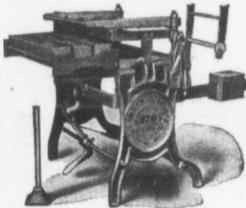


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*A Weekly Journal of Engineering, Public Works,
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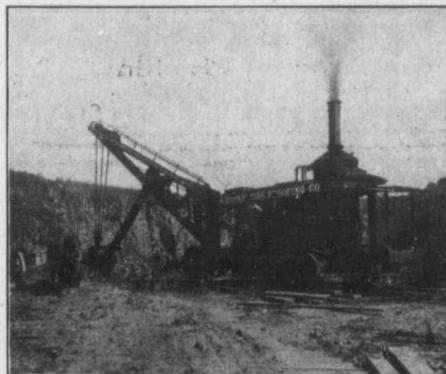
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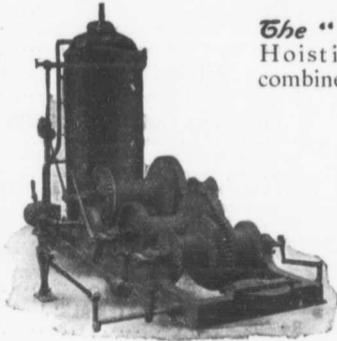
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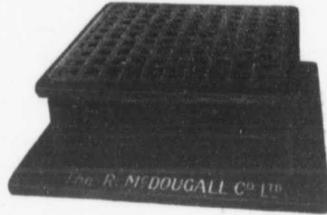
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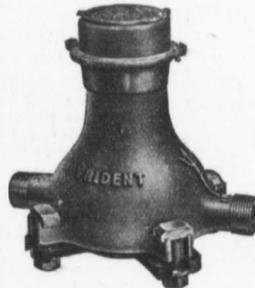
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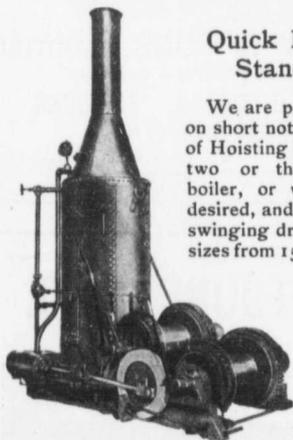
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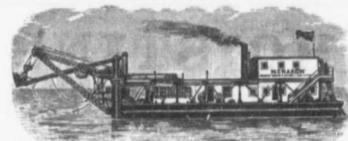
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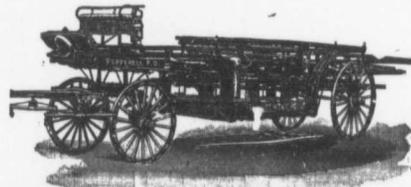


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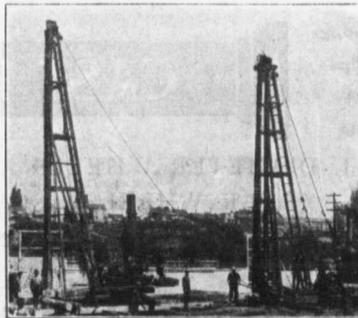
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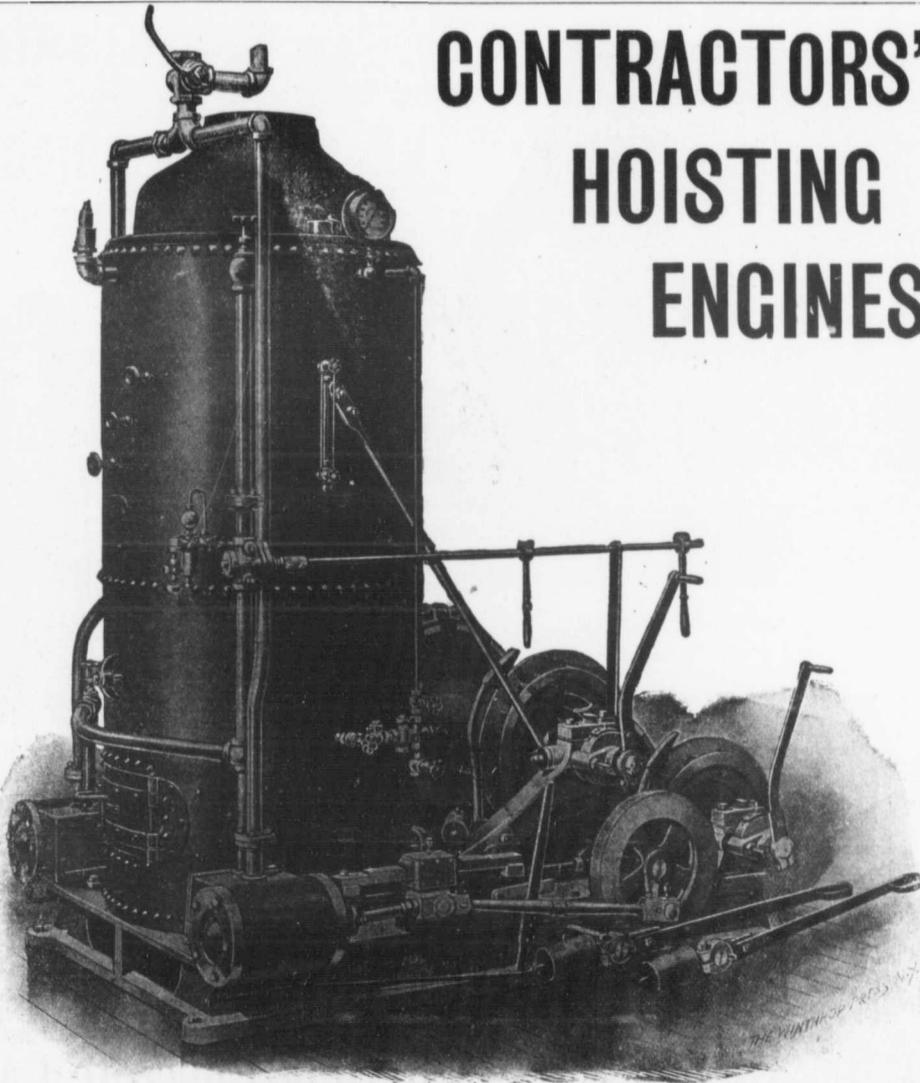
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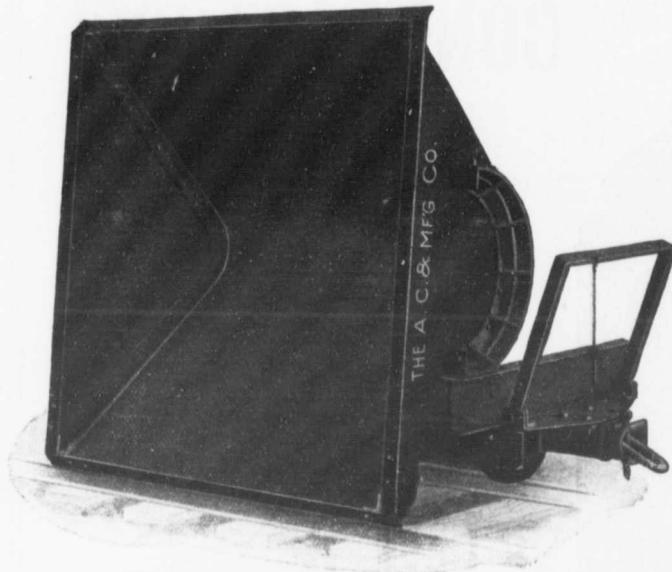
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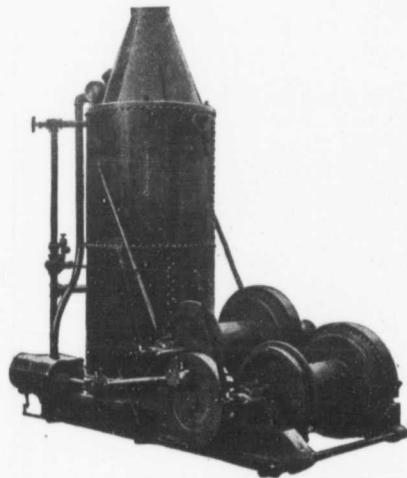
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PUBLISHED EVERY WEDNESDAY

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May Day's Labor Troubles.

May day will be a thing of the past before our next issue. Present indications are that it will see less labor trouble than in former years. Beyond the imminence of a clash between the C. P. R. and its mechanics, one hears but few reports of impending strikes. Lumber manufacturers of the east have been threatened with a little trouble, from the fall in wages, but even now reports indicate that the lumbermen of the east will be glad to accept employment at the reduced scales. From some quarters come reports of possible disputes in the building trades, but even they give evidence of being amicably adjusted by the relation of supply and demand. The laboring classes as well as the financial classes and the manufacturers have had the best of lessons during the past winter, and appear to be in almost every case in a conciliatory mood. The prospects, therefore, are for an easy solution of whatever difficulties may arise.

The difficulty between the C. P. R. and its mechanics, however, is just one of those which may cause serious injury to both sides, and be widespread in its effects. It is reported that the C. N. R. is ready to fall in line with the C. P. R., in case of a crisis. On the other hand, the mechanics are organizing as rapidly as possible for a determined effort to have their own way. The question at issue has been forced by a notice posted by the C. P. R. to the effect that after May 1st the present agreement regarding working conditions and wages will be no longer in force. At

present the C. P. R. has an agreement with each of the individual mechanical trades. The mechanics are, therefore, organizing for the purpose of effecting a change whereby in future any such agreement will have to be made with them as a complete organized body.

Statements by C. P. R. representatives high in authority are to the effect that the company is confident of its ability to weather a labor storm. They claim that if the mechanics decide to strike, they could not choose a worse time, than the present, when trade is dull and many of the men are being kept at work on short time for the sake of keeping the staff together. They report also that they have more cars and engines than they need at present, so that a tie-up of the mechanical departments would not disturb them greatly. The mechanics on their side report that they are as determined as possible, and that even if the Government's "Disputes Act" is invoked, they will not refrain from striking, in case it should result in a finding opposed to their claims. The most serious effect of the trouble, if allowed to come to a head, would be the likelihood of the employes in other departments joining the mechanics to assist them. At a time like the present, when industry in general is making an effort to shake off the troubles of the last few months, it would be folly to let a labor dispute add to the disturbing factors without every possible effort to prevent it.

Fatalities on Railroad Construction.

The great loss of life upon the construction work of the Grand Trunk Pacific should receive immediate attention, both from the Government and the contractors. It is impossible to say that any particular contractor is guilty of negligence without going specifically into the details of each particular case. Doubtless they are all just as careful as they are able to be, considering the great extent of work which at present has to be undertaken, and the speed with which it has to be pushed. But it is possible that in our feverish haste to build up the country and to cover it with railways, we may overlook the importance of human life until our attention is drawn to it by some appalling sacrifice. This has been the case in many instances of late. It does seem as though haste was being made too recklessly, or else inefficient men were being employed in connection with the work. Wherever the Government is able to step in for the protection

of the workmen, they will be applauded if they go to extremes on the side of safety. On one day of this month no less than thirteen men lost their lives in connection with the construction of the Grand Trunk Pacific. One of the accidents occurred as a result of the premature explosion of a blast of dynamite in the construction camp of Messrs. Murdock Brothers at St. Cajetan d'Armagh, Bellechasse County, when nine men lost their lives. Another accident was at the Grand Trunk Pacific crossing of the Battle river, where four men were drowned. An overloaded scow carrying the men across the river after the day's work upset in the swift current at mid-stream. It may be that in either of these cases, the men themselves were entirely to blame. The facts will all probably be brought out at the inquest. It remains true, however, that from day to day fatalities are chronicled in the press, which are occurring on the G. T. P. construction work. Nor is the death list confined alone to the Government's railway. Similar reports come from the construction camps of other railways. There is room for the appointment of a special commission to investigate the whole question of the safety of laborers upon railway construction work, on the result of whose findings the Government might be able to enact measures which, when put into force, would go a long way towards preventing the heavy death lists that now are being piled up.

