRAND RIVER.*

The flow of streams is due to a variety of causes; primarily precipitation, rainfall and snowfall; extent and declivity of the drainage area; nature of the ground, rocky or soil, and condition of the soil; condition of the surface, the chief element being whether it is forested or clear; the presence of lakes or large collecting basins in the stream. A steep rocky drainage area will give the greatest run-off in the shortest time. There is great difference in the nature of soils and in their permeability, as for instance between clay and loam, or gravel.

Whether forestation has, much influence on precipitation is not entirely clear. There are generally other governing conditions. As to the Ontario Peninsula there are the vast adjacent bodies of water—the Great Lakes. As far as records go it appears that precipitation has not decreased in Ontario with deforestation. The influence of forestation is in retarding and diverting. The forest floor is more or less obstructed with litter, and is soft and permeable. Water finds its way into creeks and rivers, much disappears into the ground to come up lower on the slope in the form of springs. A large part evaporates, and vegetation, tree growth, by transpiration, absorbs a large amount of water. Owing to evaporation and transpiration together the total run-off from a forested area is, in fact, somewhat less than from a non-forested one. Conservation and continuation of the flow, with ground water, and slow melting of the snow, are, however, very much better with the forested watershed. The forest acts as an equalizer, being a check both on extremely high and on extremely low water. Where the ground is bare and compact the water rushes quickly over the surface, forming torrents, washouts, and floods.

Large basins or lakes in the course of a river exercise an important function in its regulation. Water, though in great quantity, will increase the depth of a basin of large area very little; the head of water at its outlet will also be but little increased, and the flow will be long-sustained. With artificial control of the outlet the natural automatic regulating value of a large storage basin in a stream can be much enhanced.

The percentage of precipitation that reaches the streams, that is the percentage of run-off to rainfall, after evaporation, transpiration, etc., varies greatly with the nature of the drainage area, and may be anywhere from 40 to 60 per cent., and less or more in exceptional cases. There is also variation with meteorological conditions. After a long dry period a very heavy precipitation may not show much in the streams, while after a wet season a smaller precipitation may give a much larger run-off.

The requirement then for river regulation is to retard and conserve the water after rain-fall or snow-fall, and this is done either by forestation, including timbered swamp areas as forest, and is most effectively and to the best general benefit done in this way; or by storage on a large scale. Ground water, which for its up-keep depends so directly on forest area, is one of the most important features of general benefit due to forestation. Various towns in the Ontario peninsula, for instance, and fairly large centres of population, depend for their water supply on deep wells. Impair the supply of ground water and the water available from such wells must inevitably be largely reduced.

All larger streams normally originate in mountains or uplands, and the relatively most important areas for up-keep of the flow of a stream are the mountain slopes or upland drainage areas proximate to its source. To have such areas in forest is therefore of the first importance. In older countries, in Europe, this is effectively done, and in the United States the Federal Government is now, in the Appalachian and White Mountains Bill before Congress, giving particular attention to this question. In Germany the forest covers 26

per cent. of the surface, mountain slopes and headwaters of streams being as much as possible in forest, and, incidentally, the forests are one of the most prolific sources of public revenue. The Ontario Peninsula, only a short time ago, not much over 50 years for the greater part of it, one of the most densely forested areas in either temperate zone, now shows, as far as can be ascertained from the Government returns, which are very defective, under 15 per cent.—it is actually probably nearer 12 per cent.—of the surface as woodland. With deforestation stream flow in the Peninsula has greatly changed. Spring floods are very much higher, and there are floods on heavy rains, while during the season of minimum flow many streams, which were formerly considerable throughout the year practically disappear.

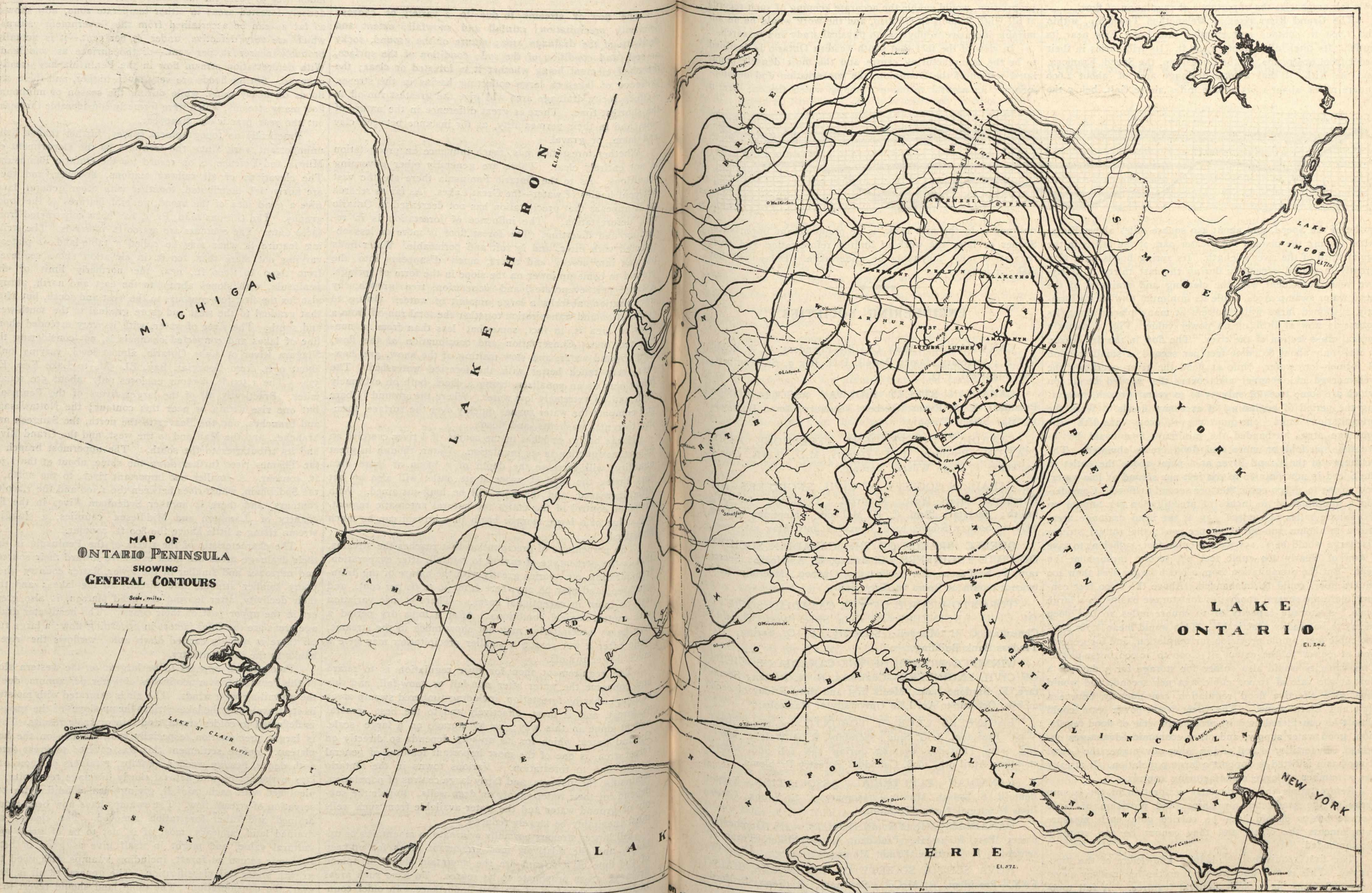
Practically no topographical survey, further than a little unimportant work along the frontiers by the Department of Militia and Defence, is on record for the Ontario Peninsula. The elevations of all railway stations, however, and they are fairly well distributed, together with other general data, give a good idea of the broad, general features of the topography. The contour map, Pl. 1, has been constructed from these data. The contours are at 100 ft. intervals. The striking feature is what may be called a table-land or plateau varying not more than 200 ft. in elevation above sea-level, from 1,500 to 1,700 ft., near the northerly limit of the peninsula, with slopes abrupt to the east and north, abrupt also for the first few contours to the west and south, but after that gradual to the west and more gradual to the south-west and south. The river of water, with its very extended shore line of lakes and connected channels is, not considering the Niagara River or Lake Ontario, almost level, varying only about 9 ft. from Georgian Bay, El. 581, to Lake Erie, El. 572. The 1,500 ft. contour encloses only about 550 square miles. Practically all of the larger rivers of the Peninsula but one rise within or near this contour; the Nottawasaga and branches, and the Beaver to the north, the Saugeen and the Maitland to the west, and the Grand River and its tributaries to the south. The uppermost branch of the Thames rises further down the slope, about at the 1,300 ft. contour. A smaller but important river, to the north, is the Sydenham, which rises between the 1,100 and the 1,200 ft. contours, and there is another Sydenham River in the flat country of Lambton and Middlesex counties, a sluggish stream rising a little above the 800 ft. contour.

