

PAGES

MISSING

The Canadian Engineer

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The Canadian Engineer

ESTABLISHED, 1893

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SMOKE CONSUMER QUESTION.

Twenty-two residents of Dewson Street, Toronto, have sent in a petition to the Board of Education, protesting against the nuisance of smoke and soot from the burning of soft coal in Dewson Street School.

How long will Toronto allow the smoke by-law to remain a dead letter? Here is a splendid chance for the City Commissioner. Let him enforce the by-law and compel the city to do that which they require of others—or else recommend the repeal of the by-law. Has he the courage to do either?

A NEW DEPARTMENT

That we may more fully serve the best interests of our readers we are opening a new department; a department for Contractors' Supplies.

To know where to look for what you want, to know where to dispose of what you don't want will surely be a great convenience. Our new department will fully answer these requirements. No body of men require different classes of machinery and equipment so frequently as the engineering-contractor. Each separate piece of work, if to give the best returns, requires special machinery. At the completion of the work the machinery is in good condition, but is not required. Your fellow contractor requires it. Let him know where he may secure it.

You require special equipment. This department will enable you to get in touch quickly with reliable men who wish to dispose of that which you require. Whether a buyer or a seller you will find this new department an aid to business.

FUEL FOR CANADA.

Periodically the question of our future fuel supply becomes a subject of discussion. Some years ago the peat beds of Canada were explored, and great promise was made for peat as a competitor of coal and wood, both for heating purposes and the generating of steam. More recently we have heard much of the "white coal." Electricity, generated at our waterfalls, was to turn machinery and heat our homes, and our supply of coal and wood was to be conserved. But the development of water powers has been slow. Again, our attention has been called to the peat beds. The Department of Mines for Canada have secured a valuable report by Mr. E. Nystrom on methods to be adopted in developing the peat and lignite industries of Canada.

The coal areas of Canada are either at the extreme east or the extreme west. The great central area of Canada, which contains the large centres of population, is without coal beds. But it does possess many large peat bogs. Ontario alone is said to have eleven thousand square miles of peat beds eight feet thick, Quebec half as much, Manitoba some five hundred square miles, while Alberta and Saskatchewan will have, including lignite, as large deposits as the three mentioned Provinces.

A peat bog of an average depth of six feet will yield 774,000 tons of peat per square mile, and when it is remembered that 1.8 tons of peat are equal to one ton of coal one can readily see the value of our peat deposits. In the past, in Canada, the gathering of peat has been expensive. The designing of suitable machinery to work over the bogs has been difficult. After the peat is gathered the next expensive process is the drying. Air-drying has been found to be the cheapest and most practical method, and by this method the moisture in the peat fuel is reduced to 25 per cent., and under very favorable conditions lower. For the convenient and economical handling of the peat it is pressed into briquettes. This in the past has been a source of trouble—a trouble, however, that experience and experiment are

fast overcoming. That peat is a valuable fuel is conceded, that the improvements in machinery for the handling of peat have made it a competitor with coal is doubted, but the day is not far distant when our peat beds will have a value equal to that of our coal deposits.

PRECIPITATION FOR MAY, 1908.

The table shows for fifteen stations, included in the report of the Meteorological Office, Toronto, the total precipitation at these stations for the month. Ten inches of snow is calculated as being the equivalent of one inch of rain:—

Station.	Depth in Inches.	Departure from the Average of Twenty Years.
Victoria, B.C.	1.30	— 0.06
Kamloops, B.C.	0.90	— 0.13
Calgary, Alta.	4.30	+ 1.85
Edmonton, Alta.	2.60	+ 0.48
Swift Current, Sask.	0.70	— 1.40
Winnipeg, Man.	3.00	+ 0.69
Port Stanley, Ont.	2.30	— 0.88
Toronto, Ont.	4.64	+ 1.93
Parry Sound, Ont.	2.30	— 0.78
Ottawa, Ont.	5.40	+ 2.87
Kingston, Ont.	4.90	+ 2.29
Montreal, Que.	5.60	+ 2.76
Quebec, Que.	3.80	+ 0.71
Chatham, N.B.	3.70	+ 0.55
Halifax, N.S.	6.20	+ 2.04

ORDER OF THE RAILWAY COMMISSIONERS OF CANADA.

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

4782—June 2—Approving location of the Quinze & Blanche River Railway through part of the Township of Guigues, Province of Quebec, across the Quinze River, through the adjoining Indian Reserve, the Township of Nedelec, and through the Townships of Casey, Harley, and Dymont, in the Province of Ontario, to New Liskeard.

4783—June 2—Authorizing the Montreal & Southern Counties Railway to connect its track with the track of the Grand Trunk Railway at a point 250 feet from the westerly end of the Victoria Jubilee Bridge, and at a point on the west side of Black Bridge, Common Street, Montreal, P.Q., and to cross the tracks of the G.T.R. at Windmill Point, Montreal.

4784—April 23—Requiring the C.N.R., C.P.R., and G.T.R. to agree upon, publish, and file tariffs of joint passenger tolls and provide facilities for passengers desiring to travel on the C.N.O.R. to and from Muskoka points.

4785—June 1—Authorizing the Maine Central Railway to use the American-Lafrance Arctic Fire Extinguisher in their cars operating in Canada.

4786—June 1—Authorizing the C.P.R. to construct and operate a branch line or railway or spur to and into the premises of Messrs. Booth & Shannon, Township 15, District of Algoma, Ont.

4787—May 27—Dismissing application of Jane Prittie for an order to vary or rescind order of the Board, December 12, 1906, respecting construction of a certain branch line from the C.P.R. in town of Toronto Junction, Ont.

4788—May 27—Authorizing the C.N.R. to place gates and a watchman at Winchester Street, Toronto, Ont.

4789—May 19—Authorizing the Michigan Central R.R. to construct a branch line to and into the premises of the Ontario Iron & Steel Company, Township of Crowland, Ont.

4790—June 2—Authorizing the C.P.R. to construct a branch line to and into the premises of S. J. Fox, Lot 14, Concession 5, Township of Ops, Ont.

4791—June 1—Granting leave to the C.P.R. to operate its trains over the crossing where its line of railway crosses the G.T.R. on the Don Improvement, Toronto, Ont., without being brought to a stop.

4792—June 1—Authorizing the C.N.R. to operate its trains over the crossing where its lines cross the C.P.R. Company's Souris branch in S.W. $\frac{1}{4}$, Sec. 32, Tp. 9, R. 20 W. Principal Mer. near Brandon, without being brought to a stop.

4793—June 1—Authorizing the C.N.R. to operate its trains over the crossing where its line cross the track of the Brancon, Sask. & Hudson's Bay Railway, at a point in S.E. $\frac{1}{4}$ of Sec. 18, Tp. 10, R. 19, W. Principal Mer. near Brancon.

4794—June 2—Authorizing the Ingersoll Telephone Company of Ingersoll, Ont., to install its telephone apparatus in the station of the G.T.R. at Ingersoll, Ont.

4795—May 18—Ordering the G.T.R. to establish and maintain gates at Bloor Street West crossing, Toronto, Ont.; the same to be in operation within six months from date of order.

4796—May 20—Ordering that the charge for switching cars by the G.T.R. and the Pere Marquette Railway to the John Campbell, Ltd., at St. Thomas, Ont., be not more than \$3 per car.

4797—June 2—Granting leave to the Burgessville Telephone Company to cross with its wires the tracks of the G.T.R. at 4th Concession, Township of North Norwich, east of village of Norwich, Ont.

4798—June 2—Approving of proposed deviation in location of the C.P.R. Company's Edmundston branch from Station 710-11, Lot 54, to Station 738-15.5, Lot 52, Parish of Grand Falls, N.B.

4799—June 2—Authorizing the C.N.R. to operate its trains over the crossing of its line with the C.P.R. in town of Morris, Man., without being brought to a stop.

4800—June 2—Authorizing the Chatham, Wallaceburg & Lake Erie Railway to put into operation the half interlocking plant installed under Order of the Board 4328, October 29th, 1907, at the crossing of its line with the line of the Lake Erie and Detroit Company at Cedar Springs, Ont., and permitting them to make said crossing without bringing trains to a stop.

4801—June 1—Approving revised location of the Esquimalt & Nanaimo Railway—Wellington to Alberni Extension—mileage 87 to 90, Province of B.C.

4802—June 1—Authorizing the C.P.R. to construct spur to and into premises of Messrs. Oldfield, Kirby & Gardner, on Dominion Government Survey, Winnipeg, Man.