Canada's Twentieth Century.

Canadians are so busy studying their own problems to-day and meeting the demands of the moment, that many of them fail to appreciate the position which Canada occupies in the business world of North America. Without any undue boasting, one can say that the backbone of North America to-day is not very far from the 47th degree of north latitude. Visitors from the United States are frequently heard to remark upon the stability of Canadian business, and to say that if Canadians can only keep up their end of the game, things will soon right themselves all over America. It is a queer change in the tide of affairs that this should have come about. We are so accustomed to drawing our commercial inspiration from the other side that we would scarcely realize the change, if it were not thus brought to our attention both by visitors and by the United States press. Already it begins to look as though Sir Wilfrid Laurier's prediction that the 20th century would be the century of Canada, is coming

true. The people of the United States have their own crop situation to fall back upon for comfort, but the effect of the stability of Canada during the last few months, when United States institutions were going to smash and many of the factories were laying off great numbers of employes, has been to enable them in some measure to stem the tide which looked for a time as though it might involve the country in a long period of depression. Reports from the Southern States say that even to-day commerce is badly crippled and the conditions of the unemployed are worse than we in the north can imagine.

Any one who doubts the importance of Canada as a factor in the commercial problems of to-day, has only to consider the light in which she is looked upon by the farmers in the Western United States. The migration of thousands of these farmers to the Canadian West is a sign which anyone can read. They have faith in Canada's future and do not hesitate to translate their faith into works. When the summer is past and the good crop has been gathered in, their faith will find its reward. What little chance there is to be taken, regarding the occurrence of a good crop, they are more than ready to assume. With the speculating blood of an American they do not wait for the proof of time. They are coming in as fast as they can in order to get as early a start as possible. If Canadians could all exhibit the same amount of faith in their own future, prosperity would return on faster wings than she is spreading just now.

The West on the Move.

Mr. F. W. Peters, of Winnipeg, assistant to Mr. Wm. Whyte, second vice-president of the C. P. R., speaking of Western matters recently to the Vancouver Province, said:

"Everything indicates that an era of phenomenal prosperity will prevail in Western Canada this year, owing to the outlook for the record-breaking crop. The weather is perfect, conditions now being one month ahead of those prevailing last year, and this spring the acreage under cultivation will be very vastly increased. The fears that there would be a shortage of seed has proved to be unfounded, the supply of good quality being ample for all purposes.

"While C. P. Railway construction this year will not be so large as in 1907, all pressing needs of the new provinces will be attended to. The Kirkella branch, which leaves the main line at Kirkella, and whose west-

ern terminus was formerly at Strassburg, is being extended as rapidly as possible four hundred miles beyond through a fertile region to effect a junction with the Calgary and Edmonton branch at Wetaskiwin. This line has now reached a point twenty-five miles west of the South Saskatchewan at Saskatoon, and a passenger service as far as railhead will be inaugurated in June.

Montreal Builders' Exhibition.

The second annual Montreal Builders' Exhibition attracted a great number of people. Last year the number of the exhibitors was about forty, but this year it is seventy-one, and all of the exhibits were of the highest interest not only to prospective builders, but to managers or stewards of large establishments, as everything pertaining to the comfort of a house was exhibited. At the formal opening, Mr. Thomas Forde, president of the Builders' Exchange, welcomed the visitors. Then a short address was given by Ald. Carter, who represented the Mayor, and another by Mr. I. Prefontaine, president of the Chamber of Commerce. Music was supplied by a good orchestra, and a series of living pictures, illustrating the building of a house, were shown on the screen. The exhibition continued till Saturday night and was well attended throughout. Those who exhibited are greatly pleased by the benefits secured in the way of publicity and increased enquiries and sales.

Toronto' Tax Rate Fixed.

Toronto's tax rate for the year has been finally fixed by the Board of Control at 18 1-2 mills. The estimated expenditure and receipts are \$6,555,000. The total assessment of the city for 1907, on which this year's tax rate will be collected, is \$206,200,000, and, on a basis of 18 1-2 mills, this sum will produce \$3,815,000. The revenue, other than from taxation, is estimated at \$1,740,000, or about \$100,000 over last year's figures, while the uncontrollable expenditure totals \$3,288,000, and controllable expenditure \$2,267,000.

Hamilton's Electric Contract.

The Hamilton City Council held a private meeting last week to discuss the Hydro-Electric power scheme. At the close of the meeting the Mayor stated that Hon. Adam Beck has made it clear that Hamilton would be the loser by delaying entering into a contract. There was a possibility

that if Hamilton did not enter now with the other municipalities the transmission line would be built six miles to the south. It was also made clear that the by-law passed by the ratepayers was sufficient for the Council to enter into a contract with the Commission. Mr. Beck was also alleged to have said that the Government would not go on with the contract unless the tenders, which would be advertised for next week, were below the estimates.

Labor Conditions for April.

The Labor Gazette for April says that in the mining industry the Nova Scotia collieries have been exceptionally busy, the output since the beginning of the year being in excess of that for the corresponding period of 1907. In Alberta and British Columbia, however, the collieries have been dull, though a steady revival in metal was reported.

The manufacturing establishments are counted quiet, but there has been an increase in railway traffic and the work of preparation for the opening of navigation gave employment to a large number of men. The unskilled labor market is more active and an abundance of employment is promised during the coming season for experienced men.

The financial position is regarded as sound, though money is still difficult to obtain on long time engagements.

Engineer Vantlet's Fees.

An Ottawa despatch says: Mr. E. H. Vantlet, civil engineer, of Montreal, was examined last week in the Public Accounts Committee at Ottawa in regard to the contract which was made with him in 1096 by the Public Works Department for the preparation of plans for a power dam at St. Andrew's Rapids, near Winnipeg. He had been employed in plan drawing by this Department from 1889 on, but never had done any work exactly similar to this at St. Andrew's Rapids, because there was nothing of the kind in existence in America. He was consulting engineer for the masonry work, but himself prepared the plans for the superstructure, for which he was to receive 5 per cent. of the contract price and a special allowance of \$600 to cover the expense of a trip to Europe, where he visited a couple of works on the Seine of a similar character. He had since been paid \$10,000 for the plans he had drawn and the improvements at St. Andrew's Rapids were now being made

NEWS OF THE BUILDING TRADE

Ottawa's New Station.

The following letter has been received by the Ottawa City Council from Mr. Hays of the Grand Trunk Railway.

"Referring to the extension of time which was given us by yourself and council for the purpose of submitting revised plans of the Ottawa station; I regret that, partly owing to my absence abroad for the last two months, from which trip I have only recently returned, and partly from other causes, among them the absence of Vice-President Fitzhugh, who has been dealing with the matter and is now away on account of ill health, we have been unable to complete revised plans for the station such as we feel satisfied to submit for the approval of yourself and council.

"I shall, therefore, be obliged if you will give us such further extension of time as may be consistent (not longer than June 1st) and we will do everything possible to put ourselves in a position to submit you revised plans by that date."

The hotel plan recently presented seemed to be viewed favorably by the city council and the company is said to be willing to go on with it as soon as the site legislation is passed while work, they say, will also be resumed on the baggage annex and foundations.

Saskatoon Building Extensively.

Reports from Saskatoon indicate no falling off in business activity but rather the reverse. Increased settlement promises renewed vigor and constant growth in the business life of the country, and the farmers who are now swarming in, furnish the guarantee that the particular district of which Saskatoon is the centre will continue its industrial and commercial progress for an indefinite period. While the building programme for the present season may not include a large number of banks, office buildings, hotels, and large structures of that character, it will "go heavy" on the residence or dwelling, the small store, and buildings in which a small amount of capital is invested. Three big railway companies have been pushing forward the work of laying their lines to and from Saskatoon, and intend to continue with more energy than ever before. The buildings to be provided by the Dominion and Provincial Governments for the use

of their various officials in the city mean a substantial addition to the business structures. In connection with the plan of municipal improvement great activity is likely to be shown. A very favorable sale of a bond issue amounting to \$408,000 has enabled the City Council to make up its mind definitely with regard to the need for following up the policy of improvement which was inaugurated about three years ago. Waterworks, sewers, electric light, streets and sidewalks are prominent items on the list.

Regarding the railways, the C. P. R. line from the east waits on the completion of the railway bridge across the Saskatchewan river in the northeastern portion of the city. It is expected that this structure will be completed during the present summer.

The G. T. P. bridge across the river at the south end of the city is practically finished, and construction trains are now running over it. Materials for pushing the work towards Edmonton have been sent on to the western prairie sections, and it is announced that the line from Saskatoon to the capital of Alberta will be completed this fall.

Builders' Wages Stay up at Hamilton.

No difficulty is expected in Hamilton this year between the contractors and the bricklayers although the Builders' Association have sought to have the bricklayers modify their demands. The bricklayers are at present working under an agreement for an eight-hour day, at 50 cents an hour. This agreement expires on April 1, 1909, and consequently for the next year there can be no trouble over hours and wages. At the same time the association recognized the setback which would be given to the building operations, because of the prevailing hard times, and approached the bricklayers to see if they would consent to work under the old agreement—eight hours per day at 47 1-2 cents per hour. The builders pointed out to the union that it would be to the benefit of the public for the lesser prices to come in force, and the association promised to give them every consideration in return for the possible reduction. The bricklayers considered the idea and finally refused to go back to the old rate of wages. The association also made similar representations to the brick manufacturers. Brick this year is selling at \$8.50. Be-

low Wentworth street the price is \$8.75, and below Sherman avenue \$9. The association asked the brick manufacturers to modify their prices and to make them as easy for the public as possible. The manufacturers declined, and the contractors will be forced to pay full prices for the brick and the laying of them.

The plasterers are still out, and there appears but little prospect of the strike coming to a speedy termination. The men state that nearly a month ago they appointed a committee to discuss the question with the bosses. The contracting plasterers, say the men, have taken no notice of the committee, and have made no effort to reach a settlement.

Cost of Toronto's Sea Wall.

The following detail of the cost of the proposed sea wall for Toronto has been submitted by Controller Ward: Queen's Wharf to 1,300 feet west, cribwork and concrete, \$31,725; from 1,300 feet west to the east end of the Exhibition grounds, \$61,300; from the east end of the Exhibition grounds to Dufferin street, under construction, \$40,000; from Dufferin street to Indian road, \$180,000; from Indian road to the Humber, \$147,000; total, \$460,125. If harborage is provided between Dufferin street and Indian road, \$252,000 additional, or a grand total of \$712,125. Controller Ward suggested that the sea wall by-law be submitted to the people on Saturday, June 27, but definite action was deferred.

Contract Awarded for Toronto Gap.

The contract for the construction of the new western entrance to Toronto harbor 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. The work in question means the construction of a splendid new western channel four hundred feet wide. In connection with the new western channel the city asked to have a tunnel constructed under it in order to provide for easy access to the Island by street car in the future. Messrs. Haney & Miller, of Toronto, tendered for the contract.

The entire village of Tofield, Alta., is being moved across the Grand Trunk Pacific.

The Neglect of Waterproofing.