The characteristic of the rivers of the Peninsula is that their drainage areas are most extensive toward their sources, and narrower and smaller in the lower, flatter country where many smaller streams flow directly to the lakes; and that their declivity, after leaving the head plateau, is also greatest in the upper part of their course. The headwater drainage areas are the chief factors in governing flow; a large run-off there is quickly carried down and overflows the river's banks in the lower country.

Precipitation appears to be largest on the western slope of the Peninsula, over 400 inches of water per annum, due to the prevailing west winds. The air is saturated with moisture in its travels over the lakes strikes the up-slopes of the ground, is deflected to colder strata, and rain or snow results. There is larger precipitation, especially snowfall also on the head plateau. Before settlement this was covered to great extent with dense, heavily wooded swamps, retainers of snow until late in the spring and natural slowly drainage reservoirs, replenished with each rainfall, giving ideal condition for conservation of stream flow. The swamps have now been mostly drained and other forestation removed. The cleared and drained land, appears, most of it, not to be of great agricultural value, and might in itself give as good or better economic return as forest, including swamps with good tree growth under this classification. The general result is, however, the consideration. The table land should revert to its former condition. It is difficult to imagine so comparatively small an area elsewhere the reforestation of which would have such far reaching results. The area in question comprises the greater part of Artemesia, Egremont, Proton, Melancthon, Arthur, West and East Luther, and East Garafraxa Townships.

(Continued on Page 262.)

*Paper read at Engineers' Club, Toronto, March 5th, 1908, by W. H. Breithaupt, M. Inst. C.E.

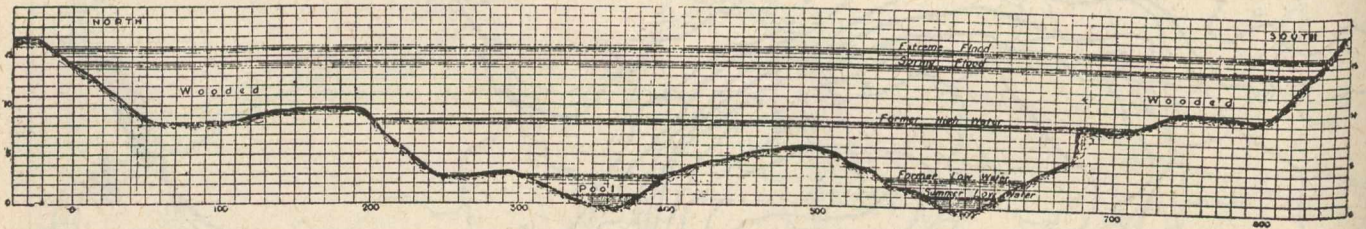


Map Showing 100-foot Contour and Sources of Rivers Ontario Peninsula.

(Continued from Page 259.)

Besides the prevention of disastrous floods the questions of pure water supply for cities and towns, and of power generation along the various rivers with their very considerable fall emphasize the importance of regulation of flow.

The Grand River rises in Melancthon Township, within the 1,700 ft. contour and empties into Lake Erie near its outlet. Its total fall is about 1,100 ft. Its tributaries in their order from upstreams are the Conestogo, the Speed, Eramosa, and the Nith. It has a total drainage area of about 2,600 square miles, about 1,325 square miles above Galt, below the



outlet of the Speed, and about 450 square miles above Elora. After leaving the plateau the greater part of the fall is in the upper third of the river's length. Its spring floods have very greatly increased especially during the last thirty to thirty-five years coincident with the clearing and drainage of the head water swamp areas, while its minimum flow which formerly sustained large water powers at many places along its course is now of little or no power value. Fig. 1 shows a typical cross-section of the river. The flow in the dry season is now only about 80 cubic feet per second, a small fraction of former low water, while at flood the river overflows the well-marked old channel and covers the wooded banks on which are some trees of only 35 to 40 years' growth, indicating the period of beginning of excessive floods. Were the precipitation from one-quarter or even one-fifth the drainage area husbanded the minimum flow could be increased four-fold or more and flood crests obviated. The discharge of the Grand River at a point above the outlet of the Speed is now only 80 to 100 feet per second at low water, and 10,000 to 20,000 cubic feet per second at flood. Considering a minimum of 30 inches of precipitation per annum on 400 square miles of surface, say at the head drainage area, and a minimum run-off of 40 per cent., the annual stream discharge would be 11,151,360,000 cubic feet, sufficient to give a flow of nearly 400 cubic feet per second throughout the year. But the precipitation from a much larger area than 400 square miles could be husbanded. Above the 1,000 feet contour there are several good sites for storage basins on a large scale. A storage capacity of 10 square miles 10 feet deep seems to be readily practicable. This would mean 2,787,840,000 cubic feet, ample provision for regulation, and for generation of power to the extent of 8,000 to 10,000 horse-power. This capacity would also suffice for storage for 3 days of a flow at the rate of 10,000 cubic feet per second, and would thus give effective flood regulation continuously between Galt and Elora alone. The great water-power gain could almost be considered as a by-product in view of flood regulation, good water supply, and other economic advantages obtained. In fertility of soil and in other advantages the Grand River basin is fitted to support a large population. It already has a number of large manufacturing centres.