4803—June 1—Authorizing C.P.R. to construct branch line to and into premises of Nicola Valley Lumber Company, Ltd., on Lot 138, Section 1, Township 14, Range 23, Yale District, B.C.

4804—June 1—Authorizing Bell Telephone Company to erect its underground wires under the tracks of the G.T.R. at Rectory Street, London, Ont.

4805—June 1—Authorizing Bell Telephone Company to carry its wires across the track of the G.T.R. at Notre Dame Street $\frac{1}{8}$ mile north of Lachine Wharf Station, Quebec, P.Q.

4806—June 1—Authorizing the Wheatley Telephone Company, Ltd., to erect, place and maintain its wires across the track of the Pere Marquette Railway on the west side of the 12 and 13 sideroad, Township of Romney, County Kent, Province of Ontario.

4807—June 1—Authorizing the Wheatley Telephone Company to cross with its wires the track of the Pere Marquette Railway at Lot 11, 3rd Concession of Township of Romney County Kent, Province of Ontario.

4808—June 1—Authorizing the Wheatley Telephone Company to cross with its wires the track of the Pere Marquette Railway on the east side of the county line between Counties of Kent and Essex, Ont.

4809—June 1—Authorizing the Wheatley Telephone Company to cross with its wires the track of the Pere Marquette Railway at Lot 15, 2nd Concession of Township of Romney, Province of Ontario.

4815—June 1—Authorizing the G.T.R. to cross with its additional track on Ferguson Avenue, Hamilton, Ont., the two tracks of the Hamilton Street Railway.

4816—May 19—Authorizing the G.T.R. to construct a branch line and two spurs therefrom to reach the establishments of the Toronto Carpet Company and the Malta Vita Food Company, Toronto, Ont.

4817—June 2—Granting leave to the Essex Terminal Railway to cross with its track the track of the W.E. & Lake Shore Rapid Railway in Township of Sandwich West, County of Essex, Ont.

4818—May 18—Ordering the G.T.R. to protect the crossing of the Berlin & Waterloo Street Railway at King Street in the Township of Waterloo, Ont., by means of mechanical folding fence gates to be installed, operated and maintained by the G.T.R.

4819—May 18—Requiring the G.T.R. and the C.P.R. to place and keep a flagman at the Church Street crossing in the City of Toronto, Ont.

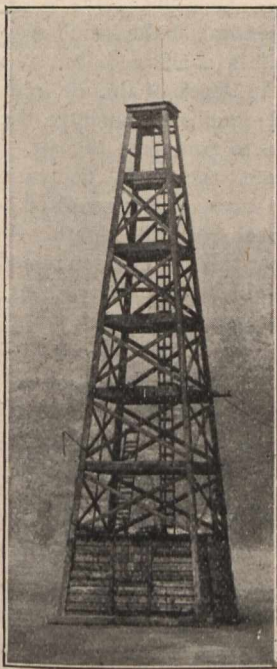
4820—June 4—Amending Order of the Board No. 2,413, dated the 1st day of December, A.D. 1906.

4821—June 5—Granting leave to the Transcontinental Railway, to operate its line of railway for construction purposes only, across the track of the C.P.R. near Bazile Station, Province of Quebec.

4822—June 5—Approving highway crossing of the G.T.P.R. in Section 11, Township 27, Range 15, W. 2nd Meridian, Province of Saskatchewan.

DIRECT AIR PRESSURE PUMPING.

During several months of the year 1907 an extended series of tests was made on a driven well, near the plant of the Westinghouse Air Brake Company at Wilmerding, Pa., to determine the amount of water raised, air required and other necessary data relative to pumping by direct air pressure. As wide a range of conditions as possible was covered in regard to different sizes of pipe and different combinations of "lift" and "submergence," obtaining for each condition the most suitable and economical arrangement. The "lift" is the vertical distance from the water level in the well to the point at which the water is dis-



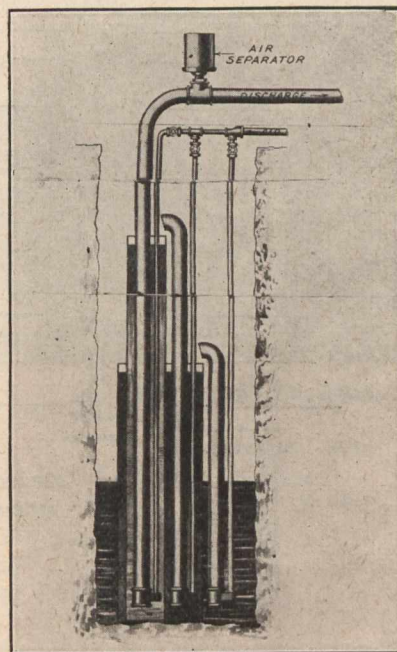
Derrick with Platforms.

charged. The "submergence" is the distance from the water level down to the point in the well where air is admitted to the discharge pipe.

Since the variety of combinations of these distances and sizes is infinite, a limited number of each were determined upon, which would give enough points on a curve to cover practically the entire range for each size of pipe.

Arrangement of Apparatus.

The well used is 174 feet deep from the surface of the ground, has 6-inch casing, and the water level is ordinarily from 16 feet to 20 feet below the surface. An oil well derrick was constructed over the well, with platforms at various heights to provide means for altering the lift. The space inside the derrick, below the first platform, was housed in to protect those making the tests, and provide suitable space for the tanks, measuring apparatus, etc., required. Each length of pipe was measured and marked as it was placed in the discharge pipe, so that an accurate knowledge of the distance to the air inlet and to point of discharge was always at hand. To measure the distance from the ground to the water level a float was used, consisting of a tin tube, about 1/2-inch in diameter and 4 1/2 feet long, hermetically sealed, weighted at the bottom, so as to float vertically, and pointed at both ends to assist in its introduction into or removal from the casing. A stout "Silver Lake" cord was fastened to a ring in the upper end, and brass markers were attached to this cord every four feet, each marker stamped with the distance from the water level point on the float.



The air supply was obtained from a one-inch connection to the air system of the Westinghouse air brake shops. The arrangement of piping, reservoirs, etc., is shown diagrammatically in Fig. 1. Two air storage reservoirs, 30 1/2 by 84 inches, received air from the supply through a three-way cock, so that only one tank could be charged at one time. At the other end of these tanks connection was made through a similar three-way cock to the line to the well. In this line was placed a 14 by 33-inch reservoir, a globe valve and a cut-out cock. The shop air system averages from 140 to 160 pounds pressure, to which the storage tanks were charged. Tank No. 2 was used for measuring the air in the tests, and Tank No. 1 for starting the pumping operation. The volumes of these tanks and their piping was obtained by water measurements. A special test gauge was attached to tank No. 2. The globe valve in the well line was used to regulate the pressure in the latter. Such pressure was always much less than the storage pressure and had to be held constant. The cut-out cock was used for cutting off all supply to the well. The small reservoir simply increased the volume of the well line to make it easier to hold its pressure constant.

The special fitting used for admitting air into the discharge pipe is also shown in Fig. 1. It consisted of a pipe sleeve enlarged on one side, the upper surface of the enlarged part being drilled and tapped for three air pipes and 1 1/4-inch gauge pipe. With the large discharge pipes there was not room enough inside the casing to get a large air supply pipe, so that two or three smaller sizes were substituted. By this arrangement also the effect of changing the sizes of air supply pipes was easily obtained, since any

one of these pipes could be closed at the top by suitable cut-out cocks. The gauge pipe was connected with a test gauge to show the pressure of the air entering the well. The water is always blown out of this pipe when starting the pumping operation. Another test gauge was placed in the air line to the well, so that pressures at top and bottom of air inlet pipe were noted.

The discharge pipe passed up through the roof of the cabin to the point of discharge. At this point the air and water lifted passed into an air separator, the air passing upward to the atmosphere, and the water falling by gravity into one of the two weighing tanks. Just under the roof of the cabin was a large three-way cock, by means of which the water was directed into either one of the tanks and weighed by means of the platform scales upon which they rested.

and the air required per gallon was slightly less than with the continuous flow, but the water delivered was considerably less. On the other hand, if the air pressure was gradually increased above that just required to give a steady flow, the quantity of water delivered would increase somewhat, but the air per gallon increases in a greater proportion, and, as the air pressure is further increased, the gain in the quantity of water delivered grows less until, at a certain point, it stops and from then on the water delivered **decreases** in amount.