Why is so little attention being paid to the crying need for waterproofing in connection with building work? asks L. E. Boyle in "The Architect and Engineer." Every possible precaution is taken against fire, while but scant consideration is given to that equally dangerous and far more insidious foe—water. Before the advent of steel framing and reinforced concrete the need for this protection could be neglected with more or less impunity; the use of steel, however, has introduced new problems, radically changing the whole situation and making the exclusion of moisture a matter of vital importance. Once let the integrity of the metal become affected by corrosion and there is no telling where the mischief will end or what disaster may follow. In view of this it would be but natural to assume that every precaution would be taken to give to structures the utmost degree of waterproofness possible, and that no reasonable expense would be allowed to stand in the way, especially as the steel must be hidden away where it cannot be subjected to periodical inspections. As a matter of fact less than a tenth of the thought and care that is given to fireproofing is usually bestowed on waterproofing, and in many cases the need for the latter is utterly ignored. When some catastrophe results from this blind disregard of consequences the subject will receive the attention it deserves. But in the meantime buildings are going up in large numbers without this all-important protection. It will be too late to waterproof them properly after they are finished, for perfect work requires planning conjointly with the planning of the building. It also requires the carrying of the waterproofing completely under and around the foundations, thus enclosing and insulating them in a watertight box. Obviously this must be done, if at all, when the foundations are being laid.

Unfortunately there exists a widespread but utterly mistaken impression that concrete is in itself waterproof. This impression is much less general amongst engineers than amongst architects. It is hard to understand how it can exist at all, as but little investigation is needed to show how unfounded it is. Concrete which is always exposed to the air will never be waterproof. To understand this one has but to remember that hydraulic cements are mineral glass, which swell and harden under water, and thus fill the voids of the aggregate. So long as the concrete remains un-

der water this condition continues. If, however, it is only part of the time under water and exposed to the air for the rest of the time, it becomes very difficult to keep it waterproof.

The absorptive power of ordinary concrete is from 2 per cent. to 25 per cent. of its weight of water. If by the use of proper materials and well-proportioned mixes we produce concrete having only 2 per cent. of absorptive power, practically no moisture would be apparent on the side exposed to the air if little or no pressure of water existed on the opposite side. In such a case a superficial observer would pronounce the material waterproof. If, however, any steelwork is embedded in the concrete it should always be borne in mind that the presence of even 2 per cent. of moisture is sufficient to set up corrosion of the metal. The elements entering into the making of concrete, such as the quality and proportion of the materials, the amount of water employed and the manner of mixing and placing the concrete, are all factors that vary so greatly that no two batches of concrete are ever exactly alike. It may be taken as practically impossible to secure a mass of concrete having even a uniform degree of waterproofness. Furthermore, even though we could turn out concrete which would be absolutely waterproof in itself, the fine hair cracks which always appear as the concrete contracts would be sufficient to carry the moisture to the embedded steel. Is it not obvious, then, that an effectual system of waterproofing is a vital necessity for all such work? And if necessary where there is little or no water pressure to contend against, how much greater must be the necessity where foundations are carried below ground water level.

The absorptive power of bricks is well understood, but even where these are used we still find as a rule waterproofing is conspicuous by its absence. When it is employed it is usually something ill-adapted for the purpose and incapable of standing the test when it comes. The bricks therefore are continually in a more or less water-soaked condition. What must be the effect on the embedded steel? No application to the metal of any waterproofing paint can protect indefinitely, especially under such conditions. The only safe course is to effectually and permanently shut out moisture from the whole foundation. This can be done; is it not time to make it the universal rule?

In the case of large buildings where steel frame construction is to be employed it is usual to call in a consult-

ing engineer, experienced in such work, to advise as to the design, proportions, etc., of this branch of the work. It is also usual to draw on the special knowledge of the sanitary engineer, the heating engineer and the electrical engineer. The work of the waterproofing engineer ranks in importance with the very first of these. The knowledge and experience of the consulting engineer is required to design steelwork which will be safe. The knowledge and experience of the waterproofing engineer is no less necessary to design and provide means for keeping it safe. Must we wait for some disaster to bring this truth home to us?

Apart from the danger of corrosion in the steelwork much might be said of the damage to brick, stone and concrete work by the action of the elements, which results in a gradual disintegration. It needs but a short walk through out streets to see abundant evidence of this. Few also realize how much of illness is attributable to the water-soaked condition of foundations and walls, or how much these water-soaked walls contribute to the difficulty of making a building warm in winter.

The fact is that while we have been making rapid strides in all other branches we have been standing still in this all-important matter of waterproofing. We have been blind alike to its necessity and its possibilities. Is it not time to bring this department abreast of other departments of building construction?

The West Toronto Public School Board is wrestling with the problem of providing more school accommodation. The proposal to amalgamate with School Section No. 29 of York is not favored, but many of the trustees think the new school should be in the western portion of the town, somewhere near the present Elizabeth street school. A suggestion has been made that a four-roomed addition be made to the Western avenue school. There are now almost enough pupils in the portable rooms at Western avenue to fill such a building, and this project would afford no relief to the over-crowded Carlton and St. Clair avenue schools.

The plan for a \$5,000 smallpox hospital for Hamilton has been submitted to the Finance Committee by the Board of Health, and the board has been asked to place all the tenders received for it before the committee at its next meeting.

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What the Railways are Doing

T. & N. O.'s Difficulties.

The report of the Temiskaming and Northern Ontario Railway Commissioners, just issued gives an idea of some of the difficulties under which railway construction was carried on last year. The chief engineer, Mr. G. A. McCarthy, writing on December 31st says: "The weather conditions along the line of railway since March 1907, have been, I believe, without parallel. The spring was the latest ever known. Snowshoes were used to advantage by members of survey parties of the National Transcontinental Railway near MacDougall's Chute as late as June 1st. Snow fell at Englehart to the depth of about nine inches on May 20th. Frost did not leave the ground so that ordinary grading could be economically done until well on in June. By this time the rainy season had set in and all operations of survey and construction were carried on under adverse conditions. At Englehart it rained in July 14 days, August 20 days, September 22 days, and in October seven days out of the first ten days of the month. These records are from engineers' diaries and can be relied upon. The swamps were full of water all summer. Streams did not fall to ordinary summer level, and generally all conditions were abnormal. When it is considered that on many other days of the month after the heavy rains, clay cuttings and swamps were too wet to work, it can be readily seen what a poor chance contractors had to get work done on time, or to carry on work economically.

"Until October laborers were exceedingly scarce, even at high prices. They kept moving continually from place to place and thus lowered their efficiency. For example, on the Kerr Lake branch in the month of August there were employed 602 men. A force of 162 men constantly employed would have been sufficient to have performed the same amount of work. On the Charlton branch in the month of July there were employed 760 men, while 197 men, if employed constantly, would have been sufficient. The difficulties confronting contractors became greater as we got farther north. Railway fares of a greater proportion of men were advanced by contractors hiring them. It is common for these men when they arrive at the different works to remain a very short time, often not working long enough to get out of the contractors' debt."

Speaking of the survey work, Mr. McCarthy says that three parties were sent out in the early spring to investigate the possibilities of a Sudbury-Cobalt line. One of them is still in the field investigating the country between Sudbury and Wahnapiatae lake. That portion of the country between Sharp Rock Portage and the north end of Obabika lake was found to be poorly mineralized. The country adjoining Round lake and the confluence of the Obabika and Sturgeon rivers proved similar to the Cobalt region. The rocks are well mineralized, and numerous veins of quartz carrying copper, iron pyrites as well as small quantities of galena were found.

A reconnaissance survey between the main line and Larder lake proved it possible to get a line at a reasonable cost with fair grades and curves, but it was decided not to make location until the country had become more developed. It was also found that no trouble would be experienced in furnishing railway facilities in the Portage Bay and Montreal river district.

C. P. R. to Mine Coal.

It is reported from Vancouver that the Canadian Pacific Railway will soon be an extensive producer of coal and coke. On January 1st next its agreement with the Crow's Nest Pass Coal Company prohibiting it from engaging in coal mining in the Crow's Nest district will have expired. The transportation company is now engaged in opening up a coal mine at Hosmer, where the erection of many of the buildings to be used in connection with the industry has already been expended in plant and equipment.

Mr. W. H. Aldridge, Managing Director of the Canadian Consolidated Mining & Smelting Company, who is acting as chief consulting engineer for the Canadian Pacific Railway owns an area of 4,000 acres of coal lands which are being opened up by a force of 500 men. He says further that good progress is being made. Many of the buildings have been completed and the town has already attained quite a respectable size. Plant and equipment will cost about \$1,500,000. A system of compressed air haulage will be installed in the mine which is being developed by two cross-cut tunnels, each 2,800 feet long. These workings will intersect twenty coal seams embraced in the series. Six or eight of these are first-class

workable seams. Shipments of coal will be commenced next January and will be gradually increased until an output of 3,000 tons a day is maintained. The company this summer will complete the erection of two hundred and forty coke ovens with a daily capacity of three hundred and sixty tons of coke.

The railway company in view of this undertaking is introducing a new type of steel coke car with a capacity of forty tons as compared with the old wooden box cars that only hold twenty two tons. The use of the more modern car will effect a large saving in the costs of handling the big tonnage of coke which is shipped to the smelters at Trail and the Boundary district. The Canadian Pacific Railway also owns forty square miles of coal lands on Elk River, forty miles north of Michel, in the Crow's Nest district. The development of these locations will no doubt follow in time, but the question has not yet been seriously considered.

There is no labor trouble in the Kootenays, concluded Mr. Aldridge. The relations between capital and labor are friendly and promise to continue so. There are 1,150 men on our payrolls at Rossland, Trail and Moyie.

Heavy Works on the G. T. P.

It is stated that the section of the Grand Trunk Pacific Railway between Tobique river and Grand Falls, to be built under the contract recently awarded to Willard Kitchen, of Fredericton, N.B., is the heaviest work on the road east of the Rocky Mountains. There are thirty-one miles to be built under Mr. Kitchen's contract, and the job will cost between \$1,500,000 and \$2,000,000. On the contract are two of the longest bridges in this section, one across Salmon river and the other across the Tobique. The engineering difficulties are many, one being a tunnel through solid rock more than 1,000 feet long, and another is the disposal of a lake. It is not expected that work will be well under way before May 1st. A large portion of the work will be let out on sub-contracts.

Hugh Sutherland, financial agent for Mackenzie & Mann's interests, says that the plant of the Atikokan Iron Company will resume operations immediately after the opening of navigation.

Quebec Bridge Problem.

Emphatic denials have been given to reports that the rebuilding of the Quebec bridge is to be turned over to the Grand Trunk Railway by Hon. S. N. Parent, chairman of the National Transcontinental Commission, and president of the Quebec Bridge Company, as well as by other officials. Mr. Frank W. Morse, vice-president and general manager of the Grand Trunk Pacific, declined to discuss the matter at all. The report was apparently started by a reduction in the clerical forces caused by the fact that there was no bridge and no work to do.

It is said that when the work is resumed it will probably be under the direct control of the Government, which is putting up the money. The bridge company is endeavoring to secure further plans from the Phoenix Bridge Company, based on the experience so disastrously gained with the sunken structure, and these will be submitted to the Government for approval.

C. P. R. Replacing Old Bridges.

The Canadian Pacific Railway has men already at work upon the new steel bridges in the West which are to replace the old structures. From Calgary to the Coast all the wooden spans and trestles will disappear during the coming summer, and in their place substantial steel structures will appear. In the Kootenay district alone large forces of men are engaged in erecting four new bridges. At Alamo, on the Nakusp and Slocan line, the new bridge is 70 feet long, and will be completed in two weeks' time. On the Slocan lake branch at Lemon Creek a new steel bridge 110 feet long will be finished about the same time. At Murphy creek, on the Rossland branch, a span 102 feet long has just been completed. The big bridge at Stony Creek, just north of Trail, will be ready inside of a month. This structure is 508 feet long, and has towers 90 feet high.