Reforestation and particularly restoration of the swamp areas of the headwater townships, and provision of large storage basins should both be carried out; each measure complements the other, and they cannot be too strongly recommended.

The first requisite is a definite knowledge of the topography. This is now known only from the few railway elevations and from the broadly general features. A full topographical survey, definite gaugings, examinations of sites for storage basins, and delimitation of especially the head drainage area should be no longer delayed.

Precipitation gaugings, rainfall and snowfall, throughout the Province are also urgently required. Definite records have been kept, but only in a few places in Ontario, for about 65 years. A feature of one series of records is that in 50

years there have been 29 rainfalls of over 2 inches in 24 hours, some as high as $3\frac{1}{2}$ inches in 24 hours. Otherwise there are only uncertain records, many of them volunteer work, and much of this has been discontinued. A small appropriation, would enable the accurate keeping of such records at all High Schools in Ontario, and the work would be an admirable incentive to physical to physical study and research.

In view of the fact that south-western Ontario is destined to be the manufacturing centre and the most densely populated section of the Dominion, the conservation and development of its natural resources, among which the one herein

outlined is in the first rank, is of preponderant importance. Sooner or later the work of limited reforestation and river regulation must inevitably be undertaken. Delay will but make it greater.

ENGINEERING SOCIETIES.

CANADIAN RAILWAY CLUB.—President, W. D. Robb, G.T.R.; secretary, James Powell, P.O. Box 7, St. Lambert, near Montreal, P.Q.

CANADIAN STREET RAILWAY ASSOCIATION.—President, E. A. Evans, Quebec; secretary, Acton Burrows, 157 Bay Street, Toronto.

CANADIAN INDEPENDENT TELEPHONE ASSOCIATION.—President, J. F. Demers, M.D., Levis, Que.; secretary, F. Page Wilson, Toronto.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—413 Dorchester Street West, Montreal. President, J. Galbraith; Secretary, Prof. C. H. McLeod. Meetings will be held at Society Rooms each Thursday until May 1st, 1908.

QUEBEC BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, E. A. Hoare; Secretary, P. E. Parent, P.O. Box 115, Quebec. Meetings held twice a month at Room 40, City Hall.

TORONTO BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—96 King Street West, Toronto. Chairman, C. H. Mitchell; Secretary, T. C. Irving, Jr. Traders Bank Building.

WINNIPEG BRANCH OF THE CANADIAN SOCIETY OF CIVIL ENGINEERS.—Chairman, H. N. Ruttan; Secretary, E. Brydone Jack. Meets first and third Friday of each month, October to April, in University of Manitoba.

ENGINEERS' CLUB OF TORONTO.—96 King Street West. President, J. G. Sing; secretary, R. B. Wolsey. Meeting every Thursday evening during the fall and winter months; April 9th, 1908, Canadian Forestry Problems.

CANADIAN ELECTRICAL ASSOCIATION.—President, R. S. Kelsch, Montreal; secretary, T. S. Young, Canadian Electrical News, Toronto.

CANADIAN MINING INSTITUTE.—413 Dorchester Street West, Montreal. President, W. G. Miller, Toronto; secretary, H. Mortimer-Lamb, Montreal.

NOVA SCOTIA SOCIETY OF ENGINEERS, HALIFAX.—President, R. McColl; Secretary, S. Fenn, Bedford Row, Halifax, N.S.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, TORONTO BRANCH.—W. G. Chace, Secretary, Confederation Life Building, Toronto.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—29 West 39th Street, New York. President, H. L. Holman; secretary, Calvin W. Rice.

SOCIETY NOTES.

Toronto Branch A.I. and E.E.

A special meeting of the Toronto Section of the American Institute of Electrical Engineers was held on the evening of Monday, March 30th, at the rooms of the Engineers' Club, thirty-one members of this section and eight visitors being present, twenty-one of whom were present at the luncheon held prior to the meeting.

The chair was occupied by the Chairman of the Section, Mr. K. L. Aitken, and the address of the evening was made by Mr. David B. Rushmore, of the Schenectady Section, who discussed "Some Factors in High Tension Power Transmission." Mr. Rushmore's address was illustrated by the use of a considerable number of lantern slides. Among other things, he drew attention to the gradual removal of the limitations in the matter of transmission voltage, illustrating his fact, by the recent remarkable improvements, (1st) in line insulators, and (2nd) in lightning arresters; the results of improvements in which have permitted the installation and operation of at least four lines in America at voltages higher than 60,000, one of which is designed for from one hundred to one hundred and twenty thousand volts. He referred to the fact that the limit which had been removed, and whose removal permitted the use of the new common sixty thousand volt lines had been the result of considerable improvement in the insulation of transformers and of the development of the multi-gap lightning arrester.

The first view shown was of a stroke of lightning, in discussion of which the speaker drew attention to the fact that recent studies had shown that the damages sustained by such electrical disturbances are unimportant when compared with those resulting from high resistance grounds on well-insulated lines in either overhead or underground systems. Other subjects illustrated were the aluminum arrester whose characteristics and principles were developed; recent designs of very high tension oil switches and air brake switches. Several different types of station design and arrangement were discussed.

In concluding his remarks, Mr. Rushmore complimented the Section upon taking the initiative toward the establishment of a new grade of membership in the Institute. He then outlined his ideas of the probable development of the Institute, if it were to attain its proper functions in American progress. His chief proposition was to the effect that the developed Institute would become more truly a federation of active scattered local sections rather than a small central body with more or less independent and therefore merely weak scattered groups of members.

A rather full discussion was taken part in by Prof. T. R. Rosebrugh, of the University of Toronto; Messrs. Converse and Ryerson, of Niagara Falls; Glassco and Darrall, of Hamilton; and Kynoch, Lambe, Black, Bucke, Price, Watts and Mitchell, of Toronto. The greater part of the discussion centred around the subjects of "lightning arresters" and "location of the centre of control in power stations;" Messrs. Converse and Ryerson declaring satisfaction with the control in the hands of chief operators absolutely isolated from the machinery of the power-house, and in presence only of the indicating apparatus, while Mr. Black declared a distinct preference that the operators should be able to see the machinery which they are controlling. Mr. Glassco set forth briefly some of the chief experiences of the Cataract Power Company, of Hamilton, with which he is connected, one of the most interesting items of which experience related to the voltage stresses resulting from the use of an open delta on the three-phase lines.

A vote of thanks, on motion of Messrs. Black and Ryerson, was tendered to Mr. Rushmore, for his courtesy in coming to Toronto and addressing our section.

The next meeting will be held at the University of Toronto, on the evening of Friday, the 17th April, and will be addressed by Mr. H. W. Price, on "The Oscillograph." The lecture will be illustrated by use of the instrument and by means of slides.