It is very easy to regulate the air supply by the sound of the discharge. The point at which the flow becomes steady is quickly recognized.

Selection of Proper Ratios.

From the results obtained it would appear that for a given lift the further down in the well the submergence is

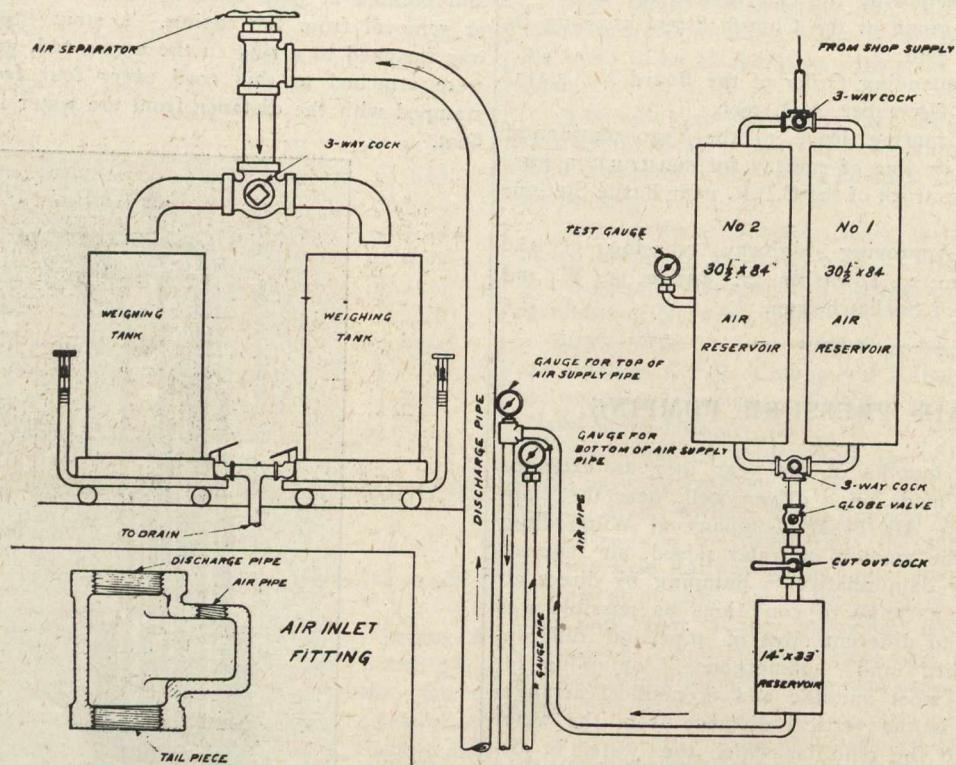


Diagram of Pipe.

The Tests.

Nearly eighteen hundred tests were made, covering from 350 to 400 different combinations of discharge pipe lift and submergence. From the figures obtained in these tests curves were plotted, showing the variation of cubic feet of air used per gallon of water raised and the gallons of water delivered per minute for the different ratios of lift to submergence. From these curves it was found that the cubic feet of air used per gallon of water raised and the gallons of water delivered per minute are practically the same for each ratio of lift to submergence for any submergence of a given size of discharge pipe. For example, a lift of 10 feet and a submergence of 20 feet will take the same amount of air per gallon, or lift the same number of gallons per minute, as a lift of 100 feet and a submergence of 200 feet, the size of discharge pipe being the same. In both these cases the ratio is identical, while the submergence in the latter is ten times as great as that in the former. Consequently, it is only necessary to consider the **ratio** of lift to submergence and the size of discharge pipe.

It was also found that, for a given size of discharge pipe, the gallons of water raised per minute decrease as the ratio of lift to submergence increases; also, the cubic feet of free air per gallon of water raised increase as the ratio increases for a given size of discharge pipe, and for a given ratio it decreases as the size of discharge pipe increases.

Air Pressure.

As regards the air pressure required, it was found that the smallest pressure possible that would give a continuous flow from the well was the proper pressure to use. It was found that, if the air pressure was choked down slightly below this point, the water would come out intermittently in spurts,

made the more economical the result would be. This is true as far as the well is concerned, but it must be considered that the greater the depth of the air inlet the greater the air pressure must be, and consequently the more horse-power must be employed to compress the air. The quantity of air required to operate the well decreases as the depth is greater, while the horse-power required to compress a cubic foot of air increases with the depth. A curve representing the horse-power per gallon of water raised for varying depths and constant lift will at first decrease as the depth increases until it reaches a minimum point, after which it increases. This point represents the most economical ratio for the given lift. To learn where this point would be some tables and curves were made, which gave the horse-power per gallon of water raised for the different lifts and different sizes of pipe, with various ratios of lift and submergence, from which it appears that the most economical ratios for a given discharge pipe decrease as the lift increases, and for a given lift they increase as the discharge pipe increases.

Tail Piece.

Concerning the use of a "tail" piece in the discharge pipe below the air inlet, it was found that this piece is essential when starting the pumping operation, as it tends to prevent the air from backing down into the well and rising in the casing outside of the discharge pipe.

Air Inlet.

The fitting used for entering the air into the discharge pipe was particularly well adapted to the purpose, because it offered no impediment to the free passage of the water. The results obtained indicate beyond doubt that anything

in the shape of a jet or pipe introduced into the discharge pipe not only has no value in assisting the pumping operation, but is actually detrimental by forming an obstacle to the free passage of water. The enlarger sleeve not only offers little resistance to the water, but makes it possible to install the air pipe very close to the discharge pipe.

Size of Air Pipe.

The size of air pipe depends upon the quantity of air required, its pressure and velocity; the latter depends upon the difference in pressure between the top and bottom of the air supply pipe, or, in other words, how many pounds pressure one is willing to sacrifice to force the air through the pipe.

Taking the results of the tests, and assuming that the drop in pressure is proportional to the length of the air supply pipe, it was found that, for one pound drop per hundred feet, the velocity is about 27 feet per second; for two pounds drop, 42 feet per second, and for three pounds drop, 53 feet per second. Economical operation is, of course, more easily maintained by having the drop in air pressure as small as possible.

Perhaps it would be well to give here a brief description of the manner in which the operation occurs inside the well. As the compressed air enters the discharge pipe at a pressure only slightly above the hydrostatic head, the column of water above is forced upward. Air continues to enter, filling up the space left by the rising body of water until the top of the water column reaches the discharge opening. The moment that a portion of the rising water is discharged the weight of the column is thereby reduced, and the air beneath it will correspondingly expand, thus reducing the pressure on the water in the discharge pipe below the air inlet. The weight of the water in the well, outside of the discharge pipe, then forces the water upward into the pipe, stopping the inflow of air. The pressure in the air supply pipe is quickly reinstated by its connection with the supply, so that it again forces an entrance into the discharge pipe. This is repeated until the whole discharge pipe, above the air inlet, is filled with alternate bodies of air and water, the combined weight of which is enough less than the water in the well to keep up a constant flow of water into the discharge pipe. As each body of air rises the total weight above it grows less, so that it continues to expand until, when it reaches the discharge, it issues at atmospheric pressure. In this way a continuous flow from the well is maintained as long as a sufficient quantity of air is supplied and the capacity of the well is not overtaxed.

In this connection it may be interesting to note that a model was made not long ago of a deep well, having casing and discharge pipe in glass, for exhibition purposes. The above description of operation, deduced from the action of the test well, was entirely confirmed by the operation of this glass model, and, in addition, the cause of some of the losses encountered was learned. The principal loss appears to be due to a slip back of a portion of each layer of water to the next succeeding layer, caused by the friction of the sides of the discharge pipe. Each change in diameter of the pipe, such as coupling or joints, materially increases this slip; also, any obstruction or sudden bend adds to this loss. The bodies of air are not clear, but are filled with bubbles and foam, caused by the presence of the water slipping back, but the bodies of water are clear and distinct.

