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AS the time for the consideration by Parliament of the proposed act incorporating the Canadian Institute of Architects draws nigh, agitation against certain stipulations laid down in the draft charter is becoming keen. When the project was first mooted it was hard to even form an opinion as to the popular sentiment of the profession; but when the subject was opened for discussion by the daily press and contemporary trade publications, the dice seemed to go against the enactment of such legislation in its entirety.

CORPORATE REGISTRATION OPPOSED.

A few more expressions like the following, emitted by the Toronto Architectural Club, at its annual meeting held December 3, will do much to relieve the minds of any interested persons who happen to be in doubt as to the final issue:

"Whereas the question of registration of architects has been brought up by the press and as it is a matter with which the newly formed Institute of Architects of Canada and the Ontario Association of Architects are attempting to deal, the club wishes to put itself on record as follows: That the Toronto Architectural Club is not opposed to a proper form of registration of architects, based on education and under direct government control, but is opposed to the form or forms of registration put forward by the Institute of Architects of Canada and the Ontario Association of Architects, which would mean giving the control of the profession over into the hands of certain privileged bodies of the profession."

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COMMENTING upon the disastrous fire which occurred in the Winnipeg Paint and Glass establishment recently, the Manitoba Free Press predicts that an impetus will be given to fireproof construction in that city, and holds up a clause in the Minneapolis Building By-law as a principle which Winnipeg should adopt in all future construction. This ordinance forbids the alteration or construction of any building for hotel purposes over three stories high, which is not fireproof. This may to some seem a hardship, but were it adopted generally all over the country, and particularly

FOLLY OF PAYING FIRE INSURANCE.

in the larger cities, it would result in the saving of many lives. Hotel proprietors are cognizant of the advantages of the fireproof building and are willing to pay a considerably increased rental because of the fact that they can state with all honesty that their building is fireproof. It is more of a point with them in soliciting the patronage of the traveling public than probably anything else. It would appear that more owners of buildings of this class than any other are willing that they should be of fireproof construction in order that they may derive a steadily increased rental. There can be no question in the minds of any as to the desirability of expending a little more money initially and using every known means of eliminating the possibility of fire. The money lost in the Winnipeg Paint

and Glass fire would have fireproofed several such buildings.

It is absolutely incomprehensible why men who lay any claim to business perspicacity will deliberately invest their money in something that is shoddy, that is ever a source of worry and expense and that stands a very great chance of being utterly destroyed.

Insurance does not insure a building. Insurance is but a gamble the average man is trapped into and, generally, with merely the hope that the loss he feels certain may occur will not be a total one.

The only thing to do is to build our new buildings better and revamp our old ones just as quickly and as well as we can. Our losses have reached the point where they are absolutely unbearable.

Thoroughly fireproof building is the only sensible, reasonable, economical way of doing things. It ultimately means a great saving, and even the initial cost is but a trifle over that of shoddy construction. By "fireproof" we mean not only that the building should be constructed of undamageable as well as incombustible materials, but they must be properly put together and the whole designed in a "fireproof", intelligent manner. It has now become the imperative duty of cities to protect themselves and their people against the continued desecration of life and property, in any such ratio as it has been going on, and that has been brought about by such utter stupidity and neglect of the very essentials in safe, permanent and sensible construction.

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AN original species of vanity has developed in Washington, D.C. Saddened by the realization that their creative genius had satisfied all requirements of the locality, the Architectural Club of the capitol city have been, until lately, in much the same predicament as one Alexander, who is reputed to have wept because he knew of no more worlds to conquer. A

PROFESSIONAL VANITY.

quixotic individual, however, has hit upon the happy idea of "letting their light so shine" by converting the most ill-appointed shack obtainable into a structure of hitherto unconceived grandeur. The suggestion will be acted upon.

The organization, according to "Rock Products," intends purchasing a deserted old barn which has been the abode of rats, bats, pigeons, spiders and other domestic animals for some years, and remodeling it into a palatial club-house, suitable for the entertainment of the most fastidious of their visiting brethren. The members have entered into the project with an earnestness that is a few degrees above normal, and are nourishing a delirious belief that when the transformation is complete, the culmination of artistic architectural development will have been achieved. The Prince of Fairy Tales, the magic lamp and enslaved Gogius, must needs fall into obivion in the face of this.

NEXT year's Building Trades' Exhibition at Montreal will be held during Easter week, April 20, 1908, and will continue for six days instead of four, as was the case last August. The management, through Mr. J. H. Lauer, secretary of the Montreal Builders' Exchange, have already issued a prospectus calling attention to the earlier date and also to a change in location from Victoria Rink to the Coliseum, on Dorchester street. The last "show" which was

NEXT CANADIAN BUILDERS' SHOW. The first exclusively devoted to building materials ever held in the Dominion, was such a success as to demand a repetition on a much larger scale. The new quarters will provide fully twice

the floor area. The value of such an exhibition, not merely to the general public but to the exhibitors more particularly, has already been demonstrated in the successful issue of the first exhibition. If kept up from year to year there is a strong possibility of this exhibition becoming a great national affair. If perfect organization is maintained and the object as outlined in the original prospectus aggressively striven for the scope of the Canadian Builders' Show will expand sufficiently to embrace all the latest up-to-date ideas in labor-saving devices, home-building economies and even household comforts from the various standpoints of heating, ventilation, plumbing and interior decoration.

The change of date from August to April is well advised, coming as it does at the close of the winter when builders and manufacturers have laid their plans for the rush of the coming season. The exhibition cannot fail to attract thousands of the best class of purchasing visitors.

The exhibit will be entirely under the direction of the Montreal Builders' Exchange, and an advisory Board of Management will be selected from leading business men in the Building and Supply Trades, so that intelligent and expert arrangements should be assured.

THERE is not the shadow of a doubt as to the prompt return of the country's business interests to a normal condition. Actually there is no real reason for even a fractional part of the unsettled state of affairs and distrust that has existed. Statistics from all parts of the continent give assurance that the crops have been good and the prices fair. This is the fundamental basis of a country's prosperity. But since a temporary halt in the commercial march seems inevitable, it were well to remember that the pendulum swings

BUILDING OUTLOOK BRIGHTER.

ahead as far as it swings back. Such a satisfactory yield as the crop statistics show, combined with the efforts being put forth by the governments of Canada and the United States to straighten out the kinks, must bring about the desired results. That building activities should be experiencing a reverse is not unnatural, though uncalled for. It would appear that the present is a most opportune time for people, who have been contemplating it, to build. The money stringency has developed some peculiar effects upon the building situation. Just prior to the so-called panic, the prices of not only material, but labor, were at the top notch. Wages were at the highest point ever reached and the amount of work done in a day was the lowest ever conceded. Labor was exceedingly independent, and the result was that buildings cost anywhere from 20 per cent. to 60 per cent. more than they did a very few years ago. Tightening of money has scared people generally; manufacturers are anxious to get rid of their stock in order to start money flowing in, and are making low prices on materials. And while wages have not been reduced to any great extent, men are desirous of "holding their jobs" and are rendering immeasurably better service. It is only a question of a little time when conditions will have eased up and labor and materials will be at the same old high-priced standard.

Unmistakably the people have had a stiff enough dose of stock depreciation and have seen the folly of trying to make big returns by stock gambling. More and more will it be brought home to them that real estate and building constitute infinitely safer investments and it will not be long before we will have boom-times again in building. The men who are far-sighted enough will close up contracts, and "cinch" their building operations and get started at once. The people who "must be shown," who want to wait and see, and postpone building contemplated structures for a year or so will pay the penalty in a greatly increased, enforced expenditure.

THE statement made by Samuel Gompers, president of the A. F. of L., at Norfolk, Virginia, that "in the transaction of our affairs we have regarded Canadian workmen as being part and parcel of the American labor movement, as much as our movement is part and parcel of theirs," and that "geographical lines have in no way interfered with the fullest development of fraternal relations," has brought forth a storm of criticism in Canada. Mr. Gompers is a powerful man in labor circles

and such a statement should give employers of organized labor in Canada grave concern.

SAMUEL GOMPERS ON CANADIAN LABOR. Is it not sufficient that the Canadian employer should have to deal with the unions in Canada, to which their laborers belong, without having to cope with conditions they are in no way responsible for? It is a truly unfortunate condition of affairs when strikes may be called on Canadian employers by American labor officials, as a result of conditions we in Canada have no control over.

An instance of the unfairness arising out of this connection existing between Canadian and American labor unions was the coal strike in the Northwest last winter, when the Canadian Government was subjected to the indignity of sending the Deputy Minister of Labor to confer with President Mitchell, of the A. F. of M., at Indianapolis, Ind., to avert a coal famine in Canada.

Many cases of the interference of American labor officials in industrial controversies in Canada might be cited. If we must have labor unions in Canada let them be controlled by Canadians, from Canadian headquarters, instead of foreign officials located in a foreign country.

Criticism of Mr. Gompers' position on this question not only comes from Canadian employers, but prominent leaders in the labor movement in Canada have some very significant comments to make, among whom might be mentioned Mr. P. J. Loughrin, of Toronto, at one time general labor organizer for the Dominion, who goes so far as to state that President Gompers is actually insincere in his unwarranted stand.

Mr. Loughrin gets after Mr. Gompers with a "big stick," and he recalls, to corroborate his criticism, the story of his own fight for the preservation of Canadian rights in the matter of saw log export. Mr. Loughrin was the first to look over the possibilities at the Soo with Mr. Clergue, and he was afterwards identified with the efforts made to force Americans to locate their lumber mills in Canada or do without Canadian logs. He recalls the fact that he was dismissed by Mr. Gompers because he stated in a Toronto paper that such a course was advisable, and he says that Mr. Gompers' hostility was due solely to American jealousy of a course of action which was bound to benefit Canada.

Mr. Loughrin is a practical lumberman, and he grew sick of seeing Canadian pulpwood being towed off to mills on the other side of the border. He tells graphically of how he helped to change this state of affairs, and what happened as a result.

"I got my appointment from Gompers," he says, "after having helped organize labor at the Soo. We got 1,762

members in five weeks, and had \$2,300 in the bank. The men there got the idea into their heads that I should be appointed Dominion organizer of labor, and I was; but did not know anything about it until I received a document from Gompers with a seal on it as big as your head. It was my appointment.

"Well, I addressed meetings from Windsor westward to Quebec during the four months I held the position. That was in 1897 and 1898. My dismissal, however, was not long in coming, and Mr. Gompers intimated that it all happened because I had advocated in a Toronto paper the prohibition of the exporting of Canadian logs to American mills.

"The situation was this: The big American lumber companies were sending their men into Canada by the hundred to get Canadian logs. The men would get their checks in the spring, and 'Back to God's country for our clothes,' they would say, and away they would go, buying their clothes and spending their money in the States, and taking the logs across the line, to be manufactured there. Even the storekeepers along the north shore who had stocked up with clothes to supply them did not reap any benefits.

"There is a clause in the constitution, as Mr. Gompers well knows, which advises organizers to take such a course as will best benefit the men in their own districts. I did so. I advocated the compulsory manufacture of Canadian logs on Canadian territory. The success of that movement has meant the spending of thirty millions of dollars on this side of the line, and the removal of practically the whole milling industry to the north shore. But Mr. Gompers saw that Canada was benefiting, and he dismissed me."

Mr. Loughrin does not spare Mr. Gompers in referring to the latter's attack on Senator Loughhead, who advocated making it a criminal offence for a foreigner to incite Canadians to strike. "Senator Loughhead was in a sense right," declares the ex-organizer. "He had the feeling, which is very general, against employing United States agents to tell Canadians what to do. There are men in our own country of quite equal ability, and they can do far more for the laboring men than a stranger."

Summing up the whole published report of Mr. Gompers' address, Mr. Loughrin brands it as an untruth, and he says he is prepared to stand back of what he says.

This is a particularly interesting discussion of the subject, especially as it comes from one who has been so closely in touch with the labor movement in Canada.

It will be of special interest to architects and architectural draftsmen to learn that the Architectural League of America has established an individual membership for persons who are not members of the various clubs of the league, but who are interested in the study and promotion of architecture and the allied arts and professions.

Such persons shall be entitled to membership in the league with all the privileges pertaining thereto, except voting at the annual convention. They may participate in all conventions with the privilege of the floor.

They are also eligible to compete for the travelling scholarship offered by the league, for fellowships offered by several universities, and shall receive an "Annual," the official organ, published and edited by the league, at the club rate of one dollar (\$1.00). The annual dues shall be two dollars (\$2.00).

At present negotiations are under way to secure club rates and discounts from publishers of architectural magazines and from clubs publishing catalogues. As soon as satisfactory arrangements have been completed, these benefits will be extended to members.

Further information and applications for membership can be secured by communicating with H. S. McAllister, Permanent Secretary, 729 15th Street, N. W., Washington, D. C.

THE electrification of Sarnia tunnel, which was begun just a year ago last October, is fast nearing completion.

The Westinghouse Company, of Pittsburg, has the complete contract for the electrification of the tunnel, the power plant, the distributing system and the locomotives.

The new power house in Port Huron is 100 by 100 feet in size, is two storeys high, fireproof and built entirely of concrete, steel and brick. It contains four batteries of boilers, automatic coal handling apparatus, two turbos, which include turbines and dynamos, and a large amount of necessary auxiliary apparatus. The plant is as complete as any in the country, and is modern in every respect.

The turbos have a total capacity of 2,500 horse-power and can be increased to 3,000 horse-power. All the electric wires from the building run through a shaft into the tunnel and supply the trolleys, pump houses and round houses, in both Port Huron and Sarnia yards, besides the shop, customs offices, sheds, etc. There will be nine miles of electric track. This includes side tracks. There will be 500 electric lights in the tunnel proper.

The cost of electrification of the tunnel including the work around the yards, will reach about \$1,000,000. The Westinghouse Company, of Pittsburg, Pa., are the general contractors. B. J. Arnold, of Chicago, is the consulting engineer for the railroad company, and has furnished all of the plans and specifications except for locomotives and the turbos.

A NOTTINGHAM miner has patented a safety pit cage, which is claimed to be a decided advance on all its predecessors, both in application and security.

It is stated that this new British invention can be applied to any kind of mine cage and ship or passenger elevator, and that it has the great advantage of being adaptable equally well to steel, wood, rope, or any form of guides that may be in use. The cage is fitted with sliding bars, each having a gripping screw with a weight or spring attached, by which the bars are coupled to the guides should the hauling or winding rope break, and without in any way damaging the guides. A particular feature is the automatic gripping action exercised on the guide ropes by the weight of the cage itself and its immediate but gentle arrest in the event of the breaking of the winding rope. Thus, it is asserted, there can be no severe jerk on sudden stoppage, and no danger of the occupants of the cage being violently thrown against the roof should an accident occur. With this system, it is contended, the danger from accidents by the breakage of winding and hauling ropes in mines, elevators, etc., is minimized.

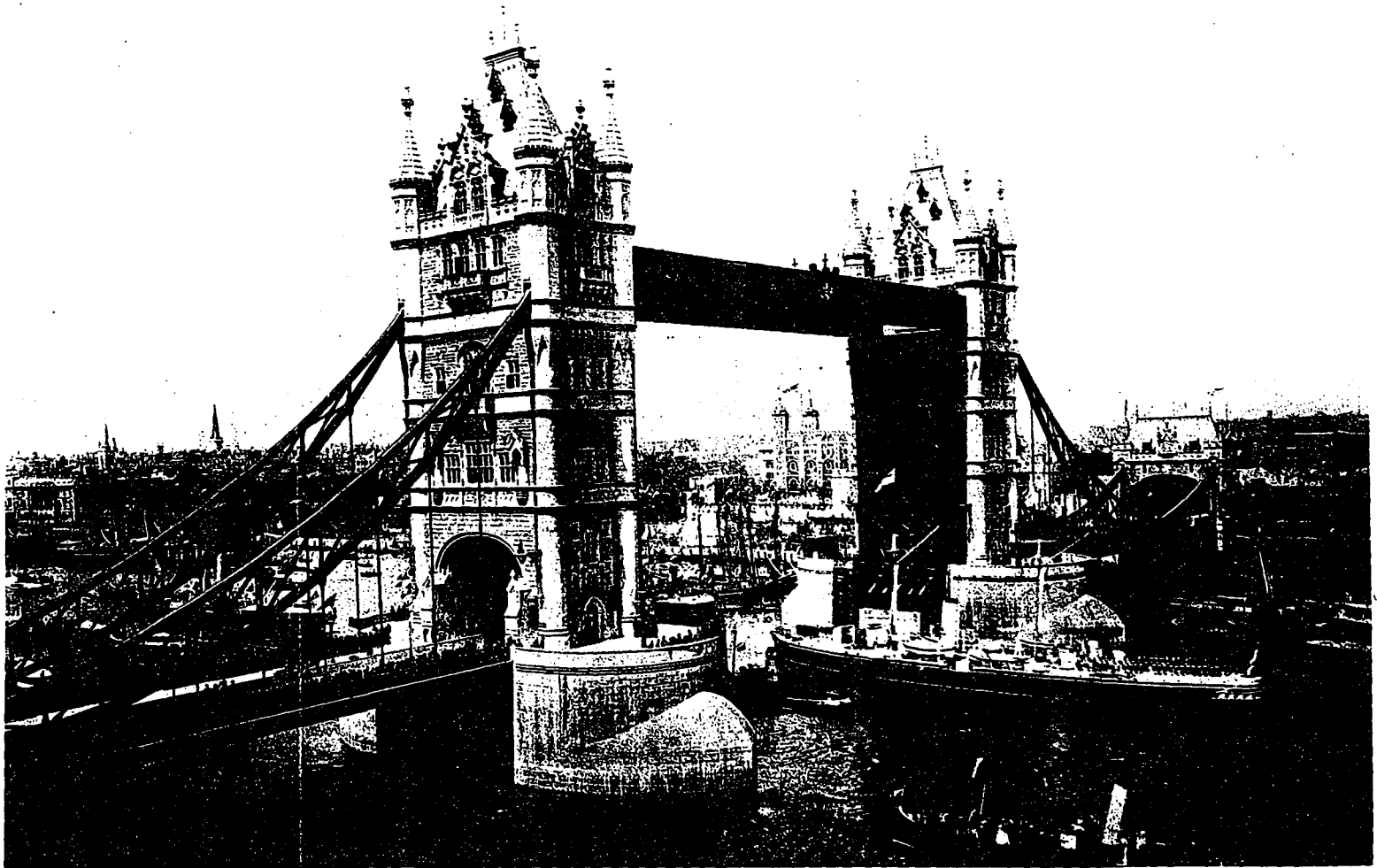
AT the annual meeting of the Winnipeg Builders' Exchange held December 3rd, the following officers were elected for the coming year:

- President—J. W. Morley (re-elected).
- Vice-President—W. P. Alsip (re-elected).
- Second Vice-President—W. H. Carter.
- Treasurer—L. D. Robinson (re-elected).
- Secretary—H. Pearce.

President Morley's report showed that, in spite of the depression and shortening of building operations, the exchange had maintained its position of a year ago.

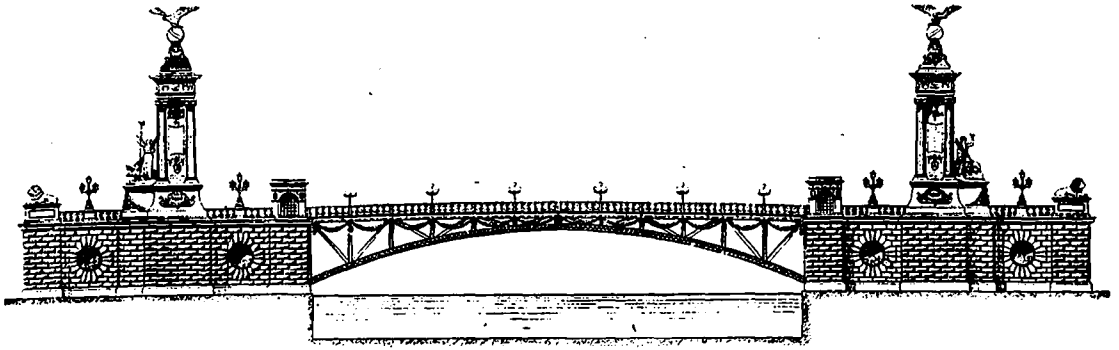
THE Toronto Architectural Club, otherwise known as the 18-Club, have elected the following officers for 1908:

- President—Mr. Eden Smith.
- Vice-President—Mr. C. D. Lennox.
- Sec.-Treas.—Mr. W. Ford Howland.
- Committee—Messrs. C. H. Acton Bond and J. P. Hynes.



TOWER BRIDGE, LONDON, ENG., COMPLETED IN 1894. COST OVER \$4,000,000, ONE-EIGHTH OF WHICH PRICE WAS EXPENDED ON ARTISTIC EMBELLISHMENT OF THE TOWERS. UP UNTIL CONSTRUCTION WORK WAS WELL BEGUN, THIS BRIDGE MARKED THE APEX OF DEVELOPMENT IN BASCULE BRIDGES PROVIDING A CLEAR CHANNEL OF 200 FEET. MODERN INVENTION HAS GREATLY DISCOUNTED THIS WORK IN LENGTH OF SPAN, RAPIDITY OF OPERATION, STRENGTH, DURABILITY AND COST, THE ARCHITECTURAL TOWERS NOW BEING RENDERED SUPERFLUOUS.

Construction, January, 1908



ARTISTIC DESIGN FOR MODERN LIFT BRIDGE, AFFORDING A CLEAR CHANNEL OF 200 FEET WHEN OPEN FOR THE PASSAGE OF BOATS—COUNTER-WEIGHTS AND MACHINERY FOR RAISING THE SPANS CONCEALED IN THE MASONRY—A GOOD SUGGESTION FOR A BRIDGE CONNECTING DRIVEWAYS OR BOULEVARDS OF A PARK, WHERE BROKEN BY A RIVER OR LAGOON. *Fig. 1.*

Development of the Bascule Lift Bridge

Length of Span, Rigidity and Time Required in Operation, Much Improved Upon by Modern Inventors—Latest Types of Drawbridges Have Awakened New Possibilities in Inland Navigation

INCREASING channel requirements have stimulated invention to wondrous achievements in movable bridge construction until, in the present day, canals and rivers may afford an unobstructed passageway of 300 feet or more in width to mammoth steel clad transport vessels of enormous beam, without interfering, to any appreciable extent, with overland traffic. With the advent of the propeller and the cheap steel vessel or barge, vast possibilities in inland waterway transportation have arisen, and commercialism, ever alert the world over, is demanding that these possibilities be effected to the very limit, and with despatch. Vessels of unprecedented draught, length and beam, are being constantly slid down the ways of the shipyards to take up their positions in the long line of progress through river, lake and canal. It therefore becomes the duty of every country's government to provide direct and adequate passageway as broad and free from obstruction as engineering science will permit.

On the other hand, there is a progressive commotion on land, ever swelling its proportions, increasing its velocity and demanding its uninterrupted right of way. Thus to avoid a congestion of traffic either on land or water, bridges must be constructed that may be opened and closed so as to give passage alternately to vessels plying up and down stream and to permit of pedestrian, vehicular or railway traffic crossing the channel—and these crossings must be effected quickly.

For many years the swing bridge, supported on a pivot pier in the centre of channel has taken precedence over the ferry and more primitive forms of draw bridges, because of the increased length of span it provided, in addition to being operated more quickly than other types. It also showed superior strength. But the day of the swing bridge's utility is on the

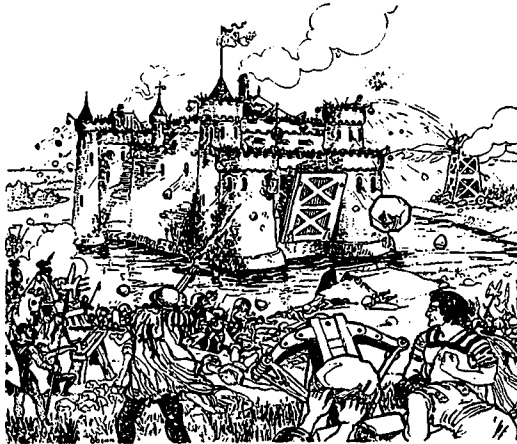
wane, it being found inefficient both in respect to the width of unobstructed channel it affords and the length of time consumed in its operation.

One does not need to go outside of Canada for an evidence of this fact.

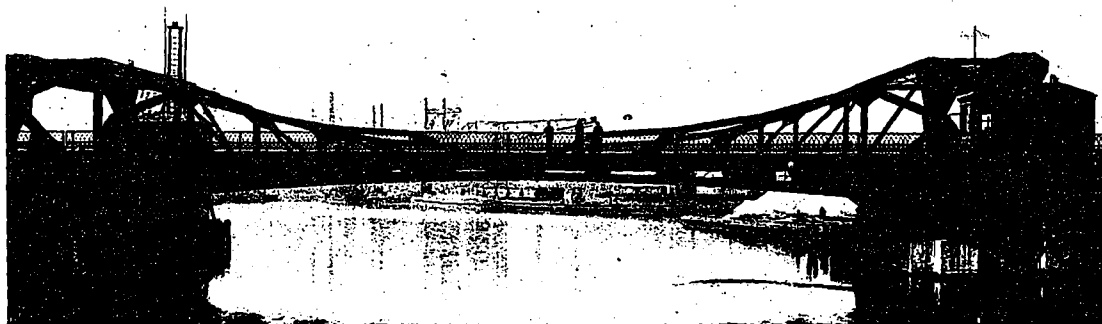
The Chief Engineer for the Dominion Government in the last annual report of the Department of Railways and Canals, states that all pivot piers of the bridges in the centre of the Welland Canal are to be entirely done away with, in order to give a clean channel of 100 feet in width. It is proposed, each year, to tear down two or three of the old bridges and build new structures spanning the entire channel, until every bridge at present standing has been replaced.