American Waterworks Association.

Preparations are being made for the 28th annual convention of the American Waterworks Association, to be held in Washington, D.C., May 11th, 16th, 1908. The programme of papers to be read and of the various excursions to be taken to points of interest near Washington is being distributed, and is unusually interesting. The secretary is Mr. J. M. Diven, 14 George Street, Charleston, S.C.

ORDERS OF THE RAILWAY COMMISSIONERS OF CANADA.

(Continued from Page 258.)

4536—March 31—Authorizing the township of Rochester to erect its telephone wires across the tracks of the Michigan Central Railroad at the Malden Road, about three-quarters of a mile east of Woodslee Station, Ont.

4537—March 31—Authorizing the township of Rochester to erect its telephone wires across the tracks of the Michigan Central Railroad at the sideroad between Lots 10 and 11, Middle Road, North Concession, Boscomb Station, Ont.

4538—March 31—Authorizing the township of Rochester to erect its telephone wires across the Michigan Central Railroad at the town line between Maidstone and Rochester, about three hundred feet west of Woodslee, Ont.

4539—March 31—Authorizing the township of Rochester to erect its wires across the track of the Michigan Central Railroad at the Sixth Concession Road, township of Rochester, about one and a quarter miles east of Ruscom Station, Ont.

4540—March 31—Authorizing the township of Rochester to erect its telephone wires across the track of the Michigan Central Railroad between Lots 4 and 5, Middle Road, South Concession, about one and a half miles east of Woodslee Station, Ont.

4541—March 31—Authorizing the township of Rochester to erect its telephone wires across the tracks of the Michigan Central Railroad at the Middle Road, Lot 9, about three-quarters of a mile west of Ruscom Station, Ont.

4542—March 31—Authorizing the township of Rochester to erect its telephone wires across the tracks of the C.P.R. at the Belle River Road, about one-tenth of a mile west of Belle River Station, Ont.

4543—March 27—Authorizing C.P.R. to construct a spur to the premises of the Monarch Lumber Company at Savonas, B.C.

4544—March 27—Authorizing the G.T.P. Railway Company to construct a spur from a point on its Lake Superior branch, being mile 87.76, north-west of Fort William, Thunder Bay District, for a distance of 1.94 miles.

4545—March 31—Authorizing Bell Telephone Company to erect its aerial wires across the G.T.R. siding to the St. Clair Foundry Company, Toronto Junction, and rescinding Order No. 4182, dated December 26th, 1907.

4546—March 27—Approving plans of C.P.R. standard pile and timber trestles.

4547—March 27—Authorizing C.P.R. to construct spur to the premises of Robert Carroll, on Lots 8 and 9, Concession 4, west, in the township of Caledon, Ont.

4548—March 27—Authorizing C.P.R. to construct spur to the premises of the Bury Pulpwood and Lumber Company, near Gould, P.Q.

4549—March 27—Authorizing the Glengarry Telephone Co-operative Association, Limited, to erect its telephone wires across the G.T.R. at the public highway, about two miles south of Dalkeith Station, Ont.

4550—March 31—Authorizing the Bell Telephone Company to erect its aerial wires across the G.T.R. at public crossing about one mile east of Forest Station, Ont.

4551—March 31—Approving by-law of the Temiscouata Railway Company authorizing F. X. Belinger, general freight agent to prepare and issue tariff of tolls to be charged for all freight traffic.

CONSTRUCTION NEWS SECTION

Readers will confer a great favor by sending in news items from time to time. We are particularly eager to get notes regarding engineering work in hand and projected, contracts awarded, changes in staffs, etc. Printed forms for the purpose will be furnished upon application.

RAILWAYS—STEAM AND ELECTRIC.

Ontario.

SARNIA.—That the Canadian Pacific will operate a branch line into Sarnia is now practically assured. Surveyors are now at work, and although no official notice has been received the town feels satisfied that the big railway will be extended here.

TORONTO.—By a mutual arrangement between the contractors, Messrs. Chandler, McNeil & McRae & Co., and the Temiskaming and Northern Ontario Railway Commission for the construction of the last forty mile extension, the work has been placed in sole charge of Mr. T. S. Scott.

Manitoba.

WINNIPEG.—A staff representative of the Winnipeg Telegram has just returned from a trip of over 100 miles of line of the G.T.P., between Kenora and Fort William, and makes a report of 50 men blown to pieces during the past twelve months, and as many more maimed for life. The report is replete with figures, names and dates on which the tragedies have occurred. This death rate is unusually high, and cannot be placed solely to poor explosives. Ignorance in handling must be responsible for many of the fatalities.

WINNIPEG.—The Canadian Northern Railway, controlled by Mackenzie & Mann, is preparing to extend its main line west from Edmonton to the Pacific coast with all possible speed. This confirms the announcement made in Vancouver last fall by Donald D. Mann, who stated that the work would be undertaken as soon as certain legislation was secured at Ottawa. A large number of survey parties will be placed in the field this spring to survey a route for the new transcontinental line, which now terminates a short distance west of Edmonton. They are now being organized by M. H. MacLeod, the general manager and chief engineer of the system.

Saskatchewan.

MOOSE JAW.—The contract for the construction of the Moose Jaw-Lacombe branch of the Canadian Pacific Railway has been cancelled. This contract was let in August, 1907, to J. D. McArthur, for fifty miles of grading west from the end of steel, and last fall and during the winter Mr. McArthur and his sub-contractors have put in a considerable amount of plant. The notice was in the shape of a formal intimation that the railway company would not proceed with the work. No explanations have been given.

TENDERS.

Quebec.

SOREL.—Tenders will be called for until April 13th, 1908, for steel plates and shapes for the Department of Marine and Fisheries. F. Gourdeau, Deputy Minister. (Advertised in Canadian Engineer.)

Ontario.

PRESCOTT.—Tenders for the construction of a steel twin-screw lighthouse tender and buoy steamer for the Georgian Bay service, to be delivered at Prescott, Ont., of the following leading dimensions, namely, length over all, 194 feet; breadth moulded, 35 feet, and depth mould, 17.6 feet, will be received until April 29th. Advertised in Canadian Engineer.

GODERICH.—Tenders will be received until April 20th, 1908, for covered reinforced concrete sedimentation basin; also, cast-iron pipe. J. Grant McGregor, engineer; W. A. McKim, clerk. Advertised in the Canadian Engineer.

TORONTO JUNCTION.—Tenders will be called for the supply of a new steam roller for this city, on recommendation of the council at a recent meeting.

CORNWALL.—Tenders will be received by the undersigned up to the first day of June, 1908, for the construction of the Grantley Creek drain in the north-west part of the township of Osnabruck and north-east part of the township of Williamsburg (about six miles from Chesterville, on C.P.R.); \$14,106.77 is engineer's estimate. H. E. Hodgins, clerk, Osnabruck Centre, Ont.