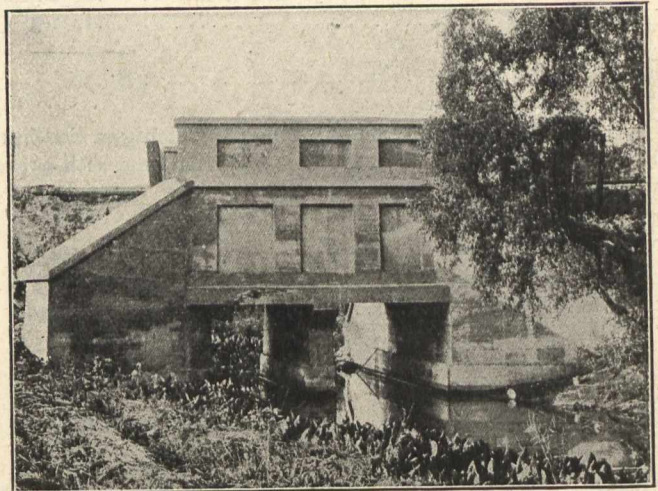
In starting the well operation it is necessary to admit air slowly into the well. The valve should only be opened a small amount, allowing the air to flow slowly, and gradually build up to the pressure required. After opening the valve the pumping will not commence immediately, but several seconds, perhaps even a minute, will elapse before the water discharges; then it comes with a great rush. After this first rush of water there comes a lull for a few seconds, and then the pumping operation begins more uniformly. By opening the valve only a small amount the air supplied will be a little less than required and cause an intermittent flow from the well. The valve can then be opened gradually until the flow becomes continuous, which is the proper position in which to leave it.

A Page of Costs

ACTUAL, ESTIMATED, AND CONTRACTED.

A REINFORCED CONCRETE BRIDGE.

The city of Hamilton during 1907, under the direction of city engineer E. G. Barrow, and under the more direct supervision of the assistant engineer, J. R. Heddle, constructed a reinforced concrete bridge at King Street West, near Valley Street. The piles in the old wooden bridge were retained and used for the foundation of this bridge. Below is given a detailed statement of the cost of material and labor used in construction of culvert, two spans of nine feet:—



Concrete Bridge, Hamilton.

	No. of cubic yds. in structure	Cost	Cost per cubic yard
Labor	\$1,101.31	\$ 6.71
Sand and gravel....	54.30	} 5.63
Cement	431.00	
Lumber and tools..	195.85	
Nails	12.06	
Gasoline and stores.	15.26	
Rubber boots	18.95	
Iron and steel rods	177.71	
Use of roller on approaches	18.00	
Total	164	\$2,024.44	\$12.34

BALLASTING.

In a recent report of the Roadmasters and Maintenance of Way Association, the cost of balancing old track is given. The costs of various classes of ballast are given.

On a northern division of the Chicago & North-Western Railway the cost of balancing one mile of track with gravel was \$1,020, figured on the basis that 3,400 cubic yards of material would be used per mile. The gravel was un-screened and unwashed and was used just as it came from the pit. The gravel was placed for a 12-in. raise with standard gravel roadbed on the top of a 11.6-in. slope, 1½ to 1 on the bottom and 16 ft. from bottom ballast line to ballast line. The itemized cost was as follows:

	Per. cubic yd.
Cost of gravel loaded on cars at pit.....	\$.07
Hauling and unloading, 50-mile haul....	.10 2-3
Ballasting12 1-3
Total	\$.30

On a division of the Lake Shore & Michigan Southern Railway for the year 1906 the cost of ballasting with gravel was as follows:

	Per. cubic yd.
Gravel, washing and loading.....	\$.18
Hauling07
Cost of digging out old ballast.....	.15
Cost of unloading and placing in track.....	.15
Total	\$.55

For crushed limestone ¾ to 1½-inch in size the cost was as follows:

	Per. cubic yd.
Cost of stone	\$.535
Digging out old ballast.....	.15
Hauling, unloading and placing in track.....	.40
Total	\$1.085

For ballasting with crushed stone on a division of the Atchison, Topeka & Santa Fe Railway, the cost was as follows:

	Per. cubic yd.
Crushed stone at crusher, loaded on cars....	\$.615
Haul, 50 miles055
Labor, Mexican insertion33

Ontario

Increased price per yard, cents

Owen Sound	5
Warton	4
Harrietson	3
Cobourg	7
Goderich	10
Midland	2
Wingfield	13
Blind River	4½
Trenton	12
Toronto	6
Penetang	5
Waubauskene	2
Rondeau	17½
River Thames	7
Port Edward	5
Kincardine	10
Quebec	
River St. Maurice	2
Riviere Geodfray	2
St. Pierre les Brequets	16
Riviere de Concouv	1
Vaudreuil	5
L'Assomption	3¾
Riviere du Loup	8
Yamaska River	7½
St. Frances River	7
Batiscan	6½
Maskinonge	15
Nicolet	9

WAGE SCHEDULE.

Contractors tendering on public works in Canada should keep in mind the "fair wage schedule." On all Dominion and Provincial works and many municipal constructions this scale is enforced.

When the contractor knows such a rate will be required it is fair and just.

As a fair example of these schedules we give herewith the one attached to the contract of the Canadian General Development Company Limited, Montreal, Que., who on April 24th, 1908, were given the contract for Section 3 Ontario-Rice Lake Division, Trent Canal:

Fair Wages Schedule.

Class of Labor	Rate of wages not less than
Foreman for laborers.....	\$2.50 per day of 10 hrs.
Laborers	1.75 " 10 "
Carpenters	2.25 " 10 "
Stonecutters	4.00 " 10 "
Masons	4.00 " 10 "
Blacksmiths	2.00 " 10 "
Blacksmith's helpers	1.75 " 10 "
Horse, cart and driver.....	2.50 " 10 "
Team, wagon and teamster.....	3.50 " 10 "
Dredge engineer.....	\$100.00 p. mo. and board 12 hrs. day
Dredge craneman	70.00 " 12 "
Dredge fireman	40.00 " 12 "
Dredge deckhands	35.00 " 12 "
Dredge cook (female).....	30.00 " 12 "
Dredge watchman	40.00 " 12 "
Scowmen	40.00 " 12 "
Tug captain	60.00 " 12 "
Tug engineer	60.00 " 12 "
Tug fireman	35.00 " 12 "
Tug deckhands	35.00 " 12 "
Drill-boat foreman	\$3.00 per day of 10 hrs.
Drill-boat drillers	2.00 " 10 "
Drill-boat drillers' help.....	1.50 " 10 "
Steam shovel runner	\$100.00 per mo., 12 hrs. per day
Steam shovel craneman....	70.00 " 12 "
Steam shovel fireman.....	35.00 " 12 "
Steam shovel watchman....	35.00 " 12 "
Steam hoist runner.....	60.00 " 12 "

HAULING BRICK.

It is the unusual work in connection with a contract that frequently eats largely into the profits. When estimating on large work extras are often "approximated." When it comes to doing the actual work with men unfamiliar with that class of labor he finds he has not made allowance enough.

For unloading two carloads of brick, each containing 10,000, the following is given as actual cost. The brick had to be hauled one and a quarter miles in sleighs over a poor snow road:—

Two teams and drivers, 4½ days at \$4 per day..... \$36 00
 Two men, 4½ days at \$1.75 per day..... 15 75

Total \$51 75

Or about \$2.60 per M. Only about 650 brick could be taken at a load.

ENGINEERING SOCIETIES.

CANADIAN RAILWAY CLUB.—President, L. R. Johnson; 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.

MANITOBA 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.

CANADIAN ELECTRICAL ASSOCIATION.—President, R. S. Kelsch, Montreal; secretary, T. S. Young, Canadian Electrical News, Toronto. The Eighteenth Annual Convention will be held in Toronto, June 17th to 19th, 1908.

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.

Canadian Electrical Association.

The Convention of the Canadian Electrical Association is to be held in the Chemistry and Mining Building of the University of Toronto on June 17th, 18th and 19th. About four hundred delegates are expected to attend. Space has been provided in which to make exhibit of standard, special

or new devices, which the manufacturers and dealers may desire to bring to the notice of the electrical people there assembled.

There are available both 220 and 110 volt direct current circuits, as also a small capacity in 110 volt, 60 cycle alternating current service. Exhibits should arrive at the building on Monday or Tuesday, June 15th and 16th.

Foundrymen's Association.

For this week at least Toronto will be the centre of iron-moulding industry of America. The American Foundrymen's Association, American Brass Founders' Association, Foundry Supply Association, and Associated Foundry Foremen are joined in one Convention at Exhibition Park, Toronto. The feature of the Convention is the display made by the Foundry Supply Association. Instead of reading papers the supply men bring their devices and show them in actual operation.

In the Process Building there are very interesting exhibits of core machines and core ovens in operation, modern moulding machines and tumbling barrels in operation; several modern gas engines, pneumatic tool exhibits, one company supplying all the compressed air used in connection with exhibits in Machinery Hall. This company has a large foundry outside of Machinery Hall, including a cupola, which runs off, heats and makes moulds for the different exhibits in the hall. In this building another company is using iron that is moulded in the cupola, and is melting souvenir moulds and castings. There is a French sand mill for this exhibit, and it is operated by hydraulic power. All the exhibits in Machinery Hall are in operation, and they show the different phases of foundry work.