Sault Rail Mill Closed.

The steel rail mill of the Algoma Steel Company, one of the subsidiary companies of the Lake Superior Corporation at Sault Ste Marie, has closed down for an indefinite period. Various rumours have been afloat regarding the move. Some reports had it that the plant had passed into the hands of the Steel Trust, and others that Mr. F. H. Clergue had associated his interests with the Steel Trust, and had succeeded in acquiring control of a sufficient amount of stock to practi-

cally control the plant. These rumours were denied by Mr. D. D. Lewis, superintendent of the Algoma Steel Company who said: "At noon on Saturday, April 18th, the following notices were posted throughout the plant, 'Owing to the unexpected condition of the rail market, the open hearth plant, Bessemer and blooming mill will suspend operations on Saturday. The rail and finishing mill will continue operations to complete the present orders. Notices will state when the works will resume.'

"This notice was a surprise and disappointment to employees of the company, as it was so unexpected. The necessity of these notices was forced on the company so suddenly that they had no alternative, owing to the conditions of the rail market and the failure of orders already arranged for to materialize."

Mr. Lewis has assured the men that just as soon as orders will materialize notices will be posted when works will resume. In the meantime, it is the intention of the company to take care of as many men as they can with the opening of navigation, as they will begin to receive ore and deliver rails, which are now piled in the yard waiting for the opening of navigation.

The blast furnaces will not be affected by the temporary suspension of the mill, but will keep on and accumulate a stock of iron, when the company will be strongly entrenched for a successful campaign after starting.

Mr. Lewis said also "that the Algoma Steel Company has fared better than any rail mill on the American continent since the depression in business and the financial stringency which the country is now experiencing. As a matter of fact there are rail mills in the United States which have scarcely done anything since November, and I feel that with the coming of Spring and the opening of navigation these conditions cannot last long."

The contract for grading on the Mother Lode spur of the Canadian Pacific Railway has been awarded to W. P. Tierney & Company, of Nelson, B. C. The contracts cover, besides this work, the filling in of several large bridges between Castlegar and Cascade, which will practically eliminate bridge work from the Columbia Western division of the Canadian Pacific Railway. The company expect to have all bridges on this division filled this year. The new contract was awarded last week.

Huge Reinforced Concrete Bridge.

The proposed erection of a bridge over the Spuyten Duyvil Creek at New York gives a striking illustration of the change brought about in the possibilities of concrete construction, by combining it with steel. The main arch is to have a span of 703 feet from abutment to abutment. When it is remembered that the span for a concrete arch at the present time is 233 feet, the magnitude of the task will be realized. The distance from centre to centre of the abutments is 725 feet. The rise of the arch from centre to centre is 177 feet, and its width is 70 feet. At the crown it is 15 feet thick and at the abutments 28 feet. The shape of the rib has been so designed that tension can occur nowhere in it. The immense dead weight makes this possible, the effect of the live load being so small that it might almost be neglected. The steel reinforcing ribs that are built in are not therefore intended to take tension load as in some reinforced concrete construction, but simply relieve the compressive strain in the concrete. The shape of the arch is very closely that of a circular arc. The working stress allowed in the concrete was 750 pounds per square inch, and its modulus of elasticity was taken as 2,000,000 pounds per square inch. The design of this arch was effected largely by a series of approximations, the proportion of steel, this not being required to take tension, being decided by the question of cost. This proportion will probably average about 1.34 per cent. The weight of the steel in the arch is about 8,500 tons.

C.P.R. Employees May Organize.

Employees of the Canadian Pacific Railway at Vancouver held a meeting last week, at which it was decided, to inaugurate a movement, looking to the immediate organization of all skilled labor employed in the mechanical departments, all over the line. The officers of the organization would have power to represent the various trades in negotiations with the company. The reason for the amalgamation of interests is the recent notice of the Canadian Pacific Railway that it will withdraw on May 1 from the wage and working agreements which it has with the employees. At present these agreements are between the company and the various trades as such. Resolutions were passed, and copies forwarded to all the Canadian Pacific Railway organizations of employees in Canada.

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

CONTRACTS OPEN.

Aberdeen, Sask.

The town council have issued debentures for \$3,000 to provide for the erection of a school house.

Alberni, B.C.

It is stated that an American firm, E. R. & A. Burkholder, of Canada, Kansas have purchased nineteen sections of timber lands near the Alberni canal and thirty-seven sections at Nookta Island, and that they will erect large plants at both places.

Brandon, Man.

The Brandon Curling Club will build a new rink for next season. T. Bronson is secretary.

Brantford, Ont.

The City Council have granted a fixed assessment of \$6,000 for ten years on the new \$30,000 theatre to be erected this summer.

Canora, Sask.

F. R. Evans, architect, Winnipeg, is taking tenders this week for the erection of a brick school at this town.

Carman, Man.

W. A. Finch will receive tenders up to May 15th for the erection of a school building. Plans may be seen on application.

Chatham, Ont.

J. L. Wilson, Son & Arnold were the successful architects for the new St. Andrews Sunday school. Tenders will be taken at the earliest possible date. The building will be steam heated and lighted by electricity.

Calgary, Alta.

P. A. Rodrigue, of this city, has applied to the council for permission to construct a street railway system, for which he has submitted plans. The matter is in abeyance.

Duck Lake, Sask.

The Bank of British North America have purchased a site for the erection of a two-storey brick building this summer. Estimated cost \$9,000.

Daysland, Alta.

Tenders are invited up to May 1st for the erection of a school building. Plans may be seen at offices of Roland W. Lines, architect, Edmonton, and H. Bently, Chairman of School Board, this town.

Duncan's Corners, B.C.

The B.C. Telephone Company will build a long distance line to Victoria, 42 miles distant. F. Halse, Vancouver, is superintendent.

Davisville, Ont.

The firehall will be put into good repair and sheeted with metallic roofing.

Edmonton, Alta.

H. G. Legrand, of Montreal, chief bridge designer of the G.T.P., recently returned to this city after an inspection of the site for the proposed Pembina river bridge. Mr. Legrand is making a tour of inspection in connection with bridge work to be started this summer.

Fort Francis, Ont.

Russell Brothers purpose erecting a large machine shop and iron foundry this season.

Fort Qu'appelle, Sask.

A new telegraph office will be erected here this season at a cost of \$2,000.

Fort William, Ont.

E. C. Hacquoil has taken out three permits for dwellings on Amelia street; total value \$10,000. F. W. Fraser has secured a permit for a brick veneer house to cost \$3,600. J. Dyke has secured a permit for improvements to the Central Book Store and Hinners & Jones' store; cost \$5,000.

Fergus, Ont.

Beatty Brothers will erect a one-storey stone addition, 55 feet by 100 feet, to their factory. Tenders are now being taken.

A rural telephone company has been organized by J. C. Templin to connect with Eramosa, Nichol and Larafrade.

Guelph, Ont.

The special committee of the council have presented a report recommending the erection of an abattoir to cost \$2,500.

Hamiota, Man.

The ratepayers have approved a bylaw to raise \$6,000 to build an addition to the school.

Hamilton, Ont.

E. S. Barrow, City Engineer, has estimated the cost of constructing a wooden bridge over the railroad tracks at Garth street at \$6,000 and a steel bridge at \$11,000.

Recent building permits include: F. Rastrick & Sons, brick house, Jackson street, between Queen and Ray streets, for John Logan, \$2,000; G. E. Mills, two brick houses, on Fairview avenue between King William and Wilson streets, \$4,000.

Indian Head, Sask.

The ratepayers have approved bylaws to raise \$10,000 for extension of waterworks, \$10,000 for electric light, \$53,000 for waterworks and other purposes and \$12,000 for the erection of a firehall.

Killarney, Man.

It is stated that Skinner & Colison, of Estevan, Sask., will install an electric light plant here.

Kamloops, B.C.

The British Columbia Telephone Company contemplate the installation of a cable telephone system at this place. They are also planning to construct telephone systems in Fruitlands and Tranquille. G. C. Hodge, Nelson, B.C., is district superintendent.

Lang, Sask.

A rural telephone company is being formed to build about 48 miles of pole line. W. Franks is interested.

Ladysmith, B.C.

The town council have engaged engineer Mahone, of Victoria, to prepare plans for a sewerage system.

Lumsden, Sask.

It is stated that plans are being prepared for the erection of a new public school.

The organization of a telephone company is in progress and it is hoped to have a complete local system installed by the end of the summer.

London, Ont.

S. Baker, City Clerk, gives notice of the civic intention to carry out tile sewer construction on Maitland street, between Grosvenor and Cheapside, and asphalt block pavement on Carling, between Ridout and Talbot.

A. O. Graydon, City Engineer, will receive tenders up to May 4th for asphalt pavement on Queens avenue and Adelaide street.

The water commissioners will ask the city council to submit to the ratepayers a by-law to carry out the Mowry water scheme, estimated to cost

\$56000. This project provides for taking in the whole Mowry North Branch filtration and Kilworth springs, which will provide 500,000 gallons of spring water daily.

Mallorytown, Ont.

W. A. Lewis is applying for the incorporation of the Mallorytown Independent Telephone Company, who hope to start construction work at an early date.

Moose Jaw, Sask.

A by-law to raise \$35,000 for the erection of a firehall will probably be submitted to the ratepayers.

Markdale, Ont.

On May 4th the ratepayers will vote on a by-law to provide for the installation of waterworks and fire protection.

Meaford, Ont.

Tenders for the erection of a new town hall were recently opened, but in all cases were found to greatly exceed the estimates. Architect Ellis, of Toronto, will probably be asked to prepare new plans and specifications for a building not to exceed \$15,000.

Montreal, Que.

The City Surveyor has presented his report to the Roads Committee asking for nearly \$3,000,000 for improvements to roads, pavements and sewers. The items include \$1,663,750 for permanent pavements, \$133,000 for construction of brick sewers, \$55,000 for flagstone crossings, \$25,000 for street gulleys, \$25,000 for purchase of paving blocks for car tracks and \$18,000 for new machinery.

Markland Molson has taken out a permit to reconstruct a warehouse on Notre Dame street east, owned by the Molson estate; estimated cost \$40,000.

Niagara Falls, Ont.

The commissioners of Queen Victoria Niagara Falls Park will receive tenders up to May 5th for brick paving driveway at Table Rock. James Wilson is acting superintendent.

North Toronto, Ont.

W. J. Douglas, Town Clerk, gives notice of the civic intention to carry out various extensions to the waterworks. Estimated cost \$5,000.

New Westminster, B.C.

At a special meeting of the City Council and officials of the B.C. Electric Railway Company it was stated by J. Buntzen, managing director, that the London, Eng., directors of the company would take up the matter of building a new dam at Coquitlam lake.

A bylaw to raise \$75,000 for civic improvements will shortly be submitted to the ratepayers.

Assurance has been received from the Ottawa government that between

one and two million dollars will be expended within a year upon harbor improvements here. The Fraser river is to be deepened and a jetty three miles long erected at the mouth of the river.

Two new industries will probably be started here at an early date, F. Page planning the erection of a pulp mill and Ewen Martin the installation of a plant for manufacturing tile pipe and brick.

Ottawa, Ont.

Tenders will be received by Fred Gelinis, Secretary, Department of Public Works up to May 15th for dredging Tiffin and Victoria harbors and at other points.