CLINTON.—Tenders will be received up to April 15th for drilling an 8-inch test well for the Clinton waterworks system; also for a second well in same vicinity if required. D. L. Macpherson, town clerk, Clinton, Ont.

FERGUS.—Tenders will be received by the county clerk, James Beattie, Esq., Fergus, Ont., until April 18th, for the construction of the Mount Forest Bridge. 1. Steel superstructure and concrete floor. 2. Concrete abutments, about 600 cubic yards. Bowman & Connor, engineers, 36 Toronto Street, Toronto.

PAISLEY VILLAGE.—Tenders for the whole or any of the undermentioned machinery, the property of the municipality of the village of Paisley, up to the first day of May, viz.; One Jerome Wheelock engine, 35 horse-power, nearly new; boiler; seven power carpet looms; one art square loom, fringe loom, two stair carpet looms, twister, spooling machine, copping machine, dye tubs, shafting, belting, heating pipes, and other necessary machinery for the equipment of a modern carpet factory. J. C. Gibson, town clerk.

Tenders addressed to the Secretary of the Militia Council, Department of Militia and Defence, Ottawa, will be received until noon, April 14th next, for plumbing, material and labor required at the Petawawa camp grounds. E. F. Jarvis, secretary.

Manitoba.

PORTAGE LA PRAIRIE.—Tenders will be received until April 15th, 1908, for pumping machinery, water pipes, pipe-laying, etc., as an auxiliary to the existing city waterworks system. The work is to be fully completed within two months. Willis Chipman, C.E., 103 Bay Street, Toronto, engineer.

WINNIPEG.—Tenders will be received up till noon on the 10th day of May, 1908, for the building of a steel bridge, with stone masonry abutments, together with necessary excavations, etc., to be erected at Section 4, Township 10, Range 29 west, over the Pipestone Creek, for the rural municipality of Wallace. James F. C. Menlove, secretary-treasurer.

WINNIPEG.—Sealed tenders will be received up to noon of 10th day of May, 1908, for the building of such telephone lines and the installation of such telephones as will be required in the telephone system in the rural municipality of Wallace. James F. C. Menlove, secretary-treasurer.

British Columbia.

VANCOUVER.—Tenders will be received until Saturday, April 25th, 1908, inclusively, for the construction of a heating system for the public building at Vancouver, B.C. Mr. Charles Tossell, Clerk of Works, Vancouver, B.C.

CONTRACTS AWARDED.

Ontario.

TORONTO.—The contract for the construction of the new western entrance to Toronto harbour has been awarded to Robert Weddell of Trenton, Ont., the lowest tenderer. His tender was \$495,000. The Public Works Department will urge that work be prosecuted with all possible speed.

GUELPH.—Drummond McCall & Co. have the contract for steel poles for the Guelph Street Railway, to replace cedar poles.

OTTAWA.—A number of contracts for construction of sections of the National Transcontinental Railway have been awarded as follows: 1. 39.7 miles, beginning at a point 58 miles west of Moncton, to the G.T.P. Construction Co. 2. 165.7 miles to G.T.P. Co. 3. 31.5 miles to Willard Kitchen Co. 4. 52.4 miles to M. P. and J. T. Davis. 5. 100 miles to C. F. and G. E. Fonquier. 6. 75 miles to C. F. and G. E. Fonquier.

Saskatchewan.

MOOSE JAW.—Messrs. Smith Bros. & Wilson have been awarded the contract for the new court house here at a cost of \$57,000.

Alberta.

LETHBRIDGE.—The Canadian Pacific has given the contract for the thirty-six miles of construction between Lethbridge and Macleod to Janse & Macdonnel, of Maple Creek. The country is all "bald-head" prairie, and will be traversed at the cost of \$15,000 a mile. This is the first of several contracts which the Canadian Pacific Railway will let this spring for the improvement of their Western service.

British Columbia.

NELSON.—W. P. Tierney & Co. have been awarded a large contract from the Canadian Pacific Railway for filling and replacing several large bridges on the line between Castlegar and Cascade; also a new spur and change of grade at the Mother Lode mine, near Greenwood. The new contract was arranged by E. F. Busted, superintendent of the C.P.R. Pacific Division; C. E. Cartwright, chief engineer of the division, and W. P. Tierney. Mr. Tierney stated that his firm would commence operations in a few days, and would require a large number of men. The firm's head office is in this city.

United States.

NEWPORT NEWS.—The contract for the electric turret-turning gear of United States warship "Delaware," now under construction at Newport News, has been awarded to the Cutler-Hammer Manufacturing Company, of Milwaukee.

SEWERAGE AND WATERWORKS.

Manitoba.

PORTAGE LA PRAIRIE.—Dr. Gordon Bell, of Winnipeg, has reported favorably upon the prospect of getting a pure supply of water for domestic use from the Assiniboine River, and the ratepayers will be shortly asked to vote on a by-law to raise \$50,000 for the installation of an auxiliary system.

CRANBROOK.—A big irrigation ditch is to be built near Fort Steele. Water will be taken from Little Bull River, and a ditch seven miles long will put the water on 2,000 acres of some of the finest fruit land in the district. This will be divided into ten-acre blocks and put on the market as fruit farms.

LIGHT, HEAT, AND POWER.

Ontario.

HAMILTON.—The municipal street lighting plant which the Board of Works is planning to install will make Hamilton one of the best lighted cities in the world. Under the present system, some 400 electric and about 250 gas lamps are used

to light the streets. The 250 gas lamps are equivalent to about 100 electric lamps. Under the new system, if the plans of the Board of Works are carried out, the city will be lighted by 900 lamps or nearly double the number now used.

BUILDINGS.

Ontario.

TORONTO.—Reid & Brown are doing the steel construction for the Colman Baking Company on Euclid Avenue, Toronto. The premises have brick walls, concrete floors on steel beams, steel frame. Dimensions, 80 by 120. Building to be ready for occupancy by 1st June.

Manitoba.

WINNIPEG.—During March there were 64 building permits issued, covering 72 buildings to be erected, at a total cost of \$92,225. In the corresponding month last year there were 225 permits for 264 buildings, costing \$703,350. To date this year the cost of buildings for which permits have been issued totals \$113,355, as against \$967,150 for the first three months of 1907.

MISCELLANEOUS

Ontario.

PORT COLBORNE.—It is thought probable that canal boats will be used to carry grain through the Welland Canal, instead of taking large steamers or vessels through it. In such case Port Colborne will become a busy transshipping point from canal boat to steamer, or vice versa. The Government elevator at Port Colborne will be ready in May. It is built of steel and concrete, and has a capacity of 800,000 bushels.

NIAGARA FALLS.—The Queen Victoria Park Commission purpose commencing this summer the erection of a commodious conservatory at Queen Victoria Park. This work has been delayed for years because of the heavy blasting operations carried on by the power companies.

Saskatchewan.