Tuesday afternoon Mayor Oliver, of Toronto, extended a welcome to those who have come from all over Canada and the United States. His Worship congratulated his hearers on the success of the Convention from point of attendance and as an exhibition of all that was newest and best in the craft of the founder. The city was not, he said, remarkable as a city of foundries any more than for her other industries, but she had nevertheless several plants of the best order. He suggested the Canadian National Exhibition as a good place for foundrymen to exhibit.

In reply, President Stanley G. Flagg, Jr., thanked the city, and spoke of the great good that arose out of exhibitions of this sort, which prompted the spirit of co-operation between all the members, whether Canadian or American, and which would serve to educate each interested visitor along the line of his own work, and the various ways other men had of doing the same kind of work. The past year had been, he said, remarkable in the curtailed output and the reduced volume of business done by practically every line of industry on the continent, and had put hundreds of the best business men under a severe strain. Despite all this, so strong was the financial footing of the foundrymen and so slightly had the decline in industrial activity affected them that there had been very little loss in their ranks.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, stated in his report that the membership of the organization stood at 730, although since that total had been reached new members had been received. The balance on hand in the treasury was \$325. The special fund set aside for work of research stood at \$848.17. Of that, \$300 had come to hand since the Convention assembled.

DOMINION LAND SURVEYORS.

At the recent examination for Dominion Land Surveyors, held in May, the following passed the final examinations. Upon taking the oath and filing bonds with the Dominion Board of Examiners they will be admitted to practise: A. Ashton, Ottawa; M. H. Baker, St. Thomas, Ont.; U. W. Christie, Chesley, Ont.; T. H. G. Clunn, Ottawa; M. F. Cochrane, Ottawa; A. L. Cumming, Ottawa; E. M. Dennis, Ottawa; J. L. Lang, Toronto; J. B. McFarlane, Toronto; F. W. Rice, Ottawa; O. Rolfson, Walkerville, Ont.; G. F. Summers, Winchester, Ont.; G. L. Williams, Vancouver, B.C.

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.

OTTAWA.—It is understood that, in lieu of Government construction and ownership of the proposed new Hudson Bay Railway, as originally suggested, it is the intention of the Government now to secure the construction of the road and control of rates in an equally effective manner by entering into an arrangement with the C.N.R. to complete the construction of their present line towards Hudson Bay from The Pas to Fort Churchill. The C.N.R. Hudson Bay line is now completed to The Pas, a distance of 480 miles from Fort Churchill, and a general survey of the rest of the route to the terminus has been made. No land grant will be made to the Company, but the cash bonus will probably be somewhat over the usual \$6,400 per mile.

PORT ARTHUR.—A plan for an extension of the car system by a series of loops centring at one point, and which would serve the whole city at an estimated cost of \$40,000, is to be submitted shortly for a vote of the ratepayers.

TORONTO.—Buffalo and Toronto traction magnates met recently regarding the building of a new bridge across the Niagara River, one-half mile above the Cantil ver bridge. The structure will be the connecting link in a proposed Buffalo-Toronto electric railway, and a franchise has been asked of the Dominion Government.

TORONTO.—Representatives of a number of street railway companies unanimously declared their opposition to the proposal of the Ontario Railway and Municipal Board, that passengers should be prohibited from riding on the front seat of open cars. The matter arose out of the recent Ottawa street car collision, which Engineer Wyse, who made an investigation on behalf of the Railway Board, reported to have been caused by front seat passengers distracting the attention of the motorman. The Board notified the street railway companies of their proposal to pass the new regulation, and they sat to-day to hear objections. All the representatives pointed out that in the summer months many people desired to ride on the front seat, and practically no accidents had occurred through their interfering with the motormen. The Board reserved their decision.

TORONTO.—Buffalo and Toronto traction magnates arising from the construction of twenty-two miles of railway in Quebec has been commenced in the Non-Jury Assizes by Mr. John Ross from John A. McRae, W. H. Chandler and the Imperial Bank of Canada. The plaintiff declares that in October, 1905, McRae agreed with him to build the railway for the St. Maurice Construction Company, and that subsequently he entered into partnership with Mr. McRae to finish the road. Each of the parties interested were to put up \$15,000 to make a total capital of \$45,000. The plaintiff declares that he and McRae put in their plant and interest into the deal, and that Mr. Chandler advanced his share of the money, and that when the work of construction was completed in 1907 a profit of \$40,000 was shown. After the contract was completed, McRae, Chandler and McNeil undertook to do construction work for the T. and N.O. Railway Commission, and the plaintiff declares the firm took the plant, formed a new company and continued the work without him. Mr. Ross sets up that in March, 1907, McRae and Chandler received the sums of \$56,251.57 and \$7,486.38 in cheques, which were deposited to their credit in the Imperial Bank. The plaintiff asks that the former cheque be paid into court by the bank. This cheque was endorsed first by Ross, McRae and Chandler, and afterwards by McRae, Chandler and McNeil, and signed in each case by W. H. Chandler. After being deposited in

the Imperial Bank to the credit of the new firm, it was cashed by the Bank of Montreal.

Manitoba.

DAUPHIN.—The Christie survey party, which has been running trial lines from Lake St. Martins and the Water Hen River to Lake Winnipegosis, has ceased operations for the season and returned east.

WINNIPEG.—Work on the construction of the first eighty miles of the Transcontinental east of Nepigon is now in progress. The Nepigon Construction Company is at present employing 200 men, and this force will be increased to about 2,000 in the course of a few weeks.

Saskatchewan.

PRINCE ALBERT.—The Canadian Northern Railway Company have ordered and are now awaiting the arrival of the rails necessary to complete the connection between the west and central stations in this city, and it is hoped to commence the work in a few days.

British Columbia.

KOOTENAY DISTRICT.—At the next session of the Legislature an application will be made for authority to build one or more railway lines in the Goat River Canyon, District of East Kootenay.

SEWERAGE AND WATERWORKS.

Quebec.

LIMOILLOU.—At the council meeting of the town of Limoilou, Que., on the 30th May, Messrs. Ouimet & LeSage, civil engineers, were appointed to prepare plans, estimates and specifications for a general sewerage system for the wards of Stadacona and Lairet. The same engineers prepared the plans of the sewerage system for the town of Limoilou last summer.

MONTREAL.—The city of Montreal have ordered one of the well-known Belliss engines of triple expansion type, and of 750 to 800 horse-power, for the low-level pumping station. The engine will be directly connected to a Worthington centrifugal pump, the contract being taken for the installation by the John McDougall Caledonian Iron Works Co., Limited, Montreal.

POINTE CLAIRE.—At the council meeting of the municipality of Pointe Claire, Que., Monday, June 1st, Messrs. Ouimet & LeSage, civil engineers, of Montreal, were appointed to draw up plans, estimates and specifications for a general system of aqueduct within the limits of the municipality.

Ontario.

BRANTFORD.—The city engineer's department is serving notices on the owners of property on Dalhousie Street in reference to the cost of the storm sewers and bitulithic pavement which it is proposed to lay down between Queen Street and George Street. The cost of the storm sewers is estimated at \$2,852, of which the city pays \$1,241, and of the pavement \$14,278, of which the city pays \$7,973. The balance of the cost is charged against the property owners, to be spread over twenty years' payment.

CHESLEY.—The corporation of Chesley are installing a waterworks system, and have placed an order for a triplex power pump with the Smart-Turner Machine Co., Limited, Hamilton, Ont.

ST. THOMAS.—A well, flowing at the rate of over 200,000 gallons a day, has been struck on the Locke farm, near the city, by the city waterworks authorities. The water is perfectly pure, and is the last of a lot of twenty-five wells, now yielding a million gallons of water a day.

British Columbia.

LADYSMITH.—The council is still in difficulty with the sewer question. Earlier in the year it decided to prepare plans of the streets, and to furnish an estimate of the cost of installing a complete sewerage system. When this decision was taken, the council was under the impression that the whole of the incorporated part of the city had been surveyed and levels taken of the streets, which was not the case.

VICTORIA.—The city council has under consideration the installation of a more complete system of surface drains for the city. Last year a proposal was submitted to the ratepayers for the installation of such a system, but it was down. It is now proposed to revive the idea, and it is hoped with better success.