Just what form or type of movable bridge is to be adopted by the Canadian officials in connection with the imminent necessity of increasing the efficiency of navigable waterways is a momentous question. Canada has already spent more money in constructing and improving her inland water transportation service than any other country in the world—a total of \$116,230,342.94—and has provided, by means of the "enlarged canal system," and

the intermediate waterways (as her chief navigation project) a minimum depth of fourteen feet of water from Lake Superior to the head of the ocean navigation at Montreal to accommodate vessels 255 feet long with 44-foot beams. "In exceptional cases," says the latest Blue Book, "this length can, with certain manœuvring, be sometimes increased to 265 feet, being governed, of course, by the form of the vessel." That the country will, before long, be called upon to make further extensions and improvements in this direction is certain, in order to meet the demands of her fast increasing population her commerce, and



MEDIAEVAL PIVOT OR TRUNNION BASCULE BRIDGE OF VERY SHORT SPAN. THE BASIS OF SUGGESTION FOR THE MODERN LIFT BRIDGE OF OVER 300 FEET IN LENGTH. *Fig. 2.*



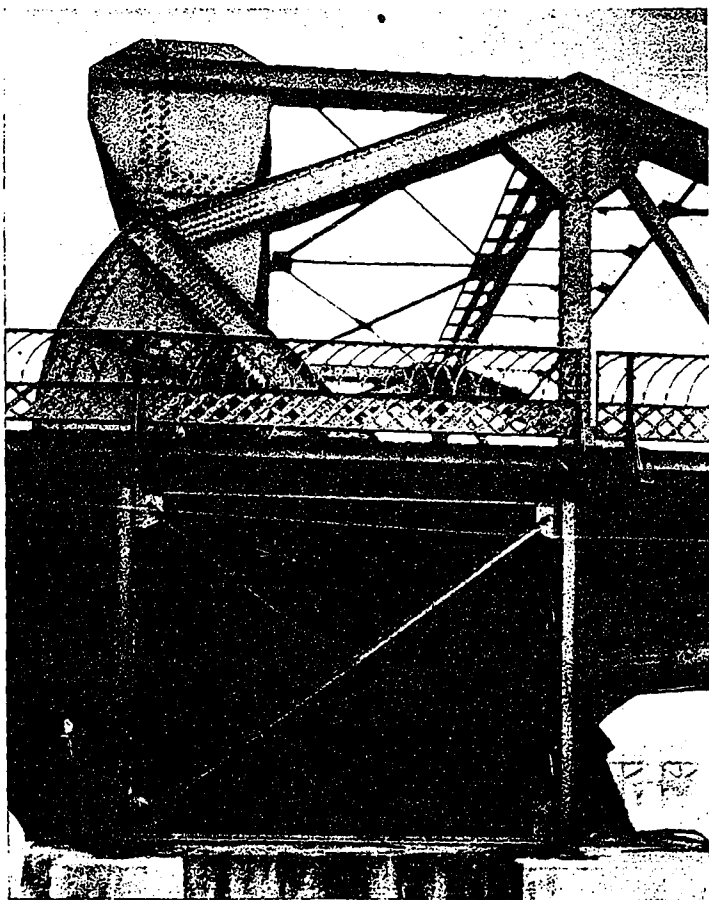
ONE OF THE NEWEST TYPES OF LIFT BRIDGE RECENTLY CONSTRUCTED AT THE INTERSECTION OF THE CUYAHOGA RIVER AND JEFFERSON STREET, CLEVELAND, OHIO, BY THE COWING ENGINEERING COMPANY. ITS TWO LEAVES, WHEN OPEN, GIVE A CLEAR CHANNEL OF 125 FEET. IT CARRIES TWO 6-FOOT SIDEWALKS, TWO ROADWAYS AND DOUBLE CAR TRACKS, CARRYING CAPACITY, 80,000 POUNDS. Fig. 3.

the rapid industrial expansion of her western provinces. The Government has been brought face to face with the impracticability of the restrictive narrow and shallow channel available in the Welland Canal—upon which over twenty-one millions of dollars have already been expended—by the possibilities which have been taken advantage of in the construction of the Sault Ste. Marie canals, giving access to and from Lake Superior and through which, during the season of 1906, a fleet of 879 vessels carried 51,751,080 tons of freight; 57 of these vessels were from 500 to 600 feet in length, and from 52 to 60 feet beam; 48 of them being of from 10,000 to 14,000 tons capacity. How much more potent would be the inland navigation service of Canada if vessels of such tonnage could find a through passage from the head of the Great Lakes to the St. Lawrence river. Upon the freight just referred to, \$36,666,889.06 was paid for transportation. These figures indicate the importance of the subject of Canadian navigation, particularly when it is borne in mind that the entire railway freight traffic of Canada for the year 1905-6 was only 57,966,713 tons, while navigation is of necessity tied up for three months each year.

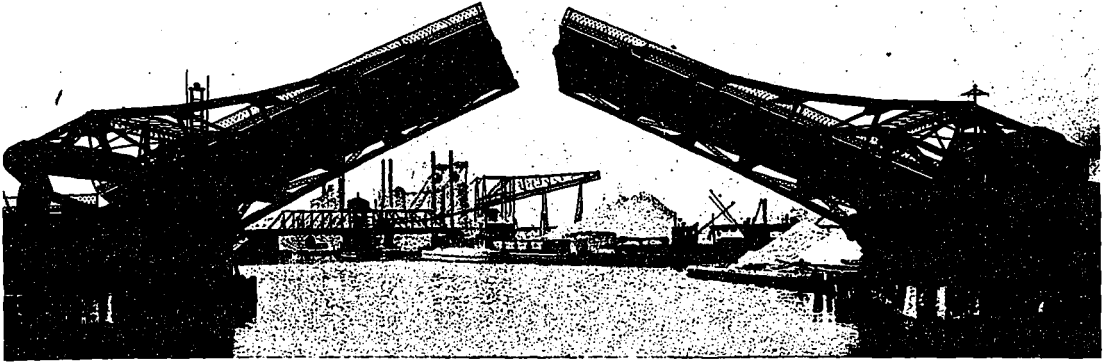
With such possibilities for facile transport, at rates lower by one-third than railway carriage—with all its infinite complications, it is not to be wondered at that the waterway is being looked forward to as the only present relief from the hitherto inevitable congestion in western traffic.

What form of action will be taken is yet undetermined, although the construction of a 20-foot navigation from Georgian Bay and Lake Huron to Montreal via the Ottawa river, is a scheme that has been much discussed, and a considerable amount of survey work has been done under the Public Works Department. It has been suggested to the Government by M. J. Butler, Deputy Minister, that a commission should be appointed for the purpose of studying the economic problems involved in the large amount of prospective canal projection and improve-

ment, and to report thereon for the benefit of the country. The prospective work referred to includes the all-river route by the river Trent, with outlet at Trenton; a 6-foot and a 9-foot navigation for the section between Georgian Bay and Lake Couchiching, via Coldwater and the river Severn; a route to the Georgian Bay, at the southwestern end of Lake Simcoe and the river Nottawasaga; and the



CLOSE VIEW OF MAIN ROLLING SEGMENT OF JEFFERSON ST. BRIDGE, CLEVELAND, O., (CLOSED) SHOWING COG SYSTEM WHICH EFFECTS THE UPWARD AND DOWNWARD ROLL. Fig. 4.



JEFFERSON STREET LIFT BRIDGE, CLEVELAND, O. (PARTIALLY OPENED) OPERATED BY TWO 25-H.P. MOTORS; AN EXTRA MOTOR IS ATTACHED TO EACH LEAF AND HELD IN RESERVE FOR EMERGENCIES. BOTH ARMS ARE CONTROLLED FROM ONE SIDE, CAN BE RAISED TOGETHER OR SEPARATELY, AND ARE AUTOMATIC IN STOPPING AT THE EXTREME POSITIONS, PRECLUDING ALL POSSIBILITY OF ACCIDENTAL DAMAGE TO THE STRUCTURE THROUGH NEGLECT ON THE PART OF THE OPERATOR. Fig. 5.

enlargement of the Welland Canal to allow of the larger class of steamers to reach Prescott and thence, by the utilization of properly designed barges, to admit of the economical transport of the products of the West to foreign countries via the sea-going vessels at Montreal.

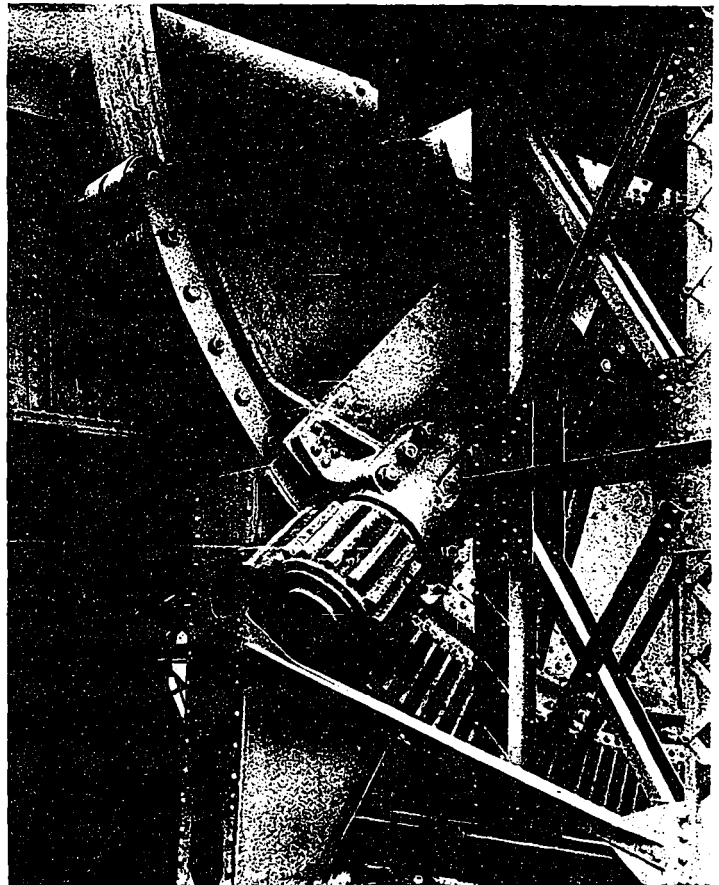
The above facts are mentioned to call attention to the measures that will be requisite in the near future, if not already imminent.

Bridging of navigable streams is not the least of the problems to be confronted in the matter of providing navigation facilities adequate to the futurity of a country so rapidly reaching out in commercial enterprise as Canada. The evolution of movable bridges in older countries of established prestige in trade and commerce is sufficient indication, in itself, of this fact. For ages gone by it has been an axiom of political geography that navigable streams or waterways be not obstructed against navigation whether there appears to be any immediate necessity for keeping the way open or not. Hence we observe the evolution of the movable bridge from the trunnion or bascule—modelled after the principle of the mediæval pivot drawbridges spanning the moats surrounding castles or strongholds—to the modern lift bridge of 275 foot span, giving safe support to the heaviest railway trains and uninterrupted passage to largest transport vessels.

The first movable bridges were mainly built of wood and designed to revolve around a hinge pivot or trunnion in a vertical direction. In some cases they were counterbalanced similar to a seesaw. They were very effective in the defence of castles and fortresses, but became obsolete upon the introduction of gunpowder and cannons. With the advance of civilization, the interests of commerce and navigation called for a bridge that could be alternately employed to span waters and provide safe crossing from above to either side. Very little progress was made in this type of bridge construction until the

nineteenth century, when iron was generally substituted for wood, proving at once light and of great strength.

From the year 1800 until the construction of the Tower Bridge at London, England, the greatest achievements in bascule bridge construction were accomplished by Knip-



SHOWING THE BEARING SURFACE, A SEMI-CIRCULAR REVOLVING SEGMENT RESTING UPON TWENTY-NINE 10-INCH ANTI-FRICTION ROLLERS, RECESSED AND HELD IN ALIGNMENT BY DISTANCE BARS. Fig. 6.

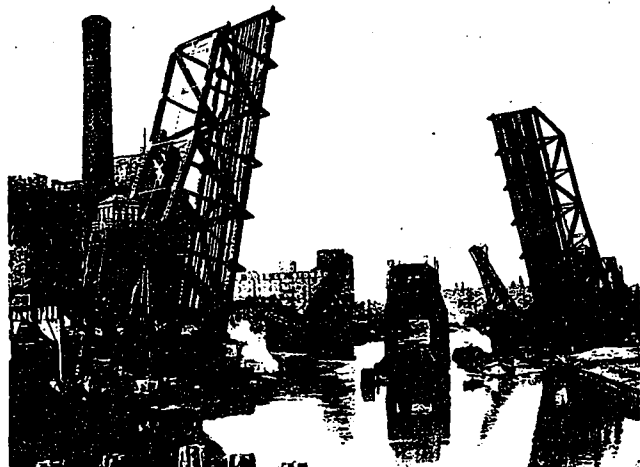
plesbro and Fijenoord, who built bridges composed of two movable leaves and operated by hydraulic power, giving clear channels of 56 feet 8 in. and 75 feet 6 in. respectively at Copenhagen and Rotterdam, Holland. For more than half a century the most eminent British engineers worked with the problem of a means for accommodating the high-

are retarded in progress in being compelled to deviate from their course to pass around the obstruction in the centre of the canal, and, the overland traffic must needs be held up longer in allowing the boats to pass than would otherwise be the case if the passageway was not restricted. This is most impracticable in modern times when quick crossings count for so much in measuring the efficiency of a canal or railway, or highway service. When the channel is narrow, the centre pivot pier must frequently be placed upon one shore or the other, and a large section of valuable land must be therefore sacrificed to idleness to permit the bridge to swing, the greater portion of the structure making its circumambient movement over the land.

The width of the swing bridge is also restricted so that it will not occupy too much of the navigable channel when opened for the passage of vessels. Whenever a number of railroad tracks must be carried across a navigable channel at one place, a swing bridge also becomes objectionable because an accident to the operating machinery while open will stop the passage of the entire traffic or force it to take a devious tour of miles while repairs are being made. On the other hand, if anything happens to the bridge while locked, navigation must suffer. Both traffic and navigation have been seriously hampered even in the erection of a swing bridge, as during the whole assembling process the high framework must occupy the centre of the channel.

Nearly every swing bridge has scored up against it some disastrous accident because of people, or rolling-stock, or both, having been precipitated into the open chasm while the bridge is in swing. Frequently where these structures have been employed to span streams intersecting crowded city thoroughfares groups of persons have been killed or maimed through being caught at the approach, when the bridge swung to.

Generally the supporting pier of a swing bridge is placed under the centre of the span. Sometimes, however, the pivot pier is located nearer to one end of the span than the other, in which case the shorter arm must be counterweighted to balance the longer arm. Another modification in this type of bridge is where the pivot is

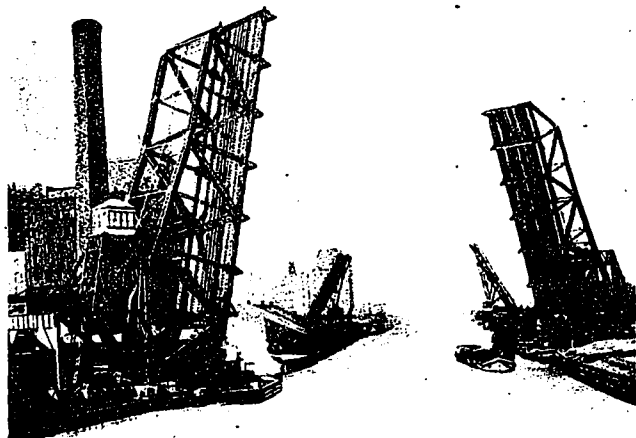


275-FOOT SPAN DOUBLE-TRACK ROLLING LIFT BRIDGE ACROSS THE SOUTH BRANCH OF CHICAGO RIVER AT ENTRANCE TO GRAND CENTRAL STATION, CHICAGO, ILL., AT TIME OF COMPLETION BEFORE THE REMOVAL OF THE CENTRE-PIER SWING BRIDGE WHICH OBSTRUCTED THE CHANNEL. LARGEST MOVABLE SPAN IN THE WORLD. Fig. 7.

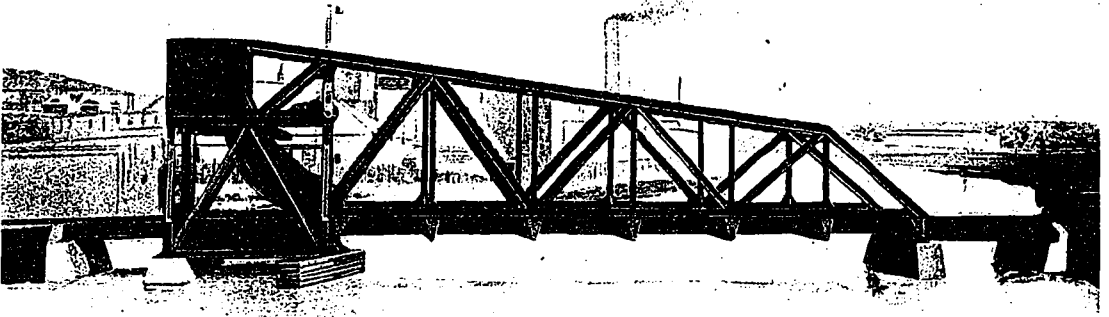
way traffic across the Thames river, east of London Bridge, near the Tower of London. The suggestions of both subway, and high-level crossings were objectionable on account of the cost, as well as the steep grades which all traffic would have to climb perpetually in crossing either way.

After a very thorough consideration of all plans, it was decided to adopt the bascule system. In view of the fact that the bascule portion of the Tower bridge gave a waterway of 200 feet clear, it proved to be the apex of the development of centuries. The construction of this structure was begun in 1878, and the bridge was completed in 1894. The total cost of the Tower Bridge was more than \$4,000,000, over \$500,000 of which was expended upon the artistic embellishment of the towers.

Sight must not be lost of the fact that at the time of which we speak the swing bridge was in practical and extensive operation; but on account of its many objections for this particular location, the engineers did not consider it. In type, it differed fundamentally from the bascule bridge, in that the main supporting pier occupied the centre or best part of the waterway dividing the channel into two narrow passageways instead of providing one wide adequate passage. It was therefore necessary to build a bridge large enough to span waterways even where only one channel for navigation was desired. This feature is found most objectionable in passages that are at best limited in width. It is for this reason that the centre piers of the Welland canal are to be abolished. To provide adequate passageway for the increasing size of vessels, and to retain the pivot pier would necessitate the widening of the canal at these points in addition to lengthening the arms of the bridge. Then, again, vessels



SAME VIEW AS FIG. 7 WITH CENTRE-PIER SWING BRIDGE REMOVED PROVIDING AN INTERRUPTED PASSAGeway OF MORE THAN DOUBLE THAT AVAILABLE IN FIG. 7, AND ALSO ENSURING SPEEDIER OPERATION WITH LESS POWER CONSUMED THAN THE OLD BRIDGE AFFORDED—A GREAT FACILITY IN OVERLAND TRANSPORTATION. Fig. 8.



DOUBLE TRACK SINGLE SPAN ROLLING-LIFT BRIDGE OF THE NEWBURG AND SOUTH SHORE RAILWAY ACROSS CUYAHOGA RIVER, CLEVELAND, O. LENGTH OF SPAN, 160 FEET. Fig. 9.

at the extreme shore end of the span while the other end is supported by a floating pontoon which swings with the span; another consists of two unequal arm spans with their pivot piers in the opposite banks, and the ends of the long arms meeting and locking over the centre of the channel.

All forms of bridges designed to be opened and closed so as to give passage alternately to vessels plying up and down stream and to permit of pedestrian vehicular or railway traffic crossing the channel, may be generally styled "drawbridges"; but the generic term of drawbridges carries with it no lucid comprehension of the type of structure which may be employed.

Drawbridges may include the following types: swing bridges; bascule bridges, which consist of one or two draws hinged at the abutment on horizontal shafts so that they are opened by raising the bridge to a vertical position, leaving the channel clear; rolling bridges, which have the span mounted on rollers, so that it may be hauled inshore and leave the channel clear; lift bridges, in which the span is placed between two tall towers and so arranged that it is lifted clear of passing vessels, like an ordinary passenger elevator. There are several modifications of each of these types.

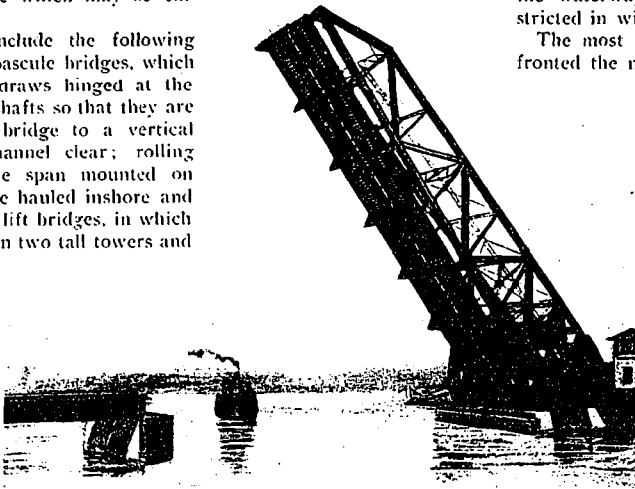
Lift bridges are seldom used. Perhaps the most important one ever constructed crosses the Chicago river at North Halstead street, in Chicago. On each side of the river are erected two steel frame-work towers 162½ feet high, between which is suspended a truss 130 feet long. When the bridge is closed this span rests on abutments like any simple truss span. To open it steel cables passing from each end of each span up and over sheaves at the tops of the towers, and thence to suitable winding drums at the surface, are wound up, raising the span to near the tops of the towers, so that vessels may pass beneath. The clear lift of this bridge is 155 feet above low water.

This is the only large bridge in which the movable span is lifted or raised by means of towers, ropes, pulleys and movable counter-weights to a height sufficient to

allow the passage of masted vessels beneath the bridge when open. There are many objections to this type of bridge. Its cumbersome mechanism is frequently getting out of repair. It has been accredited with having stuck at full height while pedestrians were on it, making a very awkward situation for some of the females. Two hundred and ninety tons of clumsy counter-weights are required in its operation and its total moving weight is 600 tons. The bridge has two 70 horse-power motors and is operated by means of nearly three miles of wire rope.

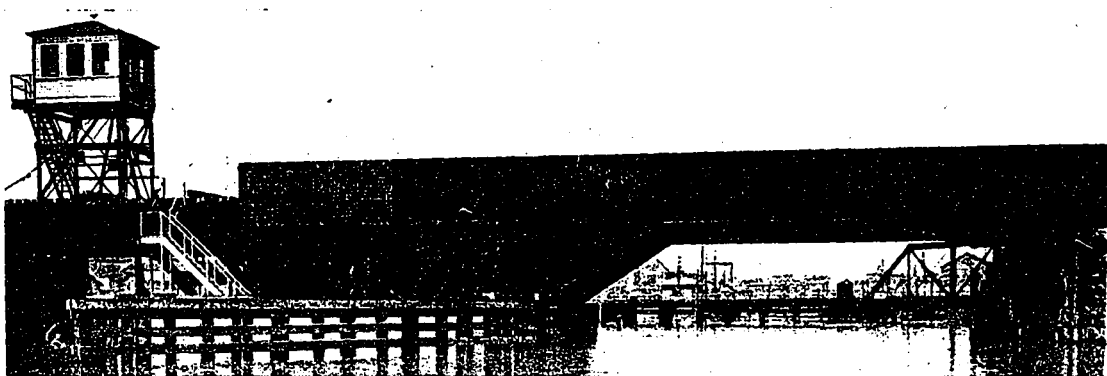
During recent years there has been a notable development in the use of *bascule* spans, where the waterways to be crossed are restricted in width.

The most difficult problem that confronted the management of the Metropolitan West Side Elevated Railroad, was the question as to how the traffic of their four tracks was to be carried across the Chicago river, so as enter the business centre of Chicago. Their right of way permitted a crossing between Jackson street and Van Buren street swing bridges, but these two bridges were so close together that it was impossible to build a third swing bridge between. A design for a pivot bascule bridge, similar to that of the Tower Bridge, at London, which was then in course of construction, was submitted, and finally accepted as the only way out



SAME BRIDGE AS FIG. 9. VIEW TAKEN FROM OPPOSITE SIDE AND BRIDGE PARTLY OPEN FOR PASSAGE OF SMALL CRAFT. THIS SPAN IS CAPABLE OF OPERATION IN 15 SECONDS, AND SWINGS ITSELF TO THIS POSITION WITHOUT THE APPLICATION OF POWER UNDER THE MERE INFLUENCE OF COUNTERWEIGHTS. Fig. 10.

of the difficulty. In working out the detailed plans objectionable features made themselves apparent and William Scherzer, C.E. (now deceased), was consulted. He deemed it impossible to eliminate the objectionable features of the pivot or trunnion type of bascule bridge and he endeavored to solve the problem on entirely new lines. A design for a four-track rolling lift bridge was prepared by him and submitted. After a careful consideration of its merits, as compared with those of other types of movable bridges, the officials of the railroad company adopted the design, and detailed plans were ordered. The great structure was calculated to rise and fall under the impulse of a tiny

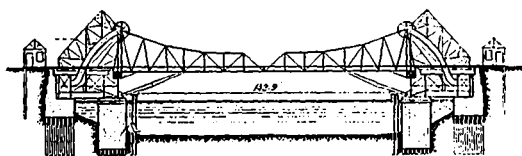


A MOVABLE STRUCTURE WEIGHING 3,200,000 POUNDS ACROSS THE PEQUONNOC RIVER, BRIDGEPORT, CONN., BEARING A COUNTERWEIGHT, TO AID THE UPWARD ROLL, OF 1,100,000 POUNDS. THIS BRIDGE CARRIES FOUR TRACKS BORNE ON TWO SEPARATE STRUCTURES DESIGNED TO MOVE DISTINCTIVELY OR AS A UNIT. Fig. 11.

electric motor, much upon the following simple principle: "Lay a walking-stick, having a semi-circular curved handle, upon the floor, the crook pointing upward; then pull down upon the end of the handle until the stick rises into the air and stands erect. This movement constitutes the *rolling lift*." The bridge is lifted by the rolling of its curved lower part upon a flat surface, or set of rails, a counterbalance being provided to overcome the dead weight of the heavy steel framework. The plan gives a large bearing surface so that the wear caused by the friction of opening and closing the draw is reduced to the minimum (a reference to the illustrations will plainly portray the principle). The Rolling Life Bridge was found to fulfill every requirement essential to a drawbridge. It eliminated the objectionable features of the pivot hinged or trunnion bascule, the swing bridge and the direct lifting bridge. The introduction of this prac-

more simple in its moving parts, and equally adequate for the purpose, it having no axle or journal friction in its structural portions when moving, and no flexible joints in the carrying parts, which is an important factor of consideration in the stability of a structure which must needs be subjected to severe and incessant usage.