BATTLEFORD.—New buildings erected in Battleford during 1907 amounted in value to \$120,000. Besides this, \$30,000 was expended for electric light plant and other civic improvements.

British Columbia.

NEW WESTMINSTER.—Two new industries and a new telephone system for this city were important matters discussed at a recent council meeting. The principal industry spoken of will be started by a large company, which also operates many large ocean vessels.

PERSONAL NOTES

MR. C. E. A. CARR, formerly of the City Engineer's Department, Toronto, and for the past three years manager of the Helena (Montana) Railway, Light and Power Company, has been appointed managing director of the Quebec Gas Company.

MR. D. McNICOLL, first vice-president, and J. W. Leonard, general manager of the C.P.R., last week inspected the Toronto terminals, including the yards at West Toronto and North Toronto.

MR. J. L. STIVER, Toronto, has been appointed assistant inspector of gas and electricity in the Toronto inspection district.

MR. C. H. RUST, City Engineer, Toronto, is in Baltimore making an investigation into the system of water filtration and sewage disposal at that place.

Mr. R. E. Young, D.L.S., Superintendent of Railway Lands Department of the Interior, is distributing a new series of maps, showing the location of the minerals and forests of North-West Canada. These maps accompany the publication, Canada's Fertile Northland, which describes the resources and possibilities of the unsettled districts of Western Canada. The book and maps may be secured from Mr. Young's department, and will be of great interest and value to any one interested in Canada's possibilities.

NEW INCORPORATIONS.

Hamilton, Ont.—Inland Navigation Company, \$2,000,000. G. L. Staunton, A. O'Heir, F. Morison.

Montreal.—Municipal Contracting Company, \$100,000; V. Morin, A. H. Desloges, T. Sutton. Special Machinery Manufacturing Company, \$49,000; L. Engelhorn, J. Vanderslice, J. R. Beaudry.

Brandon, Man.—Great West Grain Company, \$50,000. C. H. Lamontagne, J. H. R. Gillespie, C. H. Lamontagne.

Haileybury, Ont.—Vipond Mining Company, \$1,000,000. H. D. Graham, E. A. Wright, T. H. Jessop.

Blind River, Ont.—Blind River Driving Company, \$25,000. R. S. Waldie, J. R. Meredith, M. C. Cameron, Toronto.

Ottawa, Ont.—King George Mining Company, \$750,000. R. E. G. Burroughs, Smith's Falls; R. K. Farrow, G. T. Brown, Ottawa.

Holstein, Ont.—Defiance Handle and Turning Company, \$40,000. D. J. Davies, J. Galloway, A. J. Buller.

Toronto.—York Construction Company, \$100,000; W. B. Russel, C. W. Dill, S. Johnston. McFall, Limited, \$100,000; J. McEwen, F. T. Treleaven, E. Heyes. Canada Glass Mantels and Tiles, \$150,000. C. W. Thompson, E. W. Wright, J. I. Grover.

London, Ont.—Otto Lake Mining Company, \$500,000. C. S. Tamlin, T. W. McFarland, R. J. Webster.

Inwood, Ont.—Inwood Coal and Lumber Company, \$40,000. G. White, J. Thomas, F. Carson.

Quebec Province.—Eastern Lumber Company, \$6,000; S. Vallee, L. P. Dube, A. Roy, St. Pierre. La Compagnie de Gaz et Petrole de Saint Barnabee, \$20,000; S. Girard, P. Blouin, P. Leblanc, St. Barnabee.

British Columbia.—Pacific Coast Coal Mines, \$3,000,000. South Kelowna Land Company, \$100,000.

PATENTS.

Below will be found a list of patents recently granted to Canadian inventors in Canada and United States, which is furnished by Messrs Fetherstonhaugh & Co., barristers and solicitors, Toronto, Ottawa, Winnipeg, and Montreal:—

Canadian Patents.—F. J. Watkinson, Strathroy, Ont., combined automatic duster and brakes for window blinds and shades; E. S. D. Laws, Sherbrooke, Que., loom shuttles; H. E. Vipond, Montreal, Que., cork extractor; W. L. Wilson, Toronto, Ont., railway joints; J. C. King, St. Catharines, Ont., manufacture of calcium of carbide.

United States Patents.—G. A. Bothwell, Owen Sound, Ont., locomotives.

The firm of Allis-Chalmers-Bullock is opening up the season with every prospect of activity for some time to come. In reply to a number of questions by the representative of the Canadian Engineer, Mr. J. A. Milne, general manager of the company said: "Orders booked during December, January and February have been largely in excess of those for the corresponding period of last year. Our experience, in this respect, may be due to the fact that we manufacture a number of different lines and are therefore not dependent upon any one line, which, in the event of reverses in the business, for which the line is adapted, would play havoc with the manufacturers. We are experiencing an excellent demand from the Cobalt mining camps as well as from the far West. The activity is principally to hydro-electrical development for different purposes throughout the length and breadth of the Dominion. This form of power is becoming more popular day by day, and as a result we are being kept busy supplying turbines, generators, and other equipment. Just now the outlook is quite encouraging."

POWER PRESSES.

The requirements of armature work for electrical motors and dynamos have led to the construction of presses which differ in essential points from those used for other styles of sheet metal work, though modifications of double crank presses are extensively employed in this line of manufacture. We illustrate in Figs. 1 and 2 three types of presses especially adapted for producing armature disks

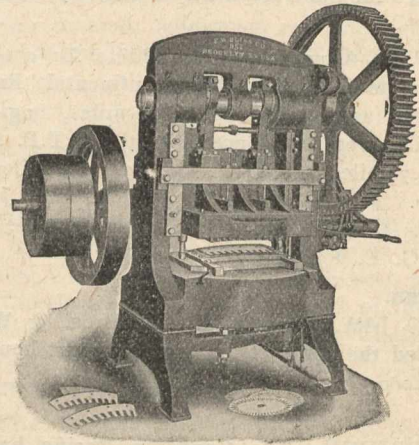


Fig. 1.

and segments. The presses in Figs. 1 and 2 are designed for simultaneously cutting the inside and outside of plain rings, with or without key notches, such as are shown on the floor in Fig. 1, or for cutting complete disks or segments, as shown on the floor in Fig. 2. The presses are supplied with automatic knockout attachments for removing the cut blanks from the die and punch, as may be seen from the illustrations. The presses are built in a number of sizes.

Rings, disks, or segments as they come from these presses are ready for notching by means of the machine shown in Fig. 2. This latter machine is for automatically notching plain armature disks. The disk to be notched is placed on a rotating table, the treadle is depressed, and the disk is automatically revolved until the required number of notches have been cut, one or more notches being cut each stroke of the press. After the disk has made a complete revolution the action of the slide will automatically stop. Presses of this type are capable of notching disks from 3 to 60 inches in diameter, and are also made with special attachments for notching segments for disks of any diameter. In addition to the machines mentioned a large number of similar tools are used for the manufacture of sheet metal products. In conclusion, we briefly mention some of the more important ones, as wire handle and wire ring machines, can-body forming, trimming and beading,

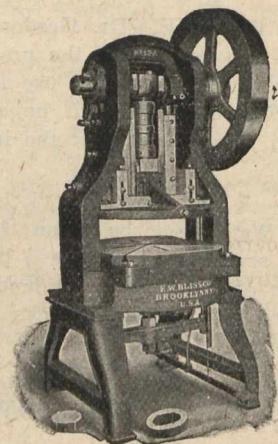


Fig. 2.

notching, crimping, flanging machines, soldering moulds, solder cutters, and soldering machines.

