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"TENDERS" AND "FOR SALE" ADVERTISEMENTS PAGE 22

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THE UNEMPLOYED.

Up to within the last fortnight but little attention had been directed to the question of the suffering of the unemployed in Toronto. With the help of the newspapers, however, exaggerated stories of distress have been circulated and the entire question trucked out with an appearance of gravity that reflects on the country's prosperity. There apparently has not been unusual suffering. The "man on the edge," the vagrant, the seasonal worker, the homeless man, the odd-job man, have been out of work for some weeks past and have suffered as they invariably do in winter. The movement of men from the smaller places to the large cities is greatly to be deplored and should as far as possible be discouraged, since the large cities have no work to offer and the unemployed is much better off in a community whose resources he knows and where he is known. Applicants for charity are not skilled men who are employed the year round.

It has been suggested at recent meetings of the unemployed that regular work which must be done by municipalities and state and national governments should be anticipated during times of stress. There should be nothing revolutionary about this. It has been adopted in European countries and is working satisfactorily and no insurmountable difficulty should prevent its successful operation in Canada. Certainly to spend the people's money in making permanent civic improvements is much more desirable than to dole it out in charitable handfuls to able-bodied men who try to maintain circulation by tooth-picking ice from the public thoroughfares.

THE SUPPLY OF LUMBER.

Considering the long period of comparative inactivity which they have been called upon to endure for so many weeks now, it must be confessed that the lumber manufacturers and dealers have the lumber situation well in hand in this country. The story of the coming building season will be written largely by them, and it seems safe to assume that they will see that it is a season of sane expenditure. That it was a bankers' and not a general agricultural and industrial panic that has alarmed us of late must be conceded, but when the banks refused to extend their credit and called in their loans and money was locked up in vaults and locks, those businesses already on the verge of collapse paid the penalty for unstableness, while others, truly alarmed, stopped and took account of their belongings. In this class was the lumbering industry.

While no panic exists, or has existed, the business of the country will take some time yet to recover. It is claimed that at present the banks have more actual cash on hand than they have had at any one time for years past, while their hoarded currency is only beginning to come out cautiously in search of quarterly and annual dividends. By summer it is thought that cheap money will be again abundantly available.

The lumbering industry is peculiarly one which, on account of its magnitude, requires large borrowed capital. That capital has been greatly reduced for months past, yet the trade has gone cheerfully along, confident in its stability and power to ultimately win out. That hope is now being verified. The cheering information of mills starting up again, and of a reawakening retail demand, are indicative of the strength that lies behind the industry. Each week is showing an improvement in the call for lumber, while just as surely is there also evidence given of a decrease in the available supply. Conditions in the bush in almost all parts of Canada have been far from favorable for cutting, and the supply of material that will next summer be available promises to be unusually small.

This is a matter for congratulation. The buyers and consumers of lumber —with some exceptions, of course— do not want the market broken or even unsettled. Those buyers not in the market now are not patricularly interested in prices, and it has been no use trying to sell them anything. It has been a good thing, this combination of fortunate circumstances which has been the means of keeping the market stable, and if demand has been slow in reviving it must not be construed as auguring ill for the future welfare of the industry.

WOODEN BUILDINGS.

Cement and steel and brick and stone are not yet used in sufficient quantities to encourage lumber users to predict the time when the forests will not be called upon to furnish the principal materials used in building operations. Notwithstanding the remarkable increase in the use of cement and other fireproof materials, the last reports of the building operations in forty-nine of the leading cities of the United States, as compiled by the Geological Survey of that country, show that for the year 1907 fifty-nine per cent. were of wooden construction. Even if the remaining forty-one per cent. of the buildings were built of brick, stone and concrete, vast quantities of wood are consumed both in the construction and in the finish, though in the latter form metal is taking the place of wood to a very large extent.

These figures also take no cognizance of the fact that large quantities of lumber are used for the construction of dwellings, stores and other buildings in small cities and towns. In these wood is usually the predominating building material and it is safe to say that if the statistics had included figures for all places of all sizes the percentage of wooden construction

would have been very much greater.

In the number of wooden buildings New York city is shown to be at the bottom of the list, though it leads with $18,075 as the average cost of its buildings. This average cost for the forty-nine cities reported on is placed at $2,035, this being an increase of over $300 during the past three years.

POWER IN ONTARIO.

The purchase outright of one or more of the existing electrical plants at Niagara Falls, fair treatment of the companies at present engaged in the development and transmission of electrical energy, and additions to the capital of the various banks doing business in Canada were among the chief items advocated by Mr. R. C. Steele, the retiring president of the Toronto Board of Trade, in his address at the annual meeting of that body on January 27 last. Mr. Steele's reference to the business of the year 1907 was that it had been a lean year, although at the time of the last annual meeting, he said, commercial and industrial activity and prosperity were at the flood tide in almost the entire civilized world, and Canada was enjoying a full share of these activities and prosperity. There were at that time few signs on the horizon of the coming financial storm which would seriously disturb the leading monetary and industrial centres of Europe and America. Mr. Steele expressed satisfaction at the reduction in freight rates made by the railways.

Upon the question of electrical energy Mr. Steele said: "I feel that it will be necessary for the Government to go still further. Recent discoveries in electrical development prove that it will be possible to distribute power from Niagara Falls practically all over what is known as Old Ontario. The Government should purchase outright one or more of the existing electrical plants at Niagara Falls. Arrangements can be made with the other company or companies to export equivalent to what is now authorized for exportation by all the existing companies."

Mr. Steele said that the province, by its action, had practically arrested private corporate electrical development in this province. But legislative or municipal power should not be used to crush private corporations or to deprive them of the fruits of legitimate enterprise. They must be honorably dealt with, said Mr. Steele.

"In all countries where it is necessary to acquire private property to carry out public enterprises, the principle has been recognized that full payment should be made for properties taken over in the public interest, and we cannot take any other course, either as a matter of right or policy. We are likely to be large borrowers in the future and must maintain our public record untarnished."

ENGINEERS' CLUB HOLD ANNUAL BANQUET.

An enjoyable time was spent at the annual meeting of the Engineers' Club, held in this city last Thursday evening at the club rooms on King street west. About 70 members and guests were present, including a number of students from the School of Practical Science, who contributed the usual quota of college yells and choruses for the evening's entertainment.

Mr. C. B. Smith, past president, occupied the chair, and had the able assistance of President J. G. Sing. After Royalty had been honored, Dr. Ellis responded to the toast of "Our Country," and Mr. R. C. Steele, ex-president of the Board of Trade, performed a similar service on behalf of "Our City." Sister societies were well represented, and brief speeches were made by Mr. T. C. Irving, for the Canadian Society of Civil Engineers; Dr. Stupart, for the Canadian Institute; Mr. W. A. Bucke, for the Institute of Electrical Engineers; Mr. J. B. Tyrrell, for the Society of Mining Engineers; Mr. J. H. Hogg, for the Engineering Society of the University of Toronto; Prof. Roseburgh, for the Faculty of Applied Science; and Capt. Gamble and Major Van Nostrand for the Ontario Land Surveyors. Mr. B. A. James, of the "Canadian Engineer," proposed the toast of "The Press," and songs were contributed by Messrs. W. Paris and R. A. L. Gray, with an accompaniment by Mr. J. F. B. Vandeleur.

RURAL FIRE PROTECTION.

A plan has been suggested in Wisconsin which should be copied in rural districts everywhere — that of having some fire protection equipment at every farm house. The suggestion is made that there should be a set of ladders of different lengths, a stock of fire extinguishers, and several sections of garden house, the principal of which should be to prevent fire. The plan is essentially practicable, and the fire protection houses will miss a good plan if they do not rise to the occasion with an outfit along these lines at a price which will enable the dealer in the country to sell it to the farmer. The number of destructive fires on farms which might have been squelched in their incipiency had some such means been available is so large as to afford a strong talking point in the sale of such an outfit, if it can be secured at a reasonable cost.