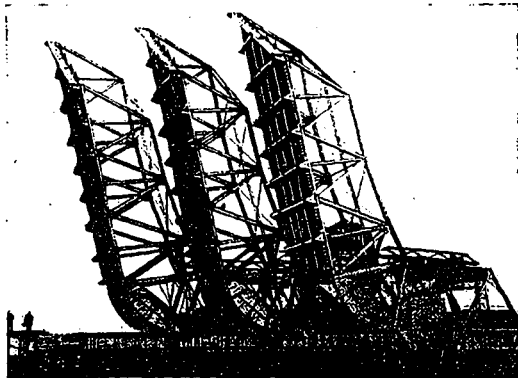
A bridge of the type shown in Fig. 14 may some day come into more or less extensive employment; it differs



THE "SCHINKE" BASCULE DESIGN—ITS CHIEF OBJECTION BEING THE COMPLEXITY OF ITS WORKING PARTS. Fig. 13.

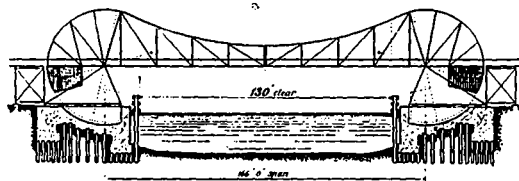
from the Rolling Lift only in that its friction member is a bolt or pivot around which the bridge revolves, instead of rolling up and down on a pair of tracks. In the trunnion lift, the utility of a counter weight to facilitate the upward motion of the cantilever arm, has also been taken advantage of.

Another type of bascule lift bridge that is coming in for popular utilization is that manufactured by the Cowing Engineering Company, of Cleveland, Ohio, illustrations of which appear in this issue. In connection with its installation in the Forest City, and in consideration of the fact that the Canadian Government has entered upon the project of eliminating the centre piers of bridges crossing the narrower navigable waterways, it is interesting to note that increasing channel requirements for the movement and handling of iron ore in the Cuyahoga river, Cleveland, are leading to the adoption of various experiments



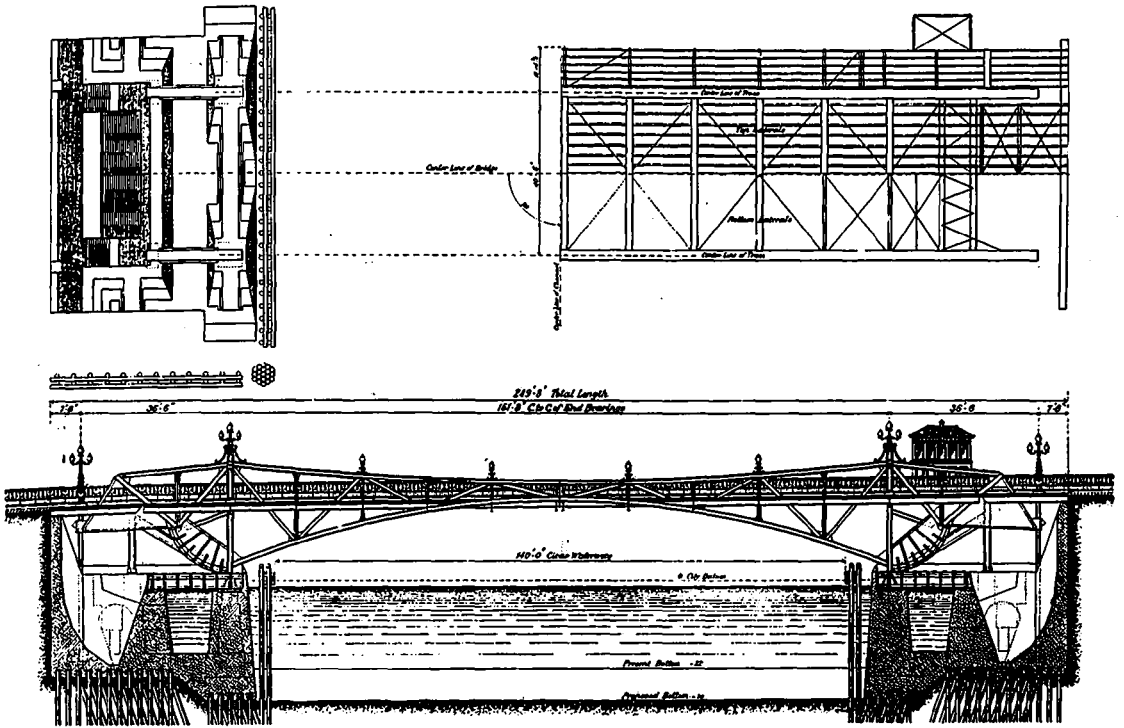
SIX-TRACK ROLLING LIFT BRIDGE CROSSING FORT POINT CHANNEL, BOSTON, MASS., AT AN ACUTE ANGLE. EACH BRIDGE OPERATED BY A 50 H.P. MOTOR, BUT ARRANGED TO WORK AS A SINGLE STRUCTURE, AND TO BE OPERATED BY ONE MAN. OVER 1,000 TRAINS CROSS IT DAILY. Fig. 12.

tical invention marked a new era in the progress of movable bridges. Several types of lift bridges, entirely at variance with the original principles of the *lift*, *trunnion* or *bascule* bridge, have developed from the suggestion of Mr. Wm. Scherzer. Figure 13 represents one of these adaptations as conceived in 1889 and submitted in a competition of designs for a structure to span the channel at Canal street, Chicago. It is the Schinke-Bascule design. In this particular instance the Rolling Lift idea was accorded the preference, because the latter was found to be



LATELY PROPOSED TYPE OF TRUNNION BRIDGE. Fig. 14.

by the city toward facilitating the progress of the industry. Notable improvements in this line have been the elimination of a curve in the river channel at Jefferson street, which was very close to 300 degrees, by cutting a channel between the two extreme ends of the curve, permitting the free passage of the largest boats drawing



GENERAL PLAN OF BRIDGE ERECTED FOR THE SANITARY DISTRICT OF CHICAGO AT STATE STREET OF THAT CITY. NOTE THE DEEP (DRY) PIT INTO WHICH THE COUNTERWEIGHTS FALL WHEN THE BRIDGE IS RAISED, THE BY-PASS TO RELIEVE THE PRESSURE OF THE CURRENT ON THE MASONRY AND THE SYSTEM OF PILING THE RIVER BED SO AS TO CARRY THE WEIGHT OF THE STRUCTURE TO THE SOLID ROCK BELOW. Fig. 15.

twenty feet of water, and the recent erection and opening to traffic of a new and modern lift-bridge at this point which has supplanted a swing bridge.

The structure is the only example of its particular type in that city and is a two leaf, revolving, lift-bridge recently designed by the Cowing Engineering Company, under patents of Mr. John P. Cowing, of Cleveland. The bridge has two six-foot sidewalks, its trusses are forty feet from centre to centre and one hundred and fifty-two feet between front bearings, giving a clear waterway of one hundred and twenty feet at an angle of twelve degrees to the longitudinal axis of the bridge. The supporting end of the bridge is a semi-circular revolving segment having a bearing surface adapted to rest and roll on twenty-nine ten-inch anti-friction rollers sixteen and a half inches long, which rest and roll in a cradle transmitting all the moving load uniformly to the foundation.

The motive power for operating the bridge is two twenty-five horse power direct current electric motors for each leaf, one on each leaf being required for operating under ordinary conditions, while the other is held in reserve for emergencies. The power is transmitted to the main rack and pinion through a series of gears from a main equalizing gear on each leaf of the bridge. (See illustration, Figs. 4 and 6). This latter gear takes the first reduction from the motor, thereby transmitting the same amount of power and motion to each of the two rolling segments of the main trusses of each leaf. To prevent lateral displacements, the rollers are recessed and held in alignment by distance bars composed of two channels.

The centre of gravity of the moving leaf is at the centre of a circular segment, the counterweight being partly above the floor and partly below it, and consisting of pig iron set in Portland cement in a steel box with covering and riveted to each truss. There are some cast-iron blocks below the floor for adjusting and properly balanc-

ing the bridge. When the bridge is closed, the dead and live load reactions are taken by a front bearing on the cradle. The uplift from the load upon that portion of the lead which is between the centre and the front bearing is taken by an anchor bar in the rear foundation and that portion between the centre of the rolling segment and the abutment is taken by an electrically-operated tail lock. The total weight of steel in the bridge proper is estimated at 506 tons and in the counterweight 800 tons.

The bridge has the advantage, at all times, of keeping the dead load and the counterweight over the centre of the pier, all resting and rolling on anti-friction rollers revolving in a cradle. The cantilever arms are counterweighted to be in equilibrium at all positions and when lowered into position meet and lock at the centre of the span with an automatic lock. Both arms of the bridge are controlled from one side, can be operated together or separately, are automatic in stopping at the extreme positions and in locking at the centre, thus making it impossible for the operator, either by neglect or carelessness, to damage the bridge. The structure is designed to carry a street car track loaded with 80,000 pound cars.

Returning to the Rolling Lift bridges, from which type the greater number of our views and drawings are taken, it is peculiarly interesting to note the method of their construction. The movable parts are erected and completely equipped for operation on the piers at each side of the waterway, in the positions which they should occupy when the bridge is open for navigation, and it is not necessary to close the bridge until it is entirely completed and ready for use. Therefore no obstruction or interference is caused to navigation during erection. The economy of this method cannot fail to impress one. The bridge may be so counter-weighted that the centre of gravity falls in the centre of the rolling segment. In order to move the bridge sections it is then only necessary to overcome the resistance due to frictions. In

C O N S T R U C T I O N

certain instances, in order to make the bridge more rapid in its operation the counterweights have been so arranged that the movable leaves are at rest when opened at an inclination of about 40 degrees and not in the horizontal position they occupy when closed. Thus, the leaves forming the movable parts of the bridge will, as soon as the locks are withdrawn, without the application of any

roadway and absolutely preventing accidents so common to other types of movable bridges. Another great advantage which the modern lift bridges have over the old forms of drawbridge is that they are capable of enlargement without disturbing traffic and of allowing one or more tracks to be always kept open while the place of crossing is the scene of repairs. If at any time it is desired to add

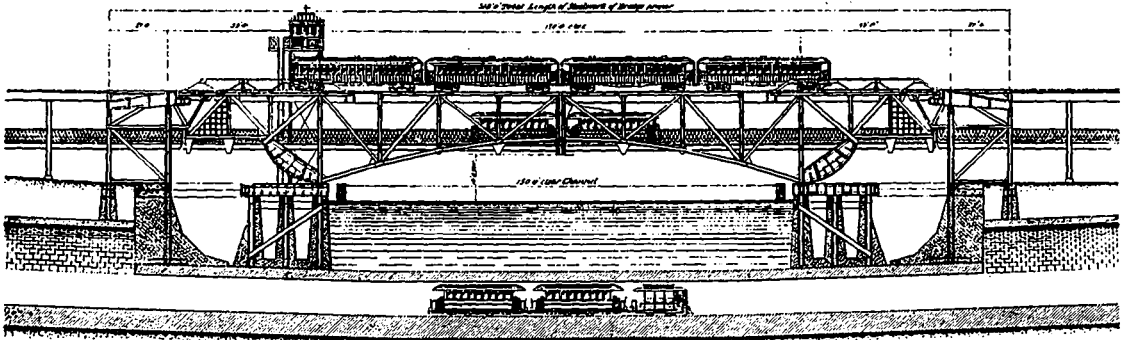
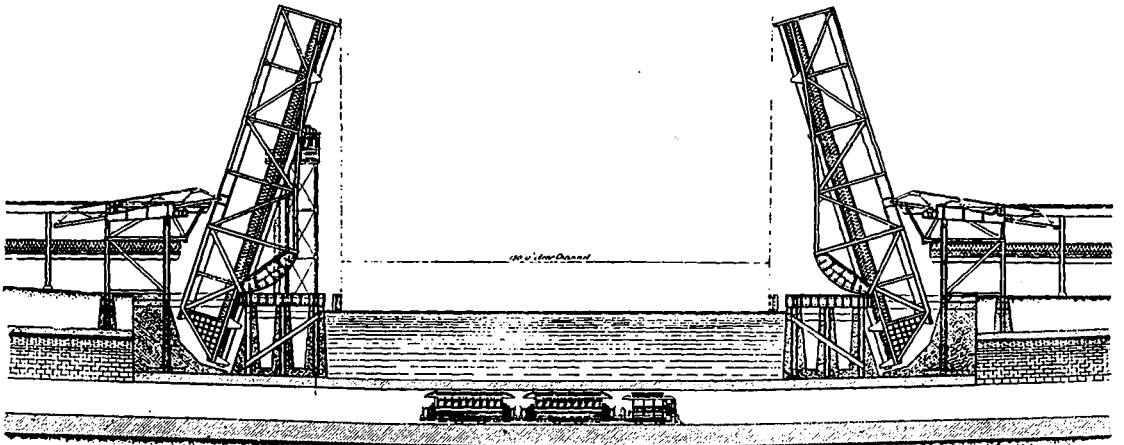


DIAGRAM SHOWING A PRACTICAL SOLUTION OF A DIFFICULT PROBLEM. FOR ELEVATED RAILROAD, STREET CAR AND HIGHWAY TRAFFIC REQUIRING A STRUCTURE OF 318 FEET OVER ALL AS OPPOSED TO A TUNNEL WHICH, AT AN AVERAGE GRADE, WOULD REQUIRE AN EXCAVATION OF 1908 FEET. Fig. 16.

power whatever, roll upwards and open a sufficient channel for the passage of vessels. The power consumed in operating the modern lift bridge is very trifling, a small motor of from 15 to 25 h.p. on each side of the channel (if but a single span is used one motor, of course, is all that should be required), proving sufficient in all cases, and this ensuring an opening in 20 seconds. The bridge counter-weight is made of blocks of cast iron, although some bridges of the *rolling lift* type have been built having hollow iron boxes filled with concrete, because it is a little cheaper. In winter, when the bridge is covered with snow and ice, another ton or two of counterweight may have to be added to balance the extra weight. The blocks for this purpose are of such size as to be easily handled by two men with a tackle. All the blocks are bolted on to the structural work. They have to be placed so as to avoid any tendency to twist or warp the bridge and they must not be allowed to come down far enough

more tracks to the crossing, this can be done without removing the existing structure. A bridge carrying one track can be made into a double track bridge whenever required, which could not be done with the old-fashioned swing bridge. It would have been necessary to take out the whole movable part of the bridge and put in a new sub-structure, a temporary bridge for the passage of trains having also to be erected. In these days of growth in traffic requiring constant changes, this is an important matter. On the Scherzer and Cowing plans a new bridge may be built beside the old one. In the four-track bridge there are really two independent bridges, and while one is being built or repaired trains can still be run over the other.

With a view of illustrating the artistic or ornamental possibilities of the modern Lift Bridge for such crossings as occur on crowded city thoroughfares that are intersected by a navigable channel, we have reproduced two



DOUBLE-DECK, DOUBLE-SPAN, FOUR-TRACK LIFT BRIDGE FOR ELEVATED RAILROAD, STREET CAR AND HIGHWAY TRAFFIC, OPEN FOR NAVIGATION. Fig. 17.

to dip into the water or strike against the ice. On every pronounced advantage of any bridge of the bascule type over the direct lift or swing bridge is that when opened for passage of vessels, it acts as a barrier, closing the

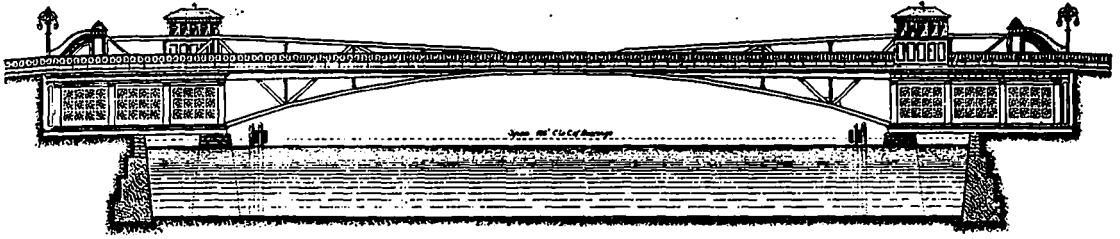
designs through the courtesy of the Scherzer Rolling Lift Bridge Company, of Chicago, shown on pages 19 and 27.

In these instances, the rear ends of the moving spans, including the counter-weight and operating machinery, are

inclosed and protected by monumental masonry or otherwise encased in ornamental iron. A clear channel of 200 feet may be provided when the bridge is open and because of the elevation of the approaches, there is sufficient head-room beneath the bridge for the passage of tugs and small craft when the bridge is closed. The monumental part of the bridge, as conceived in the artistic design, is merely

If an engineer should disregard and run by danger signals, his engine would be thrown off the track by the same derailling device which is used near switches in large yards.

The bridge operator's little house is provided with all kinds of electrical appliances to show him when the bridge is nearly open or nearly closed, or entirely opened or entirely closed and whether the lock catches on the rod or



ORNAMENTAL DESIGN FOR DRAWBRIDGE OF LONG SPAN ACROSS A CHANNEL INTERSECTING A BUSY CITY THOROUGHFARE IN A BUSINESS DISTRICT. THE COUNTERWEIGHTS AND OPERATING MACHINERY ARE HIDDEN FROM VIEW IN AN ORNAMENTAL IRON ENCASUREMENT. Fig. 18.

intended as a suggestion of the possibilities toward decorative embellishment, and follows largely the classic features of the Alexander III. bridge in Paris.

To give an idea of the universal popularity of bridges of this type it might be interesting to note that the firm manufacturing the Rolling Lift type have, since 1885, installed 103 bridges in England, Ireland, France, Russia, Egypt, India, Holland, Argentine Republic, Mexico, and the United States—the great majority of American railroads having adopted its usage extensively.

A notable example of the rolling lift bridge, as applied to railroad purposes, where traffic is heavy, is the six-track structure across Fort Point channel at the South Terminal Station, Boston, Mass., which was constructed for the New York, New Haven and Hartford Railroad Company in 1899. (See page 24.) It is composed of three double-track bridges, placed side by side, all coupled together and arranged to be operated jointly as a single bridge, or, if desired, to be handled singly. Each span is operated by means of a 50 horse-power electric motor and the bridge is usually operated, by one man with the assistance of many mechanical aids, in 30 seconds.

Electricity is preferred when a bridge is near a city, because it can then be obtained cheaply, but, in isolated places, gasoline engines are preferable. The power is supplied by an "operating strut" which takes hold of the rolling circle at about the centre and is pulled back by a rack and pinion. There is a special framework to fasten it on, for the strain is very heavy, the inertia having first to be overcome, and, secondly, the wind pressure, when the bridge is up, may be very great. Absolute safety against accidents is secured by the fact that all the ma-

not—and all without his seeing the bridge itself.

The four-track single span Lift Bridge shown on page 24 was erected over the Pequonnoc river, Bridgeport, Conn., for the same railroad company, in 1901-2. It is what is called a "half through" girder structure, the track being placed half way up in the fabric, which is done to save depth of structure and give more clear height over the water. Otherwise, too, it might be necessary to raise the track approaches for a long distance back, which would cause enormous expense.

The whole length of the Bridgeport bridge, including approaches, is 3,000 feet—that of the moving portion about 126 feet. There are four tracks carried on two double-track separate structures. The circle runs on a heavy steel track embedded in the masonry of the pier. In this case a deep pit had to be made in the pier to allow the counterweight to swing down into it. The pit reaches 16 feet below high water mark and is about 22 or 23 feet wide, extending the whole width of the bridge. The relation of the weight of the counterweight to that of the moving portion of a bridge is variable. At Bridgeport it is a little over 50 per cent of the weight of the bridge or about one-third of the whole. The Bridgeport counterweight weighs 1,100,000 pounds, and the whole structure, including counterweight, 3,200,000.

Two of the cuts accompanying this article as well as the frontispiece of this issue represent the 275 foot span double-track rolling lift bridge erected across the South Branch of the Chicago river at the entrance to the Grand Central Station, Chicago, Ill., before and after the removal of the double-track centre-pier swing bridge which obstructed the channel. It is intended to add double-

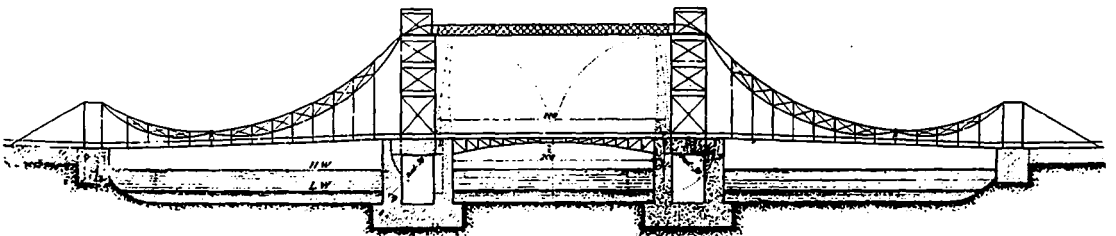


DIAGRAM OF THE TOWER PIVOT BASCULE BRIDGE, LONDON, ENGLAND. FOR PERSPECTIVE VIEW SEE PAGE 18. A GRACEFUL BUT EXPENSIVE STRUCTURE WITH A CAPACITY FOR A MOVING LOAD OF 4,900 POUNDS PER LINEAL FOOT. BRIDGES OF THE LATEST TYPE BUILT ON COMPARATIVE SCALE CARRY A LOAD OF FROM 50 TO 60 PER CENT. MORE. Fig. 19.

chinery for opening and closing the bridges is tied up with the regular system of track signalling. A draw cannot be opened if the signals are set at danger, so that it is impossible for a train to plunge through an open draw.

track bridges, providing two side by side, to be operated either jointly or singly, as desired. Owing to the slight

(Continued on page 37.)

Necessity of a Cost System

BY HERBERT J. DALY

In Which is Explained Why the Contractor or the Manufacturer is Sometimes Confronted With Rather Disappointing Profits When the Year's Trial Balance is Drawn Off

IT requires very little persuasion to convince a man of ordinary business acumen that it is far more profitable and satisfactory to operate a plant upon a systematic basis which will show the true state of affairs at all times in preference to laboring under the primitive methods so much in vogue even at the present day, but nevertheless, the ordinary run of people are loth to discard the old methods.

It seems strange that business men of all classes, so beset with keen, relentless competition on one hand and the demands and questionable tactics of labor on the other, do not enter more seriously into the matter of costs. It is true of course that the science of costs is an advent of recent years but it is also true and experience has taught that in the application of scientific methods to the productive end of a business, none has proved to be more prolific of good results, both in economy and efficiency, than a correct method of obtaining and recording the cost of production. The value of such information is so apparent that it seems almost superfluous to enter into arguments urging the necessity for maintaining such a system.

The corner grocer whose total annual turnover may not exceed \$25,000 will expend six or seven hundred dollars in the purchase of a cash register. Why? In order that he may be provided with a system which will show him at all times exactly how much business he is doing, the kind of business he is doing and the profits he is making on that business. He evidently bears in mind that the important point is not so much the volume of business as the profits that are made on the business. The grocer would naturally prefer to maintain a business with an annual turnover of \$25,000 and showing a profit of 25 per cent. in preference to one with a turnover of \$50,000 per annum showing a profit of only 10 per cent., but unless he has some method of ascertaining the cost to buy and sell how will the grocer know which is the more profitable business?

GET FAMILIAR WITH YOUR CONDITIONS.

So it is with the manufacturer. If he is to be successful in the battle for supremacy or even existence he must be thoroughly familiar with the conditions under which he is working. It is surely not a good policy to set a price of two dollars upon an article simply because a competitor has made that price. Consider the consequences accruing if the article costs two dollars and ten cents, and so far as a good many proprietors are concerned, it might in a good many instances cost even a greater percentage than that over the selling price and they would not be any the wiser, because it is a fact that even some of the foremost concerns are still groping in the dark so far as knowing the cost of their products. Their success is not due so much to their efficient methods as to their good luck. Fortune is not always disposed to smile upon us if we are not willing to extend her a helping hand.

A prominent financial man was recently asked what he thought was the cause of most of the failures among manufacturers and he replied that to the best of his knowledge at least 60 per cent. of them were due directly or indirectly to miscalculating the cost of production. Unquestionably there is no surer road to disaster than miscalculating the cost, if the miscalculation happens to be in the other fellow's favor, and, unfortunately, that is usually the case. But why surmise or guess? Would it not be better in every way to be in a position to say the work will cost exactly so much and we can therefore afford to sell it for so much? It would at least be doing business

on a sound basis, and if a competitor should outbid the price there would still be the consolation of knowing that he was getting on dangerously thin ice and running grave chances of losing money. Prospective sales soon lose their attractiveness when devoid of any apparent profit, and he would be an unpardonably reckless business man who would accept a contract in the face of an almost certain loss, but if he had no means at his disposal of assuring himself that there would not be a profit we cannot consistently criticize him. Superintendents and foremen are apt to miscalculate. They are either overconfident of their ability to cut costs or they neglect to take into consideration some important feature, or more frequently they use fictitious figures in estimating the cost, and invariably instead of keeping on the safe side they give the purchaser the best of it. A case in point came to the writer's notice only a short time ago. A structural concern quoted a price which was just 38 per cent. below the next lowest tender, and 46 per cent. below the highest tender. Of course they complained that they lost money on the job, and more than likely they d'd, but even after completing the job they cannot see why they lost money. In this case there was undoubtedly a sad lack of system.