Recent building permits include: S. J. Willoughby, three brick veneered dwellings, Elm street, \$4,500; Ottawa Free Press, alterations to building, Sparks street, \$2,500; G. W. Clauson, double brick dwelling, Division street, \$2,500; James Harvey, seven brick veneered dwellings, Nepean street, \$15,000; Chas. Mathews, solid brick dwelling, Monkland avenue, \$7,000; John Fudge, brick veneered dwelling, Woodbridge avenue, \$2,300; John Foley, brick dwelling, Laurier avenue, \$6,000.

Oak Bank, Man.

The rural municipality of Springfield are considering the installation of a telephone system this summer. C. Christopher is secretary and treasurer.

Owen Sound, Ont.

Oswald Hinds, of Manitowaning, will erect a two-storey brick business block with stores.

Port Arthur, Ont.

The city are contemplating the raising of Onion Lake dam on Current river by eight feet to increase the water storage for the power plant, estimated to cost \$10,000.

Port Stanley, Ont.

W. G. Murray, architect, Masonic Temple Building, London, has just taken tenders for the erection of a brick and concrete building for the Standard Implement Company.

Portage la Prairie, Man.

Plans for the \$100,000 training school to be erected here by the provincial government have been deposited in the office of Hugh Armstrong, M. L. A. Tenderers' specifications will follow at an early date. A large power house to contain heating and lighting plants will also be erected.

Peterborough, Ont.

Tenders have just been taken for the erection of the new Peterborough curling rink. W. G. Morrow is chairman, building committee, and Belcher & Heathcote are the architects.

The George street Methodist church will be enlarged at a cost of \$2,000.

Palermo, Ont.

An independent telephone company is being organized at this city by Dr. Buck. Plans call for lines to connect Palermo, Omagh, Bronte, Postville and Drumquin. It is expected that financial arrangements will be completed by the beginning of May. Construction will be started as soon as the necessary supplies can be obtained.

Pincher Creek, Alta.

The installation of an electric lighting plant here is contemplated. Mayor Scott is interested.

Penatanguishene, Ont.

Rev. H. M. Little, Secretary, Public Library-Board, wants tenders up to April 29th for the erection of a Carnegie Library building. J. B. Jennings is chairman of the board.

Prince Albert, Sask.

C. O. Davidson, Secretary-Treasurer, invites competitive plans up to May 11th for a high school building not to exceed \$75,000.

Quebec, Que.

The Board of Trade have approved a scheme for the erection of a large temporary hotel for the tercentenary celebration. \$5,000 has already been subscribed and the C.P.R. have promised a liberal contribution if the project is adopted by a capable and responsible company.

The officials of the Marine Department have been notified that the new light house at Point DuLac has been carried away. Several piers have also been damaged.

Rainy River, Ont.

The International & Rainy River Telephone Company contemplate the building of several extensions this summer and the installation of a local system at Emo.

Stratton, Ont.

The rural telephone system at this town, owned by Ostor Brothers, is to be considerably enlarged.

Sydney, C.B.

The Carlin block, owned by A. Kirk, of Antigonish, has been condemned by City Engineer Torston. The estimated cost of renovation is \$5,000 to \$6,000.

St. John, N.B.

The school trustees will secure estimates for the renovation of the school buildings recently condemned.

Sandwich, Ont.

It is reported that plans are being prepared for sewers in the business section of the town.

Stavelly, Alta.

Hodson & Bates, architects, Calgary, have just taken tenders for the erection of a solid brick school here.

Toronto, Ont.

C. J. Gibson, architect, 75 Yonge street, will receive tenders up to May 2nd for various trades in the erection of a bakery on Bloor street west for the Bredin Bread Company, Limited.

At a recent conference of representatives of the Board of Control, Board of Education and other interested bodies, held to discuss the erection of the new technical school, it was decided that the Board of Education should ascertain the cost of a site on Sussex avenue, a location that received general approval.

Tenders will be received by Joseph Oliver, Chairman, Board of Control, up to May 5th for supply of wire for high pressure signal boxes. Specifications at office of fire department, Richmond street firehall.

C. E. Ryerson, Secretary-Treasurer, Toronto Public Library, will receive tenders up to May 4th for all trades in the erection of a branch library corner Queen and Lisgar streets. Plans may be seen at office of city architect.

The Sunbeam Incandescent Lamp Company, of Canada, Limited, Traders Bank Building, have purchased a site on Dufferin street for the erection of a factory.

The Blackwell Varnish Works Company propose to erect a brick factory, 40 feet by 100 feet, on Wallace avenue. The estimated cost of the plant is \$40,000.

The Canada Life Assurance Company will erect four stores at Bay street, north of the old Molsons Bank building.

The Grand Trunk Railway have decided not to rebuild their elevator at the foot of Brock street recently destroyed by fire.

The Board of Education will ask the Board of Control for a grant of \$75,000 to carry out the purchase of a new site between Sussex and Brunswick avenues for the proposed technical school.

Recent building permits include: A. Stewart, two pairs semi-detached 2 storey brick dwellings, Arthur street, \$8,000; H. W. Jakeway, 2 storey and attic brick dwelling, corner Dewson and Delaware, \$3,800; R. C. Vaughan, three attached 2½ storey brick dwellings, Huron street, \$12,000; James Burns, 2½ storey brick dwelling, Springhurst avenue, \$4,000; H. E. Asselstein, 2 storey and attic brick dwelling, Geoffrey street, \$3,500; Orr Bros., Limited, one pair semi-detached 2 storey and attic brick dwellings,

Shaw street, \$6,000; J. A. Goddard, 2 storey brick dwelling, Wright avenue, \$2,500; Wm. E. Castell, four detached 1½ storey roughcast dwellings, Campbell avenue, \$3,000; Wm. Dunseath, 1 pair semi-detached 2 storey and attic brick and stone dwellings, corner Concord & Northumberland avenues, \$4,500; Wm. Barrett, 2 storey brick store and dwelling, Christie and Garnet, \$2,500; H. Kemp, 2-storey brick store and dwelling, Bloor and Clinton streets, \$4,000; Love Bros., 1 pair semi-detached 2½ storey brick stores and dwellings, Broadview avenue, \$6,000; Fred S. Duff, 2½ storey brick dwelling, Beatrice street, \$3,800; A. Moore, 5 attached 2½ storey roughcast dwellings, Morley avenue, \$5,000; W. Friend, 1 pair semi-detached 2-storey brick veneer dwellings, Jones avenue, \$2,500; Fred S. Duff, 2½ storey brick dwelling, Beatrice street, \$3,500; Allan Houden, 2 storey brick veneer dwelling, corner Perth avenue and McCauley street, \$2,000; George Barrett, four attached 2½ storey brick dwellings, Borden street, \$9,000; W. Allan, 2 storey brick dwelling, Parkway avenue, \$3,000; F. J. Sale, 2½ storey brick dwelling, Indian Grove, \$4,000; H. P. Squires, 2 storey and attic brick dwelling, Palmerston boulevard, \$5,500; Joseph Russell, one pair semi-detached 2 storey brick dwellings, Smith street, \$10,000; W. Shaughnessy, one pair 2 storey roughcast dwellings, Audley avenue, \$2,000; G. Brady & Son, 2 storey brick dwelling, Galloy avenue, \$3,000; Geo. McWilliams, 2 storey brick dwelling, Armstrong avenue, \$2,300; C. Kigg, 2 stores brick dwelling, Dupont street, \$2,200; W. A. Murray, 2 storey, brick stable, Ontario street, \$15,000; College Street Methodist Church, 2 storey brick and stone church, Sheridan & College streets, \$30,000; Geo. Lattimer, 1 pair semi-detached dwellings, Lakeview avenue, 5,700; Wilkins & Company, 3 pair semi-detached 2½ storey brick dwellings, Avenue road, \$15,000; J. L. Nichols Company, Wellington street, addition to factory, Wellington street west, \$4,500; Empey & Hammer, 3 attached, 2 storey, brick dwellings, Wallace avenue, \$6,000; W. C. McTaggart, 1 pair semi-detached, 2 storey brick stores and dwellings, Bloor street west, \$6,000.

Victoria, B.C.

A fine new building to cost \$12,000 will be erected on Cormorant street for the Chinese Girl's Rescue Home.

The Mahon Block, recently destroyed by fire will be at once rebuilt by the owner. W. Ridgway Wilson is the architect.

Tenders are being taken by the B.C. Agricultural Association for their new buildings. H. Frame, architect, prepared the plans.

Plans for the proposed sanitarium have now been completed by the architects, Dalton & Eveleigh, of Vancouver. The entire cost of the structure will be \$75,000.

The ratepayers have approved by-laws for the following purposes; to raise \$70,000 for school buildings and site in the north end; \$70,000 for high pressure salt water system for fire protection; \$20,000 for additional fire halls and apparatus, and \$50,000 for extensions to sewerage. No delay will be made in commencing the various works.

Vancouver, B.C.

Parr & Fee, architects, Granville street, will receive tenders up to May 16th for the new Calori hotel to be erected corner of Powell and Alexander streets.

Tenders will shortly be called for the enlargement of Christ church. Dalton & Eveleigh are the architects.

Arrangements are being made for the erection of a Methodist church in this city to cost \$100,000. Rev. A. N. Sanford is interested.

Tenders will shortly be taken for the construction of a 13 storey steel office building for the Imperial Trust Company.

Recent building permits include: H. P. Leck, two frame cottages, Cotton and Parker streets, \$2,000; W. A. Miller, frame dwelling, Barnard street, \$1,800; J. A. Harron, frame dwelling, Eighth avenue, \$1,600; Joseph Clarke, frame cottage, Keefer street, \$1,400; V. W. Haywood, brick store and apartment building, \$20,000; J. W. Parker, frame dwelling, Clark Drive, \$2,600; F. J. Tripp, frame dwelling, Eighth avenue, \$1,600; William Richardson, Pender street, \$2,000; Grant McArthur, frame restaurant, Westminster avenue.

J. W. Weart, Manager, Imperial Trust Company, states that bids will probably be received in October for the erection of an office building, to cost about \$300,000.

Winchester, Ont.

Thos. H. Dunn, Town Engineer, will receive tenders up to May 1st for construction of 43,000 square feet of concrete sidewalks.

West Toronto, Ont.

At the initial meeting of the new city council, the need of a general hospital was one of the primary subjects to be introduced by Mayor Baird.

(Continued on page 21.)

TENDERS AND FOR SALE DEPARTMENT

T. H. BAMFORTH,
Architect, North Bay,
will be pleased to receive catalogues concerning the
building trades. 18

TENDERS

Sealed tenders, addressed to W. Calder, Esq., Mayor of Durham, Ont., will be received not later than **SATURDAY, MAY 27th**, for the building of a Reinforced Concrete Arch Bridge of 42' span, with retaining wall approaches, in the Town of Durham. About 800 cubic yards.

Plans and specifications may be seen at the Mayor's office or at the offices of the Engineers.
BOWMAN & CONNOR,
Engineers,
W. CALDER, Mayor, 36 Toronto St., Toronto,
Durham, Ont. and Berlin, Ont.

City of Medicine Hat.

For Drilling Gas Well

Tenders will be received at the office of the City Engineer up to 12 o'clock noon of **MAY 18th, 1908**, for the drilling of an 8-inch Gas Well to a depth of 1,100 feet more or less. Specifications and forms of tender may be had at the office of the City Engineer.

W. P. MORRISON,
City Engineer. 20

NOTICE

Drainage Contract

Sealed tenders will be received by the undersigned up to 12 o'clock noon of **MONDAY THE FIRST DAY OF JUNE, A.D., 1908**, for the construction of the Grantley Creek Drain in the northwest part of the Township of Osnabrock and northeast part of the Township of Williamsburg (about six miles from Chesterville, on C.P.R.) Engineer's estimate of total work, \$14,106.77. Parties tendering will please state whether dredge or team work is intended. An accepted cheque for one-tenth the amount of tender will be required as a deposit.