STEEL RAILS MAY DROP.

About seventy steel men representing the United States Steel Corporation, the Republic Steel Company, the Jones & Laughlin Steel Company and the Pennsylvania Steel Company, were in conference in New York last week.

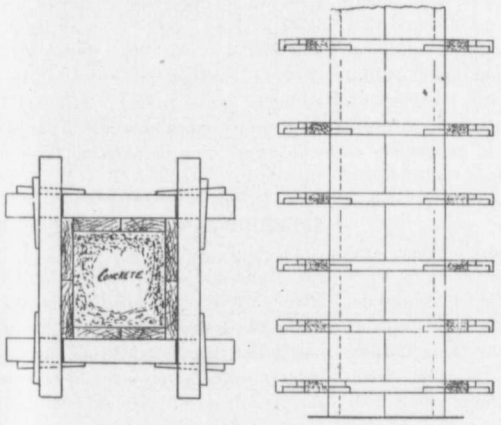
It was stated unofficially that a proposal was under discussion to reduce the price of steel in general, and particularly the price of steel rails, because it is feared that in view of the financial depression the railroads would not buy rails this year, and would postpone their extensions unless the price of steel was made low enough to make it an object for them to buy now.

DROP IN SHINGLE PRICES.

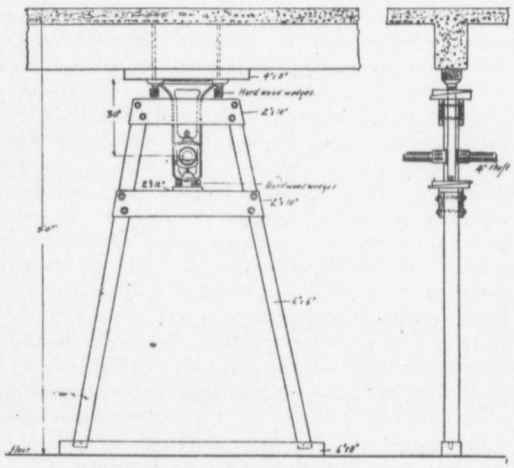
It is announced from Vancouver, B.C., that the shingle manufacturers in that province have made a cut of 25 cents per thousand from prices that have recently prevailed.

Doubling a Factory's Floor Space

An interesting piece of factory construction was recently completed at Passaic, N.J., at the Pantasote Leather Company's factory, where Salmond Brothers Company, of Arlington, N.J., made a record, not only in the speed with which they added 42,000 feet of floor space to that already existing, but by their ingenious method of enveloping a one-storey wing of the old factory, 65 feet by 85 feet in dimensions, by a two-storey modern brick structure covering three times the ground space of the old wing dimensions. This work was completed in 80 days, entirely effacing the old structure while the machinery therein was in continual operation.



DETAIL OF COLUMN BRACING.



DETAIL OF TIMBER SUPPORTS AND MANNER OF BLOCKING UP SHAFT HANGERS.

The wing of the old factory, which was enveloped by the new, was known as the embossing mill, where four ten ton machines were embossing the pantasote and giving it the external appearance of leather. On September 26th the contractor was admitted to the embossing mill on the understanding that the machines (excluding Saturday and Sunday) must be kept running continually with the exception of a two days' shut down. It was during this short time that six reinforced concrete piers 6 1-2 feet square were sunk 14 feet deep and the necessary excavation made inside of sheet piling, in order to furnish new foundations partly under the embossing machines for the columns of the heavier two-storey structure being erected. Also in this brief time the contractor by an ingenious and original scheme, which is hereby shown, supported the heavy 4 inch line shafting supplying power to the embossing machines, by means of vertical struts and cross timbers which held the shaft hangers firmly in their original place after the roof of the old factory had been torn away.

On Monday, September 29, the mill was again running at full capacity, and the forms for constructing the concrete girders and the second floor were put up in five days more. In the succeeding four days' time the second floor concrete was laid over a surface 68 feet by 140 feet in dimensions. In a total of fourteen days after the contractor was admitted to the embossing mill, the roof of the second storey was being constructed, and on October 26, just one month after starting their portion of the work, the roof was completely finished, including a monitor skylight. On November 2, or six days later, the interior was finished and new machinery being installed.

The attached sketch of the method adopted by the Salmond Bros. Company, which is supporting the line shafting while the old roof was being torn away, will probably be of interest to factory men. This work will be seen to be exceptionally difficult when it is considered in relation to the new structure. The change over from the old building to the new building was effected without moving the machines, without lengthening or shortening a single belt, and, in fact, without disarranging in the least the previously existing layout of the embossing machines, line shafting or any other apparatus. It thus follows that the new building had to be built so as to suit the machinery, reversing the general order of installing the machinery in accordance with the lines of the factory interior. The sketch therefore illustrates how the contractor rigidly held this 4 inch shaft and the hangers in place without being allowed any head room and, under the further difficulty of the necessity of wooden forms in which the reinforced concrete girders and roof had to be moulded. The wooden pads on to which the hangers were later to be bolted when the factory was completed, it will be seen were made to act in the double capacity of the bottom of the wooden false work upholding the wet concrete, which when set, would suport the hangers through the pads. Moreover, the floor girder was constructed at such a height as to ultimately support the hanger in ex-

actly its old position after the new building was completed.

Contractors and others interested in concrete construction are invited to inspect the attached sketch furnished through the courtesy of Salmon Bros. Company. It will be noticed that the complete forms for a column are put snugly in place with close joints without the use of any nails whatsoever with the exception of light 4d nails used now and then to tack in place the wedges. A further advantage resulting frm this construction method is that the salvage from the lumber is practically 100 per cent. Since the small nails are merely used as tacks and only partially driven in place, they can easily be withdrawn from the wedges, and these in turn can be removed for use again by a slight tap of the hammer. Then the entire false work can be removed from the concrete column, after it is sufficiently set, and the boards are in perfect shape, neither pierced nor penetrated to the slightest degree by a single nail, nor subjected to the damaging effect of nail pullers nor the alternative of prying the boards off with a jimmy. In this factory construction there were fifty-six columns in which this method was adopted by clamping the forms.

The conclustion to be drawn from the above description is as follows: That the Pantasote Leather Company have doubled their floor space in less than three months; that they have done this with an increased ground space only aproximately 65 per cent. larger than the original space occupied, that this increase was made not through the expedient of any additional storeys to buildings already in existence, but was carried out partially by replacing a wing of the old structure one storey in height by an entirely new building two storeys in height, and this was accomplished in addition to the complete wrecking and removing of that portion of the old building enveloped, without interfering with the operation of that portion of the plant suspended from the roof of the old structure or that portion resting upon the floor of the old structure.

A typical instance in connection with such rush work as described above is as follows: One hundred metal window frames were ordered by the contractor on Monday to be shipped from New York City to Passaic, N.J. On Wednesday thirty of these window frames had been delivered and were installed that same week.

PROLONGING THE LIFE OF SHINGLES.

Curled and warped shingles on the roofs of suburban and country houses are a common but by no means desirable sight. Shingles warp and curl because after a wetting—and they get many—the upper side dries first. In a few years the roof leaks, decays rapidly and has to be replaced. Many years ago farmers made what they called their "everlasting" roofs of white pine, cedar and black walnut shingles, free from sap, rived with a frow and shaved with a drawing knife. To-day this is impossible, as the fine straight-grained timber necessary for the manufacture of such is impossible.