PROFITS SOMETIMES DISAPPOINTING.

Take the contractor who is requested to tender on the construction of a building, or a steamfitter who is asked to give a price on a heating system, or the manufacturer who is estimating on the cost of a machine, or the printer who is figuring on job work, if they have not that important adjunct, a cost system, it is safe to say they all figure along the same lines, viz.; they estimate that the labor will cost so much, the material so much and then add a fair margin for profit. The price is quoted and the contract closed. We cannot blame the contract man if the firm discovers at the end of the year, after transacting an enormous business, that their profits are disappointing. The contract man has done the best he could with the only available basis of figuring afforded him. He has no means of comparison, he is not positive that the prices on the material are correct, and his estimate of the cost of labor may be fair enough but the firm has no means of ascertaining if they are getting full value for the money so expended. He has perhaps lost sight entirely of that most important element, indirect or overhead expense, by some accountants referred to as burden; but if he has thought of it, he may not know that in adding 25 per cent. to cover this item he is just 20 per cent. short of what he really should have allowed, which in itself might be sufficient to wipe out the entire profit provided for. This worries the contract man, because he knows, although he may not say so, that the figures he has submitted are the results of guess work to a very great extent; it causes the directors to be displeased when the dividends are not up to their expectations and it certainly weakens the position of the firm, but still in the face of all this worry and uncertainty the installation of a cost department is neglected.

SYSTEMATIZE THE STOCK DEPARTMENT.

A cost system is applicable to almost every kind of mercantile business, from the humble carpenter in his work-shop to the builder of the ocean leviathans. The system itself depends entirely upon the nature of the business. It can be either simple in its operation, or very elaborate, but in either case it should be devoid of red tape or useless routine and much consideration should be

given to the matter before finally deciding upon the system to be installed.

To obtain the desired results from a cost system it is first necessary to arrange and systematize the stock department because without an efficient system of stock keeping it is impossible to get the proper results from a cost system, but this too should be in keeping with the demands of the business. In some well regulated plants the stock department is so organized that not only the men in charge of the stock department know the exact location of the stock in the stock room, the quantity of stock on hand, the quantity on order, the quantity issued and to whom issued, but the office is also in full possession of this information. This is accomplished by means of stock record cards which are maintained by the office and are the connecting links between the stock department and the cost department. The aisles or sections in the stock department are lettered or numbered and each bin or compartment in the aisle or section is numbered, so that by referring to the index it is a very simple matter to locate any particular line of stock. A record card is maintained for each line of stock and this card shows the folio or card number, which also serves as the stock number. It also shows the name of the part or article and in what connection it is used. It shows the location of the stock in the stock room and the usage for a given number of periods. It shows the quantity of stock on hand and the price of same, also the quantity of stock on order and from whom ordered and at what price. It furthermore shows the quantity of stock issued and for what purpose it was issued. This card alone affords an abundance of information and it reduces to a minimum the possibility of running short of stock just when it is most necessary. It affords a sure means of quickly detecting the loss of stock, and who will deny that many dollars' worth of stock go out unaccounted for from every stock room which is not systematically operated. But this card does even more than that, because it shows the manufacturer or contractor where the stock went to, that is, what job it was used on, and by this means each job is charged with the actual amount of stock it consumed and such usage is charged against the job on a cost record. This information is collected on the stock card by the use of requisitions and the stock keeper is not permitted to issue any goods unless they are receipted for by a requisition; then with the aid of a simple system all the goods which are received into the stock room are recorded on the card referred to, as are also all goods which are returned from the various jobs; thus the actual amount of stock on hand always appears on the cards. The labor too is checked and collected and charged against the job to which it properly belongs. This important factor is also handled without difficulty by the use of systems, and means are afforded of readily checking the work so that the employer will know at once if he is the victim of that malicious practice, soldiering, or if the labor is costing too much in comparison with the price secured for the work.

SAFEGUARD AGAINST UNRELIABLE EMPLOYEES.

An effective cost system will not only show the cost of the work but it will also give the proprietor a thorough insight into the value and efficacy of labor and enable him to honestly gauge or determine the capabilities of an employee, and by means of comparison he can readily discover if he is being amply reimbursed for the money expended for labor—a most important feature to be sure. It soon becomes generally known by the employees that the proprietor has methods of determining the productive powers of the individual employee and this incites the latter to work more faithfully, because after all, there are very few employers who will not remunerate his employees in accordance with their true worth. This matter of labor is a very far-reaching subject and it is not the intention to deal with it extensively in this article,

but it is referred to simply to show what can be achieved by the adoption of system.

The idea seems prevalent that it is a very difficult matter to install a cost system and that it entails a considerable expenditure of time and money. This impression is misleading, because a cost system is neither difficult to install nor expensive either in time or money, in proportion to the good resulting therefrom. The printed matter necessary and the character of the printed matter depends entirely upon the business for which the system is intended, and the labor necessary to handle the system depends upon the system installed, but it should be borne in mind that no system, however well devised or elaborate it might be, will bring forth the proper results unless it be strictly adhered to. It has been stated by some writers that it is a very difficult matter to get hold of men competent to handle a cost system properly and that for this reason many well meant systems miscarry, but why men capable of handling positions, requiring intelligence and good judgment, in other branches of commercial work cannot show equal ability in handling a cost system is a mystery, and there need not necessarily be any more complication in a cost system than any other factory system. However, such contentions as these are mere trifles to the shrewd business man when he is on the hunt for something that will afford him a protection against the danger of selling his goods for less money than he can afford to sell them and that will serve as an unerring compass to help him steer clear of the rocks of disaster.

Enter Electric, Exit Steam Railways

WITHIN the next two years every railway train which enters the city of New York will be moved by electricity, says a New York despatch. The New York Central Company is spending \$70,000,000 to accomplish this. The Pennsylvania Company is spending an equal amount to bring its patrons into the very heart of the city. Its new station at Seventh avenue and Thirty-first street, which is reached by tunnel from Jersey City and Long Island will cost more than \$12,000,000 without including the approaches. The Long Island railway which does a very large suburban business is now being electrified. Immense power stations are being erected at Long Island City for that service and at Jersey City for the Pennsylvania service, and the Erie, Lackawanna and other roads which come in at Hoboken and Jersey City will also have access to New York by electric power through tunnels under the Hudson.

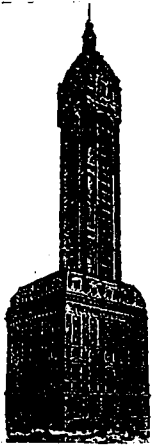
New York is an island with a river on either side. It cannot be approached without a bridge or a tunnel except from the north, and even there the railroad has been compelled to run underground and to adopt electrical power to protect the citizens from the smoke and noise nuisance, which is even greater in Chicago than it has ever been in New York. Only the advent of electricity could have enabled the New York roads to make these improvements, or even to handle their suburban traffic at all, and the improvements are not for economical reasons entirely. Altogether it will cost more than \$150,000,000 to complete the facilities that have already been planned to handle the passengers that arrive and leave New York city by railway, and the connections are so arranged that any person may be transferred from one railroad to another without crossing a street or even going into the open air.

WINE tanks are made of cement reinforced by iron or steel rods, in Algeria. They can be constructed for any capacity, those in general use containing from 500 to 5,000 hectoliters (hectoliter, 26.417 gals) The lining is composed of pieces of glass 12x24 centimeters cemented together.

Flagpole of World's Tallest Office Building

BY JOHN P. SLACK

Some of the Difficulties Encountered in Mounting the 3-ton Flag Staff Upon the Singer Building, and the Way They Were Met



Singer Building N.Y. City, 49 storeys, 612 ft. high, floor area 411,333 sq. ft., foundations 90 ft. deep.

UP to the present time the 45-storey Singer building, New York, represents the supreme test of the builder's art, so far as skeleton steel construction is concerned. Before the lofty tower was reared to its present eminence, the trials and problems of the builder were many. Now that the work of enclosing the gigantic cage within its shell of stone and brick is well under way, all difficulties in the building of the skeleton frame seem to have been safely surmounted. The crowning feature of the achievement, viz., the placing of the 90 foot steel flag pole which surmounts the dome, gave not a little trouble to the contractors before its base was safely in position at the 43rd storey.

Composed of hollow steel tubing, the pole is imbedded for 30 feet of its length in a specially constructed steel pocket extending from the 43rd floor to the top of the tower. The portion extending beyond the tower is 60 feet, or two-thirds of its total length.

At the 43rd storey is a ten-foot length of steel tubing, its dimensions 9 $\frac{3}{4}$ inches inside by 10 $\frac{3}{4}$ inches outside. This is fitted at the wrought bottom into a rod steel shoe 18 inches square. This portion of the pole projects through the 44th floor, and is screw-jointed into a 20 foot length of smaller piping, thus bringing the socket of the pole three inches outside of the outlet ring which forms the highest part of the dome structure or lantern surmounting the main structure. At this point the slip-joint occurs, telescoping 9 $\frac{3}{4}$ inches outside by 8 $\frac{3}{4}$ inches inside into the 10 inch socket for a distance of 2 feet 6 inches. From there above, the bolt is in five sections, 60 feet over all, and tapers from the 9 $\frac{3}{4}$ inches before mentioned to an ultimate 5 $\frac{3}{4}$ inches. The four joints are accomplished by shrinking the larger over the smaller piping for a distance of about 20 inches. In addition, each joint is tapped and bolted. At the top the pole is closed by means of a ball-bearing truck mounted on a cast iron reducing coupling into which the king pin is screwed.

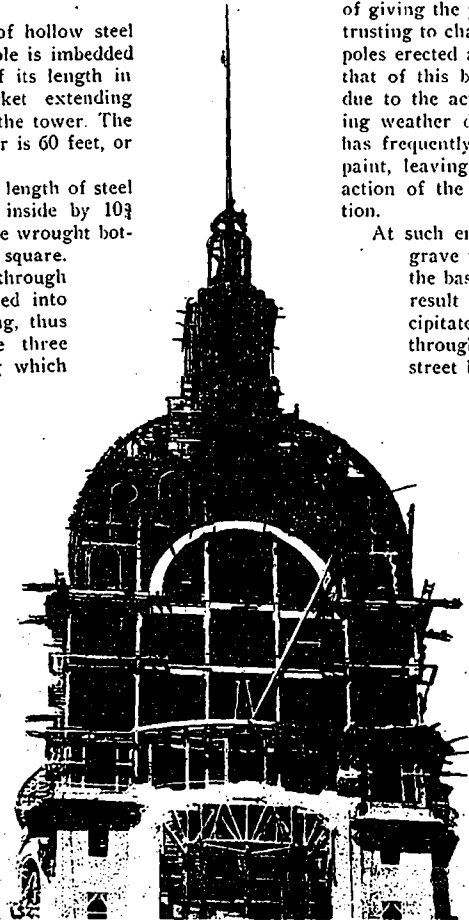
The body of the cast iron truck, containing the 2x $\frac{3}{4}$ inch bronze sheaves, revolves about the king pin on two steel ball-bearings to

provide against the flag wrapping itself about the mast. The body of the truck is surmounted by a $\frac{3}{4}$ inch galvanized iron rod 3 feet long, to the top of which is attached a 12 inch copper ball. The total weight of the pole is approximately 3 tons, or 6,300 pounds.

A difficulty confronted the contractors in turning over to the owners a steel flag-pole, in position, which they could guarantee as exempt from the effects of rust and corrosion. While ordinarily it would seem an easy matter to paint a steel pole before placing it in a position, this could not be safely done in the instance of the Singer building, since in hoisting the huge pole to its ultimate destination severe scratching in transit would have been inevitable. Such damage would have warranted considerable doubt as to its being fully covered with protective material when finally in position.

Furthermore, the action of the elements at this height—612 feet—was an unknown factor as far as steel flagpoles were concerned. Therefore, it was not deemed advisable to rely upon ordinary methods of giving the pole a coat or two of metallic paint, trusting to chance for results. The paint on steel poles erected at a considerably lower height than that of this building has been known to blister, due to the action of the sun's rays; then freezing weather depositing its layer of icy coating, has frequently removed portions of the blistered paint, leaving the steel beneath exposed to the action of the elements with resultant deterioration.

At such enormous height wind pressure is a grave feature. With corrosion at or near the base of the column a high wind might result in the huge steel pole being precipitated hundreds of feet, crashing through buildings or being hurled into the street below.



DOME AND LANTERN SUPPORTING 90-FOOT FLAG STAFF. BLACK SPECK AT LEFT OF NEEDLE REPRESENTS A MAN AT WORK WITH A PAINT BRUSH. TREMENDOUS WIND STRESS SWAYS THE SHAFT HALF A YARD OUT OF STRAIGHT.

Public safety is a serious factor in any engineering attempt where the construction details are of such huge proportions. In this instance it was not deemed advisable to take chances. The provisions necessary to obtain safety were: first, that the pole be covered with a protective coating after being placed in position; and second, that the effectiveness of the material chosen as a resistant to varied atmospheric conditions be absolutely dependable. The first requirement was not easily met, since the ordinary steple-jack looked askance at the task of painting a sixty-foot needle 612 feet above the ground. Ultimately E. Capelle, a Frenchman, and one of the most reckless steeple climbers in the metropolis, was found willing to undertake the work.

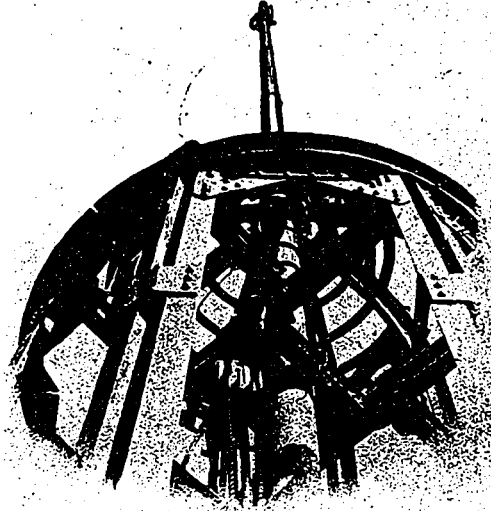
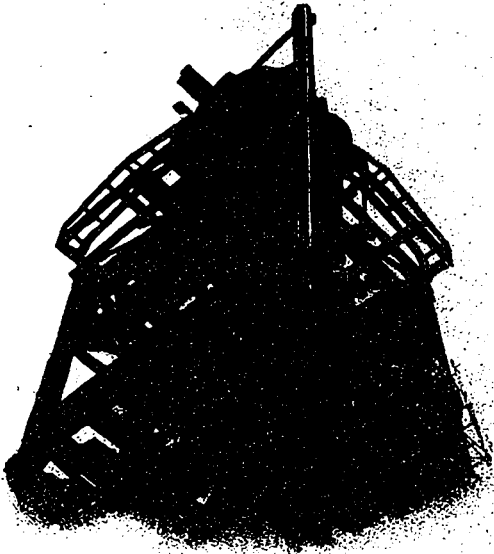
For a material which

would meet the requirements mentioned above. voltax, an anti-corrosive compound made by the Electric Cable Co., of New York, was chosen.

Owing to the difficulty in this instance, of manipulating the compound in its ordinary consistency, because of the insecure position of the workman, it was deemed advisable to thin it considerably and to apply five coatings in its diluted form to ensure proper protection. Mr. Capelle's experience, and his statement of the conditions which obtained while performing the crowning feat of his life, are of more than passing value. He states that the wind velocity at such a height ranges from 10 to 40 miles an hour at times when lower air currents show no appreciable velocity. With a stiff breeze blowing below, 40 to 80 miles an hour may be registered above. In the latter case the top of the steel pole sways in a radius of about a foot and a half. The larger illustration on the first page of this article shows the staff several degrees out of straight through this cause. This movement, contrary to general impression, is an indication of strength. If the tensile strength of a steeple or a flag-pole does not admit of a certain flexibility, calamity is the almost inevitable result of high wind pressure. Instances are on record where

the same direction one of each set being cut and passing the other with a riveted plate. No wind bracing is employed above the 36th floor.

Founded on bed rock 90 feet below the earth's surface, on a base 65 feet square, the tower portion of this building rises 612 feet above the ground, and in graceful



VIEW SHOWING BASE OF THE GIANT BOLT FIRMLY ROOTED INTO THE SKELETON FRAMEWORK OF THE LANTERN.

lines will pierce the clouds. The height of the main building, from sidewalk to roof, is 192 feet.

There is a total floor space in the building of 9.44 acres, there being about 24,000 square feet available on each of the fourteen floors of the main portion, and 3,300 square feet on each of the tower floors.

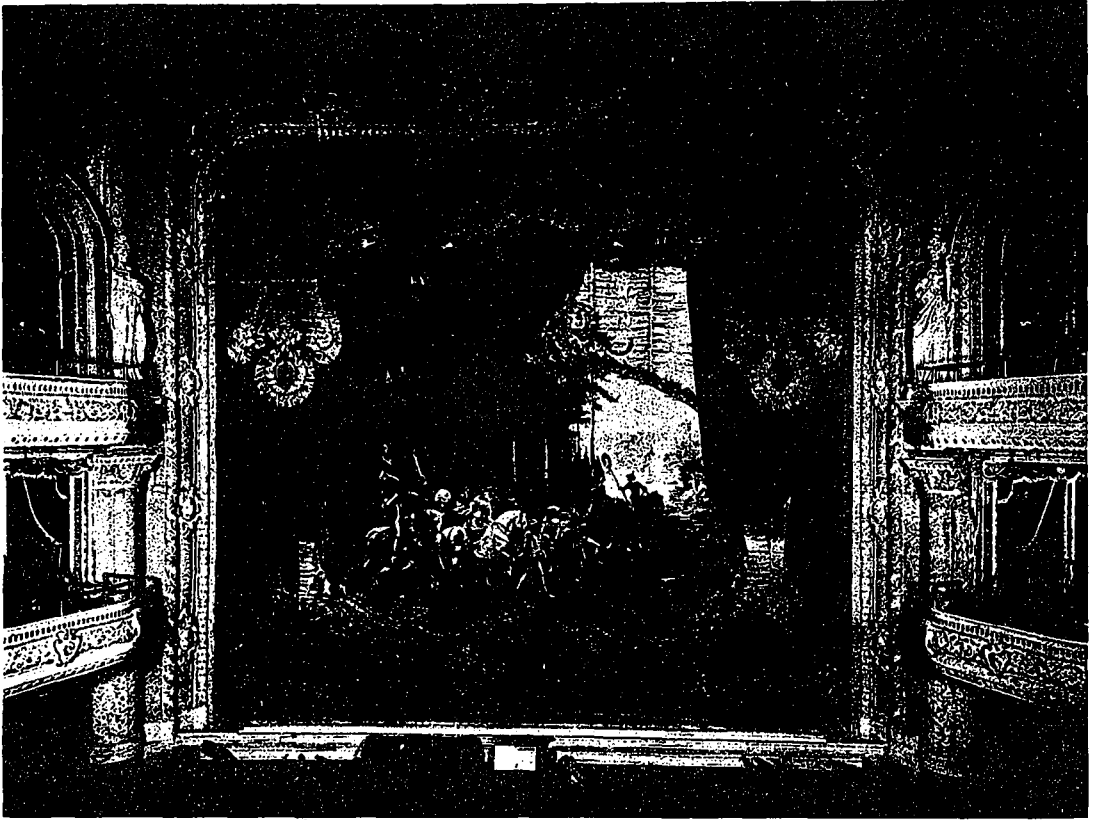
ASSEMBLING SECTIONS OF 6,300-POUND STEEL POLE—SLOW WORK AND CAUTIOUS. A SLIP AT SUCH GREAT ALTITUDE WOULD MEAN CALAMITY.

both steeples and poles have been broken off by reason of lack of elasticity with which to accommodate them to varying wind pressure.

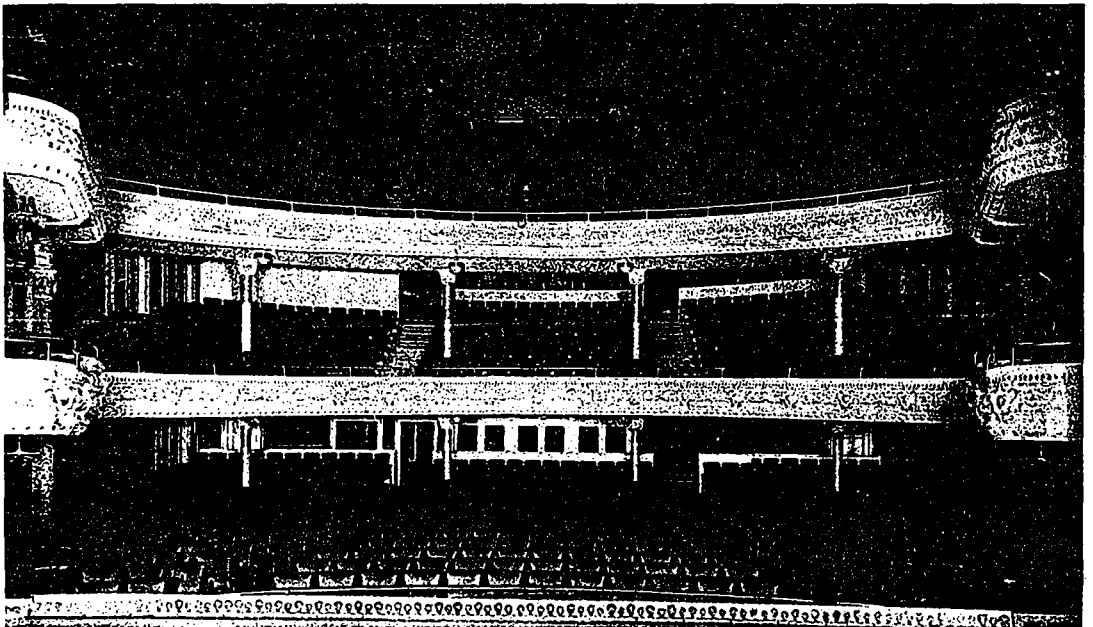
In designing the building the principal difficulty to contend with was the wind. The law requires strength to resist any possible wind pressure on each face of the tower. To provide against vibration and the over-turning action of the wind, diagonal bracing is provided in the four corners of the tower and about the elevator shafts. These braces are not only placed in the outer walls of the building, but in the interior partitions which form the corner rooms of the tower. They are so arranged that they form vast trusses stood on end. If laid down they would appear like bridge trusses of a railway and indeed they are about the size of a railway trussed bridge for a single track, being 12 feet in cross section. They form five skeleton towers, four at the corners and one in the middle, all fastened together at each floor by the floor beams and girders and x-braced with double crossed channel iron beams with their flanges facing in



SWINGING IN AN 85-MILE BREEZE 612 FEET IN THE AIR, HE ONLY SUPPORT A 1-INCH ROPE AND THE SLENDER SHAFT FROM WHICH HE WAS SUSPENDED SWAYING IN A 3-FOOT RADIUS, MR. E. CAPELLE, A FRENCHMAN, APPLIED 5 COATS OF PAINT TO THE FLAG-POLE OF THE SINGER BUILDING.



VIEW OF PROSCENIUM ARCH, NEW GAYETY THEATRE, TORONTO, SHOWING THE INEXPENSIVE YET ELABORATE DECORATIVE EFFECTS PRODUCED ON THE SPLAY OF THE ARCH AND AROUND THE BOXES. THE ASBESTOS CURTAIN IS BEAUTIFULLY RICH IN THE COLORING. THE PAINTING IS ENTITLED "THE BRIDAL PARTY." GEO. W. GOUINLOCK, ARCHITECT.



GENERAL VIEW OF AUDITORIUM, GAYETY THEATRE, FROM STAGE, SHOWING ARRANGEMENT OF GALLERIES AND SEATS. THE FOUR FIREPROOF EXIT DOORS MAY BE SEEN ON EACH SIDE OF THE THEATRE. GEO. W. GOUINLOCK, ARCHITECT.

New Gayety Theatre, Toronto

A Playhouse in the Construction of Which no Effort Has Been Spared in Providing Every Possible Safeguard and Appliance to Render the Structure Absolutely Fireproof. Neither Has Any Money Been Wasted on Useless Extravagance in Decoration

IN the November issue of CONSTRUCTION we devoted considerable space to the Royal Alexandra Theatre, lately erected in Toronto, as an example of high class theatre construction. In the Alexandra, as was shown by the description and accompanying illustrations, no expense nor effort was spared in not only making the theatre complete in every respect, but in producing artistic embellishments, making the building not only one of exceptional merit in its construction, but of a distinctive style of architecture.

We reproduce herewith half-tones illustrating another new theatre lately completed in Toronto which is of an entirely different type of construction.

The new Gayety Theatre has been constructed along the most economical and scientific lines. Not a dollar has been expended in the attempt at unnecessary equipment or decoration. The building is an excellent example of a well planned thoroughly fire-proof, substantially constructed, but economically built, moderate priced theatre.

We do not dwell on this building because of any exceptional architectural merit it may possess, nor because of its having any individual style or type of architecture carried out through its design, but because of the many economical constructive features it possesses as an absolutely fire-proof structure.

This building was constructed by the Engineering & Contracting Co., with offices in Toronto. The supervising architect was George W. Gouinlock, of Toronto. Practically all of the material used was manufactured in Canada, and with one or two exceptions, all the sub-contracts were executed by Canadian contractors. The building has a cement foundation with cement walls in the basement. The framework is of steel encased in concrete. The outside walls are built of brick and the facade is trimmed with artificial stone manufactured by the Canadian Art Stone Co., of Toronto. The partitions are built of hollow tile, while all floors are of cement and all stairways have iron railings with wood hand rails and slate rises and treads. The steel columns in the auditorium have all been fire-proofed with cement casings. Expanded metal supplied by the Expanded Metal and Fireproof Co., Toronto, was the concrete reinforcement used throughout. The boxes shown in the illustrations are constructed throughout of metal upon which is placed the plastic relief work. In fact, there are absolutely no

inflammable materials to be found anywhere in the interior of the theatre, with the exception of the seats, chairs, stair hand rails on the stair railings, and the scenery on the stage.