LIGHT, HEAT, AND POWER.

Quebec.

MONTREAL.—The Central Heat, Light and Power Company have placed, through Messrs. Laurie & Lamb, consulting engineers, Montreal, their order for a fourth Belliss engine for their power-house, St. Peter Street, Montreal. This engine will be of 430 horse-power, with 25 per cent. overload capacity.

Ontario.

GUELPH.—It was announced in a recent council meeting by the Light and Heat Commission that the Board has decided on a big reduction in the rates charged in Guelph. The new scale will include gas at a flat rate of \$1 for light and cooking, to be charged up on one meter. The \$1 price will only hold good provided that payment is made within fifteen days. For electric lighting the commercial rate will be reduced from 12 cents to 10, and the residential rate will remain at 10 cents, the Commissioners not having been in a position to make any reduction there. The rate charged for the city street lights will be reduced from \$65 per annum to \$60. The reduction, which came into force yesterday, will mean a net reduction of from \$14,000 to \$15,000 a year.

HAMILTON.—Chief Engineer Sothman, of the Hydro-Electric Power Commission, announced that the right-of-way from Niagara Falls to Toronto had all been secured. The Commission has decided now to place the main switching station near Dundas, whether Hamilton comes in or not, as it will shorten the distance to Toronto. The engineer declares that copper will be secured much cheaper than was even hoped for, and that the line will be built well within the estimates.

LONDON.—The city council at a special meeting signed the power contract. Hon. Adam Beck and Engineer Sothman were present.

PORT ARTHUR.—At a joint meeting of the city council and Board of Commissioners it was practically decided to follow the power improvements along Current River as outlined by Mr. Cecil B. Smith. They will proceed at once with improvements of Onion Lake dam and the construction of a new reservoir above the power-house. There will be an increase in the height of the dam of eight feet. Nothing is to be done on the Paquette, which gave way, or the Hazelwood dam.

ST. CATHARINES.—By improvements which are now being made to locks, vessels will save three full hours in every passage through the Welland Canal. A force of men has just completed the installation of electric motors on Locks 23, 24 and 25. The motors were made at the Beatty plant at Welland. The machinery was installed by Frank O'Neill, of the Packard Works, of this city. The men are now at work installing motors of five horse-power at each of the remaining locks. The gates will now open and close in thirty seconds. It formerly required four minutes to open and the same time to close. There are twenty-five locks on the canal. With saving seven minutes on each, three hours will be made up. The new arrangements will not affect the number of men employed.

Alberta.

CALGARY.—The Robb Engineering Company, of Amherst, N.S., have recently received the order for a 24 x 48 x 30-in. Robb-Armstrong cross compound Corliss engine, which equals 1,100 horse-power, arranged for direct connection to a 750 kw. Bullock generator, for the city of Calgary, Alta.

TENDERS.

New Brunswick.

FREDERICTON.—Tenders for Fredericton bridge superstructure will be received at the Department of Public Works, Fredericton, until Monday, 20th day of July, 1908, for constructing three metal superstructure spans of the Fredericton highway bridge, between the city and the south end of the already revised work. John Morrissy, Chief Commissioner. Department of Public Works, Fredericton, N.B.

Ontario.

COBOURG.—Tenders for Cobourg Harbour Breakwaters will be received at this office until 4.30 p.m. on Monday, June 29, 1908, for the construction of two breakwaters at Cobourg, Northumberland County, Ont. Fred. Gelinis, secretary, Department of Public Works.

GUELPH.—Tenders will be received until June 16th for teaming, excavation, laying and back filling for a 24-inch earthenware water conduit 20,000 feet in length, also for a cast iron pipe. Davis & Johnston, engineers; J. J. Hackney, manager, Guelph Waterworks. (Advertised in the Canadian Engineer.)

OAKVILLE.—Tenders will be received until June 23rd, 1908, for laying 20,000 feet water pipe and supply and build power-house, water tower, etc., for town of Oakville. A. S. Chisholm, chairman of Board; Willis Chipman, chief engineer. (Advertised in "Canadian Engineer.")

OTTAWA.—Tenders for fog alarm machinery will be received up to noon of the first day of July, 1908, for supplying the machinery required by the Department of Marine and Fisheries for fog alarm purposes during a period of one or three years, at the option of the Minister of Marine and Fisheries. G. J. Desbarats, Acting Deputy Minister of Marine and Fisheries.

OTTAWA.—Tenders will be received by registered post only up to 4 o'clock, Tuesday, June 16th, endorsed "Tender for the Supply of Asphalt," for the supply of refined asphalt required by the city of Ottawa for the year 1908. Newton J. Ker, City Engineer.

OTTAWA.—Tenders will be received by registered post only up to 4 o'clock, Tuesday, June 16th, endorsed "Tender for the construction of a sewer on Kent and Queen Streets." Newton J. Ker, City Engineer.

OTTAWA.—Tenders marked "Tender for Rotary Condenser" will be received by registered letter only at the office of the Municipal Electric Department, 21 Sparks Street, Ottawa, until 12 o'clock (noon) of the 16th day of June, 1908. J. E. Brown, Electrical Superintendent, Municipal Electric Department.

Manitoba.

MINNEDOSA.—Tenders will be received at the office of the secretary-treasurer of the Board in Minnedosa, and at the office of the architect in Winnipeg, up to June 25th, 1908, for the erection of a six-room school building in the town of Minnedosa. Wm. Wallace Blair, architect, Winnipeg.

WINNIPEG.—Tender for St. Andrew's Rapids Works will be received until Wednesday, July 8, 1908, for the construction of movable dam, steel service and highway bridge, repair shop, etc., at St. Andrew's Rapids, Red River, Province of Manitoba. Fred. Gelinis, Secretary Department of Public Works, Ottawa.

Alberta.

STRATHCONA.—Tenders will be asked for the furnishing of all material and labor of the following trades on the new Canadian Bank of Commerce building, Strathcona.

VERMILION.—Tenders will be received up to Saturday, the 30th of June, 1908, for the installation of a steam heating plant in the Vermilion Centre School. H. A. Fieldhouse, secretary-treasurer, Vermilion, Alta.

Saskatchewan.

ARCOLA.—Tenders for Arcola courthouse will be received up to June 20th, 1908, for the erection of a courthouse building at Arcola, Sask. Messrs. Storey & Van Egmond, architects, Regina. F. J. Robinson, Deputy Commissioner, Department of Public Works, Regina.

INDIAN HEAD.—Tenders for Nokomis Public School will be received up to Wednesday, 23rd day of June, 1908, for all trades in connection with the erection and completion of a four-roomed school. Plans and specifications to be seen at the office of the architects, Messrs. Hunter, Cantilon & Co., Indian Head.

REGINA.—Tenders will be received until June 22nd, 1908, for construction of concrete abutments and retaining walls for a bridge over Wascana Creek, Regina. F. J. Robinson, Commissioner. (Advertised in the "Canadian Engineer.")

REGINA.—Tenders will be called for until June 22nd, 1908, for the erection of Legislative and Executive buildings for the Province of Saskatchewan. F. J. Robinson, Deputy Commissioner of Public Works. (Advertised in the Canadian Engineer.)

REGINA.—Tenders for spur line of railway will be received up to Monday, June 15th, 1908, for the grading of a spur line of railway from a point south of R.N.W.M.P. barracks, Regina, to the Parliament Building site, south of Wascana Lake. About 8,000 cubic yards of earthwork will be required. F. J. Robinson, Deputy Commissioner. Department of Public Works, Regina.

CONTRACTS AWARDED.

Quebec.

MONTREAL.—The W. J. Poupore Co., Limited, have secured the contract for dredging at Lunenburg and Mahone Bay for this season. This work is paid for by the Dominion Government. The channel in this harbor will be dredged. The Company takes the contract to do the work from the Government.

Ontario.

OTTAWA.—The contract for dredging at Red Islands has been awarded to Contractor Moore, of St. John, N.B. This work will be undertaken at once.

ST. THOMAS.—The contract for mason work of the new Ingram & Davey Block on Talbot Street has been awarded to Mr. A. E. Ponsford, and the carpenter work to Messrs. J. M. Green & Co. The block will be a three-storey one, with 40 feet frontage on Talbot Street and 115 feet on Southwick Street. There will be a two-storey warehouse at the rear, 40 x 50 feet. Work will be commenced at once and the building completed by the middle of September.

Manitoba.