It has been found, however, that shingles treated with creosote by a special process warp but little and decay slowly because the loose grain of the wood is so filled up that the shingle is rendered impervious to water. The creosote is nothing more than dead oil of coal tar. A shingle roof treated with this material costs a lttile more at first perhaps, but the life of the shingle is so lengthened that this additional cost is scarcely worth considering.

The preserving apparatus is neither expensive nor hard to operate. One such outfit will serve several farmers. The main items are an iron tank (an old engine boiler will do) with preservative fluid in it and a fire under it, and another tank of cold preservative. The shingles or other woods to be treated are immersed for a sufficient time in the hot creosote and then in the cold.

Shingles are one of the most important lumber products in this country. It is a significant fact that the chief source of shingle supply is now the forests of the far northwest. The eastern sources of supply are not able to meet the eastern demand. It is therefore fortunate that shingles are so easily given a preservative treatment by which their life is lengthened.

Moreover, many handsome residences in all parts of the country have their sides and gables covered with shingles. This architectural use often calls for staining or painting in harmonious colors. Such coloring is less frequently seen on roofs, where it does not last long, because rain washes it off.

It has been found that stains may be carried into the shingles along with the preservatives by the process outlined above. The coloring matter is mixed with the creosote, reaches every fibre which the creosote touches, and lasts as long as the creosote lasts—and that is a long time. Such a stain does not easily weather out, whether on walls, gables or roof. It is expected to prove much superior to the old way of staining or painting the surface only.

SPLENDID SAWMILL DESTROYED.

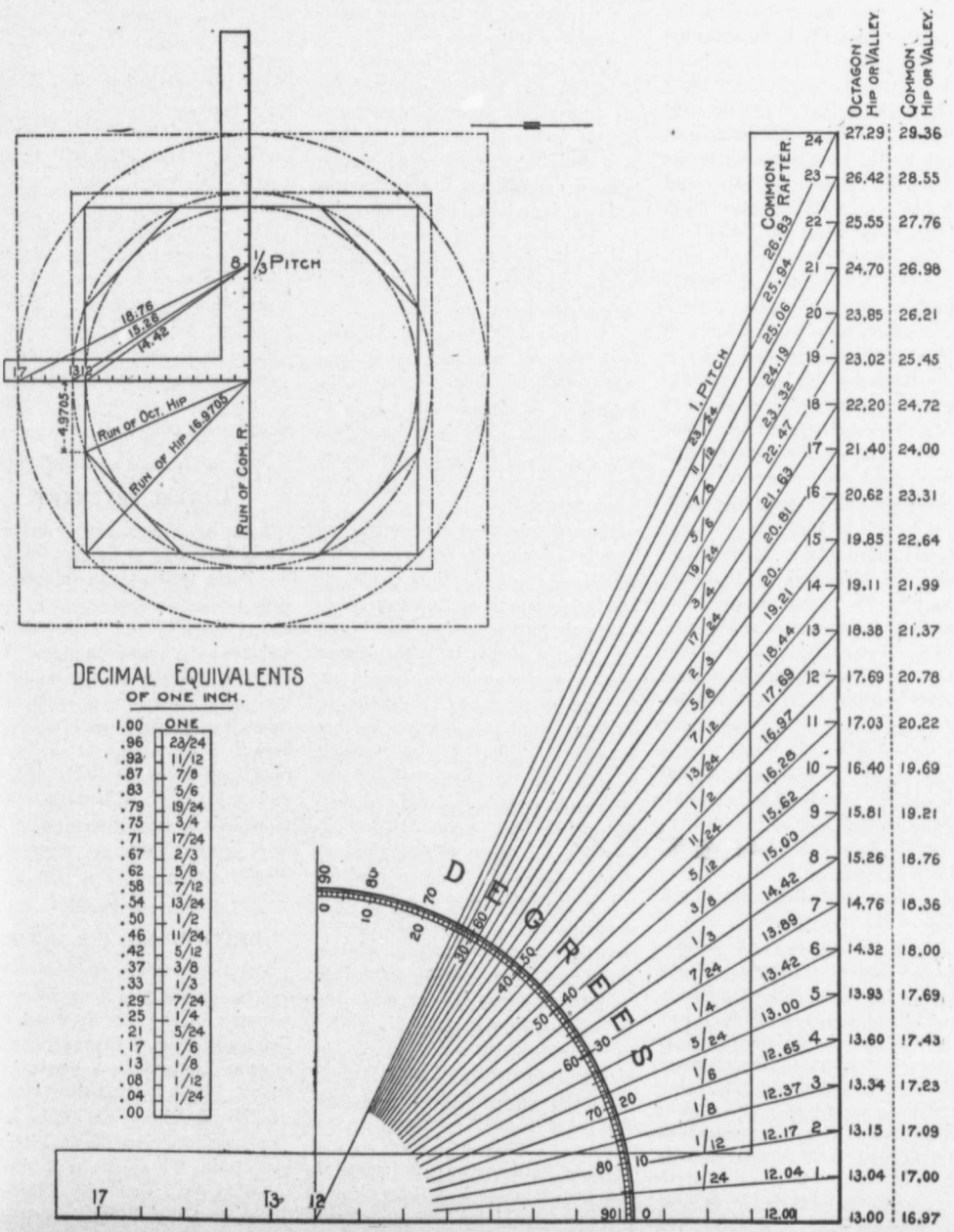
The splendid saw mill of the Louison Lumber Company at Jacquet River, in the vicinity of Campbellton, N.B., was destroyed by fire on February 2 last, together with all the machinery. The loss is believed to be in the vicinity of $20,000. The mill was a new structure, scarcely completed, and would have been one of the finest of its kind in the province. It was thoroughly up-to-date in every particular. The engine and boiler room attached were built of concrete and it is thought escaped being wrecked.

The Louison Lumber Company is a comparatively new concern, having recently acquired three lumber properties in the vicinity—Calhoun's, McNair's and Dutch's.

To mark tools, first cover the article to be marked with a thin coating of tallow or beeswax; then with a sharp instrument write the name in the tallow. Clear with a feather; fill the place written—the letters—with nitric acid; let it remain from one to ten minutes, then dip in water and rub off, and the marks will be etched in the steel or iron.

Roofs of Various Pitches

We reproduce from the "American Carpenter and Builder' an extremely useful diagram, designed to assist carpenters in building roofs of various pitches. The fractional pitch lines for the common rafters are shown; for each inch in rise up to the full pitch and their lengths are expressed in decimal figures to the one-hundredth part of an inch, while to the right of the blade the same is expressed for the corresponding octagon and for the common hip or valley for a square-cornered building, which are reckoned from 13 and 17 on the tongue respectively. However, neither is absolutely correct, though near enough as far as the cuts are concerned, the greater deviation being in the hip for the square cornered



building. It lacks .0295 of being 17 inches and represents the run of the hip to a 12 inch run of the common rafters. Its true length being 16.97505 inches, this is the length from which we have reckoned for the lengths of the hips instead of 17, as is the usual custom. This may seem a trifling difference, and so it is in a short run and low pitches; but suppose it is for iron construction. To begin with, the shortage of each foot in run with the common rafter is .0295 of an inch; added to this the gain it would have in the pitch, which would be .015 of an inch by the time it got up to the full pitch for the common rafter and this, added to the .0295 to start with, would be a difference of .0445 of an inch to the foot in run with the common rafter. Now suppose the run to be 18 feet; 18 times .0445 equals 8 plus, or 19-24 of an inch difference; or, if no account was made of the gain in pitch, the .0295 of an inch in the run would amount to over half an inch in the length of the hip alone. This is a common error, and while it is not much, and probably would never be noticed in wood construction, it is well to know this discrepancy and guard against it when the occasion demands, and for that reason we give the correct amounts. The shortage in the octagon is not so pronounced. Instead of it being in the run, it is the tangent that is lacking the same amount, it being 4.9705 instead of 5 inches. This, coming as it does, cannot affect the length of the rafter nearly so much as in the above.