In the basement on the left hand side of the building are to be found ten private dressing rooms, and one large general dressing room. These are all of fire-proof material in every particular, having metal doors and are ventilated through windows opening out into a grilled opening along this side of the structure. To prevent any possibility of fire in these rooms that might arise

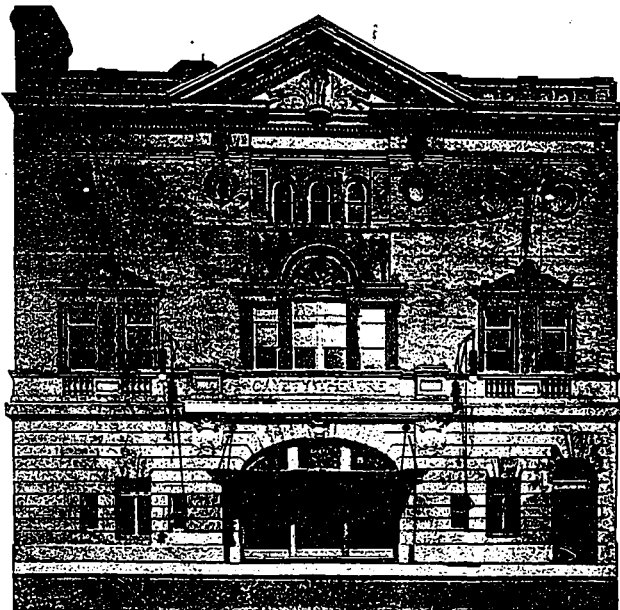
from the costumes or the performers' effects becoming ignited, each one of these rooms is provided with automatic sprinkler heads. The gentlemen's smoking room and lavatory is also to be found in the basement at the left of the front of the building. In the right front corner of the building is to be found the ladies' retiring room and lavatory. The box office of the theatre is conveniently located on the left side of the entrance, and for a theatre of this nature it is both spacious and convenient.

It will be noticed that three tiers of boxes have been provided on both sides of the proscenium arch. Each tier contains two boxes. The large top splay of this proscenium arch is one of the

features of this theatre, it being so arranged as to act as a sounding board, lending excellent acoustic properties to the auditorium.

A sprinkler system is provided for with a sprinkler head in every square of ten feet over the entire stage, affording excellent protection in case of fire in the scenery. A row of sprinklers are also arranged along the top of the asbestos drop curtain which, in case of fire, throws a sheet of water down the entire front of the curtain.

Another feature of this theatre is the economical suction system of ventilating that has been installed. A large fan is placed in a fan house erected on the roof of the auditorium, which draws the air from the auditorium through ducts arranged in several parts of the theatre, thereby changing the air every three minutes without draughts upon the audience. This was a very important problem for the designers, in so far as it is proposed to allow smoking in every part of the auditorium. The manner in which the smoke is drawn off demonstrates the practicability of this plan of changing the air. The building is heated throughout by a system of direct ra-

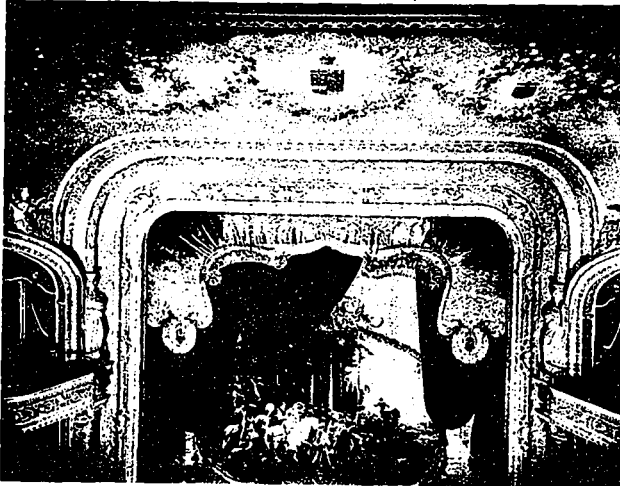


FACADE OF NEW GAYETY THEATRE, TORONTO, A FEATURE OF WHICH IS ITS ARTISTIC SIMPLICITY. GEO. W. GOUINLOCK, ARCHITECT.

diation from a large boiler in the basement of theatre.

In the design of a modern theatre one of the most important of all things to be kept in mind by the architect is the arrangement of adequate means of escape in

the deep pitch of the smaller and lower splay. In the latest and newest vaudeville houses this effect has been extensively tried, and is quite generally being pronounced practical. Certainly, in the case of the new "Gayety," it is a practical success, critics having commented in the highest terms of approval upon this special feature.



A FEATURE OF THE GAYETY THEATRE IS THE EXTREME DEPTH OF THE SPLAY AROUND THE PROSCENIUM OPENING, ESPECIALLY DESIGNED FOR ACOUSTIC EFFECT. IT IS ALMOST DOUBLE THAT OF MOST THEATRES OF THIS SIZE. THE DECORATION IN THE ARCH CONSISTS OF THE COATS OF ARMS OF THE DOMINION, ONTARIO AND TORONTO, ENCIRCLED WITH WREATHS OF MAPLE LEAVES. GEO. W. GOUINLOCK, ARCHITECT.

case of emergency. In the Gayety Theatre we have reason to call the attention of our readers to the provision made for exit in case of fire. Eight emergency exits have been arranged for, four on each side. These exit doors have metallic frames with asbestos board panels, a decidedly new type of fire-proof doors in Canada. These doors which are to be supplied with automatic bolts, with a push bar about thirty inches long, and folding when open so as not to block the way of a panic-stricken crowd in turning from the doors to go down the iron stairways. In other words, each exit has a centre door and two narrow side doors, all of which fly open and fold up, when unbolted, thus giving free access to the iron stairways on the outside of the building.

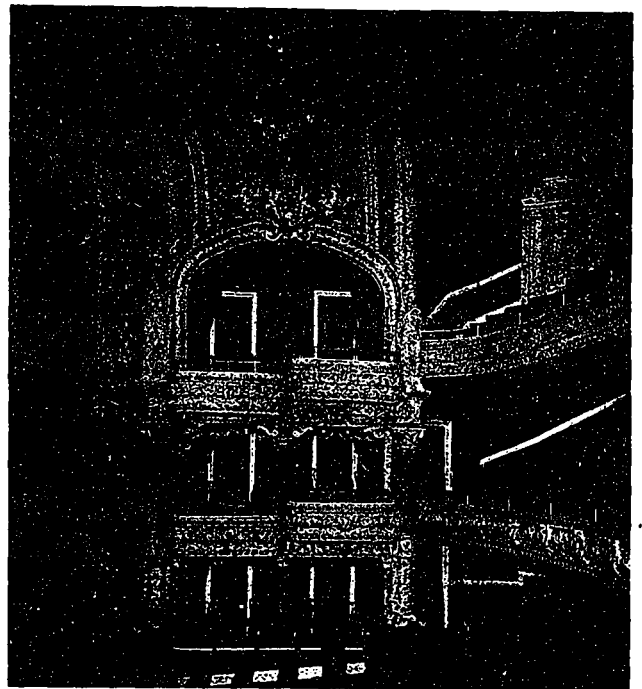
The interior decoration of the theatre, while not elaborate, is tastefully carried out in yellow and gold. The drop-curtain is a combination of beautiful colors upon which is painted a scene entitled "The Bridal Party."

The large splay at the top of the proscenium arch is beautifully decorated with the Dominion and Ontario coats of arms surrounded by wreaths of the Maple Leaf.

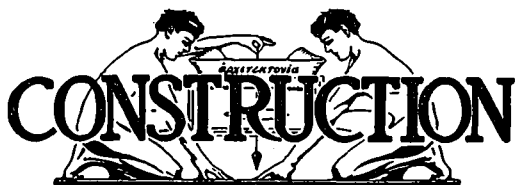
It will be noticed upon reference to our illustrations that this splay is more than double the width, or depth, of the usual theatre splay. This idea is designed to materially aid the acoustic properties of the house, the second flight directly over the orchestra in which brass instruments are much in evidence, acts as a sound board to throw the blatant notes of the cornet and trombone upward and spread the tone to all parts of the auditorium; while the performers' voices, coming from farther back, will be strengthened by

A popular-priced theatre, with heavy concrete foundations, fireproof walls, fireproof partitions, fireproof floors and stairways, fireproof exit doors, fireproof curtain, fireproof dressing-rooms, a fire arresting sprinkler system and fireproof boxes; in fact, a building practically without any combustible materials whatever in its make-up, and at the same time tastefully decorated, well arranged and equipped, was something unheard of even ten years ago. It required several appalling theatre catastrophes to bring about many of the above-mentioned features, but it is comforting to know that when one is sitting in a play-house of recent construction he is not liable to be involved in any such calamity. In the Gayety Theatre, Toronto, all of the above mentioned features have been embodied, and it stands as a fair example of what building science has done in the way of solving the problem of fireproof theatre construction.

The building cost in the neighborhood of \$125,000 and will seat 1,400 people. It was constructed in seven months, work having been started May 21, and the house was completed Dec. 7. In our opinion it is a credit to all those connected with its construction, as an excellent example of a moderate priced thoroughly fire-proof theatre.



VIEW SHOWING EXCELLENT ARRANGEMENT OF BOXES, GAYETY THEATRE, TORONTO. THE OCCUPANT OF EVERY CHAIR IN EACH OF THE SIX BOXES HAS A FULL VIEW OF THE STAGE. THESE BOXES ARE CONSTRUCTED ENTIRELY OF METAL UPON WHICH IS PLACED THE RELIEF DECORATION. GEO. W. GOUINLOCK, ARCHITECT.



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CORRESPONDENCE.—The Editor will be pleased to receive communications upon subjects of interest to the readers of this journal.

Vol. 1 January, 1908 No. 3

Items of Interest

THE Builders Exchange of Toronto are now luxuriously housed in their new quarters in the late addition to the Sons of England Temple on Berti street, near the corner of Richmond street, the formal opening of which took place December 9 last.

ENGLISH capitalists are making exhaustive experiments in Sweden, in an endeavor to make paper from peat. The paper thus produced would of course only be of the coarse wrapping-paper variety, but it should considerably relieve the demand for wood pulp. If this can be accomplished satisfactorily the large peat deposits in Canada could be utilized to advantage for this purpose.

AGYROSCOPE for steadying ships was given a public test last month off the river Tyne on the "Seabar," formerly a first-class German torpedo boat, measuring 116 ft. in length, 11.7 ft. beam, with a displacement of 56.2 tons. The apparatus consists of a heavy fly-wheel rotating about an axis, and carried by a frame which can oscillate about a horizontal axis, the oscillating motion of the frame being checked by brakes. The wheel is one meter in diameter, weighs 1,106 lb., and makes 1,600 r.p.m. It is steam driven. The periphery is provided with blades and works like a turbine, the wheel being enclosed in a casing. In the tests with the gyroscope out of action the roll was about 14 deg., according to The Engineer, London, while the boat was kept steady with the machine acting.

TWO scholarships in McGill University, Montreal, will be given by the Canadian Pacific Railway to those employees or sons of employees who stand highest in entrance examinations next year. There are three students now holding such scholarships.

FOLLOWING are the newly elected officers of the Manitoba Association of Architects; President, Mr. S. Hooper; first vice-president, Mr. J. Greenfield; second vice-president, Mr. J. Chisholm; secretary, Mr. W. P. Over; treasurer, Mr. L. T. Breston; directors, Messrs. J. D. Atcheson, Wm. Fingland, S. F. Peters, V. W. Horwood and H. Matthews.

THE Hutchinson-MacGlashen Company is the name of a new firm of architects lately formed in Regina to take over the business of G. E. Hutchinson, who has been practicing at this place for the past three years.

Mr. MacGlashen comes from Boston, Mass., although he has been practising his profession during the past few years at Watertown, South Dakota. The offices of the new firm will be in the Masonic block.

CANADIAN manufacturers of furnaces for residential heating, who are interested in foreign markets will find a valuable hint in the report of an American Consul in China who states that there would probably be an excellent opportunity for the introduction of American furnaces for househeating in that country, especially the northern ports. He states that he has already received inquiries regarding the cost of installing a hot-air furnace in a large house of 20 rooms. The consul also names the principal importers of stoves in Shanghai. He adds that catalogues of furnaces and stoves with lowest wholesale export prices and discounts, probable freight rates, etc., should be sent to him.

THE Minister of Education for the province of Ontario, Hon. Dr. Pyne, states that the government will do nothing this session for the improvement of the system of technical education in the province because of the fact that the scheme will not be formulated in time for presentation. He believes, however, that the Federal authorities should aid the province in their efforts to provide technical training schools for their people. The Dominion, he argues, creates a tariff which excludes the manufacture of other countries. It should, therefore, provide facilities for their production in the Dominion. The question of technical education is an important one and a rapidly growing country such as Canada cannot treat it with indifference.

THE report of the Royal Commission appointed to investigate the "Quebec Bridge Disaster" is awaited with much interest by the entire engineering world. The contradictory nature of the evidence given before the commission makes its task a difficult one. We reviewed the evidence given by Chief Engineer Cooper at New York, in the November issue of CONSTRUCTION. In their evidence given later the officials of the Phoenix Bridge Co. flatly contradicted many of Mr. Cooper's most important statements. This evidence was most interesting not only because it placed a large portion of the blame on the chief engineer, but because it agreed with the evidence of Mr. Cooper in showing that the whole affair from beginning to end was loosely conducted, and that the Quebec Bridge Co., the government and its officials came in for a large portion of the blame for the catastrophe. The Commission promises to place the responsibility for the disaster, and it is to be hoped that in their report the commissioners will not spare either the government nor its officials from any portion of their responsibility for this great national calamity.

AN engineer's mistake will cost the Pennsylvania railroad \$500,000 to \$1,000,000 to rectify, and has rendered useless half a mile of construction work, from the mouth of the tunnel under the palisades southwest to the Secaucus Meadows in New Jersey. At one point where the Pennsylvania crosses two railroads, an expensive massive bridge had been built, it was found the bridge was 75 feet out place as specified by the original plans, and this work will have to be changed.

* * *

A PARTNERSHIP has been formed by Messrs. A. L. Weeks and Allan Keefer, to take over the business of Messrs. Machado & Weeks, of Ottawa. Mr. Keefer is the son of Mr. C. H. Keefer, of Ottawa, and, of course, is well known here. He has for some time been practising architecture with a well-known Boston firm. Mr. Weeks, who is a New Brunswicker, has in the two years during which he was associated with the late Mr. Machado in Ottawa, worked up an excellent practice, and with the assistance of Mr. Keefer, there is little doubt that the business will continue to grow steadily.

* * *

A NEW building by-law is proposed by the council of Battleford, Sask. The new regulations will impose restrictions in the matter of the future erection of buildings in the central portion of the town and will permit only of the erection of first-class buildings conforming with the regulations of the Fire Underwriters' Association. It is gratifying to note that these rapidly growing towns of the West are showing a disposition to profit by the mistakes of our older eastern cities, in adopting building laws that permit the erection of structures that are proving a menace to the growth and development of their business centers.

* * *

THE Protestant School Board of the city of Montreal has been found liable for damages as a result of the burning of the Hochelaga school last winter. J. F. Anderson, who lost his child of six years old, in the fire, brought a suit for damages and was awarded \$300. The jury at the trial found that the death of this child was due directly and entirely to the negligence displayed by the Protestant School Board in neglecting to equip the Hochelaga school building with fire escapes of any description, and also in not having provided adequate means for the escape of smoke. It is not unlikely that a number of other actions for damages brought by bereaved parents will follow. It is to be hoped that this jury's decision may act as a deterrent to the gross carelessness displayed in the past by the average School Board.

* * *

IF all the skyscrapers in New York were piled one atop of the other a building of 6,553 storeys would rear itself toward high heaven. Compared to such a structure the Tower of Babel would look like a mushroom, says the New York World. The city building department has finished counting the lofty buildings in the city; 540 of them have been erected since 1890, when the Pulitzer building was the first of its class. Including the Metropolitan Life building, which is not finished, the census of high buildings is as follows: One of 48 storeys, one of 41; two of 26; three of 25; two of 23; four of 22; nine of 20; two of 19; nine of 18; two of 17; nineteen of 16; nineteen of 15; eighteen of 14; thirteen of 13; one hundred and nine of 12; one hundred and one of 11; one hundred and sixty-four of 10.

The discovery of the structural possibilities of steel has accomplished this. Modern fireproofing methods—protecting the steel with unburnable terra cotta, and using the same materials for floors and partitions and enclosing elevator shafts and stairways—made the skyscrapers safe.

ACCORDING to reports from Nottingham, recent acts of Parliament authorize the construction of some 200 additional miles of railway in the United Kingdom, involving an outlay exceeding \$50,000,000. The authorized constructions include railway extensions in the Midlands and other parts of the kingdom, and various dock improvements at railway termini. The chief item is a projected railway in Ireland over 100 miles long, terminating on the west coast, and forming a link in a future route between England and Canada by rail across Ireland and by a direct steamship line from Blacksod Bay.

* * *

ACCORDING to a statement of Newyn Macartney, surveyor of the Fabric of St. Paul's Cathedral before the Royal Institute of British Architects, this historic edifice is sinking. There are, according to Mr. Macartney, four main points of weakness in the cathedral. These are the dome—the dominating architectural feature of the metropolis—the south transept, the western towers and the portico. The dome, which is the centre of the great mass has sunk and is now severed from the surrounding masses. Each one of eight piers on which the dome is carried has sunk westernmost, one by more than six inches. The two towers are each out of perpendicular, the inclinations being sufficient to jeopardize the safety of the two wide arches of the portico, which itself has followed the direction of the towers.

* * *

THE Board of Trade and Chambre de Commerce of Montreal are canvassing the proprietors in West, East and Centre wards to seek their opinion relative to asking the city to make arrangements for the installation of a supplementary water supply for fire purposes only, in the district mentioned. The proposition, as provided for by a clause inserted by the Legislature, is that if a majority of the proprietors agree, the city is empowered to float bonds or sell debentures to provide for the installation of a special water service for fire protection in the three wards. The proprietors are to be taxed for this amount, the taxation being spread over a period of forty years. As such a system will aid in securing a lessening of fire insurance rates in the congested district—which is now subject to an extremely high premium—it is altogether probable that the proprietors will express a willingness to accept the plan.

* * *

THE Vancouver council will shortly consider a portion of the new building by-law upon which civic committees have been working during the past two years.

An interesting provision in the proposed code is that the limit as to height of buildings is placed at 100 feet save when special fire fighting appliances are part of the structure, in which case the building inspector is to use his judgment. All buildings over 70 feet in height except grain elevators and churches; all apartment houses over 55 feet in height and all institutional buildings over 50 feet in height, must be fireproof. Regarding churches the demand is made that when the edifice is planned to accommodate 1,200 people the portion including the main auditorium shall be fireproof.

It provides that no permit for the removal of buildings is contemplated when the same shall have been damaged by wear or tear, fire, etc., to the extent of 50 per cent. of its value.

The question of street permits is very closely guarded, the requirements being that the contractor shall construct a platform from four to six feet wide and at least eight feet high along the side walk occupied. It is also provided that street space shall not be used for the storage of materials except those intended for immediate use.

The provisions regarding the placing of fire escapes are very rigid, basing the number and size on the use to which the building is to be put as well as its height.

THE National Lumber and Building Material Association will hold an exhibit at the Chicago Casino, Peck Court and Wabash avenue, the week of February 10 to 17, 1908. Everet W. Hogle, secretary of the Illinois Masons' Supply Association, is in general charge of the arrangements for the exhibit and convention, which will be important.

FEBRUARY 4 and 5, 1908, have been set as the days for the next annual convention of the builders' supply men in Chicago. Headquarters will be at the Auditorium hotel, and in all probability a banquet will be given at the close of the convention. Frank Wright, of the firm of Meacham & Wright, is the Chicago member of the executive committee. Membership in the organization has been growing steadily.

A SPECIAL committee appointed by the National Lumber Manufacturers' Association to look after obtaining \$150,000 to endow a professorship of lumbering in the Yale Forest School have reported that the subscriptions amount to \$67,500, which is \$17,500 more than was reported at the meeting of the association at Norfolk last spring. Fifty thousand dollars of this endowment in bonds has already been turned over to Yale University, the income of which will be used for instruction in applied forestry and lumbering.

THE fourth annual convention of the Iowa Association of Cement Users will be held in Des Moines, Ia., February 19, 20, and 21, 1908. Headquarters will be at the Savery hotel and application for space, which will be allotted by the square foot, should be made to J. R. Hubbard, manager of the hotel. George H. Carlon, Oskaloosa, Ia., is president; George H. Ross, Grinnell, Ia., treasurer, and Ira A. Williams, Ames, Ia., secretary. All of these gentlemen will be glad to answer inquiries in regard to the convention and the exhibit.

A 150-ton crane of unusual construction has been installed at Birkenhead, opposite Liverpool, England, for the handling of great weights into vessels alongside the wharf. It consists of a special 3-footed supporting framework, which rises about 60 feet above the dock level and is enlarged at the top to carry a revolving derrick structure with an overhanging jib. The latter is pivoted on a step bearing within the lower part of the supporting frame, and bears at the top against a pressure ring that withstands the thrust of the overhang. The jib has an extreme overhang of 38 feet 8 inches, and at the end carries an auxiliary hoisting gear of 50 tons capacity. The main gear, of 150 tons capacity, has a radius of action of 28 feet. A peculiar feature of the derrick is the use of continuous current power for the operation of the hoisting motors.

THE next convention of the National Association of Cement Users will be held in the concert hall of the Tech Theatre building, Buffalo, N. Y., on January 21 to 24. The exhibition will be open from Monday noon, Jan. 20, to Saturday midnight, Jan. 25.

The program includes papers on "Cement Sidewalks" by C. W. Boynton, Chicago, Ill.; "Elementary Mechanics of Reinforced Concrete," by Prof. W. K. Hatt, Purdue University, Lafayette, Ind.; "Factory-Built Concrete," by W. H. Mason, Stewartsville, N. J.; "Concrete as a Plastic Material for the Expression of Architectural Ideas," by Irving K. Pond, architect, Chicago, Ill.; "Artistic Effects in Reinforced Concrete," by Ross F. Tucker, New York City; "Exposed Selected Aggregates in Monolithic Concrete Construction," by Albert Moyer, New York City; "Progress in Manufacture and Use of Cement

Building Blocks," by A. N. Pierson, East Orange, N. J.; "Practical Methods Involved in the Erection of a Reinforced Concrete Building," by H. H. Fox, New York City; "The Unit vs. the Loose Bar System of Reinforced Concrete Construction," by Emile G. Perrot, architect, Philadelphia, Pa. There are a number of other subjects on the preliminary program for which speakers have not yet been obtained, and each of the committees is given a time to make a report. An hour is given each morning to a meeting of those interested in the fields covered by these committees.

The list of exhibitors already procured for the show is large and promises to be larger than it was at Chicago last year.

The attendance will be drawn largely from a new field. The first three conventions drew from the same states, Indiana, Illinois and Wisconsin, most largely, with many of the same faces each year. But few of these will appear at Buffalo on account of the expense of the trip and possibly in a few cases because the Chicago show took the place for them that the association has heretofore.

It is likely, however, that it will be attended largely by Canadians, in so far, as this is the first convention of the association held within reasonable distance of the Canadian boundary.

Bascule Lift Bridges

(Continued from page 27.)

elevation of the base of rail above water, about 10 feet, the bridge is designed as a through truss cantilever. It crosses the channel at the acute angle of 36 deg. 30 min., which necessitates a span of 275 feet, centre to centre of bearings, in order to give a clear channel of 120 feet. The loading is 10,000 pounds per lineal foot of bridge, with a concentrated load of 50,000 pounds at any point of each track. The bridge is operated by electricity, and the machinery and equipment is so arranged that it may be operated by one man from the operator's house on one side of the channel. The sub-structure rests upon piles driven to rock and cut off five feet below the bottom of the channel. This system of piling is shown to good advantage in figs. 13, 14 and 15.

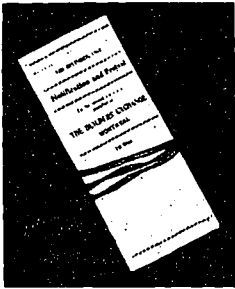
Additions to Chateau Frontenac

(For illustrations see page 44.)

ON page 44 will be found illustrations showing the Chateau Frontenac, Quebec City, as it will appear well known hostelry, one of the finest on the American when the additions to cost \$1,500,000, proposed by the owner, the Canadian Pacific Railway, are completed. This continent, is picturesquely situated at the foot of the elevation upon which is located the historic citadel, overlooking the St. Lawrence river. It is one of the best examples in Canada of the French Chateau type of architecture and it may be seen in the illustration that Mr. Painter, the architect, has quite successfully carried out the original style in his design for the new additions. The present building will be a very small part of the completed structure, as proposed, although the designer has worked out the problem of planning the additions so as to make the existing building become a very part of the finished structure, in a most commendable manner. The hotel now contains 260 rooms, but when the enlargement has been completed it will contain 640 rooms, which will make it by far the largest hotel in Canada. It is noteworthy that the contract for the first section to be added provides for reinforced concrete construction and was awarded to the Provincial Construction Co., of Toronto. The Kahn system of reinforcement is specified. In view of the fact that the present building is of skeleton steel construction this appears to be a victory for reinforced concrete.

Banquet of Montreal Builders

Hon. W. A. Weir Declares That the Building Trades Should Show the Government Some Appreciation of the Lemieux Bill and Advocates Technical Education as a Solution of the Labor Problem—Sumptuous Programme and Record Attendance



THE SUMMONS.

THE best traditions of the Montreal Builders' Exchange were sustained in the success which attended the last annual banquet, held in the Place Viger Hotel, Montreal, on the evening of December 12. The attendance proved the largest in the history of the organization and included many representative men whose interests lay outside the building industries.