Tenders for culverts in the Township of Osnabrock will be accepted at the same time and subject to the same conditions, but need not necessarily accompany tender for excavation. Plan, profile, etc., can be seen with the undersigned or with Magwood & Walker, Engineers in charge, Cornwall, Ont.
(The Township of Williamsburg build all culverts in the said township by arrangement.)

The lowest or any tender not necessarily accepted.
H. E. HODGINS, Clerk.
Osnabrock Centre, Ont. 20

NOTICE

Sealed bids will be received at the office of the City Clerk of Vancouver, British Columbia, up to noon of **SATURDAY, APRIL 27th, 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 superstructures of new bridges over False Creek, at Westminster Avenue and Granville Street has been extended to noon of **SATURDAY, MAY 16th, 1908.** 20

TENDERS

Sealed tenders, marked "Tender for Pavement," will be received by the undersigned up to 6 p.m. **FRIDAY, MAY 15th, 1908**, for about 6,000 sq. yards of Vitriolized Brick Pavement with Cement Curb on Main Street, Petrolia.

Plans and specifications may be seen and form of tender obtained at the office of the Town Engineer or at the Town Clerk's office.

The lowest or any tender not necessarily accepted.
J. McHATTIE, Town Clerk,
Petrolia, Ont. 18

CITY OF PRINCE ALBERT SASKATCHEWAN

Waterworks and Sewerage Department

Sealed tenders will be received by the Secretary-Treasurer of the City of Prince Albert until 8 p.m. on **FRIDAY, MAY 15th**, for the following:

Extensions to Water and Sewerage Works

Laying 11,420 lineal feet of Water Pipes and Connections
17,350 " " Sewers with Brick Man-holes,
Catch Basins, etc.

Plans and specifications may be seen at the Office of the City Engineer in the City Hall, Prince Albert, after April 13th. No tender necessarily accepted.

R. S. COOK, Mayor, **F. A. CREIGHTON,** City Engineer,
C. O. DAVIDSON, Secretary-Treasurer. 18



Temiskaming and North- ern Ontario Railway Commission

Sealed tenders, addressed to the undersigned, will be received up to Twelve o'clock noon, Thursday, May 7th for the following works. Tenders to be marked on envelope.

Frame Stations—Moose Lake and Dane.
Frame Freight Shed—Haleybury.
Waiting Room—Thornlie.
Two Water Tanks.
Five Sections Houses.
Brick Office and Stores—Englehart.
Painting Stations—North Bay to New Liskeard.
Ice House—Englehart.
One Forty ft. Concrete Arch—M.P. 184.
Two Ten ft. " Culverts—M.P. 210—212.
One Ten ft. " " —M.P. 118.
One Five ft. " " —M.P. 64½.
Three Abutments at Englehart and Krugerdorf.

Plans may be seen and specifications and forms of tender obtained, at the offices of the Commission, 25 Toronto Street, Toronto, or at office of Chief Engineer, North Bay.

An accepted cheque, on a chartered bank, equal to amount of security as shown on form of tender, must accompany each tender.

The lowest or any tender not necessarily accepted.
A. J. MCGEE,
Secretary-Treasurer. 18

WANTED

A thoroughly competent man to solicit work in building and estimate same, give experience.
Box 126 CONTRACT RECORD, Toronto.

CITY OF CALGARY

Sealed proposals addressed to the City Clerk will be received up to the 13th MAY, 1908, covering the installation of the following units at the City Electrical Generating Station:

- 1,000 H.P. reciprocating Engine.
- 750 K.W., 3 Phase, 60 Cycle, alternating current Generator.
- One direct connected steam driven Exciter Set, direct current, 120 Volts, 30 K.W.
- One "Tirril" automatic voltage Regulator.
- Switch Board of two Panels.
- One Station Watt Meter (daily recorder).

ALTERNATE SCHEME.

- One 750 K.W. Turbo Generator, complete in all details.

V. HILL,
Engineer,
Calgary, Alberta. 19

CITY OF BRANTFORD

Sewer Extension

Sealed tenders addressed to Samuel Suddaby, Esq., Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock Noon on

THURSDAY, MAY 21st, 1908

for the following:

- The furnishing and laying of about 1,700 feet of double strength 15 in. Sewer Pipe. Average cut 10½ feet.
- The laying of about 2,000 feet of 12 in. Sewer Pipe. Average cut 18 feet, and 750 feet of 12 inch cast iron pipe, including crossing of Grand River. Average cut 7 feet. These pipes furnished by the city.
- The furnishing and laying of about 1,750 feet of 12 inch extra strength Sewer Pipe and 450 feet of 12 inch cast iron pipe. Average cut 16 feet.

Plans and specifications may be seen and instructions to bidders and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent., of the amount of the tender.
The lowest or any tender not necessarily accepted.

T. HARRY JONES,

City Engineer's Office, City Engineer.
Brantford, April 27th, 1908. 20



TENDERS

For Wire for High Pressure Signal Boxes

Tenders addressed to the undersigned will be received by registered post only up to Noon on

TUESDAY, MAY 5th, 1908,

for supplying the above mentioned material.

Specifications and forms of tender, together with the conditions governing tenders as prescribed by city by-law, may be obtained upon application at the office of the Fire Department, Richmond Street Fire Hall, Toronto.

The lowest or any tender not necessarily accepted.

JOSEPH OLIVER (Mayor),
Chairman Board of Control,
City Hall.

City Hall, Toronto, April 22nd, 1908. 18

SHERBROOKE WATERWORKS

TENDERS FOR

Laying Water Pipe

Sealed Tenders marked "Tenders for laying water pipe" and addressed to Thomas Tremblay, City Engineer, Sherbrooke, Que., will be received up to 6 p.m., of TUESDAY, MAY 27th, 1908, for trenching, refilling, and laying about 13,300 feet of 20-inch C.I. water pipe, about 6,700 feet of 16-inch, and 900 feet of 24-inch. The whole to be completed for the 8th October, 1908. Price to be given per lineal foot. For further information apply to the City Engineer. The lowest or any tender not necessarily accepted. Successful tenderer will be required to furnish a satisfactory guarantee.

CITY OF GUELPH

Notice to Contractors

Sealed tenders addressed to the undersigned will be received up to Noon, MONDAY, 18th OF MAY NEXT, for the following Works:

- 1st, A High Duty Pumping Engine, $\frac{2}{3}$ and 2 million gallon capacity,
- and, A Water Tower of Steel or Reinforced Concrete, 30 feet in diameter, 100 feet in height.
- 2nd, A Concrete Foundation for Water Tower.
- 3rd, The supply of about 3,000 feet of 12-inch Cast Iron Water Pipe, with the necessary special castings, valves and hydrants.

Plans and specifications may be seen at the office of the Manager of the Guelph Water Works or of the Engineers, Davis & Johnston, Berlin, after the 27th of April. The lowest tender not necessarily accepted.

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

CONTRACTS OPEN.

(Continued from page 19).

Welland, Ont.

A small brick school for primary classes will be erected in ward four.

Winnipeg, Man.

A bylaw to raise \$100,000 for an isolation hospital, and also a measure to submit the same to the ratepayers, passed the first reading at a special meeting of the city council held recently.

It is ascertained that the plans of the Red river bridge at Lombard street entail an expenditure of \$800,000. Chief Engineer Poulin is at Ottawa this week trying to arrange details. It is hoped that the cities will give a definite answer upon his return, so that work upon the proposed structure can be started this summer.

H. W. Gerhardt has just taken tenders for a factory building to be erected at Lac du Bonnet for the Inter-West Peat Fuel Company.

Rugh & Riddell are preparing plans for a \$14,000 residence on Wellington crescent for J. Y. Reid, also for a \$5,000 residence on Strathcona street for S. B. McLellan.

Hon. J. H. Howden, Minister of Telephones and Telegraphs, will receive tenders up to May 10th for material and telephone instruments for Manitoba Government construction this season. Specifications may be

seen at office of Chief Engineer. Department of Telephones and Telegraphs, this city.

The James McDiarmid Company have taken out a permit for the erection of the new examining warehouse for the Dominion Government; estimated cost \$300,000.

At a recent meeting of the fire, water and light committee it was decided to take tenders for a new fire hall corner of Logan and McPhillips streets to cost \$15,000.

It is stated on good authority that the Canadian Northern will build a number of new stations on their western line and that work will commence within a month. Further details are not yet to hand. M. W. McLeod is engineer of construction.

The government telephone commissioners are preparing plans and specifications for the long distance work to be undertaken this summer, also for the enlargement of the city system. Several new exchanges will be built and the work will be proceeded with immediately.

The Ontario, Manitoba & Western Land Company have taken out a permit for a store and apartment block to be erected corner of Portage avenue and Carleton street at a cost of \$25,000. Davidson Brothers are the contractors.

A permit has been taken out for a Scandinavian church on Montcalm street, Elmwood, to cost \$2,000. Other permits include: J. Van Buren, dwelling, Rosedale, \$2,000; Nelson Snider, dwelling, Ethelbert avenue, \$4,500; Hallgrimson & Johansson, five cottages, Carlow avenue, \$10,000; John Yost, double house, corner Redwood and St. Andrews, \$2,600; O. Storster, modern house, Home street, \$2,500; Morgan Watson, apartment block, corner of Garry and St. Mary's, \$20,000; D. Kirkwood, residence, corner Bartlett and Hay streets, \$4,000; Berkman & Svenisson, residence, Toronto street; S. H. Foster, residence, Gertrude avenue, \$7,000; James Johnstone, cottage, Aubrey street, \$1,600; Jerry Robinson, repairs to house on Broadway, \$3,000; J. E. Botterell, residence, Wellington crescent, \$7,000; A. Heilig, residence, Selkirk avenue, \$2,000; Charles Rose, residence, Portage avenue, \$2,500.

Yellow Grass, Sask.

A telephone company are organizing to build town and rural systems.

G. A. Stimson & Company, Toronto, have been allotted \$15,000 town of Niagara five per cent. 20-year debentures; also \$14,774 5 per cent. 29-year debentures of the town of Streetsville.

CONTRACTS AWARDED

Chesley, Ont.

Bowman & Connor, consulting engineers, report that ten different tenders were received for excavation and pipe laying in answer to an advertisement in the CONTRACT RECORD. The contract was let to Fred. W. Miller, of Mt. Clemens, Mich., at an average of 17 cents per lineal foot. The contractor will also put in services at 10 cents per foot, materials being found by the corporation.

Edmonton, Alta.

The city council have awarded the following contracts for supplies: sewer pipe, Edmonton Concrete Company, \$7,070; galvanized iron pipe, Gorman, Clancey & Grindley, \$1,232; lead pipe, J. Robertson & Company, \$5.60 per hundred pounds; brass goods, Northern Supply Company, \$1,589.

W. J. Carter, of this city, has been awarded the contract for street paving at \$14,063.

Cannell & Spencer have been awarded the contract for the construction of the power-house to be built in connection with the general hospital at \$40,000. R. P. Barnes is architect.

Fort William, Ont.

W. C. Chambers and W. A. MacCaffrey, both of Kenora, who recently completed a large contract on the C.P.R., have been awarded the first contract to be let on the Transcontinental railway east of this city in a stretch of 75 miles east of Nepigon.

Montreal, Que.

The John Macdougall Caledonian Iron Works were the successful tenderers for the new 12 million gallon pump for the waterworks. Seventeen bids in all were received. These included Hathorne Davey, reciprocating engine, cost \$61,770, annual charges, \$22,192; John Macdougall Caledonia Iron Works, reciprocating engine, cost \$78,837, annual charges, 23,337; Drummond McCall Company, turbine engine, cost \$43,495, annual charges, \$24,963; John Macdougall Iron Works, turbine engine, cost \$34,595, annual charges \$25,598.