MARKET CONDITIONS.

Montreal, April 8th, 1908.

In the United States there are a few lots of pig iron being sold at reduced prices, the urgency of the seller largely controlling the situation. Generally speaking, however, the market is quiet and unchanged, production being limited to immediate demands.

The English market is active, a slight reduction having taken place in the price of warrant iron. This, however, is speculative and does not materially affect makers' brands. Latest reports indicate continued good demand from Germany, and heavy shipments on account of old orders, the result being a further reduction in stocks in store. Home demand is fair, and has shown an improvement, especially in steel making grades which have advanced about 4s. from the February figure. Scotch makers are apparently in a fairly strong position, and prices are being well maintained, with indications of an upward tendency. Generally speaking, the pig iron markets in England and Scotland is in a satisfactory position.

The local demand is improving, and several good sized lots have been arranged for, for delivery commencing upon the opening of navigation. The Ontario market is however being well taken care of by local furnaces which are making heavy tonnage and have fair stocks on hand for immediate disposal. These furnaces are quoting prices which are lower than it is possible to import at, and as a consequence they are booking the bulk of the orders, save in cases where users desire other mills for mixing.

Antimony.—The market holds steady at about 10c. per lb.

Bar Iron and Steel.—Owing to the fact that there will be arrivals ere long by steamer, the market has declined 10c. all round on bar iron. Business is showing a seasonable improvement. Bar iron, \$1.90 per hundred pounds; best refined horseshoe iron, \$2.15, and forged iron, \$2.05; mild steel, \$2.05; sleigh shoe steel, \$2.05 for 1 x 3/8-base; tire steel, \$2.05 for 1 x 3/8-base; toe calk steel, \$2.50; machine steel, iron finish, \$2.15.

Boiler Tubes.—The market holds steady, demand being fair. Prices are as follows: Two-inch tubes, 8 to 8 1/4 c., 1 1/4-inch, 11c.; 3-inch, 12 to 12 1/4 c.; 3 1/2-inch, 15 to 15 1/4 c.; 4-inch, 19 1/4 to 19 1/2 c.

Building Paper.—Tar paper, 7, 10, or 16 ounce, \$2 per 100 pounds; felt paper, \$2.75 per 100 pounds; tar sheathing, No. 1, 60c. per roll of 400 square feet No. 2, 40c.; dry sheathing, No. 1, 50c. per roll of 400 square feet, No. 2, 32c.

Cement—Canadian and American.—Canadian cement, \$1.70 to \$1.75 per barrel, in cotton bags, and \$1.95 and \$2.05 in wood, weights in both cases 350 pounds. There are four bags of 87 1/2 pounds each, net, to a barrel, and 10 cents must be added to the above prices for each bag. Bags in good condition are purchased at 10 cents each. Where paper bags are wanted instead of cotton, the charge is 2 1/2 cents for each, or 10 cents per barrel weight. American cement, standard brands, f.o.b. mills, 75c. per 350 pounds; bags extra, 10c. each, and returnable in good condition at 7 1/2 c. each.

Cement—English and European.—English cement has advanced of late, and holders are now asking \$1.85 to \$1.90 per barrel in jute sacks of 82 1/2 pounds each (including price of sacks) and \$2.20 to \$2.30 in wood, per 350 pounds, gross. Belgian cement is quoted at \$1.70 to \$1.80 per barrel in bags, and \$2.05 to \$2.20 per barrel, in wood.

Iron.—Prices for delivery after the opening of St. Lawrence navigation are approximately as follows: No. 1 Summerlee, on cars, Montreal, \$20.50 to \$21 per ton; No. 2 selected Summerlee, \$20 to \$20.50; No. 3, soft, \$19.50 to \$20; Cleveland, \$18.50, and No. 3 Clarence, \$18; No. 1 Carron, \$22 to \$22.50; Carron special, \$20.25 to \$20.75; Carron, soft, \$20 to \$20.50. Stocks on spot are light. Clarence No. 1 is quoted at \$20.50 to \$21; Clarence No. 3 at \$19 to \$19.50; Carron No. 1 at \$24.50 to \$25, and Carron, soft, at \$22.50 to \$23, cars, Montreal.

Lead.—Trail lead is quoted at \$5.95, ex-store.

Nails.—Demand for nails is improving, but prices are steady at \$2.30 per keg for cut, and \$2.25 for wire, base prices.

Pipe—Cast Iron.—Trade dull and prices steady at \$36 for 8-inch pipe and larger; \$37 for 6-inch pipe, \$38 for 5-inch, and \$39 for 4-inch at the foundry. Gas pipe is quoted at about \$1 more than the above.

Pipe—Wrought.—The market is firm but dull. Quotations and discounts for small lots, screwed and coupled, are as follows: 1/4-inch to 3/8-inch, \$5.50, with 54 per cent. off for black and 38 per cent. off for galvanized. The discount on the following is 66 per cent. off for black and 56 per cent. off for galvanized: 1/2-inch, \$8.50; 1-inch, \$16.50; 1 1/4-inch, \$22.50; 1 1/2-inch, \$27; 2-inch, \$36; and 3-inch, \$75.50; 3 1/2-inch, \$95; 4-inch, \$108.

Spikes.—Railway spikes are in better demand, \$2.60 per 100 pounds, base of 5 1/2 x 9-16. Ship spikes are steady at \$3.15 per 100 pounds, base of 5/8 x 10 inch and 5/8 x 12 inch.

Steel Shafting.—At the present time prices are steady at the list, less 25 per cent. Demand shows an improvement.

Steel Plates.—Demand is good, and the market steady. Quotations are: \$2.55 for 3-16, \$2.40 for 7/8, and \$2.30 for 1/4 and thicker, in smaller lots.

Tar and Pitch.—Coal tar, \$4 per barrel of 40 gallons, weighing 575 to 600 pounds; coal tar pitch, No. 1, 75c. per 100 pounds, No. 2, 65c. per 100 pounds; pine tar, \$4.35 to \$4.50 per barrel of about 280 pounds; pine pitch, \$4.25 per barrel of 180 to 200 pounds.

Tin.—The market is unchanged at 34 1/2 c. per pound.