Aside from the growing popularity of this aggressive exchange, there appears to be no way of accounting for this record-breaking patronage unless those who attended were moved by some fearful impulse as a result of having been suddenly served with writs commanding them to be present at every course of the dinner, or appear before an officer of the Montreal Builders' Exchange to answer the charge and to be further dealt with according to law. No doubt several honest men smiled dubiously (being conscience-clean) as they tore the binding of red-tape from a formidable looking legal folder endorsed "NOTIFICATION AND PROTEST"; but one would scarcely believe that so many people in Montreal had learned to dread the appearance of a buff-colored piece of cardboard bearing a red seal.

Any reference to the banquet would be incomplete without a word about the menu card. We are reproducing on this page miniature half-tones of the menu and the folder, the originality of which, upon careful perusal, could not fail to impress one with the idea that the officers of this organization are alive. From start to finish, covering four large sheets of closely printed paper, the document scintillates with droll humor, as the great array of viands are introduced in rotation.

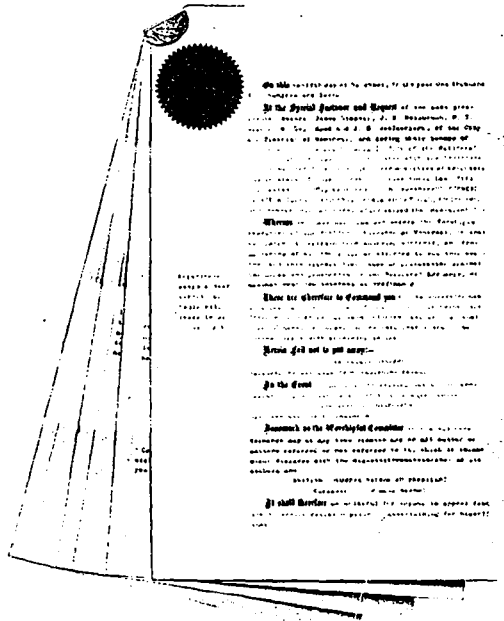
The toast-list was not large, but each proposal was honored by two or three responses, and with a most generous programme of musical and instrumental diversions the evening wore well on into night ere the party broke up.

Mr. James Simpson, first past-president, presided, and arranged on his either hand were the following speakers: the Hon. R. Dandurand, speaker of the Senate; Mr. L.

A. Rivet, M.P.; Ald. De Serres, acting mayor; Hon. J. D. Rolland, president of the Canadian Manufacturers' Association; Mr. C. H. Catelli, president of the Chambre de Commerce; Mr. A. O. Brossard, provincial architect; the Hon. W. A. Weir; Mr. Rene P. Lemay, president Province of Quebec Association of Architects; Mr. W. T. Cast'e, Mr. Geo. A. Ross; Messrs. Alcide Chausse, J. H. Lauer, Joseph Thibeault, of the Builders' Exchange; Mr. W. E. Ramsey, Mr. N. T. Gagnon.

In responding to the toast, "Our Province, Quebec," the Hon. W. A. Weir suggested that the master builders should show the Government some appreciation of the passing of the Lemieux Bill, which he pronounced a great success, having received the approval of both parties. He said the foundation of all successful legislation was the assent of public opinion, and from this fundamental point

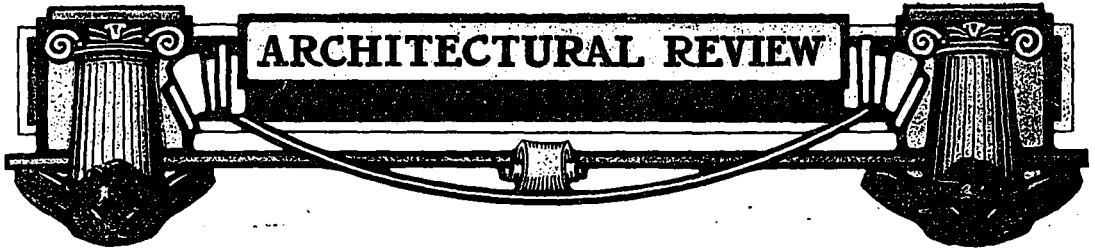
of view he believed the bill went a long way in the right direction. The principle on which the Government had gone was the appeal to common sense or public opinion. Without it they were bound to fail. He believed that before long they would see compulsory arbitration; not only in public utilities, but in every walk of life dealing with industrial energies. Men had, of course, every right to combine, but to his mind there was one fatal principle in trades unionism, and that was that all workmen, whether skilled or not, must be paid the same wage; a man who is inferior at his trade must receive the same as the skilled workman. It was a fatal defect, and one which he believed the workers themselves would eventually remedy. The Government, he considered, had done its best for the people of Quebec. He recalled with gratification the passing of the Factory Act, by which no child under fourteen can be employed in a factory, and no child between fourteen and sixteen, if it is not able to read or write. This was



AFTER THE SHOCK OF HAVING BEEN SERVED WITH A WRIT OF PROTEST HAD WORN OFF, MANY A MAN SMILED AT THE PROSPECTS OF A BOUNTIFUL FEAST. THE ABOVE IS A REPRODUCTION OF THE MONTREAL BUILDERS' MENU.

a distinct advance, and when the school inspectors met at New Jersey last year it was stated that there was nothing like it in the United States. Technical schools had been established, which would fill a great want in the province of Quebec.

We should have a thorough system of education before Canada could take her place among the great industrial factors of the world. What was wanted in Canada was the development of thought power. Further, there should be a community of sentiment, by which each province should have a thought for the needs of the others.



Would Registration of Architects be a Menace to the Profession?

Some Interesting Comment on the Proposed Act for the Incorporation of the Canadian Institute of Architects by Prominent Members of the Profession and the Daily Press

THE position taken by CONSTRUCTION on the question of the advisability of making the profession of architecture a closed one, through granting a Dominion charter to the Canadian Institute of Architects, giving them the right to control the title of architect, has brought forth a large number of letters from prominent members of the profession, as well as considerable newspaper comment.

It will be noted in the following letters and comments on this subject that the general opinion expressed is that the granting of such powers as asked for by the C.I. of A. would not only be impractical from the standpoint of the architect, but unfair to the public and profession alike.

This is exactly the position taken by CONSTRUCTION, although we have repeatedly stated that a Dominion association of architects would be beneficial to both the profession and the public, and the organization should be encouraged in every possible way, and that this association should work to bring about legislation providing for a Government board of examiners responsible only to the Government.

Wrong Methods Adopted

PROFESSOR PERCY E. NOBBS, M.A., A.R.I.B.A., Professor of Architecture, McGill University, says wrong methods were adopted by organizers. Q.A.A. not consulted. Registration bound to come. Museums required more than schools of architecture. Does not think legislation applied for will be granted, but C.I.A. should not give up hope of a career of usefulness.

Editor CONSTRUCTION,

Dear Sir,—I trust you will find space in your valuable columns for a brief reference to a few points, apt to be overlooked by both sides among the heated partisans now agitating the profession in Canada, for or against, the proposed legislation applied for by the Institute of Architects of Canada.

In the first place, I feel that had another method been adopted at the initiation of this organization, there would have been less controversy. Such an institute in Canada should have resulted naturally from the drawing together of various provincial organizations for mutual strength and support. It is unfortunate that the promoters saw fit to launch the organization independently of any "pour parlers" between existing associations which even if they had caused delay would at least have clarified the issues on which the profession was at one.

The thing having been done, however, it is very doubtful in my mind whether any society, however much ignored at the beginning (and no society was more pointedly ignored than the Province of Quebec Architectural Association), should now stand aloof on that account.

The new institute has for its main objects the panacea

of "registration." It appears to me that registration is bound to come. Personally, I heartily dislike the idea, but there is no blinking the fact that professional opinion is tending that way. In England it is only within the last year that this thing has come about. Two of our Canadian provinces already have it; others have sought it and failed; others are still seeking it.

Now, when registration comes, the first step is the recognition of all sorts and conditions of persons as architects on very thin pretexts. That has had to be done in England by creating a new class of "licentiates of the R. I. B. A.," a class which will in time die out. Now, for us in the east, this is not so very serious a matter. Our growth has been comparatively slow, and our public knows, broadly speaking, what an architect is. In the west it is quite different. The growth there is very much more rapid. Should registration be achieved through the agency of this new institute, within the next few years, it will involve a far smaller "licentiate" class than it will say twenty, or even ten, years hence; and, assuming that it is bound to come, I think it is fair to argue the sooner it comes the better.

As far as a superficial observer can see, the gentlemen who met last summer in Montreal to organize this institute were not very seriously concerned with the betterment of our art. The R. I. B. A. has become, almost in spite of itself, the administrative body for registration—that is after 50 years of educational work.

This brings me to the sad condition of architectural education in Canada to-day. Till last year there was but one organized school of architectural design, the output from which till recently has been extremely limited—I refer to the department of architecture at McGill University. There is at this time not a single travelling scholarship open to Canadian students of architecture, either in connection with the provinces, or the Dominion as a whole, and travelling scholarships have, in the past, in all countries, done far more for architecture than schools of design.

ARCHITECTURAL EDUCATION.

The examinations of the Province of Quebec Architectural Association—and I speak as a member of their examining board—have been conducted on the most elementary lines. It is to be devoutly hoped that the standard will be raised within a very short time. The R. I. B. A. has for many years held its qualifying examinations in Canada. The candidates have been few, and rarely of Canadian birth.

Up till now we have depended for the successful running our offices upon lads trained in the Old Country, or Canadian youths who have had sufficient enterprise to go to the United States for wider experience. Our past,

as far as architectural education goes, has not been glorious, and much cannot be hoped from the tendency to institute a multitude of examining "authorities" in connection with the provincial associations. On the matter of education I see a meeting point for all the architectural organizations of the Dominion in a central Canadian institute.

MUSEUM OF ARCHITECTURE.

What we require most, however, is not schools of architecture, but museums. There is not a public collection of architectural casts and models between Cape Breton and Vancouver.

Under these circumstances it seems to me vain to initiate legislation for the express purpose of keeping out architects from the British Islands and the United States (where better conditions of education obtain), until we have shown ourselves capable of producing the breed required. It is not legislation, but education that we want, and I consider it the duty of every architect to think twice before he exercises his votes or his influence against an institute in which our only hope for improvement in this matter is founded.

It seems to me very unlikely that the legislation applied for will be granted; but the institute should not give up hope of a career of usefulness on that account. If this institute carefully differentiates among its members between those who are admitted simply because the screw nails in their door plates are in position, and those who have some qualification, and are trained architects, it will be the first step towards the self respect which will lead to its longed-for haven of "registration." Incidentally it is worth noting that registration is not considered feasible in the United States, where architectural education is better organized than in any other country.

Yours very truly,

PERCY E. NOBBS.

Would Fossilize the Profession

ARCHITECT EDEN SMITH, president Toronto Architectural Club, says as member of Provisional Board of the Institute, he strongly objected to the effort to monopolize the profession. Is not opposed to governmental registration.

Editor CONSTRUCTION,

Dear Sir,—In the article in your November issue of M. Alcide Chausse, on the incorporation of the Institute of Architects of Canada, is stated that among the two hundred and five architects petitioning the government for protection, are the presidents of every association of architects now in existence in Canada.

As president of the Toronto Architectural Club I should like it to be made known that I objected, as a member of the Provisional Board of the Institute, to the proposition of the Canadian Institute to monopolize the title architect or endeavor to close the profession, as I consider doing so would be quite ineffectual as a means of safeguarding the public, and would most effectually fossilize the profession. Since then the Toronto Architectural Eighteen Club, now the Architectural Club of Toronto, has passed a resolution objecting to the form of registration proposed by the Canadian Institute of Architects and the Ontario Association of Architects, though not necessarily opposed to a system of governmental registration.

And at the convention of the American Institute of Architects held at Chicago last month the report of the committee on registration was adopted, which embodied a resolution to the effect that the institute would take no action in the advocating of any such legislation, deeming it a part of the public and not the profession to ask for it, and that the institute's chapters only give their guidance in framing such legislation when being enacted by the state.

Yours truly,

EDEN SMITH.

Mr. Chausse's Bad Comparison

ARCHITECT J. C. B. HORWOOD, of the firm of Bark & Horwood, Toronto, says: Mr. Chausse wrongly places the law proposed by the C.I.A. on the same level with the Architects' License Law of Illinois. Proposed law would not protect the public.

Editor CONSTRUCTION,

Dear Sir,—In your November issue I notice that Mr. Chausse in his "Outline of the Objects of the Incorporators of an Organization for the Protection of the Architectural Profession in Canada," wrongly places his proposed legislation for the I. A. C., on the same level as the architects license laws of the states of Illinois, New Jersey and California, notwithstanding that by his ineffective method the licensing of architects would be very unwisely placed in the hands of a close corporation of practising architects, and by the states' laws the licensing of architects rightly remains with the government.

I oppose Mr. Chausse's method because I believe it would be very bad public policy, in these days, to enact such a law, and also because it would not give the public the protection needed.

Merely to "prevent anyone from using the title of architect, if he has no right to it," would not be "a protection to the public" that the public needs because, as Mr. Chausse unwittingly says, "This bill to incorporate the architects of Canada, if passed, will not prevent anyone from drawing plans for himself or for others and charging for them," therefore, it is quite evident the bill, if passed, would not prevent the erection of unsafe buildings which would be a menace to the lives of our countrymen and therefore it would not secure for the public the protection needed.

Yours truly,

J. C. B. HORWOOD.

Unconstitutional

THE TORONTO GLOBE, in an editorial, December 3, believes that the proposed law would be no protection to the public, which is protected fully by a City Architect, backed with proper laws. Proposed Act unconstitutional. Would plunge the whole country into litigation.

"'Construction,' a new journal for the building and engineering interests of Canada, gives in its second number a brief account of a movement to secure from the Dominion Parliament the incorporation of a society to be called 'The Canadian Institute of Architects.' The title should imply that the proposed 'institute' is to be established for the purpose of giving intending architects theoretical instruction and practical training; but nothing of the sort is intended. The aim of the proposed legislation is 'the protection of the profession in Canada.' In plain English this means that the privilege of practising as an 'architect' and using that title shall be limited to those who become members of the proposed association, which is to masquerade under the misleading title of 'institute.'

"Mr. Alcide Chausse, who writes in 'Construction' as the 'promoter' of this project, very naively informs the profession that 'this bill to incorporate the architects of Canada, if passed, will not prevent anyone from drawing plans for himself or for others, or charging for them, but it will prevent anyone from using the title of architect if he has no right to it, and as such it will be a protection to the public.' Every architect in Toronto knows that such a statement is absurd. This city depends for its protection on an effective building by-law enforced by a competent City Architect. The fact that a man belongs to an association affords not the slightest guarantee that he will do good and honest work even if he is capable of doing it.

"Apart altogether from the merits of such legislation, however, there is an insuperable objection to the incorporation of such an organization by the Dominion Parlia-

ment. There could not possibly be a clearer case of infraction of the British North America Act, which gives to the Provincial Legislatures exclusive jurisdiction over 'property and civil rights.' The right to draw building plans and to call oneself an architect in doing so is a civil right, of which only a Provincial Legislature can deprive a citizen of any province. The enactment of such a law would at once plunge the whole country into litigation, for the prohibition of the use of the name 'architect' would continually and deliberately be violated, and the courts would be asked to determine disputes as to fees for professional services.

"The Legislature of Ontario settled this question one way many years ago. The Legislature of Quebec has settled it another way. Alberta has, it is said, followed the example of Quebec. No one here will find fault with either of these Provincial Parliaments which presumably are in harmony with the public opinion of their constituencies. But it is safe to predict that the proposal to get such legislation enacted at Ottawa will be condemned by every member of the Legislatures of Quebec and Alberta, as well as of other provinces that have shown no inclination to put architects under unnecessary and invidious restrictions on their personal freedom and civil rights."

Likes Illinois System

THE TORONTO GLOBE, in an editorial, December 9, believes "Construction" rendered the public good service in reprinting the Illinois law. Absurdity of propaganda of Alcide Chausse. Approves Illinois system. No more monopolies wanted.

"In the states of Illinois, New Jersey and California, there is in force a system of licensing architects by State Boards of Examiners, and 'Construction'—the building and engineering journal of this city—has rendered the public good service by reprinting the Illinois statute in extenso. It is hard to understand how anyone intelligent enough to practise architecture can read it through without feeling the absurdity of the propaganda carried on by Mr. Alcide Chausse to secure the incorporation of the proposed 'Canadian Institute of Architects.' His proposal is foredoomed, not merely because it aims at creating a close corporation controlled by architects themselves, but because the request for the necessary legislation has been made to a parliament that has no authority to grant it.

"Under the Illinois system, which has been adopted and adapted by California and New Jersey, a State Board of Examiners is organized, its members being appointed by the State Governor and the State Senate, as other officials of the state are. One of the five members must be a member of the faculty of the State University, the other four being resident architects of ten years' experience. They are all paid for their services out of the fees received from applicants for examination and license. Each licensed architect is required to keep a seal properly inscribed for the purpose of stamping all drawings and specifications sent out from his office. The statute prescribes penalties for practising architecture without a license and provides for the cancellation of licenses for 'gross incompetency or recklessness in the construction of buildings, or for dishonest practices on the part of the holders thereof.' An 'architect' is for the purpose of this statute defined as 'any person who shall be engaged in the planning or supervision of the erection, enlargement, or alteration of buildings for others, and to be constructed by other persons than himself.' Any person may act as the architect of his own building, and a civil engineer is not regarded as an architect unless he makes planning, designing, and supervising buildings his occupation.

"This system of licensing architects is about as unlike the proposals put forward heretofore in any part of Canada as one can imagine. If protection to the public and not merely protection to the practitioners within the 'ring,' is what is desired, the architects who are moving in this matter should have made application to their re-

spective Provincial Legislatures, and have proposed to make the business of examining and licensing as completely public as it is in the states above mentioned. This is entirely different from the close corporations of which the College of Surgeons and the Ontario Law Society are outstanding examples. There should be no more monopolies created by Provincial Legislatures, and the Dominion Parliament should promptly reject all invitations to interfere with provincial jurisdiction."

A Dominion Monopoly

THE TORONTO WORLD, in an editorial, believes such an organization a good thing for the interchange of professional knowledge, but objects to article 4 of proposed Act. Infringes on constitutional rights of the provinces.

"Close corporations formed for the purpose of controlling professions and businesses of any kind and in any form are objectionable at all times and are peculiarly repugnant to democratic principles. It is admittedly necessary for the public protection to prescribe in certain cases a proper standard of proficiency, but neither its quality, the method of its acquirement, nor its ascertainment should be matter of private regulation. Experience certifies that whenever those are left to associations or institutions the result is the establishment of a monopoly. Conditions are imposed which practically restrict admission to certain preferred classes and the door of that particular avocation is closed to many deserving applicants whose professional talent may be of the highest grade, but who find it impossible to meet the initial requirements, arbitrarily imposed for social or other irrelevant reasons.

"For some time past a number of the architects of the Dominion have been moving for parliamentary incorporation under the title of 'The Canadian Institute of Architects.' Their professed purpose is laudable enough in itself to facilitate the acquirement and interchange of professional knowledge among the members of the corporation. To that there can be no objection, but their real objective is disclosed in article 3 of the proposed act, which enacts that after its date no person in the Dominion shall be entitled to use the title of architect, or any abbreviation thereof, or any name, title or description implying that he is a corporate member of said institute nor act. This attempt to have the generic name 'architect' re-to act or practice as architect within the meaning of this stricted to the members of one corporation is directly against the public interest, and should not be countenanced in any shape or form. If an official standard is deemed advisable, it should be under state control, and be open to every applicant without discrimination who can qualify for it. In its November number the new building journal, 'Construction,' publishes the state license law of Illinois, which has been in operation for ten years with marked success, has been adopted by California and New Jersey, and will be followed by other states of the Union. It fulfills the essentials of a license law as applied in a democratic community, and is certainly infinitely preferable to the class legislation favored by the Canadian Institute. Another point of much importance is that the proposed act infringes the constitutional rights of the provinces of Canada, which alone are entitled to deal with the civil status of their citizens. The incorporation of the institute on the basis of a Dominion monopoly should be strongly opposed by the provincial governments and the public."

66 **C**ONSTRUCTION," a new journal devoted to the building and engineering interests of Canada, has made its first appearance. The initial number is highly attractive in dress and make-up and it sets a high journalistic standard. There should be room for so good a publication in the Dominion, and we are glad to welcome the stranger.—Concrete.

American Institute of Architects on Competitions and Fees

Past President Considers the Question of Competitions More Important Than That of Licensing Architects. New Schedule of Practice and Charges Adopted at Annual Convention

AT the recent convention of the American Institute of Architects, held in Chicago, many important matters were discussed relative to the problems the profession is confronted with. The reports of some of the various committees should be of especial interest to Canadian architects in general, among the most important of which were the Revision of the Schedule of Practice and Charges, and concerning Competitions.

Past-President Frank Miles Day delivered an able address, in which he reviewed the progress made by the profession during the past fifty years, in which period the architect had developed from "a harmless dilettante to a great factor in the scheme of American civilization." He attributed much of the recognition and public confidence acquired by the architect of to-day to the successful efforts of the Institute in combining American architects to promote the artistic, scientific and practical efficiency of the profession. His remarks on the question of licensing architects should be of especial interest to members of the profession in Canada just at this time.

He said: "The question whether it is a wise policy for the state to examine and license architects as it does physicians, receives answers of wide diversity from different parts of the country; but this question has not the perennial life of our attempts at the regulation of competition. That question is always before us."

THREE FORMS OF COMPETITIONS RECOGNIZED.

The report as presented by the committee on competitions was adopted by the convention as follows:

Your committee recommends that, whenever possible, an architect be employed without competition; that, when competition is unavoidable, the American Institute of Architects recognize three forms of competition:

- a. Limited to a certain number of invited architects.
- b. Open to all architects.
- c. Mixed; certain architects being invited, but other architects being at liberty to take part.

Your committee recommends that, for the present, no attempt should be made to impose any fixed code of competition upon the members of the Institute, but that the Institute recognize, as conducive to the best results, the following underlying principles for the conduct of all competitions:

1. The object of a competition is to secure the most skilled architect.

2. An architectural adviser should draw up the programme, advise the employer in regard to it, and the adviser, or, preferably a jury of practicing architects should advise the employer in making the award.

3. The amount to be expended on the work should be sufficient, within a reasonable margin, to erect a structure of the character and size indicated in the programme, or there should be no cost limit stipulated.

4. The programme should be in the form of a contract relating to the award of the work and to other payments.

5. Whenever practicable the competitors and the professional adviser should meet with the employer, and agree upon terms which shall be binding upon all.

6. There should be, in limited competitions, payments sufficient to cover the preparation of the drawings demanded; in open competitions premiums sufficient to cover the expense of at least five schemes; in mixed competitions payments to the invited competitors as above, and an additional amount, representing the cost of five sets of drawings, distributed among the authors of the best five schemes, such payments not to be confined to the uninvited competitors.

7. The drawing required should be the minimum necessary to express the design and arrangement.

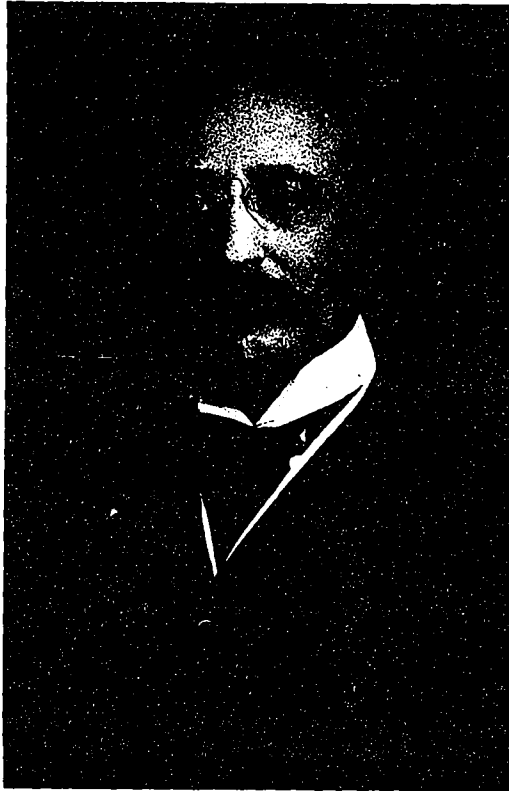
Your committee further recommends that the following resolution be adopted by the Institute.

Resolved. It is unprofessional conduct for a member of the American Institute of Architects, even for payment, to submit drawings knowingly in competition with another, unless under such conditions explicitly approved by a competent disinterested professional adviser, either a member of the American Institute of Architects, or of some foreign architectural association of similar standing.

REVISED SCHEDULE OF PRACTICE AND CHARGES.

The report of the committee on the revision of the schedule of charges as adopted by the Institute is as follows:

- A. The American Institute of Architects as a professional body, recognizing that the value of the architect's services varies with his experience, ability, and the locality and character of the work upon which he is employed, does not establish a rate of compensation binding upon its members, but it is the deliberate judgment of the Institute that for full professional services, adequately



MR. CASS GILBERT, NEW YORK, NEWLY ELECTED PRESIDENT AMERICAN INSTITUTE OF ARCHITECTS.

rendered, an architect should receive as reasonable remuneration therefor at least the compensation mentioned in the following schedule of charges, and that any variation from the schedule corresponding to a difference in quality and amount of the service rendered may properly be left to individual members or chapters of the Institute.

B. The architect's professional services consist of the necessary preliminary conferences and in the preparation of studies, working drawings, specifications, large scale and full size detail drawings and in the general direction and supervision of the work, for which, except as hereinafter mentioned, the minimum charge, based upon the total cost of the work to the owner, is as follows:

On the first \$10,000 of cost or any part thereof 10 per cent
 On the second \$10,000 of cost or any part thereof 7 per cent
 On the next \$30,000 of cost or any part thereof 6 per cent
 On any balance of cost.....5 per cent

C. Where an operation is conducted under more than one contract the above schedule is to be applied to each contract as a separate transaction (This was amended and confined to a more limited application).