Moncton, N.B.

James Read, of St. John, has obtained the contract for the erection of a new building for the Bank of Montreal.

Mount Forest, Ont.

Bowman & Connor, consulting engineers, write that in answer to the advertisement for a new bridge, recently inserted in the CONTRACT RECORD, 20 bids were received for the concrete abutments and six for the steel superstructure. The former contract was awarded to M. M. Hiles, of Atwood,

Ont., at \$4.98 per cubic yard and the latter to the Dickson Bridge Works Company, of Campbellford, Ont., at \$5,710.

Notre Dame de Grace, Que.

The Council have awarded the contract for the construction of two sections of the sewerage system to Henault & Hefferman, at \$70,000.

Prince Rupert, B.C.

The subcontract for the first mile of the G.T.P., from Prince Rupert has been awarded to contractor Ross, of Victoria.

Palmerston, Ont.

For the proposed system of waterworks James Peat & Sons, Petrolia, Ont., have been awarded the contract for drilling an eight-inch water well, if required, to depth of 600 feet.

St. Louis, Que.

The Waterous Engine Company have been awarded the contract at \$5,500 to furnish a 600-gallon fire engine.

Tillsonburg, Ont.

The Borden Condensed Milk Company have awarded the Sand Lime Brick Company a contract for 500,000 bricks for their new factory.

Toronto, Ont.

The Board of Control have awarded the following contracts for roadways: asphalt, Parliament street, Winchester to Wellesley, Constructing & Paving Company, \$4,756; Symington avenue, Royce to North City street, Godson Company, \$1,843; Armstrong avenue, Dufferin to west end, Constructing & Paving Company, \$5,878; bitulithic, Roxborough street, Yonge to 2,180 feet east, Warren Company, \$14,449.

The Department of Public Works have awarded to the James Morrison Company, of this city, at \$2,000 the contract for wiring the electric light fixtures at the Parliament Buildings. This is in addition to the contract for rewiring recently secured by the same company at \$10,000.

The following contracts have been let in connection with the new public baths: plumbing, K. J. Allison, \$8,990; heating, Geo. Syne, \$4,450; wiring, W. J. McGuire, \$500; machinery, Toronto Laundry Machine Company, \$2,500.

Victoria, B.C.

H. T. Knott, of this city, has been awarded the contract for a modern garage to be erected by Woods Brothers. Hooper & Watkins, architects.

Vancouver, B.C.

The Board of Park Commissioners have awarded the contract for the construction of a bathing pavilion at

Kitsalano to Gillespie & Binnie, of this city at \$3,575. Charles Morgan was awarded the plumbing work at \$650.

Woodstock, N.B.

Powers & Brewer have been awarded the contract for the concrete work on the Upper Woodstock C.P.R. bridges.

Winnipeg, Man.

The council will award the sewer pipe contract among W. F. Lee, Dunn Bros., Dobson & Jackson, and Bissett & Louckes, each to get the order for that portion of the pipe on which they submitted the lowest offer.

The Superior Portland Cement Company have been awarded the contract for supply of 15,000 to 25,000 barrels of cement for city work at 70 cents per hundred pounds.

Bids.

Montreal, Que.

For the installation of a new fire alarm system in this city only two tenders were submitted. These were as follows: Star Electric Company, New York, 51,700; Gamwell Fire Alarm Company, New York, \$53,000. Superintendent Ferns will examine and report.

Fires.

Grand Central Hotel, Chateauguay, Que., property of J. Sampson; loss \$13,000.

Lumber and stave mills of David McMechan, Highgate, Ont.; loss \$20,000.

Buildings of Robert Johnson, T. Chalmers and George James, Halifax, N.S.; loss \$5,000.

Elevator building of G.T.R., Toronto, Ont.; total loss \$62,400.

Buildings of J. J. Gorrill, David Fitzpatrick and others, Carleton, N.B.; loss \$8,000.

Premises of Diamond Glass Company, Montreal, Que.; loss \$12,000.

Imperial elevator and C.P.R. depot, Mowbray, Man.; totally destroyed, amount not estimated.

Building of Aberdeen Lodge, I. O. O. F., Glace Bay, N.S.; loss \$15,000.

Summer residences of C. A. Donaldson, Dr. Kelley and Rev. E. Woodcock, of Butternut Bay, near Brockville, Ont.; loss \$4,000.

Observatory building of Arcadia University, Wolfville, N.S.; loss not ascertained.

Buildings of city power and light sub-station, Nelson, B.C.; loss \$24,000.

Lindsay roller rink, Lindsay, Ont.; loss \$2,000.

Foundry building of Sir Richard Cartwright, Napanee, Ont.; loss \$2,000.

Building of Imperial Furniture Company, owned by J. Roberts, Hull, Que.; loss \$7,000.

Premises of Behl & Jacobs, A. Wilson and others, High River, Alta.; loss including stock, \$15,000.

New Companies.

Canadian Instrument & Testing Company, Limited, Montreal, Que., incorporated, capital \$20,000. Incorporators, E. M. Archibald, Montreal, W. A. Henry, H. B. Stairs and R. V. Harris, all of Halifax.

Hurdman Lumber Company, Limited, Ottawa, Ont., incorporated, capital \$20,000. Incorporators, G. C. Hurdman, T. F. Elmitt, O. E. Culvert and others, all of Ottawa.

Granite Crushed & Dimension Limited, Toronto, Ont., incorporated, capital, \$40,000. Incorporators, J. A. McKnight, W. E. Douglas, M. J. Adams and J. Pearson, all of Toronto.

John Poag & Company, Limited, Hamilton, Ont., incorporated as lumber dealers and manufacturers, capital \$20,000. Incorporators, John Poag, A. Andrews, C. H. Roper and others, all of Hamilton.

Canadian Steel Rolling Mills, Limited, Campbellford, Ont., incorporated, capital \$100,000. Incorporators, A. H. McKeel, C. E. Dunk, W. J. Doo-see, T. S. Tait and Duncan Kerr, all of Campbellford.

Aylmer Pump & Scale Company, Limited, Aylmer, Ont., incorporated, capital \$90,000. Incorporators, S. H. Chapman, W. Warren, F. W. Chapman, G. M. Miller, W. A. James and Henry Hunt, all of Toronto, and others.

S. Knechtel Woodturning Company, Limited, Southampton, Ont., incorporated, capital \$40,000. Incorporators, S. Knechtel, of Southampton, Ont., A. Oppertshausser, of Hanover, Ont., and others.

West Toronto Masonic Temple Limited, West Toronto, Ont., incorporated, capital \$40,000. Incorporators, W. D. Thomas, J. S. Hill, A. J. Anderson, J. A. Ellis and others, all of West Toronto.

St. Mary's Wood Speciality Company, Limited, St. Mary's, Ont., incorporated, capital \$40,000. Incorporators, S. L. Doolittle, G. Brown, J. A. Johnson, of St. Mary's Ont., and others.

T. Cannon & Son, Limited, Toronto, Ont., incorporated as builders and contractors, and dealers in builders' supplies, capital \$50,000. Incorporators, T. E. Cannon, Sr., T. E. Cannon, Jr., and E. J. Cannon, all of Toronto.

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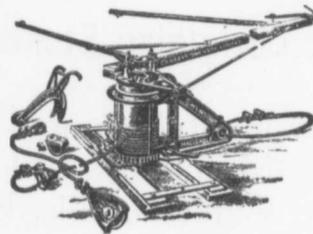
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Mr. J. W. Stewart, of Foley, Welch & Stewart, who are building much of the Western section of the G. T. P., said in a recent interview: Our two contracts with the railway company approximately aggregate about ten million dollars. Between five and six thousand white laborers will be required on construction work. Any white workingman wanting a job is sure of obtaining employment. We shall give the preference at the outset to the unemployed in the coast cities, and shall engage men here and in Vie-

toria through labor employment agencies. The more men we secure on the coast the better, as we desire to avoid if possible the necessity of bringing in men from points east of the Rockies, where a great deal of railway construction work is now in progress. Standard wages will be paid. Besides the army of laborers there will be hundreds of jobs for carpenters, blacksmiths and other mechanics. Headquarters will be established at Prince Rupert, where I shall direct operations when not looking after our contract for 125 miles of main

line of the Grand Trunk Pacific west of Edmonton. It is quite likely we shall also open a branch office in Vancouver.

Mr. Stewart denied the report that the firm's outfit would be shipped over American lines. Every pound of freight for his company, he says, will come by the C. P. R.

G. T. P. Progress.

G. T. P. steel has reached Nokomis, Sask., and will be connected with Saskatoon by the end of this week.

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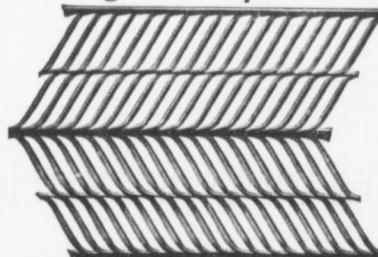
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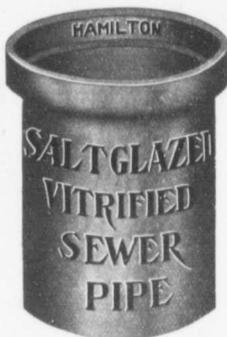
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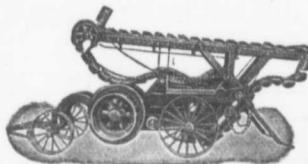
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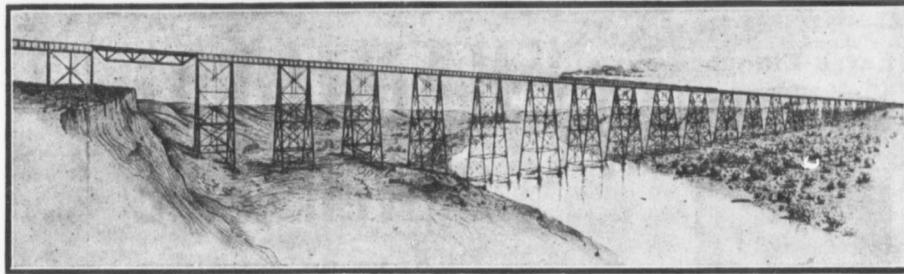


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C. P. R. Belly River Bridge.

The Canadian Pacific Railway's new bridge over the Belly river at Lethbridge, shown in the accompany-

ing illustration is being erected at a cost of \$1,000,000. When completed the distance between Macleod and Lethbridge will be shortened and straightened, and a number of trestle

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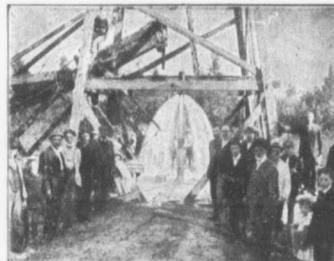
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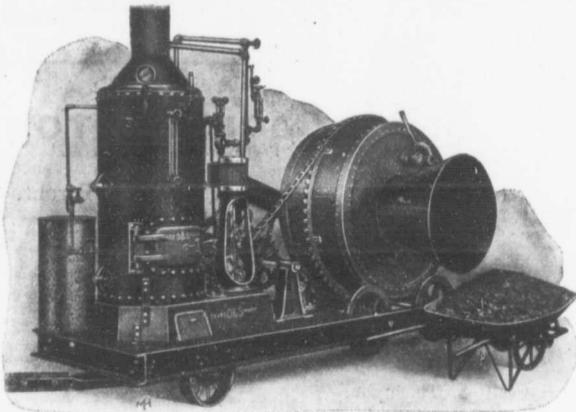
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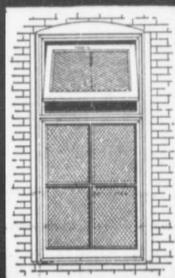
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Cement Association Formed.