We explain this shortage better by referring to that part of the illustration which shows the plan of a combination square and octagon frame with the heel of the steel square resting at the centre. From this it will be seen that the two outer circles catch the corners of the frame and seemingly intersecting the tongue at 13 and 17 and represent the figures to use on that member for the seat cuts, but the true length of the run of the hip is 16.9705, and that for the tangent of the octagon is 4.9705.

In connection with this illustration we also give a table of decimal equivalents to the one-twenty-fourth part of an inch for convenience in finding their value in common fractions.

ST. ANDREWS LOCKS.

By the opening of St. Andrews Locks, at Winnipeg, which event will, it is calculated, take place in a little more than two years' time, that city will derive immense commercial benefit, as it will mean that a territory from 300 to 500 miles north of the city will be thrown into direct connection with it. By this means greatly increased trade will result.

Messrs. Quinlan and Robertson, of Montreal, who have the contract for the excavations, approaches and also for the lock and dam and the iron and steel work, commenced operations on June 28 last. In three months and ten days they laid 19,000 cubic feet of concrete and completed the lock in October last. It was one of the fastest pieces of work of its kind ever accomplished in Canada.

The lock is 290 feet long, 215 feet from gate to gate, and has a total depth of 37 feet from the top to the bottom of the foundations. It is 45 feet in width. The drop for vessels will be about 21 feet. The walls were built in sections with expansion bolts every fifty feet.

Since October last the contractors have been laying the concrete for the sub-structure of the dam, which is 230 feet in length, and they expect to escape the spring freshets which prevail at that time. It is the largest piece of concrete work in Canada undertaken under winter conditions. In order to handle the concrete so that it will not be affected by the frost, it is necessary that the whole of the work in progress be enclosed and heated, and a huge space 110 feet in length by several in width is thus enclosed. The sand and gravel used for mixing with the cement is heated by steam pipes in a bin of 200 yards' capacity. Large quantities of this latter material are being hauled to the scene of operations for use in the work this coming season.

The contractors expect shortly to have an output of 200 yards a day. They expect to complete their contract by May 1, 1909.

Moveable Dam.

Owing to the extreme swiftness of the current in the Red River, if the ordinary type of dam were constructed it would mean that the surrounding country would soon be under water. It was therefore decided to construct a moveable dam, the first of its kind in Canada. This dam is patterned after European ideas, and will be so arranged that by allowing the volume of water to escape from time to time the water above the locks can be maintained at a certain elevation as long as navigation is open.

The part of the huge dam which is to be moveable is made up of a system of steel frames and rolling steel curtains. These latter will be operated by electrical power from an overhead service bridge.

This work, when completed, will allow the largest vessels on Lake Winnipeg to come clear through to Winnipeg, where the greatest facilities are provided for the distribution of freight to all parts of the country.

Winnipeg will be made the outlet for the fish, wood and fur industries of the north country.

A STEEL PAVEMENT.

A section of steel pavement has recently been laid in the Rue St. Martin, Paris, to test its usefulness. The steel blocks are nearly seven inches long and an inch and a third thick, and are ridged on both sides. They are laid in cement so that the tops of the ridges just reach the surface. The ridges are so close together that a horse's shoe covers at least three ranges of them. It is believed that such a pavement will prove superior to asphalt in being less slippery, and more durable than a pavement of wooden blocks.

DEATH OF MR. A. B. IRWIN.

Mr. A. B. Irwin, a resident of Vancouver for the past four years, and manager of the Pacific Coast Pipe Company, died on January 21 last after an illness of three months' duration. While never active in public life, Mr. Irwin was one of the prominent business men of the city and his demise will come as a distinct shock to the community. He was fifty-six years of age, and unmarried.

Lath and Proportion of Cement for Exterior Plaster Work

Relative to the kind of lath to use and the proportions of cement for exterior plaster work, a correspondent of "Carpentry and Building" makes some interesting comments. He thinks the best lath for outside work is galvanized wire cloth stiffened with rods about 1-4 in. in diameter and placed every 8 or 9 inches. This lathing is quite expensive, but heavy expanded metal, say 24-gauge, small mesh, is cheaper and much easier applied.

For good work over a frame building proceed as follows:. After the wall is boarded and thoroughly nailed cover with one layer of waterproof paper, well lapped, and fur with 7-8 x 1 inch stock, 8 inches on centres; applied vertically. Now put on horizontally the lathing, which is in strips 16 to 20 inches wide and 8 feet long, using wire staples about 1 inch long. Stretch the lathing as much horizontally as possible by hand, so that it will not lie "wavy." Make all laps at least 1 inch; more will not hurt and sometimes it is cheaper to let some of the laps be 4 or 5 inches than to cut off the metal and throw it away.

We are now ready for the mortar. The first, or scatch, coat should be made as follows: Slake one barrel of best wood burned lime, putting it, while in liquid state, through a fine sieve, say about 100 meshes to the square inch. To this add 3 bushels of long cattle hair that has been thoroughly beaten and pulled apart and from 5 to 6 barrels of clean, sharp sand that is reasonably coarse. As soon as this is thoroughly mixed in the bed it should be thrown out on a platform of boards previously prepared. In this manner slake as many barrels of lime as the job requires, and when piled allow to stand for at least one week.

At the end of this period cut away from the pile as much as can be tempered at one time; wet and thoroughly mix with a hoe until of the proper consistency. Now apply it to the lath, using sufficient force to crowd well through the lath, but not enough so that it will fall inside. It is not a bad plan to use a little Portland cement in this scratch coat, say a couple of flat shovels full to such a batch as is usually tempered at one time. Care must be used not to get in too much cement, as it will make the mortar "short," and a great deal will be lost by dropping, especially behind the lath. This scratch coat should not be applied very thick, and when it begins to set the entire face should be scored with a tool made by taking three or four short pieces of lath, about 6 inches long, sharpening one end of each piece to a blunt point and nailing them, side by side flat ways, on to a piece of 7-8 inch stock about 3 inches wide. Grasp this tool firmly in the hand and draw it across the face of the plastering diagonally in both directions. When this coat has set sufficiently apply the brown coat, which should be of the same mortar as the first coat, but very strongly gauged with Portland cement. Put in as much cement as it will stand, and not fall off of the hawk or wall. This coat must be trued up with a long, straight edge or darby, and all angles and corners be cut clean and sharp. This straightening must be done about as fast as the coat is applied, as it will begin to set quickly. Put on 10 or 12 square yards, and true it up and repeat the process.

This coat is followed by the skin coat, which should be composed of very sharp, coarse sand; Portland cement, about 3 to 1; and a very little lime putty, just barely enough to hold the mixture together, so that you can get it from the hawk to the wall without losing too much. It is possible to get this on without any lime being used, and if you can accomplish it a better job will result.

If the brown coat is quite dry it may be dampened by throwing water on it with a brush. The skim coat should be applied evenly about 1-8 or 3-16 inch thick, allowed to set sufficiently to hold it to the browning, at which time it may be troweled smooth or scoured to a sand finish with a carpet float. Another finish is often put on to an outside wall called "slap-dash." This is accomplished by making the last coat of Portland cement with a little sand, mixed to about the consistency of molasses, and applied by being thrown on the wall with a whitewash brush. Pebbles are sometimes thrown on to the wall while this coat is still soft, making a finish called "pebble-dash."