D. For landscape architecture and for furniture, monuments, decorative and cabinet work, the minimum charge is 10 per cent. In many instances this is not remunerative, and it is usual and proper to charge a special fee of 10 per cent. in excess thereof.

None of the charges above enumerated cover alterations and additions to contracts, drawings and specifications, nor professional or legal services incidental to negotiations for site, disputed party walls, right of light, measurement of work, or failure of contractors. When such services become necessary, they shall be charged for according to the time and trouble involved.

Where heating, ventilating, mechanical, structural, electrical and sanitary problems in a building are of such a nature as to require the assistance of a specialist, the owner is to pay for such assistance. Chemical and mechanical tests, when required, are to be paid for by the owner.

Necessary travelling expenses are to be paid by the owner

Drawings and specifications, as instruments of service, are the property of the architect.

The architect's payments are due as his work progresses in the following order: Upon completion of the preliminary studies, one-fifth of the entire fee; upon completion of working drawings and specifications, two-fifths; the remaining two-fifths being due from time to time in proportion to the amount of work done by the architect in his office and at the building.

Until an actual estimate is received, the charges are based upon the proposed cost of the work, and payments are received as installments of the entire fee, which is based upon the actual cost to the owner of the building or other work, when completed, including all fixtures necessary to render it fit for occupation. The architect is entitled to extra compensation for furniture or other articles purchased under his direction.

If any material or work used in the construction of the building be already upon the ground or come into the owner's possession without expense to him, its value is to be added to the sum actually expended upon the building before the architect's commission is computed.

In case of abandonment or suspension of the work, the basis of settlement is as follows: Preliminary studies, a fee in accordance with the character and magnitude of the work; preliminary studies, working drawings and specifications, three-fifths of the fee for complete services.

The supervision of an architect (as distinguished from the continuous personal superintendence which may be secured by the employment of a clerk of the works) means such inspection by the architect, or his deputy, of work in studios and shops, or of a building or other work in process of erection, completion or alteration, as he finds necessary to ascertain whether it is being executed in gen-

eral conformity with his drawings and specifications or directions. He is to act in constructive emergencies, to order necessary changes and to define the true intent and meaning of the drawings and specifications, and he has authority to stop the progress of the work and order its removal when not in accordance with them.

On buildings where the constant services of a superintendent are required, a clerk of the works shall be employed by the architect at the owner's expense.

Paragraphs were also added fixing a higher minimum fee for residential work and a minimum fee of 10 per cent. on alterations to existing buildings.

OFFICERS FOR 1908.

Officers for 1908 were elected as follows:

President—Mr. Cass Gilbert, New York.

First Vice-President—Mr. John M. Donaldson, Detroit.

Second Vice-President—Mr. Wm. A. Boring, New York.

Secretary and Treasurer—Mr. Glenn Brown, Washington, D. C.

Directors—Messrs. Frank Miles Day, Philadelphia; R. Clipston Sturgis, Boston; George Cary, Buffalo.

International Architects' Exhibition

TO more fully meet the wishes of foreign exhibitors who expect to have displays at the International Architectural Exhibition which is to be held from May 18 to June 14, 1908, at Vienna, in conjunction with the Eighteenth International Congress of Architects, the Working Committee have issued a supplementary pamphlet. This supplement gives notice of certain modifications in the General Regulations, to wit: Photographs will be admitted to the Exhibition in addition to drawings (photographs as large as possible are desired for the sake of the decorative effect); exhibiting artists should send a collection of their works in panels, albums or books, in addition to the objects they expect to display; all exhibits should be shipped in time to arrive in Vienna by May 4, 1908.

Diminishing Monotonous Street Facades

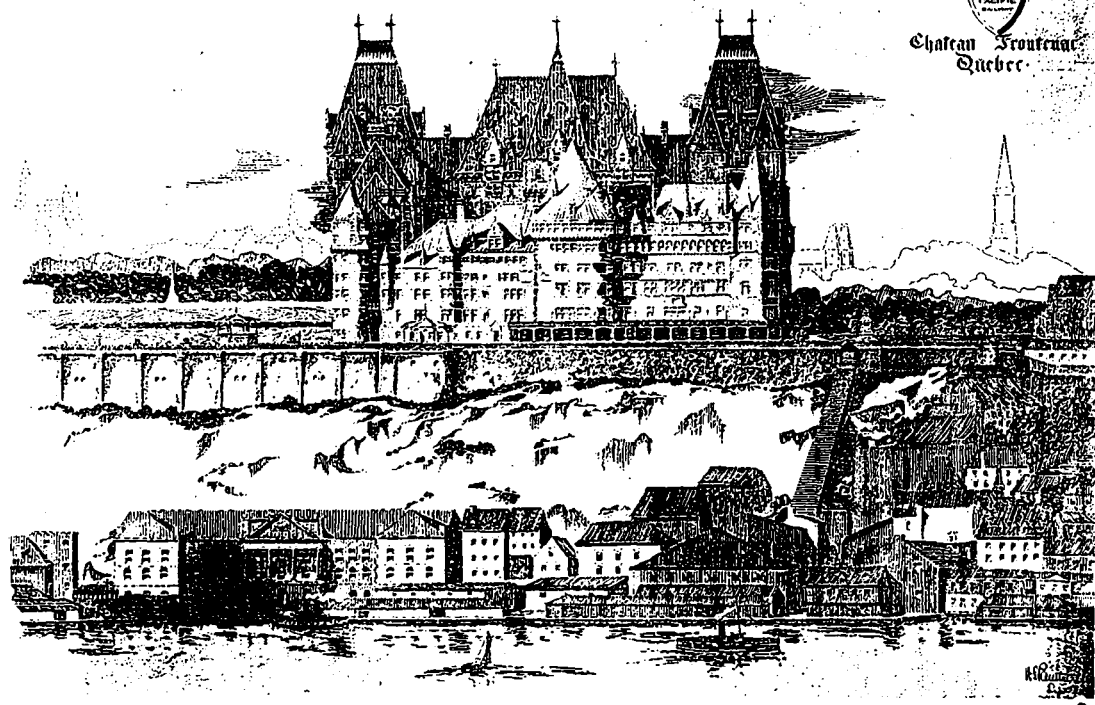
SOJOURNERS in Germany are frequently impressed by the evidence of many sided efforts on the part of municipal authorities to gratify the aesthetic sentiment of the population at large in all that appeals to both eye and ear. An interesting phase of this policy is revealed in the prize competition offered recently by the authorities of a Saxon town in the vicinity of Chemnitz. The town council invites architects to submit suitable plans for the fronts of residential and business edifices. These facades should be in keeping with the general character and location of the place and aim at fitting and harmonious effects, within the reach of modest purses. Four substantial prizes are offered for the most successful competitors, and other projects are to be purchased, if deemed desirable. These plans will be placed freely at the service of property owners who desire to build or to alter existing constructions.

It is hoped by this means to combat unfortunate and all too prevalent tendencies on the one hand towards monotonous uniformity, on the other toward the baroque and grotesque, when architectural details of projected edifices are often confided entirely to builders destitute of adequate training or taste for the aesthetic.

The idea is certainly one which, if intelligently carried out, should eventually improve materially the general appearance of the towns where it is introduced. It is of importance in a country like Germany, where even in villages the buildings are erected in continuous blocks. As but one side of a structure is usually exposed to public view, it frequently happens that the services of an architect are not sought. This habit of compact building, even in small places, dates from the olden time when dictated by the needs of mutual aid and protection.



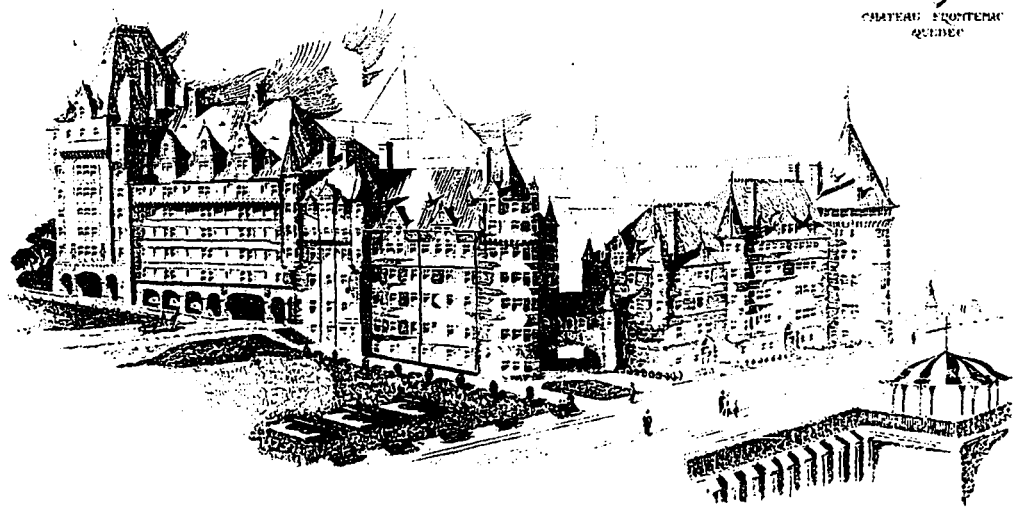
Chateau Frontenac
Quebec



VIEW FROM ST. LAWRENCE RIVER FRONT, SHOWING THE STRUCTURE AS IT WILL APPEAR WHEN THE PROPOSED ADDITIONS HAVE BEEN COMPLETED. THE PRESENT BUILDING MAY BE SEEN ON THE LEFT FOREGROUND, WHICH NOW CONTAINS 269 ROOMS. THE HOTEL, WHEN COMPLETED, WILL CONTAIN 640 ROOMS, AND WILL BE THE LARGEST AND MOST ELABORATE IN CANADA. THE FRENCH CHATEAU STYLE OF ARCHITECTURE ADOPTED THROUGHOUT LENDS ITSELF ADMIRABLY TO THE QUIANT SURROUNDINGS OF CANADA'S HISTORIC FRENCH CITY.



CHATEAU FRONTENAC
QUEBEC



THIS VIEW FROM THE CITADEL GIVES AN EXCELLENT IDEA OF THE EXTENT OF THE PROPOSED ADDITIONS. THE STRUCTURE AS IT NOW APPEARS WILL BE SEEN ON THE RIGHT. IT WILL BE NOTICED THAT THE DESIGNER HAS CAREFULLY CARRIED OUT THE ARCHITECTURAL STYLE IN THE ORIGINAL BUILDING.

Perspective Views of Proposed \$1,500,000 Additions to the "Chateau Frontenac," Quebec City—
W. S. Painter
Architect

(SEE PAGE 37)



CHARACTERISTIC COLONIAL HOUSE OF MR. C. M. HALL, TORONTO JUNCTION. THE MASSIVE WHITE COLUMNS, THE WHITE CORNICE, WINDOW-SASH AND FRAMES, GIVE A PLEASING CONTRAST TO THE DARK RED COMMON BRICK WALLS WITH THEIR WHITE MORTAR JOINTS—AN EFFECT MUCH ATTEMPTED BY DESIGNERS OF THE MOST EXPENSIVE HOUSES OF THIS TYPE. IT IS PLAIN, SIMPLE AND SQUARE IN DESIGN, AND POSSESSES ALL THE HOMELIKE FEATURES POSSIBLE IN THE TYPICAL COLONIAL HOUSE. ELLIS & CONNERY, ARCHITECTS.

Colonial House Costing \$5,709

A Remarkable Example of an Inexpensive Typical Colonial House That Has Every Appearance of a Building Costing Twice the Sum—Verified Statement of Costs Given

HERE is probably no type of moderate priced dwelling that for economic and convenient arrangement excels that of square design. Add to this a well proportioned colonial front, and architects could not do better in cases where rich effect is desired and means are limited, than to advise their clients to adopt this type of design.

We reproduce herewith a half-tone of the exterior, as well as the floor plans, of a colonial house which we believe to be an excellent example of an imposing, yet plain, convenient and moderate priced residence.

Erected in the centre of a large circular lot crowning the brow of a broad knoll overlooking a deep, wooded ravine, the exterior is majestic in appearance. The plan of the interior, as may be seen, is simple, yet convenient, and no money has been wasted in meaningless effects.

This building was recently constructed for Mr. C. M. Hall, at Toronto Junction; the architects were Ellis & Connery, of Toronto; and while the structure has every appearance of having cost from \$10,000 to \$12,000, in actual figures it cost only \$5,709, as is shown by the following verified figures supplied by the architects, for each branch of the work:

Excavating and cement walls	\$ 300.00
Cement floors	50.00
Brick veneer	550.00

Carpenter and joiner work	3,000.00
Lathing and plastering	300.00
Painting and glazing	350.00
Plumbing, gas and wiring	75.00
Sheet metal work	109.00
Heating (warm air)	150.00
Decorating	525.00

Total \$5,709.00

To keep within this figure, and yet provide so luxurious an appearance, required careful study and a wise selection of materials. The white-lime mortar and common-red stock brick give a combination of materials and contrast of color which lends itself harmoniously to the characteristic colonial design. Since the advent of brick it has become almost a part of the design in replacing the primitive clapboard siding. The only attempt at decorative effect—the outline itself being bold and regular, if not cold—is found in the massive verandah pillars, the deep cornice and balcony rail surmounting the roof.

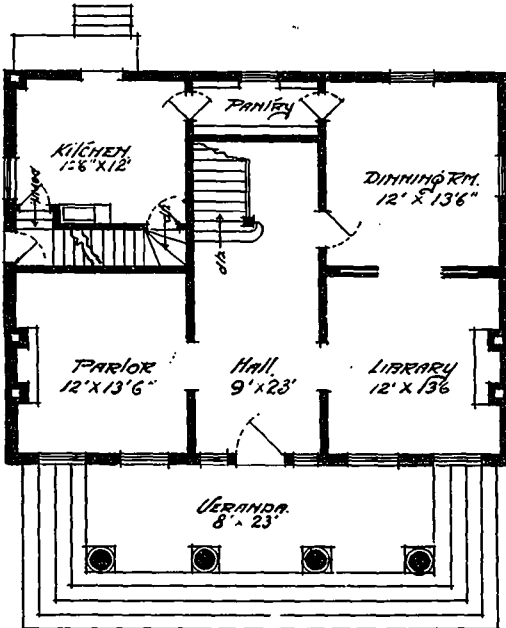
Concrete walls separate the various compartments of the basement, comprising a large furnace room, two coal bins, a laundry equipped with two stationary tubs and a fruit cellar. Cement foundations (tar-coated on the outside) 14 inches thick support the building.

C O N S T R U C T I O N

The arrangement of the ground floor, though simple, is particularly fine for a family of hospitable inclination, and is quite characteristic of the proverbial Colonial House. It will be noticed that the dining room, library, reception hall and parlor may be thrown together as one large room for festive occasions when the house is *en fete*. And the plan is rendered none the less appropriate to such scenes by the presence and location of two typical fire places facing each other from opposite walls in the dining room and parlor when the folding doors flanking the hall-way are thrown back. Upon entering the house the first impression is one of a pervading *salve*. "Welcome" extends itself in the deep broad hall, furnished with comfortable inviting chairs and settees and carpeted with rugs and hung with rich figured tapestry of *art nouveau* design. The floors of the reception hall, library, dining room and first stair landing are finished in quarter-cut oak, while the woodwork of the hall, parlor, library and dining room are of pine white enamelled—a distinctive colonial treatment.

Plain, simple and square throughout the plan admits of rich decoration in every room, and while there is a noticeable absence of built-in cupboards, seats and closets, the commodious rooms give large enough space between the window and door openings for the location of polished furniture to fill these requirements, in almost any spot desired.

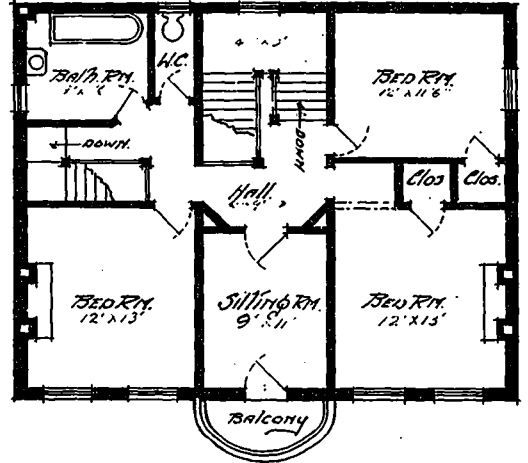
In order to provide a proportionate depth to the broad hall, the main staircase is placed well back, allowing merely enough space at the rear of the house for a pantry and passage between the dining room and kitchen. This arrangement gives an isolation to the kitchen that is always desirable, at the same time making it convenient to the dining room. The pantry is fitted with the usual workboard and shelves enclosed behind glass doors. On the second floor but three bedrooms are provided, although



FIRST FLOOR—PARLOR, RECEPTION HALL, LIBRARY AND DINING-ROOM MAY BE THROWN TOGETHER ON FESTIVE OCCASIONS BY ARRANGEMENT OF FOLDING DOORS. THE DEEP BROAD HALL AND OPPOSITE POSITIONS OF THE FIREPLACES BEAR A MARKED COLONIAL STAMP.

the dimensions of the building would easily permit of four good-sized sleeping rooms by narrowing the two main

bedrooms and enlarging the sitting room. The result, as it is, however, is more in keeping with the colonial style in providing high-walled, spacious and airy sleeping compartments. In each of the main chambers a cheerful grate and mantel has been placed. Like those on the lower floor the fire-places are of brick with low and broad white mantels. The grates in the parlor and library are equipped



SECOND FLOOR, MR. C. M. HALL'S HOUSE, TORONTO JUNCTION. THE BEDROOMS ARE LARGE, HIGH OF CEILING, CHEERFUL AND AIRY.

with irons and dogs for coal or wood fuel, while those in the bedrooms are fitted with gas-logs.

The narrow front room, opening directly upon the second stair landing and communicating with the little front balcony, is designed and furnished as a cosy sitting room. The bath-room and closet are separated, according to the most approved and modern ideas of residence design.

The appearance of the structure is greatly enhanced in relation to its surroundings, by the dark green stain of the roof. Dormers are placed in either side of the roof, with the idea of some day adapting the attic as a studio, the owner being an artist. The staved Ionic columns supporting the verandah are 20 feet in length by a 24-inch diameter.

AS an aid toward clearing up the financial atmosphere we advise everybody who can conveniently do so to pay their bills. There are a great many otherwise good business men who think in financial stress it is better to ho'd money than it is to pay it out. This is a fallacy. Pay your bills promptly and you help a lot of other people who may be in sore need of help. Incidentally it would be a great source of comfort to you if everything should temporarily go to pot. Many a man has carried a good bank balance at the expense of his creditors who, if his bank should happen to suspend, wisher he had not.—N.Y. Lumber Journal.

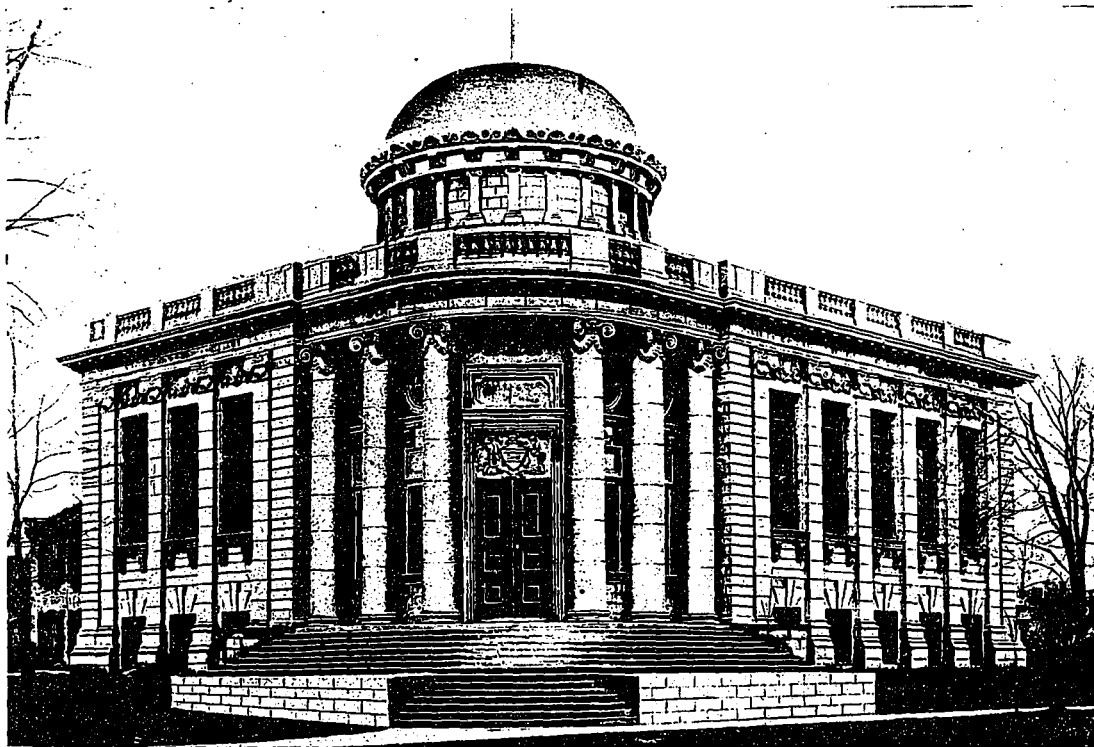
STEEL reinforcement in brickwork is advocated by an architect of York, England, who has carried out a number of experiments with brick walls, in which the joints contain galvanized wire netting in the mortar. As a result of the experiments many claims are made for this type of construction, some of which seem a bit far-fetched, such as the assertion that by reinforcing its mortar joints, brickwork can be rendered as monolithic as reinforced concrete. On the other hand, the reinforcement of brickwork, when skillfully done, adds materially to the resistance of the walls to collapse after cracking.



Manufactured Building Stone

BY S. B. NEWBERRY

Up-to-date and Authoritative Talk on Artificial Stone and Cement Building Blocks—Various Methods of Manufacture, Types of Machines in Vogue, Proper Proportioning of Aggregates, Finish, Cost, and Extent of Use Thoroughly Gone Into. Attention Also Called to the Abuses of This Modern Structural Material



PUBLIC LIBRARY AT GUELPH, ONTARIO, CONSTRUCTED ENTIRELY OF MANUFACTURED STONE AND CEMENT BLOCKS. IN APPEARANCE THIS BUILDING WOULD DELUDE ANYONE BUT AN EXPERT INTO BELIEVING IT TO BE BUILT OF CAREFULLY SELECTED LIMESTONE. W. FRY COLWILL, ARCHITECT,

[That great possibilities lie in the way of artificial stone construction for all future structural purposes is evidenced in the development which has taken place in this line within the past few years, some slight comprehension of which we have endeavored to give our readers, both by illustrations and argument, in this and last month's issues of this journal. Mr. Newberry, the writer of this article, is recognized as one of the best authorities on cement construction that the present age has produced, and his observations on the subject should be most valuable to all who interest themselves in cement construction. In our November number, the subject was discussed generally. In this issue it has been taken up in detail from every point of the maker's view and is accompanied by a great fund of statistical information.—Ed.]

THREE are three important considerations which must be kept in view in adjusting the proportions of materials for block concrete—strength, permeability and cost.

So far as strength goes, it may easily be shown that concretes very poor in cement, as 1 to 8 or 1 to 10, will have a crushing resistance far beyond any load that they

may be called upon to sustain. Such concretes are, however, extremely porous, and absorb water like a sponge. It is necessary, also, that the blocks shall bear a certain amount of rough handling at the factory and while being carted to work and set up in the wall, and safety in this respect calls for a much greater degree of hardness than would be needed to bear the weight of the building. Again, strength and hardness, with a given proportion of cement, depend greatly on the character of the other materials used; blocks made of cement and sand, 1 to 3, will not be so strong or so impermeable to water as those made from a good mixed sand and gravel, 1 to 5. On the whole, it is doubtful whether blocks of satisfactory quality can be made, by hand mixing and tamping, under ordinary factory conditions, from a poorer mixture than 1 to 5. Even

this proportion requires for good results the use of properly graded sand and gravel or screenings, a liberal amount of water, and thorough mixing and tamping. When suitable gravel is not obtainable, and coarse mixed sand only is used, the proportion should not be less than 1 to 4. Fine sand alone is a very bad material, and good blocks cannot be made from it except by the use of an amount of cement which would make the cost very high.

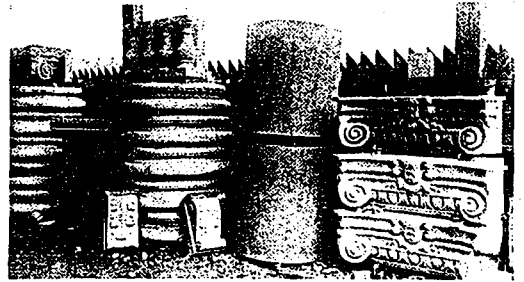
The mixtures above recommended, 1 to 4 and 1 to 5, will necessarily be somewhat porous, and may be decidedly so if the gravel or screenings used is not properly graded. The water-resisting qualities may be greatly improved, without loss of strength by replacing a part of the cement by hydrate lime. This is a light, extremely fine material, and a given weight of it goes much further than the same amount of cement in filling the pores of the concrete. It has also the effect of making the wet mixture more plastic and more easily compacted by ramming, and gives the finished blocks a lighter color.

The following mixtures, then, are to be recommended for concrete blocks. By "gravel" is meant a suitable mix-

portion of coarse material allows the mixture to be made wetter without sticking or sagging. Use of plenty of water vastly improves the strength, hardness and water-proof qualities of blocks, and makes them decidedly lighter in color. The rule should be:

Use as much water as possible without causing the blocks to stick to the plates or to sag out of shape on removing from the machine.