The "Canadian Cement & Concrete Association" was formed last week, at a meeting of about thirty cement manufacturers, engineers, architects and others interested in the use of cement. The chief business of the meeting was the appointment of officers and the drafting of a constitution. The election of officers resulted as follows:—President, Peter Gillespie, S. P. S., Toronto; Vice-president, F. Pulfer, Ontario Concrete Machinery Company, London; Executive Council: Thomas E. Dates, Sun Portland Cement Company, Owen Sound; J. N. Killbourn, Lakefield Portland Cement Company, Montreal; Gustave Kahn, Trussed Concrete Steel Com-

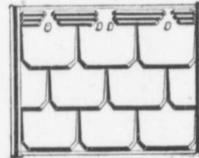


PRESIDENT PETER GILLESPIE.

pany, Toronto; Cecil A. Thompson, Montreal; R. A. Rogers, Concrete Contractor, Toronto; and J. E. Murphy, Excelsior Concrete Company, Toronto.

Matters were left more or less, in the hands of the executive to get the institution developed and to make arrangements for an annual meeting and exhibition. Notices of the meeting will be sent out about two months beforehand. The object of the association will be to arrange for the reading of papers, and in a general way to promote the advantage of the business. It is expected that an annual exhibition, to be held on lines similar to those now held in the United States, will be a great benefit to the business at large. It will provide a means for the discussion of new ideas and for displaying and studying all the new materials on the market.

The International Coal & Coke Company has shut down on account of car shortage.



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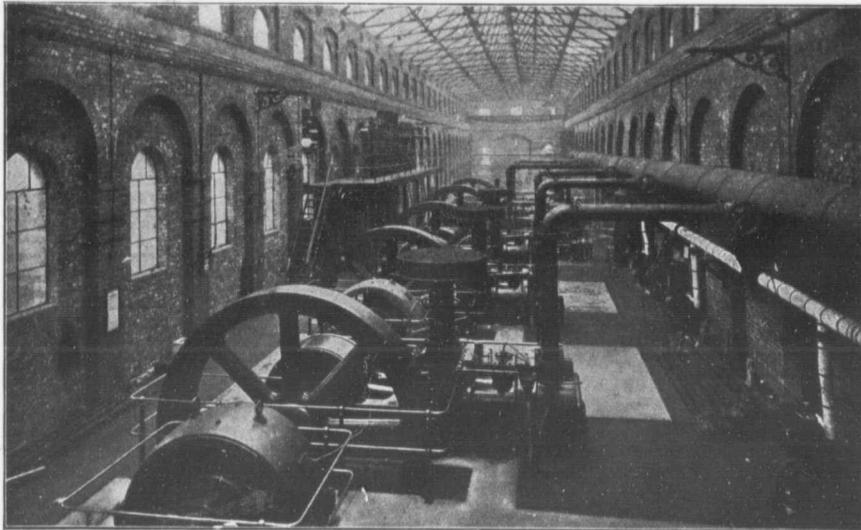
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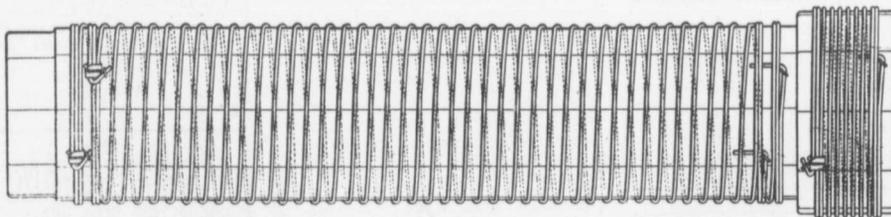
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**The Action of Portland or
Hydraulic Cement Con-
cretes upon lead.**

In order to set at rest some prevalent opinions as to the action of hydraulic cement concretes and other mixtures upon lead, when in direct contact, the writer has inaugurated a series of experiments, enabling him to directly determine what action takes place, if any, not confining the experiments to cement concrete alone, but also to the action of common lime or building mortar in ordinary use.

To properly approach our subject, we shall first define the material used, or to be used in experimentation, with the tools and methods applied.

Accepting the definition of the German Association of Portland Cement Manufacturers, we find Portland cement described as follows:

"A hydraulic cementing material having a specific gravity of not less than 3.10 in the calcined condition, and containing not less than 1.7 parts by weight, of lime to one part each of silica, alumina, and ferric oxide, the material being prepared by intimately grinding the raw ingredients, calcining them to not less than clinkering temperature and then reducing this clinker to proper fineness."

The American and English societies' standards are practically similar, with the exception that they all allow an amount, after calcination, of not to exceed 3 per cent. of any needed ingredients to be added.

When Portland cement is in proper condition to be used as a cementing material, and is so used, it possesses the property of hardening under water to a compact mass of insoluble silicate of calcium.

We are all aware that the method of employing Portland cement in building construction is not in "neat" form, but by mixing it with two or three times its bulk of sharp torpedo sand or limestone screenings, and four to six times its quantity of larger sizes of crushed limestone or gravel, 1 1/4 inches to 2 inches in diameter. The object sought in such a mixture is to have cement enough present to thoroughly coat the other material added for stability and cheapness, so as to form a compact mass, when placed in the moulds and properly tamped, the result being that the larger material is encased and cemented in compact form by the hydrated silicate calcium formed after water has been added in moderate and proper quantities to the material.

This mixture forms the average composition for concrete used for

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building and other foundations, rail-
road retaining walls and such struc-
tures generally, with which lead pipe
is apt to be placed in direct contact
and surrounded.

Lime mortar generally used for
laying brick and stone structures
above the ground line will be found
to be composed of about two parts
of hydrate of lime or slaked lime, in-
timately mixed with four to six parts
of sharp sand, with sufficient water
added to bring it to a pasty consist-
ency.

This common building mortar so
produced does not possess the prop-
erties of hardening under water, but
does harden partly by drying and
partly from absorption of carbonic
acid from the atmosphere. We there-
fore have reason to expect our experi-
ments to show a marked difference
between the action in one case and
that in the other.

All authorities agree that metallic
lead is slightly soluble in pure water,
unless the same is deprived of oxy-
gen, though the presence of chlorides
or sulphates hinder the solution of
the metal; and, according to Chris-
tison, all salts impede the action of
pure water upon lead, and nearly in
the inverse ratio of the solubility of
the compounds which their acids
form with lead oxide.

Bicarbonate of lime acts with special
benefit by depositing on the con-
tact surface an insoluble carbonate.
This would probably be the limit of
action upon lead when laid in con-
tact with hydraulic cement mortar,
yet could not be if in contact with
common building mortar, which ab-
sorbs carbonic acid in drying, which
carbonic acid, in excess of moisture,
is a partial solvent for lead carbon-
ate, making it possible for several
successive coatings of lead carbonate
to be formed and dissolved while the
drying process is going on.

These are the theoretical views of
the question as they appear, subject
to any correction that our experi-
ments may show.

To bring our methods within scope
of easy and ready handling, consid-
ering the number of experiments that
have to be made for accurate and reli-
able determination, it was decided to
make circular moulds 5 inches in di-
ameter, 12 inches long, from galvan-
ized iron, and said moulds being con-
structed in two halves, having four
loose partitions, also made from gal-
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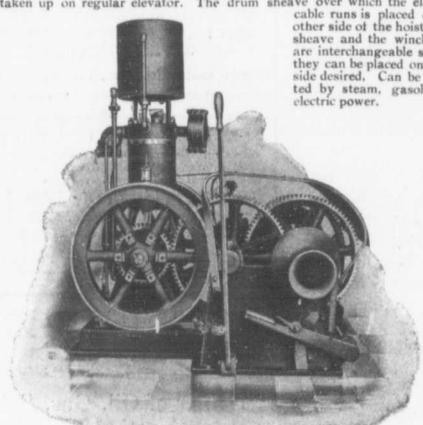
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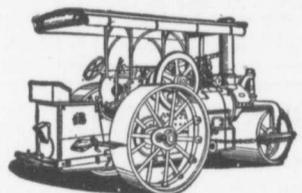
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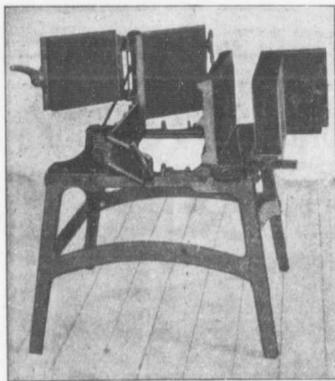


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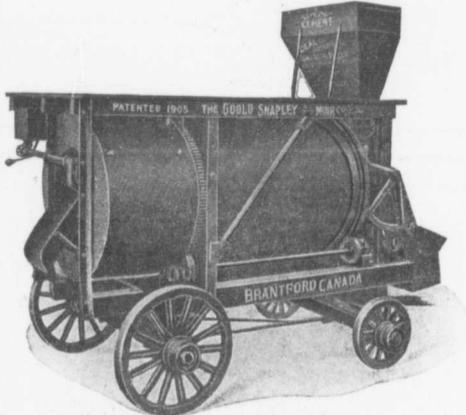
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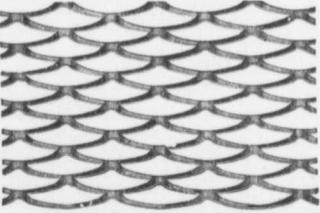


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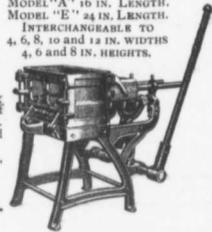
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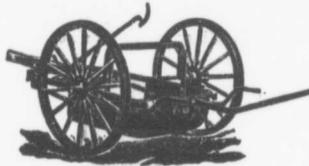


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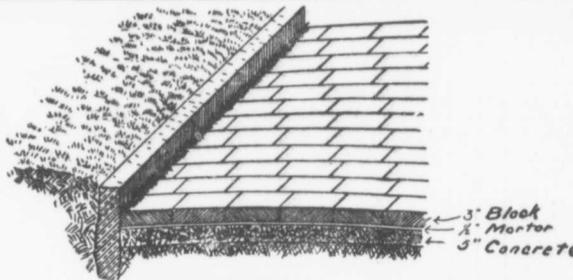
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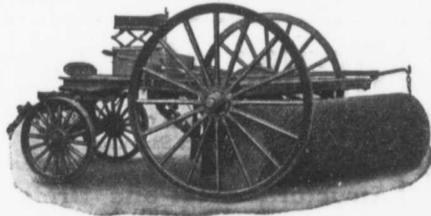
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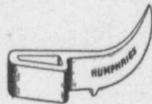
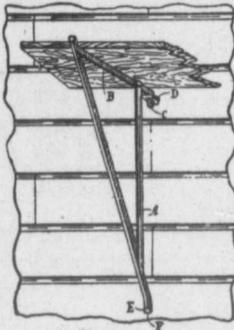


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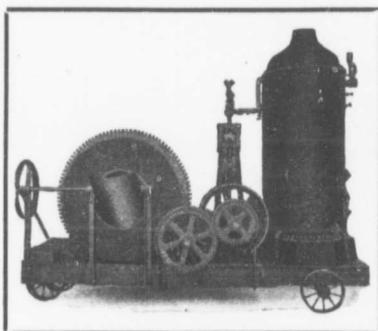
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