Considerable skill is required to make these last two finishes and get a serviceable and artistic result. If these directions are followed a first-class job will be the result, but if you expect it to stand, the water must be kept from behind it. Especial care must be used in flashing the top of all horizontal members of finish, and those that are angular, unless nearly vertical, must also be flashed on top. Vertical members must be rabbeted. Use heavy zinc, lead or copper for flashing, taking utmost care, and you will have a job of outside plastering that will last for years. The total thickness of the plastering should not be less than 1 inch.

FOUNDATION 98 FEET DEEP.

The deepest foundation in New York is that provided for the building that is soon to be erected over the downtown terminal of the McAdoo tunnel, says the "Improvement Bulletin." This consists of a caisson, recently completed, which was sunk to a depth of ninety-eight feet. The previous record, ninety feet, was held by several skycrapers that rest upon foundations reaching that distance into the earth. Filled with concrete, this caisson will furnish the support for the corner of one of the twin buildings at Church and Fulton streets, which the tunnel company is now working upon.

This immense column of concrete will also serve another purpose, constituting a part of the great cofferdam which is to surround the station for the electric cars which are to come from New Jersey beneath the Hudson river. This cofferdam will be almost a wonder in engineering work, being the largest ever made for a New York office building. It is a solid wall of concrete which penetrates the earth to the bedrock, a distance varying from seventy-five to ninety-eight feet.

Contracts Department

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

CONTRACTS OPEN.

Belleville, Ont.

H. Corby, F. R. Tingham and others are reported to be contemplating the establishment of another large cement industry in this locality. It is stated that the initial expenditure will run into several millions and that valuable properties along the Bay of Quinte have already been purchased.

Burnaby, B. C.

Additional school buildings of a modern type are to be erected during the coming season by this town.

Campbellford, Ont.

The Canadian Steel Rolling Mills Company have effected an arrangement with the council by which they contract to erect and equip a factory building at a minimum cost of $60,000.

Caron, Sask.

The old school building on Ernfold street is to be remodeled for an Oddfellows Hall.

Collingwood, Ont.

The school property committee are considering the advisability of submitting a bylaw to raise the necessary funds for building an eight roomed school in the western ward.

Cornwall, Ont.

It is reported that the St. Lawrence Power Company's plant has been taken over by a syndicate and that plans for extensions, involving some $3,000,000, have been submitted to the International Waterways Commission. Geo. C. Foster, of Montreal, is stated to be the president of the new concern.

Creston, B. C.

A project is on foot to develop power at the Goat River canyon and a company is now in process of organization.

Durban, Man.

H. W. Lee, Secretary Treasurer, is offering for sale ten Central Valley school district debentures of $200 each at 6 per cent. interest.

Dunnville, Ont.

The ratepayers have approved bylaws to fix the assessment of the Monarch Knitting Company at $10,000 for ten years and of the Webster Citizens' Company at $7,000 for the same period.

East Kildonan, Man.

At a recent meeting the school trustees adopted a motion to erect a central school and also to provide temporary accommodation with a view to further extensions.

Edmonton, Alta.

Tenders will shortly be taken by the city commissioners for a supply of 2,500 yards of gravel to be used on paving work during the coming season.

The city have decided to install a new power plant consisting of a 1,000 horse power gas producer engine and a 2,300-volt generator. Particulars may be obtained of R. Keely, City Engineer.

The city council have come to an arrangement with the Stratheona authorities in regard to the proportion of funds to be raised in connection with the proposed high level bridge and it is expected that bylaws will shortly be submitted to the ratepayers of the two cities.

Eugenia, Ont.

The Georgian Bay Power Company will build a dam and power house this season in connection with the water power development for transmission to Owen Sound. A quantity of fifty-four inch steel pipe will be required in the undertaking. H. von Schon, of Detroit, Mich., is the consulting engineer.

Fernie, B. C.

$50,000 will be expended here next spring by the C.P.R. in new trackage, freight sheds and other improvements.

Granby, Que.

It is stated that plans have been prepared for a large rubber factory to be erected here this spring and that contracts for brick and machinery have already been let. S. H. Miner, late of the Consolidated Rubber Company, is understood to be the promoter of the concern.

Guelph, Ont.

The Railways and Manufacturers Committee are considering a petition for an overhead bridge over the Grand Trunk tracks to connect Metcalfe and Elizabeth streets. Negotiations are also being carried on in regard to other improvements projected by the G.T.R.

The city will apply to the Legislature for authority to issue debentures for the construction of sewers and sewer connections.

A deputation recently waited upon the Minister of Militia to ask for the sale of certain land to the corporation for use for building purposes in connection with the winter fair building. The matter is in abeyance.

Hamilton, Ont.

A recommendation is being submitted to the Board of Education looking to the enlargement of the Sophia street school at a cost of $30,000.

The finance committee have voted a sum of $5,000 for the erection of a smallpox hospital. Plans are to be prepared and submitted to the council for ratification.

It is stated that a writ will probably be issued against the county of Wentworth at an early date to enforce the erection of a House of Refuge in compliance with the provincial statutes.

Hawkesbury, Ont.

The need of a bridge over the Ottawa river is urgently felt in this locality and at the meeting last week of the special committee appointed to forward the project a resolution was adopted by warden Lapointe and reeve Berthiaume calling upon the federal government and the Ontario and Quebec legislatures to erect the desired structure.

Kamloops, B. C.

The plans of Architect Barnett, of Short's Point, have been accepted by the Vernon hospital board for their proposed new building, which is to be erected at an estimated cost of $35,000.

Ladstock, Sask.

It has been decided to build a new public hall at this place.

Laggan, Man.

J. P. O'Leary, superintendent of hotel construction for the C.P.R., arrived recently to supervise the erection of the company's projected buildings at Lake Louise.

London, Ont.

It is understood that application will be made by a private concern at the next session of the Legislature for authority to establish an abattoir

business in the city. Finlay Marshall is said to be interested.

Following the incorporation of the Canadian Packing Company, which formerly conducted two businesses, one at Port Huron and one in this city, it is announced that the firm will largely extend their plant. The concern is capitalized at $599,000.

The bylaw for the new firehalls has passed its third reading by the council and the construction of the buildings this spring is now assured.

Plans for a new isolation hospital have been submitted to the special committee by A. E. Nutter, city architect, and have met with general approbation, although action has been deferred until estimates have been received. It is understood that the cost of the proposed structure will be in the neighborhood of $50,000.

A rumor is current to the effect that a Government official recently paid a visit to the asylum for the purpose of reporting to the Provincial Secretary upon the advisability of either building a large addition to these premises or erecting another asylum in Western Ontario.

Tenders will be received by H. F. McNaughton, Secretary, Department of Public Works, Toronto, up to February 18th for the erection of a hygienic institute in this city. Plans at office of Moore & Henry and at the Department.

Magrath, Alta.

The Associated Boards of Trade have decided to erect the new Agricultural College at this point.

Medicine Hat, Alta.

W. P. Morrison, City Engineer, wants tenders up to February 17th for the supply of tools, specials and fittings necessary for the extension of the water and gas systems.

Moncton, N. B.

Tenders will be received by Fred Gelinas, Secretary, Department of Public Works, Ottawa, up to February 29th for the construction of an extension to the wharf at this city, according to plans at offices of E. T. P. Shewen, Resident Engineer, St. John, N. B., Geoffrey Stead, Resident Engineer, Chatham, N.B., with the local postmaster and at the Department.

Montreal, Que.

An independent lighting and power plant will possibly be installed at McGill University.

New Westminster, B. C.

The B. C. Electric Railway Company have purchased the Vulcan Boiler Works property in this city with the view it is stated of future extensions.

M. C. Moss, C.E., has submitted a report to the council in connection with the proposed new steel bridge for Lulu Island. The estimates involve a minimum expenditure of $147,000.

North Bay, Ont.

Plans are being prepared for the construction of a 1,000,000 gallon reservoir at Trout Lake.