WINNIPEG.—The following tenders are reported to have been let by the Manitoba Government for the Long Distance lines to be built this summer: The F. Bissell Company, Toledo, Ohio, cross-arms; copper wire, Wire and Cable Company, Montreal; copper sleeves, F. B. Cook, Chicago; steel strand wire, E. M. Skinner, Limited, Winnipeg, Man.; weatherproof iron wire, Canadian General Electric Company, Montreal and Winnipeg.

British Columbia.

NEW WESTMINSTER.—The contract for the construction of the Cloverdale-Westminster section, twelve miles long, of the British Columbia Electric Railway extension to Chilliwack has been let to a Vancouver firm, Boyd & Craig. The laying of the rails is to be completed by February, when the Company hopes to be operating cars on the section. The electrical machinery for sub-stations and other supplies may entail some delay in putting the section into active use for several months, but the Company will not wait till the line to Chilliwack is finished before operating cars on the Cloverdale section of the bridge.

PRINCE RUPERT.—N. Keith, of Winnipeg, has been given three miles adjoining J. E. Bostrom's five mile

section, just east of Prince Rupert. MacDonald & McAllister have the next five miles; M. Shaddy, of Winnipeg, has the next three miles, and Smith Bros., of Kenora, a similar distance. A. Stewart has been given three miles, and A. Harstone gets a three-mile section near the Little Canyon, below the junction of the Copper River with the Skeena. J. W. Stewart has also awarded contracts for clearing four miles of the right-of-way on the Copper River end of the Kitamaat branch. Ross & Carlson's men are making good progress on the construction of the first mile of grade east of the town.

VANCOUVER.—The British Columbia Electric Railway Company have let the contract for the construction of the first section of the Chilliwack line to Boyd & Craig at \$100,000.

VICTORIA.—The council have awarded contracts for fire hose as follows: Two hundred and fifty feet of Amazon brand at 95 cents per foot, manufactured by the Graham Rubber Company, Seattle; 2,000 feet of Paragon brand at \$1 per foot, manufactured by the Gutta Percha Rubber Company, Toronto; 250 feet Keystone brand at \$1 per foot, and 300 feet of one-inch chemical hose at 65 cents per foot, manufactured by the Canadian Rubber Company, of Montreal.

PERSONAL.

MR. B. A. ROWE, formerly of the C.P.R. engineering staff, Walkerton, Ont., has removed to Edmonton, Alta.

MR. D. T. SWARTWONT, president of the Ohio Blower Company, of Cleveland, Ohio, was this week in Toronto on a business trip.

MR. ARCHIE STEWART, of the firm of Stewart & Hewitson, who has been superintending the contracts of the Company along the C.P.R. west of Port Arthur, arrived in that city Saturday night.

MR. JAMES P. GORDON, of Toronto, is now located at Moosomin, Sask., and has charge for Mr. Willis Chipman, Toronto, of the waterworks and sewer extension work which the town is this year completing.

PROF. FRANK ADAMS, Ph.D., Logan Professor of Geology and Palæontology at McGill, succeeds Dean Bovey as Dean of the Faculty of Applied Science, McGill University.

PROF. C. H. McLEOD, Ma.E., Professor of Surveying and Geodesy, was appointed Vice-Dean.

Amongst the interested visitors to the Foundrymen's Convention, Toronto, are two Japanese Government representatives, Messrs. Y. I'Kawa and K. Kaijuma, of Tokio. They are watching the machinery to obtain pointers in connection with the manufacture of large firearms and machinery of war.

MISCELLANEOUS.

Ontario.

BRANTFORD.—In the Stratford skating rink for some days a very interesting demonstration has taken place of a sand-cutting machine for moulding, of which the patents are owned by the "Auto Sand Mixer Company." The machines are being manufactured by the Company in Brantford, and many orders have already been received.

KINGSTON.—It is intended to improve the following streets and parts of streets during the present year: Bagot, Barrie, Brock, Clergy, Division, Montreal, Queen, and Union. H. B. R. Craig, City Engineer.

ST. THOMAS.—At the meeting of the Elgin county council, held recently, the good roads by-law, to improve 250 miles of road, erect bridges, etc., was read a second time, and it was decided to submit the by-law to the vote of the electors at the next municipal elections. The estimated expenditure of \$150 per mile for road improvement, erection of bridges, etc., means an expenditure of \$375,000. It is proposed to complete the work by 1912.

CONTRACTOR'S SUPPLIES

RECENT FIRES.

Ontario.

MERRICKVILLE.—The buildings and contents of P. Kyle's sawmill were totally destroyed by fire. Loss, about \$5,000.

SARNIA.—Sarnia was visited on June 9th by one of the severest thunder and wind storms ever witnessed by the town of Sarnia. The Standard Chain Works, a new industry here, were almost completely destroyed with a large loss, the roof and sides of the building being swept down before the wind.

British Columbia.

VICTORIA, B.C.—The three machine shops of the Victoria Machinery Depot Co., Limited, were totally destroyed Saturday evening by a fire which did \$180,000 damage and threw 150 men out of work. The insurance amounted to \$30,000. The fire was caused, it was thought, by the flare from the moulding-room. Usually it is the custom to send men out to watch the sparks from this source, but when the last cast was made the precaution was omitted.

MACHINERY WANTED.

No. 14.—A subscriber requires a cableway for depositing concrete over an area, 70 feet by 300 feet. Wishes to leave mixer in one position all the time.

MARKET CONDITIONS.

Montreal, June 11th, 1908.

The pig-iron markets of the United States are still in a disturbed state, prices being made largely to suit local conditions. Certain Eastern producers have within the past few days made low prices, thereby securing most of the business offering. Southern interests are holding firm at prices recently established, the result being that business is now being taken by northern and eastern furnaces. The situation is largely governed by the conditions and requirements affecting intending purchasers and sellers. This is shown by the fact that some Pennsylvania furnaces are asking and securing fully \$1 per ton higher than others, this difference being governed by the location of the producer. In short, the market is an exceptionally irregular one. The volume of business being done is fair with several large inquiries pending, at least two of the big consuming interests having asked prices for their requirements covering their operations for the next two or three years. This would seem to indicate that present prices are as low as they are likely to be for some time to come. It was reported that one million tons of steel rails have been ordered from the United States Corporation by the Siberian Railway. It was formerly stated, however, that rails for the Siberian road must be the product of Russian mills, so that doubt is cast on the story. A million-ton order would mean about 25 per cent. of the entire American output for one year. The latest information goes to show that at the present time the American mills have only about a million and a half tons on their books for 1908, a large part of which is already rolled, and rail mills are now anxiously awaiting further orders. Such an order would be equal to the output of the United States Corporation mills for four or five months. If it were possible to commence operations on such an order, shortly, it would have a decidedly beneficial effect on the entire steel industry of the country. It would mean the consumption of fully 1,200,000 tons of pig-iron, or about double that quantity of iron ore and would materially increase the operations of mines, transportation companies, blast furnaces and finishing mills.

The pig-iron market of Great Britain remains quiet, conditions being unfavorable to any immediate resumption of operations. Exports to Germany, the Continent and to Canada have fallen off considerably. On the other hand, a number of the furnaces are at present out of blast and stocks in store are not showing any material increase. It had been expected that prices would show a considerable decline but this has not yet materialized, cable reports during the past week having indicated a firm tone. Most people continue to look for further concessions and are holding off in consequence. Hematite iron for steel making purposes is very quiet, owing partly to the cessation of shipbuilding, in which it is largely used; but even in that grade it is not possible to secure any considerable reduction in price, makers preferring to curtail their output.

Locally, a fair business is being done, and there is a possibility of increased quantities being required. The bulk of orders are being taken by local furnaces which are in a position to successfully compete with foreign brands. Notwithstanding the sharp decline in steel bars, reported from the United States, prices remain steady in Montreal. The reason given for this is that previous declines in the local market had discounted the declines which have just taken place in the United States.

Antimony.—The market is firm and sales are being made at 9½ to 10c. per lb.

Bar Iron and Steel.—Bar iron, \$1.90 per 100 pounds; best refined horse-shoe, \$2.15; forged iron, \$2.05; mild steel, \$1.95; sleigh shoe steel, \$1.95

To know where to look for what you want, to know where to dispose of what you don't want is a great convenience. You require special equipment. This department will enable you to get in touch quickly with reliable men who wish to dispose of that which you require. Whether a buyer or a seller, you will find this department an aid to business.

RATES FOR THIS DEPARTMENT ARE VERY SPECIAL. BETTER SEND FOR THEM.