Tool Steel.—Demand is light, but the market is firm. Base prices are as follows: Jessop's best unannealed, 14 1/2 c. per pound, annealed being 15 1/2 c.; second grade, 8 1/2 c., and high-speed, "Ark," 60c., and "Novo," 65c.; "Conqueror," 55 to 60c.; Sanderson Bros. and Newbould's "Sabon," high-speed, 60c.; extra cast tool steel, 14c., and "Colorado" cast tool steel, 8c., base prices. Sanderson's "Rex A" is quoted at 75c. and upward; Self-Hardening, 45c.; Extra, 15c.; Superior, 12c.; and Crucible, 8c.; "Edgar Allan's Air-Hardening," 55 to 65c. per pound.

Zinc.—The market is unchanged, at 5 1/4 to 5 1/2 c. per pound.

* * * *

Toronto, 9th April, 1908.

A better feeling exists in the building trade. More jobs are being projected, and money shows signs of greater ease. Merchants and manufacturers say that improvement is on the way, their customers talking and writing in better spirits. Balmy days this week have had their share in bringing about this better state of feeling, but there is still much snow to be cleared away, especially in Northern Ontario.

Metal markets are in fair shape, as a rule, pig iron being firm and looking upward in Britain; the bar iron market has not really fallen, notwithstanding that some cutting is being done in Toronto, and that we reduce prices slightly in consequence. Other structural materials are dealt with in our prices current.

The following are wholesale prices for Toronto, where not otherwise explained. Higher prices are quoted for broken quantities:—

American Bessemer Sheet Steel.—Fourteen-gauge, \$2.45; 17, 18, and 20-gauge, \$2.60; 22 and 24-gauge, \$2.65; 26-gauge, \$2.80; 28-gauge, \$3.

SECOND-HAND FOR SALE

Hoisting Engines, double cylinders & drums. 6 1/2 x 8" & 7 x 10" with boilers
Robinson Steam Shovel, 2 1/2 yards capacity.
Saddletank Locos, 36" and standard gauge.
Concrete Mixers, Smith, Ransome, Champion, all sizes.
Crushers, gyratory and jaw, various sizes, some portable.
Switch Engine standard gauge.
Pumps, Derricks, Engine Boilers, &c., &c.

PRICES ON APPLICATION.

NEW MACHINERY OF EVERY DESCRIPTION

THE HARTLAND COMPANY

332 Board of Trade Building, MONTREAL.

TENDERS CALLED FOR

NOTICE

Sealed bids will be received at the office of the City Clerk of Vancouver, British Columbia, up to noon of Saturday, April 4th, 1908, for the manufacture and erection of the superstructures of the new bridges over False Creek at Westminster Avenue and Granville Street. Estimated weight of structural steel about 2,800 tons.

Plans and specifications will be on file at the City Engineer's office, Vancouver, on and after Saturday, March 14. Copies of all the papers may be secured from Waddell and Harrington, Consulting Engineers, Kansas, City, Mo., upon the receipt of a deposit of twenty-five dollars, which will be refunded upon return of the plans and other papers in good order.

Notice.—The date for receiving bids at the office of the City Clerk of Vancouver, B.C., for the manufacture and erection of the superstructure of new bridges over False Creek, at Westminster Avenue and Granville Street has been extended to noon of Friday, May 1st, 1908.

CITY OF BRANTFORD WATERWORKS EXTENSION.

Sealed tenders, addressed to F. W. Frank, Secretary of the Board of Water Commissioners, Brantford, will be received till 12 o'clock noon on Friday, April 24th, 1908, for the following:—

- (a) The construction of a Storage Reservoir.
- (b) The furnishing and laying of about 850 feet of 24-inch Cast-iron Suction Pipe.
- (c) The furnishing and laying of about 1,150 feet of 15-inch, 18-inch, and 24-inch Sewer Conduit Pipe.

Plans and specifications may be seen at the office of the City Engineer, Brantford, from whom instructions to bidders and forms of tender may be obtained.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Hall, Brantford, April 1st, 1908.



TENDERS FOR STEEL PLATES AND SHAPES.

Tenders addressed to the undersigned at Ottawa and endorsed on the envelope, "Tender for Steel Plates and Shapes, Sorel," will be received at the Department of Marine and Fisheries, Ottawa, up to noon of the thirteenth day of April next, for the furnishing of about seven hundred and fifty tons of Steel Plates and Shapes required at the Government Shipyard at Sorel, P.Q.

Specifications and detailed information can be obtained from the Department of Marine and Fisheries, Ottawa, from Mr. G. J. Desbarats, Director of the Government Shipyard at Sorel, and from the Agent of the Department of Marine and Fisheries, Montreal, P.Q.

Each tender must be accompanied by an accepted cheque on a chartered bank, for the sum of \$1,500 to the order of the Minister of Marine and Fisheries. This cheque will be forfeited if the party whose tender is accepted declines to enter into a contract to deliver the Steel Plates and Shapes, or fails to carry out the contract. If the tender is not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from the Department will not be paid.

F. GOURDEAU,

Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries,
Ottawa, Canada, 16th March, 1908.

TO SEWER PIPE MANUFACTURERS

Sealed tenders addressed to the undersigned, will be received up to noon, Monday, April the 20th next, for the supply of 21,000 lineal feet of 24-inch sewer pipe. Specifications may be obtained from Davis & Johnston, Engineers, Berlin, Ont.

J. J. HACKNEY,
Manager Guelph Water Works.

CITY OF PORTAGE LA PRAIRIE, Province of Manitoba.

NOTICE TO CONTRACTORS.

Tenders addressed to the Secretary-Treasurer will be received until 8 p.m. on Wednesday, April 15, 1908, for Pumping Machinery, Water Pipes, Pipelaying, etc., as an Auxiliary to the existing City Water Works System. The work is to be fully completed within two months, and Machinery delivered from stock.

Plans may be seen at Toronto and at Portage la Prairie.

For further information apply to the Chief Engineer, 103 Bay Street, Toronto, Ont.

Edward Brown, Esq.,
Mayor,
Portage la Prairie, Man.

F. W. Clayton, Esq.,
Secretary-Treasurer,
Portage la Prairie, Man.

Willis Chipman, C.E.,
Chief Engineer,
103 Bay Street,
Toronto, Ont.

TENDERS FOR CAST IRON PIPE AND SPECIALS.

Sealed tenders will be received by the City Clerk of the City of Prince Albert until 8 p.m. on Thursday, April 16th, 1908, for the following:—

- 3,756 feet 8-inch Cast Iron Pipe.
- 6,444 feet 6-inch Cast Iron Pipe.
- 8,000 lbs. Special Castings.
- 4-inch by 8-inch valves.
- 2-inch by 6-inch valves.
- 17 Hydrants.
- 16 Valve Boxes.

Specifications, conditions and form of tender may be obtained at the office of the City Engineer, or at the office of the City Clerk, City Hall, Prince Albert.

No tender necessarily accepted.

R. S. COOK, Mayor.

F. A. CREIGHTON, City Engineer.

C. O. DAVIDSON, City Clerk.

Prince Albert, March 23rd, 1908.