Oak Bay, B.C.

Plans are being prepared for a new school building, the erection of which is urgent owing to excessive overcrowding.

Oliver, Sask.

G. M. Hallen, Secretary Treasurer, wants tenders up to February 25th for $1,400 school district debentures.

Ottawa, Ont.

Fred Gelinas, Secretary, Department of Public Works, invites tenders up to March 2nd for the construction of three steel tugs, according to specifications at offices at E. T. P. Shewen, Resident Engineer, St. John N.B., C. E. W. Dodwell, Resident Engineer, Halifax, N.S., J. G. Sing, Resident Engineer, Confederation Life Bldg., Toronto, Charles Desjardins, Clerk of Works, Post Office Building, Montreal, and at the Department.

The owners of the site adjoining Bennett's theatre are reported to be raising the capital for the erection of a new hotel.

We understand that a difference has arisen between the Grand Trunk Railway and the architects regarding certain sections of the plans for the new station and hotel and that in consequence the plans cannot be ready by February 16th, the date set for the approval of the plans by the city council. It is therefore probable that an extension of time will be granted to the railway company.

Peterborough, Ont.

The by-law to issue debentures for $10,000 for the waterworks system has received the approval of the Ontario Railway & Municipal Board.

City Engineer Hay, reporting upon the Smith street bridge, recommends the rebuilding of the structure, with a provision for the immediate construction of necessary repairs.

Portage la Prairie, Man.

A project is being formed with a view to supplying the railways with water. The scheme involves the laying of a pipe line to the river and the installation of a separate system at a cost of some $30,000.

Port Arthur, Ont.

Negotiations are stated to be in progress with the Winnipeg Safe Works, with a view to the establishment of a factory.

W. Monds, civil engineer, of Toronto, has just completed the survey of Dog Lake for the report being issued by Cecil B. Smith on power transmission to the city.

Port Elgin, Ont.

R. Munroe will receive tenders up to February 17th for $10,000 five percent. 30-year waterworks debentures.

Prince Rupert, Sask.

Plans for the new hotel to be erected by the G.T.P. at a cost of $1,250,000 are stated to be definitely under construction at Montreal under the supervision of F. W. Moss, General Manager.

Rosser, Man.

W. H. Beachell, Secretary Treasurer, will receive tenders up to March 1st for $20,000 five per cent. 20-year drainage debentures.

Simcoe, Ont.

The public buildings here are to be renovated this season at an estimated cost of between $2,000 and $3,000.

St. John, N. B.

The Board of Works have decided to proceed at once to repair the wharves damaged in the recent storms. The estimated cost of the work is $3,500.

St. Stephen, N. B.

The New Brunswick Southern Railway are applying to Parliament for authority to build a bridge across the St. Croix river in this locality.

St. Thomas, Ont.

Grace church are reported to be contemplating the erection of a new building.

Sydney, N. S.

D. Pottinger, General Manager, Intercolonial Railway, invites tenders up to February 18th for the construction of a hard pine trestle bridge. Plans and specifications at station master's office, this city.

Sydney, BC. .

At a recent meeting of the school board the commissioners decided to communicate with towns that had academy buildings with a view to finding out the best plan for a building of this sort.

Toronto, Ont.

Tenders will be received by Joseph Oliver, Chairman, Board of Control, up to Feb. 18th for the construction of asphalt, vitrified block and bitulithic pavements. Further particulars and specifications may be seen at office of City Engineer.

A campaign is being inaugurated to raise funds for the rebuilding of Westmoreland avenue Methodist church at a cost of $30,000.

A. W. Holmes, architect, has received instructions from the Separate School Board to prepare plans for the erection of two additional class rooms at St. Francis' school.

The plans of the proposed school board offices and the York street school are reported to be well in hand. The estimated cost is $110,000.

H. F. McNaughton, Secretary, Department of Public Works, will receive tenders up to February 18th for the erection of a hygienic institute building at London, Ont. Plans and specifications at office of Moore and Henry, London, and at the Department.

An addition to the customs department of the General Post Office will be constructed immediately.

In the report issued by the special committee of the legislature on prison labor it is recommended that the Central prison be disposed of and that an area of four or five hundred acres within easy access of the city be purchased for the erection of a new provincial reformatory.

Recent building permits include:—Sterling Bank, alterations to premises, corner Bay and King streets, $4,000; M. Frick, 2-storey brick store and dwelling, Yonge street, $2,000; Wm. Booth, 2½-storey brick dwelling, Summerhill avenue, $3,000; Salvation Army, alterations to dwellings, Bloor street, $4,000; Imperial Loan & Investment Company, alterations to offices, Yonge street, $1,500; T. E. Warlington, pair 2-storey rough cast dwellings, Manning avenue, $1,600; G. H. Bowen, 1-storey brick store, Bloor street, $1,200; Andrew Duff, 4 attached 2-storey brick dwellings, Columbus avenue, $8,000; Samuel Nosworthy, 2-storey brick veneered front and rough cast dwelling, Russell avenue, $1,200; A. Nicholson, addition to dwelling, Concord avenue, $1,500; John Silver, 2-storey and attic brick dwelling, Hamburg avenue, $2,800.

Tweed, Ont.

An explosion occurred last week at the Ontario Powder Works involving a loss of $3,000.

Vancouver, B. C.

J. A. L. Waddell, bridge engineer, of Kansas City, has been summoned to Vancouver to enter upon the work of preparing plans and specifications for the projected Westminster avenue and Granville street bridges.

Plans are being prepared for a four-storey brick block on Hastings street, next the Astor Hotel, to the order of B. Davidson.

Recent building permits include: Vancouver Granite Company, stone sawing plant, foot of Burrard street, $1,500; W. Twambley, dwelling, William street, $1,600; A. McKenzie, dwelling, Harris street, $1,800; J. E. Werry, frame dwelling, Keefer street, $1,500; J. Leckie & Co., brick warehouse, Water street, $80,000; Colonial Portable House Company, dwelling, Pendrill street, $2,000; F. Enwright, frame dwelling, Princess street, $1,500; C. J. Church, frame dwelling repairs, Sixth street, $2,100; W. J. Heming, frame apartment building, Columbia avenue, $5,000; C. W. Mattiers, frame dwelling, Cornwall street, $3,000; E. Seabold, frame cottage, Hastings street, $3,000; Wm. Salter, frame dwelling, Third avenue, $1,700; H. Komura, frame warehouse, Powell street, $1,500; A. Bates, frame dwelling, Tenth street, $2,500.

Victoria, B. C.

At the expiration of F. Foster's lease on the Government street premises it is stated that a fine bank building will be erected by the new owners, the Royal Bank of Canada.

George Jay, chairman of the school board, at a recent meeting of that body suggested the erection of a new high school in the city to relieve the present congestion. The cost of such a building would be somewhere in the neighborhood of $90,000. No decision has yet been reached.

A report has reached us from this city stating that a large mining merger is in contemplation. The principal properties in Franklin camp are stated to be involved in the transaction which if completed will result in the carrying out of a programme of extensions that will cost a quarter of a million dollars. The Maple Leaf Mining Company, of New York, are said to be at the head of the deal.

Welland, Ont.

J. C. MacMillan will receive tenders up to February 21st for repairs at the town hall and for a metallic ceiling in the basement of the same building. Further particulars at office of town clerk.

Architect Pitt, of Toronto, has about completed plans for the enlargement of the public school, the construction of which is to be put in hand at the earliest possible date.

Winnipeg, Man.

Funds are being raised for the building of St. Margaret's Anglican church.

It is understood that the Manitoba government are contemplating the erection of a new building for the provincial library.

The Congregational Church Extension Association have acquired sites on Portage avenue, near St. James park, and at Fort Rouge West for building purposes.