FOR SALE

ENGINE LATHES.

- 1 new 32" x 16' New Haven, (triple geared).
- 1 refitted 30" x 14' heavy bed, screw cutting.
- 1 new 28" x 16' New Haven, B.G.
- 1 nearly new 24" x 16' London, B.G.
- 1 new 22" x 12' Lodge & Shipley, double, B.G.
- 1 new 19" x 10' Greaves, Klusman, B.G.
- 2 new 18" x 8' Rahn Carpenter, B.G.
- 1 new 16" x 6' Rahn Carpenter, B.G.
- 2 new 16" x 8' Lodge & Shipley, patent head.
- 1 refitted 16" x 6' Gardner, B.G.
- 1 new 15" x 6' London, B.G.
- 1 new 15" x 6' Sebastian, B.G.
- 1 refitted 14" x 6' Sebastian, B.G.
- 1 new 12" x 6' Champion, B.G.
- 1 refitted 12" x 5' screw cutting, B.G.
- 1 nearly new 9" x 57" Barnes, B.G.

TURRET AND SPEED LATHES.

- 1 new 24" Gisholt turret lathe.
- 1 new No. 1 Bardons & Oliver turret lathe.
- 1 nearly new 18" x 8' Davis turret lathe.
- 1 refitted No. 2 Pratt & Whitney turret lathe.
- 4 refitted No. 3 Brown & Sharpe turret lathes.
- 1 refitted 15" x 5' American speed lathe.
- 1 new 12" x 5' Wells speed lathe.
- 1 new 12" x 4' Wells speed lathe.
- 1 refitted 11" x 4' bench speed lathe.
- 1 refitted 10" x 51" bench speed lathe.

DRILLS.

- 1 refitted 36" B.G. hand feed.
- 1 new 32" B.G. sliding head, Mechanics.
- 1 new 28" B.G. sliding head, Kern.
- 1 rebuilt 26" B.G. tapping attachment, Barnes.
- 3 new 26" B.G. sliding head, Mechanics.
- 1 new 25" B.G. sliding head, Kern.
- 3 new 24" B.G. sliding head, Cincinnati.
- 1 new 24" B.G. sliding head, Mechanics.
- 4 new 20" B.G. power feed drills.
- 1 refitted 20" W. & L. feed, Sibley & Ware.
- 4 new 20" power feed, Mechanics.
- 3 new 20" B.G. power feed, Mechanics.
- 3 new 20" friction, Mechanics.
- 2 new 16" lever feed, sensitive.
- 2 new 15½" combined drills and milling machines, Knight.
- 1 refitted 15" two-spindle, sensitive.
- 2 new 14" lever feed, Mechanics.
- 1 new 13" lever feed, sensitive, Reed.

H. W. PETRIE, Ltd.

Toronto Montreal Vancouver

for 1 x ¾-base; tire steel, \$2 for 1 x ¾-base; toe calk steel, \$2.45; machine steel, iron finish, \$2.20; mild steel, \$2.05.

Boiler Tubes.—The market is rather lower, quotations being as follows:—2-inch tubes, 8c.; 2½-inch, 10½c.; 3-inch, 11½c.; 3½-inch, 15c.; 4-inch, 19¼c.

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 \$1.05 and \$2.05 in wood, weights in both cases 350 pounds. There are four bags of 87½ 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 2½ cents for each, or 10 cents per barrel weight. American cement, standard brands, f.o.b. mills, 85c. per

TENDERS CALLED FOR

TENDERS



SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Cobourg Harbor Breakwaters," will be received at this office until 4.30 p.m. on Monday, June 29th, 1908, for the construction of two breakwaters at Cobourg, Northumberland County, Ontario, according to plans and specifications to be seen at the offices of H. J. Lamb, Esq., Resident Engineer, London, Ont.; J. G. Sing, Esq., Resident Engineer, Confederation Life Building, Toronto, on application to the Postmaster at Cobourg, Ont., and at the Department of Public Works, Ottawa.

Tenders will not be considered unless made on the printed forms supplied, and signed with the actual signatures of tenderers.

An accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, for thirteen thousand dollars (\$13,000.00) must accompany each tender. This cheque will be forfeited if the party tendering declines the contract or fails to complete the work contracted for, and will be returned in case of non-acceptance of tender.

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

By order,
FRED. GELINAS,
Secretary.

Department of Public Works,
Ottawa, May 28th, 1908.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.

TOWN OF OAKVILLE, PROVINCE OF ONTARIO.

WATER-WORKS AND ELECTRIC LIGHTING.

Notice to Contractors.

Sealed tenders will be received by the Chairman of the Board of Water & Light Commissioners until 8 p.m., on Tuesday, June 23rd, 1908, for the following works:—Contract "A," Pipelaying, 20,000 feet. Contract "B," Power House. Contract "C," Water Tower. Contract "D," Cast Iron Pipes and Specials. Contract "E," Fire Hydrants and Gate Valves. Contract "G," Electrically Operated Pumping Machinery. Contract "K," Electric Lighting and Power System. Contract "L," Sedimentation Basin.

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay Street, Toronto, or at Oakville on and after June 15th.

No tender necessarily accepted.

A. S. CHISHOLM, ESQ.,
Chairman of the Board,
Oakville, Ont.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
103 Bay Street,
Toronto, Ont.

June 9th, 1908.

TENDERS

ELECTRIC LIGHT EQUIPMENT LISTOWEL, ONT.

Tenders addressed to the Corporation of Listowel, will be received by C. A. Lee, Esq., Chairman of Electric Light Committee, Listowel, Ont., up till noon on Wednesday, June 17th, for Gas Producers and Engines, (or Boilers and Engines); Generators, Switch Boards and Transmission Supplies, etc.

For information apply to,

K. L. AITKEN,
Consulting Engineer, 1003 Traders Bank Bldg., Toronto.
Lowest or any tender not necessarily accepted.



TENDERS

Traffic Bridge, Broad St., Regina, Saskatchewan.

Sealed tenders will be received up to 4.30 p.m. of Monday, June 15th, 1908, for the construction of two reinforced concrete abutments and retaining walls for a highway bridge over Wascana Creek, on Broad Street, Regina, Sask., which tenders must be accompanied by an accepted cheque or other satisfactory deposit for the amount of \$2,000, payable to the Deputy Commissioner of Public Works. The deposits of unsuccessful tenderers will be returned when this contract is signed. The right to reject any or all tenders, and to waive any defects or irregularities therein is at the discretion of the Commissioner of Public Works.

Plans, specifications, form of tenders, and all information may be obtained on application to the undersigned. The unauthorized insertion of this advertisement will not be paid for.

F. J. ROBINSON,
Deputy Commissioner.
Department of Public Works, Regina, Sask.,
May 30th, 1908.



TENDERS

Provincial Legis'lative and Execu- tive Buildings for Saskatchewan

Sealed tenders addressed to the Deputy-Commissioner of Public Works, Regina, and endorsed on envelope, "Tender for Legislative and Executive Buildings," will be received by the undersigned up to 4.30 p.m., Monday, June 22nd, 1908, for the erection of the said buildings on the south side of the Wascana Lake at Regina. Each tender must be accompanied by an accepted cheque for \$100,000, payable to the Commissioner of Public Works at Regina, which deposit will be forfeited if the tenderer fails to execute the contract, and when requested, and will be returned to the unsuccessful bidders when the contract is signed. The right to reject any or all tenders and to waive any defects or irregularities therein is to be at the discretion of the Commissioner of Public Works. Plans, specifications and form of tender may be seen and all information obtained at the office of the undersigned or at the office of Messrs. E. & W. S. Maxwell, Architects, Montreal, after June 1st. A deposit of \$100 must accompany any application to remove plans and specifications from the office, and such privilege will only be granted to bona fide contractors for the entire work.

The unauthorized insertion of this advertisement will not be paid for.

F. J. ROBINSON,
Deputy-Commissioner of Public Works.
Department of Public Works, May 23rd, 1908.

CITY OF GUELPH.

NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned, will be received up to noon of **Tuesday, 16th of June**, for the teaming, excavation, laying and back filling for a 24-inch, earthenware, Water Conduit, 20,000 feet in length; and also for 3,000 feet of 12-inch Cast Iron Water Pipe.

Plans and specifications may be seen, and forms of tender obtained at my office or at the office of Davis & Johnston, Engineers, Berlin. The lowest or any tender not necessarily accepted.

J. J. HACKNEY, Manager,
Guelph Water Works.