Information has been received from William Mackenzie, President of the Canadian Northern Railway Company, that the contracts for the erection of a union depot and hotel for the Canadian Northern and Grand Trunk Pacific Railways will be let not later than April 1st.

The Manitoba Roman Stone Company will establish a large industry in this city and have already secured an option on an extensive site in the west end.

A number of wooden bridges in western Canada belonging to the C.P.R. system will be replaced this season by steel structures, according to plans now being prepared under the supervision of C. N. Monsarrat, Engineer of Bridges, Montreal.

The Congregational church have purchased a site for a new building at the corner of Preston and Home streets.

C. J. Brown, City Clerk, gives notice of the civic intention to carry out paving and sewer work on Cornish street, Lipton street and Sutherland avenue at a total estimated cost of $4,081.

The Parks Board are considering plans for a large pavilion building in Assiniboine Park.

Woodstock, Ont.

G. Archibald, Superintendent of the Water and Light Committee, is authority for the information that the city will purchase new pumps and extend the power lines at an estimated cost of $27,000.

CONTRACTS AWARDED

Calgary, Alta.

The W. G. Millar Hardware and Heating Company, of this city, have secured the contract for the roofing and galvanized iron work for the new high school now in course of construction.

Campbellford, Ont.

The contract for the erection of the new power house in connection with the Middle Falls power project has been let to Bogue & Buchanan, of Peterborough. The dam is to be constructed by Brown & Aylmer.

Toronto, Ont.

J. C. Claxton & Sons, contractors, this city, have obtained a contract for the erection of H. C. Barker's new bakery building corner of Patrick street and Spadina avenue; architects, Wickson & Gregg.

Vancouver, B.C.

Smith & Sherborne have obtained the contract from J. Leckie & Company, shoe manufacturers, for the

construction of their new seven storey factory, corner of Cambie and Water streets, at an approximate cost of $75,000.

FIRES

Building of John White, Carberry, Man.; loss $10,000.

Woollen Mills of B. Leckie & Co., Stratford, Ont.; loss $2,500.

Convent building of Sisters of Providence, Montreal, Que.; loss $5,000.

Sawmill of Louison Lumber Company, Jacquet River, N. B.; loss $25,000.

Buildings of Gervais Bros., and C. A. Papineau, St. John, Que.; loss including stock, $20,000.

Premises of Dominion Fancy Vest Manufacturing Company, Toronto, Ont., loss $20,000.

Elevator of Ogilvie Flour Mills Company, Winkler, Man., totally destroyed, loss not ascertained.

Buildings of Robert Lowery, H. Kingston, Empire Lumber Company and others, Latchford, Ont., total loss $100,000.

House and barns of Robert Carey, Drummond, Ont., loss $5,000.

Buildings of Gamey Block, Gore Bay, Ont., loss $10,000.

Store of Dominion Coal Company, Dominion, N.S., building loss $5,000.

Residence of G. Richards, Port Arthur, Ont.; loss $2,000.

TENDERS AND FOR SALE DEPARTMENT

Department of Railways and Canals, Canada

TRENT CANAL.

ONTARIO-RICE LAKE DIVISION.

SECTION No. 3.

NOTICE TO CONTRACTORS.

Sealed tenders addressed to the undersigned and endorsed "Tender for Trent Canal," will be received until 16 o'clock on Thursday, 12th March, 1908, for the works connected with the construction of Section No 3, Ontario-Rice Lake Division of the Canal.

Plans, specifications and the form of the contract to be entered into, can be seen on and after the 5th February, 1908, at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Superintending Engineer, Trent Canal, Peterboro, Ont., and at the office of Mr. J. B. Brophy, Division Engineer, Trenton, Ont., at which places forms of tender may be obtained.

Parties tendering will be required to accept the fair wages Schedule prepared or to be prepared by the Department of Labour, which Schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered, unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signatures, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque for the sum of $10,000 must accompany each tender, which sum will be forfeited, if the party tendering declines entering into contract for the work, at the rates stated, in the offer submitted.

The cheque thus sent in will be returned to the respective contractors whose tenders are not accepted.

The advertisement dated the 16th January, 1908, is hereby cancelled.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, February 3rd, 1908.

Newspapers inserting this advertisement without authority from the Deparment will not be paid for it.

TENDERS FOR

CITY SUPPLIES

Sealed tenders, endorsed "Tenders for Cement, or etc., will be received by H. E. Gillis, City Clerk, Calgary, Alta., until March 1st, 1908, for the following materials:—

Cement
Pig Lead
Lead pipe
Cast iron water pipe
Corporation Cocks
Sewer pipe

Specifications may be obtained from the City Engineer. The lowest or any tender not necessarily accepted.

R. E. SPEAKMAN,
City Engineer.

Calgary, Alberta, Jan. 25th, 1908.

CHESLEY WATER WORKS

Tenders will be received until Feb. 29th, for Cast Iron Pipe, Hydrants, Valves, Lead, Water Tower.

For all information apply to

BOWMAN & CONNOR,
Consulting Engineers,
Court House, Berlin.

Notice to Contractors

I have a patented construction process far ahead of any so far used. I require Contractor to work it up. The strongest and lightest buildings can be made. For particulars address, P. O. Box 1144, Montreal.

DEBENTURES FOR SALE

Tenders will be received by the undersigned up to SATURDAY, THE FIFTEENTH DAY OF FEBRUARY, A.D., 1908, for the purchase of Twelve Thousand Dollars ($12,000) worth of debentures of the said Town of Aylmer bearing interest at the rate of six per cent. per annum running for a period of twenty years. Interest and Principal payable in eqnal yearly sums of $1,036.22.

JUNIUS BRADLEY,
Town Clerk,
Aylmer, Ontario.

TENDERS

Office Commissioner, Public Works and Mines

Department Technical Education, Halifax, Nova Scotia.

Sealed tenders, marked "Tenders for Technical College" will be received at office of undersigned up to noon on MONDAY, FEBRUARY 17, 1908, for the erection of the

Nova Scotia Technical College,

in the city of Halifax.

Plans and Specifications can be seen at the office of Herbert E. Gates, Architect, Roy Building, Halifax, N.S. Each Tender must be accompanied by a Certified Cheque for 10% of the total amount of the Tender, as security for the performance of any contract entered into with the Department.

The Commissioner is not bound to accept any Tender.

C. P. CHISHOLM,
Commissioner Public Works & Mines.

NOTICE TO CONTRACTORS

Tenders from all trades will be received by the undersigned until February 29th, 1908, for a Hospital building to be erected in Welland, Ont. Plans and specifications may be seen at the office of the Architects, or at the Town Hall, Welland, on and after February 15th.

LANGLEY & HOWLAND, Architects,
Continental Life Bldg.,
Toronto, Ont.

The city council of Brandon, Man., have decided to accept an offer from J. Wilson Smith, of Montreal, for $10,000 4½ per cent 40-year fire equipment debentures.

Wood, Gundy and Company, Toronto, were the successful tenderers for $157,000 debentures of the city of Fort William, consisting of $102,000 for waterworks, $30,000 for electric light and $25,000 for high school purposes.

SPECIFICATIONS FOR PAINTING METAL ROOFS.

New Work.—All new metal, tin, galvanized iron or steel, used for roofing, cornices, valleys, gutters, down spouts, iron railings, gratings, etc., shall be painted according to the following specifications:

Before Painting—All surfaces shall be carefully cleaned by scrubbing with sand soap and water, and thoroughly dried, before paint is applied. Only when this is done will the paint adhere properly to the metal. This is very important.

Formula.—Southern dry pure red lead, 30 pounds; pure boiled linseed oil, 1-3 gallon; pure raw linseed oil, 2-3 gallon; pure lamp black ground in oil, 4 ounces.

Mixing.—The materials must be thoroughly mixed before application. The mixture shall be of uniform consistency and stirred frequently while in use.

Application.—All surfaces shall receive two uniform coats, as above. When necessary to follow a color scheme, finishing coats of pure white lead and linseed oil, tinted to suit, shall be applied over these coats. Each coat shall dry thoroughly before the next is applied. Paint on under side of roofing shall dry hard before roofing is laid.

Old Work.—Metal surfaces not new shall be thoroughly cleaned with wire brush, removing all loose paint and particles, and then painted as above. —The Western Builder.

Condensing engines consume two to six pounds of coal per horse-power, and require 20 to 25 gallons of water to condense the steam represented by one gallon of water evaporated.

A SUBSTITUTE FOR CONCRETE.

A composition resembling concrete, now being considerably used in France, and known as lime beton, is described as being more generally used than concrete. It is a cheaper composition than cement beton, or concrete, easier to work, and if the initial load be not too great it is for nearly every purpose just as good. A good lime beton can be obtained by mixing mortar and stones, gravel, or cinders, mortar and good-sized stones making the best composition. Probably one-half of the houses in Marseilles have been built of this material, and thousands of the older buildings, many hundred years old, are held together by ordinary lime. Walls built of quick-lime beton must be laid up slowly, but with hydraulic lime beton they can be erected as fast as masons can work. The solidity of lime beton construction is shown by the sea walls and docks in Marseilles, where masonry of this kind may be seen to which building material can be subjected.

FIREPLACE SUGGESTIONS.

Mistakes are sometimes made by inexperienced persons in building the fireplaces which are coming into such favor again. The people find that the fireplace smokes and is susceptible to every vagrant breeze that happens to blow down it. The reason for this is a fault in construction, a disregard of a fundamental law and a principle well known to most builders. The fireplace has not been provided with a proper "throat" and "smoke shelf." Some people have the idea that the bigger the chimney the better will be the draft, and they build

only clear water, but a permanent river bed.

The nature of the material composing the bottom of the river, though in many places very difficult of dredge, is for the same reason of such a character that a dredged cut once made is substantially permanent.

In the ship channel the material to be excavated varies from soft blue clay into which a pole may be planted some 6 to 7 feet by hand, to stiff clay, to hard pan as hard as a macadamized road, to shale rock and large boulders. In one or two localities coarse sand is found, at which points dredging has to some extent to be repeated. Below Quebec, at the localities where the fresh and salt waters meet, there are the usual sand bars, but these do not seem to be increasing. The movable nature of the material, added to the lack of uniformity of the tides, more instability in the shoals below currents and salt water, results in Quebec. It is therefore expected that the maintenance of the excavated channels there will require some annual re-dredging. The currents of the St. Lawrence are, for a river of such size, not only reasonable and regular, but altogether free from the usual dangers to navigation resulting from freshets. Except for floods during the chimney large and of the same size throughout. The throat should be a few inches above the arch of the fireplace and should be comparatively narrow.

TORONTO ENGINEERS ELECT OFFICERS.

At the annual meeting of the Toronto branch of the Canadian Society of Civil Engineers, held in the society rooms last week, Mr. Charles H. Mitchell was elected chairman for the year 1908, to sceeed Mr. E. H. Keating, who resigned on account of contemplated absence from the city. Mr. Thos. C. Irving, jr., was elected hon-

orary secretary-treasurer, and the election for the executive committee resulted in Messrs. Mitchell, M. J. Haney, Irving, Simpson and Norman McLeod being elected.

The general annual meeting of the Canadian Society of Civil Engineers takes place next week in Montreal. Mr. C. H. Rust, City Engineer, has declined to allow his name to stand for the presidency of the society, so that Dr. John Galbraith, Principal of the School of Practical Science, is elected president for 1908 by acclamation.

The meek shall inherit the earth, but the hustler will have the estate before the legatee can probate the will.—Elbert Hubbard.

BRICKS WHICH RESIST FROST.

With the increased use of steel work in building construction, and of reinforced brick and terra-cotta work, there is an increased necessity for paying attention to the effect of frost on bricks used in connection with steel and iron work, says "The British Clayworker." These metals are so seriously altered in size by variations in temperature that in large buildings great care is needed in the arrangement of the various materials.

Porous bricks have long been placed as of secondary value for positions where the effect of frost is at all likely to be severe, and vitrified or engineering bricks have taken their place. Bricklayers, on the other hand, prefer more porous bricks, on account of their absorbing more water and being easily laid. It is, therefore, often necessary to effect a compromise, and choose bricks with sufficient porosity to be securely fixed by the mortar and yet sufficiently vitrified to resist the action of frost as much as the circumstances of the case will permit.

The amount of porosity permissible in bricks exposed to frost varies greatly with different cases, but is, roughly, proportionate to the weight the bricks have to carry. Bricks used for light buildings, or subject to comparatively small strains, may be very porous and yet not become disintegrated, whilst the same bricks used in the foundation walls of a lofty building might be dangerous on account of the greater compression to which they are subjected.

This relation between porosity and frost resistance is a problem which has never received the attention it deserves, and it is only recently that builders (especially on the continent and in America and Canada, where the frosts are much more severe than in this country) have given much serious thought to the matter.

Extensive experiments carried out in Germany appear to show that the effect of frost cannot be predicted from a study of the porosity of sample bricks, as the disintegration of such bricks on repeated freezing and thawing is quite as much dependent upon the way in which the brick has been made and the care and sufficien-

cy with which the clay has been prepared as upon the ordinary physical characteristics of the bricks themselves.

Hence, whilst it is generally found that vitrified brick is least affected by frost, for other porous bricks the only reliable tests consist of repeated freezings and thawings under conditions as nearly like those which would occur in actual practice as are possible.

There is a curious and hitherto unexplained increase in the strength of some bricks after freezing, but this phenomenon only occurs with highly porous goods.

What is much needed at the present time is a variety of porous bricks which can be easily laid by ordinary bricklayers (and unlike sand-lime bricks do not require special skill in this direction), and which will at the same time be able to resist thirty or

more severe freezings without in any way losing strength. It is difficult to suggest details as to how these ends may be reached, but we imagine that brickmakers will find it most desirable to ascertain the strength of their bricks after repeated freezings and thawings (one prolonged freezing is not sufficient to effect a notable change in good bricks), and to experiment on their best bricks (by this test) by adding small proportions of flux or by slight increases in the temperature at which they fire their goods. Pavers are excellent frost resisters, and so are most fire bricks, though they are generally fairly por-

RED IRON STAINS FOR CEMENT BLOCKS.

It is often desirable to be able to produce a red or iron colored cement block or concrete factory floor. This, says the "Cement and Engineering News," can readily be accomplished, as follows: Sprinkle sawdust over the floor to the depth of one-half inch; next scatter iron filings over the surface one ounce to the square yard, and over this spread one inch deep wood shavings. Make a solution of sal-ammoniac one pound to 6 quarts of water; sprinkle the floor and keep moist for several days. The sawdust and shavings can be used over and over again. This preparation is said to produce a high degree of waterproofing. The shavings are not absolutely necessary and are only used to prevent evaporation for cement blocks, a cement basin 10 by 20 feet raised four inches at the sides may be used. Cover with one inch of sawdust and use the same mixture, noting that the greater the quantity of iron used the darker the stain produced. The tank or basin should be flooded to the depth of stain required on the face and sides of the blocks. The longer the block remains in the solution the darker and more dense the stain and the more waterproof it will become.

This is not new or patentable as it has been used for years in Europe. Ironite, which is being made as a waterproofing, is substantially the same compound. Iron dissolved by sal-ammoniac and used as a paint.