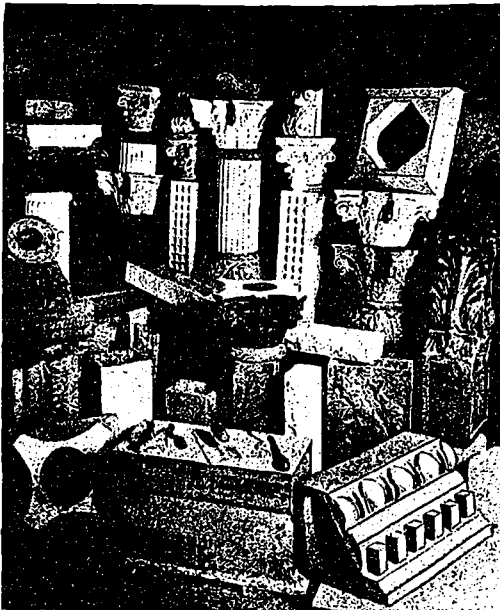
The amount of water required to produce this result varies with the materials used, but is generally from 8 to



CAST SECTIONS OF 20-FOOT COLUMNS, AS KEPT IN STOCK IN THE STONE YARD.

9 per cent. of the weight of the dry mixture. A practiced block-maker can judge closely when the right amount of water has been added, by squeezing some of the mixture in the hand. Very slight variations in proportion of water make such a marked difference in the quality and color of the blocks that the water, when the proper quantity for the materials used has been determined, should always be accurately measured out for each batch. In this way much time is saved and uncertainty avoided.

FACING.—Some block-makers put on a facing of richer and finer mixture, making the body of the block of poorer and coarser material. As will be explained later, the advantage of the practice is, in most cases, questionable, but facings may serve a good purpose in case a colored or specially water-proof surface is required. Facings are generally made of cement and sand or fine screenings, passing a $\frac{1}{4}$ inch sieve. To get the same hardness and strength as a 1 to 5 gravel mixture, at least as rich a facing as 1 to 3 will be found necessary. Probably 1 to 2 will be found better, and if one-third the cement be re-



A FEW SAMPLES OF SPECIAL STONES DEMONSTRATING THE UNLIMITED POSSIBILITIES FOR PRODUCING DECORATIVE EFFECTS IN CAST STONE.

ture of sand and gravel, or stone screenings, containing grains of all sizes, from fine to $\frac{1}{2}$ -inch.

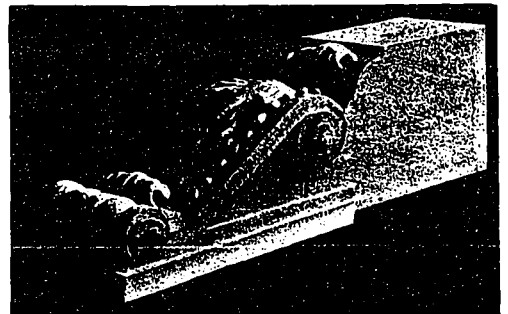
1 to 4 Mixtures, by Weight

Cement 150, gravel 600.
Cement 125, Hyd. lime 25, gravel 600.
Cement 100, Hyd. lime 50, gravel 600.

1 to 5 Mixtures, by Weight

Cement 120, gravel 600.
Cement 100, Hyd. lime 20, gravel 600.

PROPORTION OF WATER.—This is a matter of the utmost consequence, and has more effect on the quality of the work than is generally supposed. Blocks made from too dry concrete will always remain soft and weak, no matter how thoroughly sprinkled afterwards. On the other hand, if blocks are to be removed from the machine as soon as made, too much water will cause them to stick to the plates and sag out of shape. It is perfectly possible, however, to give the concrete enough water for maximum density and first-class hardening properties, and still to remove the blocks at once from the mould. A good pro-



ORNAMENTAL CAST BRACKET.

placed by hydrate lime the waterproof qualities and appearances of the blocks will be improved. A richer facing than 1 to 2 is liable to show greater shrinkage than the body of the block, and to adhere imperfectly or develop hair-cracks in consequence.

POURED WORK.—The above suggestions on the question of proportions of cement, sand and gravel for tamped blocks apply equally to concrete made very wet, poured

into the mould, and allowed to harden a day or longer before removing. Castings in a sand mould are made by the use of very liquid concrete; sand and gravel settle out too rapidly from such thin mixtures, and rather fine limestone screenings are generally used.

MIXING.

To get the full benefit of the cement used it is necessary that all the materials shall be very thoroughly mixed together. The strength of the block as a whole will be only as great as that of its weakest part, and it is the height of folly, after putting in a liberal measure of cement, to so slight the mixture as to get no better results than half as much cement, properly mixed, would have given. The poor, shoddy and crumbly blocks turned out by many small-scale makers owe their faults chiefly to careless mixing and use of too little water, rather than to too small proportion of cement.

The materials should be mixed dry, until the cement is uniformly distributed and perfectly mingled with the sand and gravel or screenings; then the water is to be added and the mixing continued until all parts of the mass are equally moist and every particle is coated with the cement paste.

CONCRETE BLOCK SYSTEMS.—For smaller and less costly buildings, *separate blocks*, made at the factory and built up into the walls in the same manner as bricks or blocks of stone, are simpler, less expensive and much more rapid in construction than monolithic work. They also avoid some of the faults to which solid concrete work, unless skilfully done, is subject, such as the formation of shrinkage cracks.

There are two systems of block making, differing in the consistency of the concrete used:

- 1.—Blocks tamped or pressed from semi-wet concrete, and removed at once from the mould.
- 2.—Blocks poured or tamped from wet concrete, and allowed to remain in the mould until hardened.

TAMPED BLOCKS FROM SEMI-WET MIXTURE.—These are practically always made on a block-machine, so arranged that as soon as a block is formed the cores and side-plates are removed and the block lifted from the machine. By far the larger part of the blocks on the market are made in this way. Usually these are of the *one-piece* type, in which a single block, provided with hollow cores, makes the whole thickness of the wall. Another plan is the *two-piece* system, in which the face and back of the wall are made up of different blocks, so lapping over each other as to give a bond and hold the wall together. Blocks of the two-piece type are generally formed in a hand or hydraulic press.

Various shapes and sizes of blocks are commonly made; the builders of the most popular machines have, however, adopted the standard length of 32 inches and height of 9 inches for the full-sized block, with thickness of 8, 10 and 12 inches. Lengths of 24, 16 and 8 inches are also obtained on the same machines by the use of parting plates and suitably divided face plates; any intermediate lengths and any desired heights may be produced by simply adjustments or blocking off.

Blocks are commonly made plain, rock-faced, tool-faced, panelled, and of various ornamental patterns. New designs of face plates are constantly being added by the most progressive machine-makers. The following illustrations show some of the forms of blocks most commonly made:

BLOCK MACHINES.—There are many good machines on the market, most of which are of the same general type, and differ only in mechanical details. They may be divided into two classes; those with vertical and those with horizontal face. In the former the face plate stands vertically, and the block is simply lifted from the machine on its base plate as soon as tamped. In the other type the face plate forms the bottom of the mould; the cores are withdrawn horizontally, and by the motion of a lever

the block with its face plate is tipped up into a vertical position for removal. In case it is desired to put a facing on the blocks, machines of the horizontal-face type are considered the more convenient, though a facing may easily be put on with the vertical-face machine by the use of a parting plate.

BLOCKS POURED FROM WET CONCRETE.—As already stated, concrete made too dry is practically worthless, and an excess of water is better than a deficiency. The above-described machine process, in which blocks are tamped from damp concrete and at once removed, gives blocks of admirable hardness and quality if the maximum of water is used. A method of making blocks from very wet concrete, by the use of a large number of separable moulds of sheet steel, into which the wet concrete mixture is poured and in which the blocks are left to harden for 24 hours or longer, has come into considerable use. By this method blocks of excellent hardening and resistance to water are certainly obtained. Whether the process is the equal of the ordinary machine method in respect of economy, and beauty of product must be left to the decision of those who have had actual experience with it.

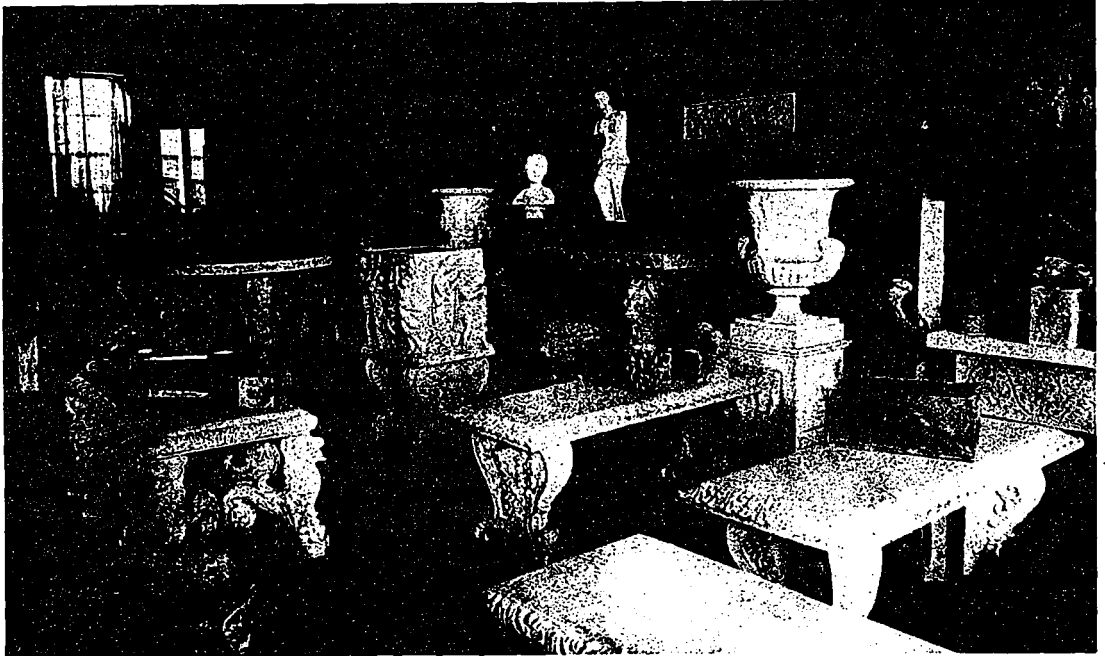
The well-known cast-stone process consists in pouring liquid concrete mixture into a sand mould made from a pattern in a manner similar to that in which moulds for iron castings are produced. The sand absorbs the surplus water from the liquid mixture, and the casting is left in the mould for 24 hours or longer until thoroughly set. This process necessitates the making of a new sand mould for every casting, and is necessarily much less rapid than the machine method. It is less extensively used for building blocks than for special ornamental architectural work, sills, lintels, columns, capitals, etc., and for purposes of this kind it turns out products of the highest quality and beauty.

TAMPING OF CONCRETE BLOCKS.—This is generally done by means of hand-rammers. Pneumatic tampers, operated by an air-compressor, are in use at a few plants, apparently with considerable saving in time and labor and improvement in quality of work. Moulding concrete by *pressure*, either mechanical or hydraulic, is not successful unless the pressure is applied to the face of a comparatively thin layer. If compression of thick layers, especially of small width, is attempted, the materials arch and are not compacted at any considerable depth from the surface. Moulding blocks by pressure is therefore practiced only in the two-piece system, in which the load is applied to the surface of pieces of no great thickness. Hand tamping must be conscientious and thorough, or poor work will result. It is important that the mould should be filled a little at a time, tamping after each addition; at least four fillings and tampings should be given to each block. If the mixture is wet enough no noticeable layers will be formed by this process.

HARDENING AND STORAGE.—Triple decked cars to receive the blocks from the machines will be found a great saving of labor, and are essential in factories of considerable size. Blocks will generally require to be left on the plates for at least 24 hours, and must then be kept under roof, in a well-warmed room, with frequent sprinkling, for not less than five days more. They may then be piled up out of doors, and in dry weather should be wetted daily with a hose. Alternate wetting and drying is especially favorable for the hardening of cement, and concrete so treated gains much greater strength than if kept continuously in water or dry air.

Blocks should not be used in building until at least four weeks from the time they are made. During this period of seasoning, blocks will be found to shrink at least 1-16 inch in length, and if built up in a wall when freshly made, shrinkage cracks in the joints or across the blocks will surely appear.

EFFLORESCENCE, or the appearance of a white coating on the surfaces, sometimes takes place when blocks are repeatedly saturated with water and then dried out; blocks



THE FUTURE OF CEMENT IN ITS APPLICATION TO ORNAMENTAL WORK MAY BE PARTIALLY JUDGED WHEN THE ABOVE CUT HAS BEEN CAREFULLY CONTEMPLATED. NOTHING IN THE WAY OF MOULDED OUTDOOR ORNAMENTS WOULD NOW SEEM IMPOSSIBLE IN CEMENT. THIS GROUP, WHICH WE ARE ENABLED TO DISPLAY THROUGH THE COURTESY OF "CEMENT AGE," COVERS A WIDE RANGE OF DESIGNS INCLUDING ALMOST EVERY NECESSITY, OF THIS NATURE, FOR LAWN OR GARDEN DECORATION—FROM THE LAWN SEAT TO SMALL STATUARY AND ELABORATE PATTERNS IN LOW RELIEF—AS MANUFACTURED BY THEODORE A. ROWLEY, OF CHICAGO.

laid on the ground are more liable to show this defect. It results from diffusion of soluble sulphates of lime and alkalis to the surface. It tends to disappear in time, and rarely is sufficient in amount to cause any complaint.

PROPERTIES OF CONCRETE BLOCKS.
Strength.

In the use of concrete blocks for the walls of buildings the stress to which they are subjected is almost entirely one of compression. In compressive strength well-made concrete does not differ greatly from ordinary building stone. It is difficult to find reliable records of tests of sand and gravel concrete, 1 to 4 and 1 to 5, such as is used in making blocks; the following figures show strength of concrete of approximately this richness, also the average of several samples each of well-known building stones, as stated by the authorities named:

Limestone, Bedford, Ind. (Ind. Geo. Survey)	..7792 lbs.
" Marblehead, O., (Q. A. Gillmore)	..7393 "
Sandstone, N. Amherst, Ohio.	..5831 "
Gravel Concrete, 1:1.6:2.8, at 1 yr. (Candlot)	..5500 "
" " 1:1.6:3.7, " " "	..5950 "
Stone Concrete, 1:2:4 at 1 yr. (Boston El. R. R.)	3904 "

Actual tests of compression strength of hollow concrete blocks are difficult to make, because it is almost impossible to apply the load uniformly over the whole surface, and also because a block 16 inches long and 8 inches wide will bear a load of 150,000 to 200,000 lbs., or more than the capacity of any but the largest testing machines. Three one-quarter blocks, 8 inches long, 8 inches wide and 9 inches high, with hollow space equal to one-third of the surface, tested at the Case School of Science, showed strengths of 1,805, 2,000 and 1,530 lbs. per square inch, respectively, when ten weeks old.

Two blocks 6x8x9 inches, 22 months old, showed crushing strength of 2,530 and 2,610 lbs. per square inch.

These blocks were made of cement 1 1/4, lime 1/2, sand and gravel 6, and were tamped from damp mixture.

It is probably safe to assume that the minimum crushing strength of well-made blocks, 1 to 5, is 1,000 lbs. per square inch at 1 month and 2,000 lbs. at 1 year.

Now a block 12 inches wide and 24 inches long has a total surface of 288 sq. inches, or, deducting 1/3 for openings, a net area of 192 inches. Such a block, 9 inches high, weighs 130 lbs. Assuming a strength of 1,000 lbs. and a factor of safety of 5, the safe load would be 200 lbs. per sq. inch, or 200x192=38,400 lbs. for the whole surface of the block. Dividing this by the weight of the block, 130 lbs., we find that 295 such blocks could be placed one upon another, making a total height of wall of 222 ft., and still the pressure of the lowest block would be less than one-fifth of what it would actually bear.

This shows how greatly the strength of concrete blocks exceeds any demands that are ever made upon it in ordinary building construction.

The safe load above assumed, 200 lbs., seems low enough to guard against any possible failure. In Taylor and Thompson's work on concrete a safe load of 450 lbs. for concrete 1 to 2 to 4 is recommended, this allows a factor of safety of 5 1/2. On the other hand, the Building Code of the city of Cleveland permits concrete to be loaded only to 150 lbs. per sq. inch, and limits the height of walls of 12 inch blocks to 44 ft. The pressure of such a wall would be only 40 lbs. per square inch; adding the weight of two floors at 25 lbs. per sq. ft. each, and roof with snow and wind pressure, 40 lbs. per sq. ft., we find that with a span of 25 ft. the total weight on the lowest blocks would be only 52 lbs. per sq. inch or about one-twentieth of their minimum compression strength.

Blocks with openings equal to only one-third the surface, as required in many city regulations, are heavy to handle, especially for walls 12 inches and more in thickness, and, as the above figures show, are enormously

stronger than there is any need of. Blocks with openings of 50 per cent. would be far more acceptable to the building trade, and if used in walls not over 44 ft. high, with floors and roof calculated as above for 25 feet span, would be loaded only to 56 lbs. per square inch of actual surface. This would give a factor of safety of 18, assuming a minimum compression strength of 1,000 lbs.

There is no doubt that blocks with one-third opening are inconveniently and unnecessarily heavy. Such a block 32 inches long, 12 inches wide, and 9 inches high, has walls about 3½ inches thick, and weighs 180 lbs. A block with 50 per cent. open space would have walls and partitions 2 inches in thickness, and would weigh about 130 lbs. With proper care in manufacture, especially by using as much water as possible, blocks with this thickness of walls may be made thoroughly strong, sound and durable. It is certainly better for strength and water-resisting qualities to make thin-walled blocks of rich mixture, rather than heavy blocks of poor and porous material.

WATER-PROOF QUALITIES.

The chief fault of concrete building blocks, as ordinarily made, is their tendency to absorb water. In this respect they are generally no worse than sandstone or common brick; it is well known that stone or brick walls are too permeable to allow plastering directly on the inside surface, and must be furred and lathed before plastering, to avoid dampness. This practice is generally followed with concrete blocks, but their use and popularity would be greatly increased if they were made sufficiently waterproof to allow plastering directly on the inside surface.

For this purpose it is not necessary that blocks should be perfectly waterproof, but only that the absorption of water shall be slow, so that it may penetrate only part way through the wall during a long-continued rain. Walls made entirely water-tight, are, in fact, objectionable, owing to their tendency to "sweat" from condensation of moisture on the inside surface. For health and comfort, walls must be slightly porous, so that any moisture formed on the inside may be gradually absorbed and carried away.

Excessive water-absorption may be avoided in the following ways:

1.—USE OF PROPERLY GRADED MATERIALS.—It has been shown by Feret and others that porosity and permeability are two different things; porosity is the total proportion of voids or open spaces in the mass, while permeability is the rate at which water, under a given pressure, will pass through it. Permeability depends on the size of the openings as well as on their total amount. In two masses of the same porosity or percentage of voids, one consisting of coarse and the other of fine particles, the permeability will be greater in case of the coarse material. The least permeability, and also the least porosity, are, however, obtained by use of a suitable mixture of coarse and fine particles. Properly graded gravel or screenings, containing plenty of coarse fragments and also enough fine material to fill up the pores, will be found to give a much less permeable concrete than fine or coarse sand used alone.

2.—USE OF RICH MIXTURES.—All concretes are somewhat permeable by water under sufficient pressure. Mixtures rich in cement are of course much less permeable than poorer mixtures. If the amount of cement used is more than sufficient to fill the voids in the sand and gravel, a very dense concrete is obtained, into which the penetration of water is extremely slow. The permeability also decreases considerably with age, owing to the gradual crystallization of the cement in the pores, so that concrete which is at first quite absorbent may become practically impermeable after exposure to weather for a few weeks or months. There appears to be a very decided increase in permeability when the cement is reduced below the amount necessary to fill the voids. For example, a good mixed sand and gravel weighing 123 lbs. per cubic foot, and

therefore containing 25 per cent. voids, will give a fairly impermeable concrete in mixtures up to 1 to 4, but with less cement will be found quite absorbent. A gravel with only 20 per cent. voids would give about equally good results with a 1 to 5 mixture; such gravel is, however, rarely met with in practice. On the other hand, the best sand, mixed fine and coarse, seldom contains less than 33 per cent. voids, and concrete made from such material will prove permeable if poorer than 1 to 3.

Filling the voids with cement is a rather expensive method of securing water-proof qualities, and gives stronger concretes than are needed. The same may be accomplished more cheaply by replacing part of the cement by slaked lime, which is extremely fine-grained material, and therefore very effective in closing pores. Hydrate lime is the most convenient material to use, but nearly as costly as Portland cement at present prices. A 1 to 4 mixture in which one-third the cement is replaced by hydrate lime will be found equal to a 1 to 3 mixture without the lime. A 1 to 4 concrete made from cement 1, hydrate lime ½, sand and gravel 6 (by weight), will be found fairly water-tight, and much superior in this respect to one of the same richness consisting of cement 1½, sand and gravel 6.

The cost of lime may be greatly reduced by using ordinary lump lime slaked to a paste. The lime must, however, be very thoroughly hydrated, so that no unslaked fragments may remain to make trouble by subsequent expansion. Lime paste is also very difficult to mix, and can be used successfully only in a concrete mixer of the pug-mill type. Ordinary stiff lime paste contains about 50 per cent. water; twice as much of it, by weight, should therefore be used as of dry hydrate lime.

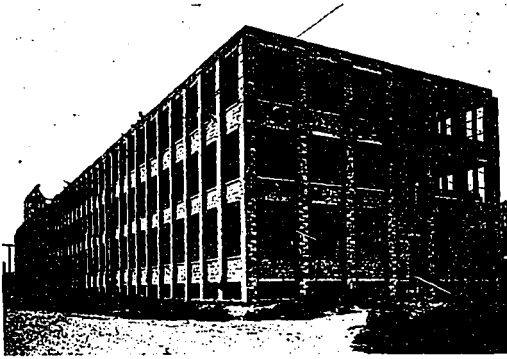
3.—USE OF A FACING.—Penetration of water may be effectively prevented by giving the blocks a facing of richer mixture than the body. For the sake of smooth appearance, facings are generally made of cement and fine sand, and it is often noticed that these do not harden well. It should be remembered that a 1 to 3 sand mixture is no stronger and little if any better in water absorption than a 1 to 5 mixture of well graded sand and gravel. To secure good hardness and resistance to moisture a facing as rich as 1 to 2 should be used.

4.—USE OF AN IMPERVIOUS PARTITION.—When blocks are made on a horizontal-face machine, it is a simple matter, after the face is tamped and cores pushed into place, to throw into each opening a small amount of rich and rather wet mortar, spread this fairly evenly, and then go on tamping in the ordinary mixture until the mould is filled. A dense layer across each of the cross-walls is thus obtained, which effectually prevents moisture from passing beyond it. A method of accomplishing the same result with vertical-face machines, by inserting tapered wooden blocks in the middle of the cross-walls, withdrawing these blocks after tamping and filling the spaces with rich mortar, has lately been patented by Purdy and Henderson of New York. In the two-piece system the penetration of moisture through the wall is prevented by leaving an empty space between the web of the block and the inside face, or by filling this space with rich mortar.

5.—USE OF WATER-PROOF COMPOUNDS.—There are compounds on the market, of a fatty or waxy nature, which, when mixed with cement to the amount of only one or two per cent. of its weight, increases its water-resisting qualities in a remarkable degree. By thoroughly mixing 1 to 2 lbs. of suitable compound with each sack of cement used, blocks which are practically water-proof may be made, at very small additional cost, from 1 to 4 or 1 to 5 mixtures. In purchasing water-proof compound, however, care should be taken to select such as has been proved to be permanent in its effect, as some of the materials used for this purpose lose their effect after a few days' exposure to the weather, and are entirely worthless.

6.—APPLICATIONS TO SURFACE AFTER ERECTING.—Various washes, to make concrete and stone impervious

to water, have been used with some success. Among these the best known is the Sylvester wash of alum and soap solution. It is stated that this requires frequent renewal, and it is hardly likely to prove of any value in the concrete block industry. The writer's experience has been that the most effective remedy, in case a concrete building proves damp, is to give the outside walls a *very thin*



MAIN BUILDING OF THE GRAND RAPIDS REFRIGERATION CO., GRAND RAPIDS, MICH., CONSTRUCTED ENTIRELY OF CONCRETE BLOCKS. WITH THE ADDITION OF FIVE SMALLER BUILDINGS THIS PLANT WILL OCCUPY NEARLY 6 ACRES.

wash of cement suspended in water. One or two coats will be found sufficient. If too thick a coating is formed it will show hair cracks. The effect of the cement wash is to make the walls appear lighter in color, and if the coating is thin the appearance is in no way injured.

COST.

The success of the hollow concrete block industry depends to a great extent on cheapness of product, since it is necessary, in order to build up a large business, to compete in price with common brick and rubble stone. At equal cost, well-made blocks are certain to be preferred, owing to their superiority in strength, convenience, accurate dimensions and appearance. For the outside walls of handsome buildings, blocks come into competition with pressed brick and dressed stone, which are, of course, far more costly. Concrete blocks can be sold and laid up at a good profit at 25 cents per cubic foot of wall. Common red brick costs generally about 12 dollars per thousand, laid. At 24 to the cubic foot, a thousand brick are equal to 41.7 cu. ft. of wall; or, at \$12, 29c. per cu. ft. Brick walls with pressed brick facing cost from 40c to 50c per cubic foot, and dressed stone from \$1 to \$1.50 per foot.

The factory cost of concrete blocks varies according to the cost of materials. Let us assume cement to be \$1.50 per barrel of 380 lbs., and sand and gravel 25c. per ton. With a 1 to 4 mixture, 1 barrel cement will make 1,900 lbs. of solid concrete, or at 130 lbs. per cu. ft., 14.6 cubic feet. The cost of materials will then be:

Cement, 380 lbs.	\$1.50
Sand and gravel, 1,520 lbs.	0.19

Total \$1.69

or 11.5c. per cu. ft. solid concrete. Now, blocks 9 inches high and 32 inches long make 2 square feet of face of wall, each. Blocks of this height and length, 8 inches thick, make 1 1/2 cubic feet of wall; and blocks 12 inches thick make 2 cubic feet of wall. From these figures we may calculate the cost of materials for these blocks, with cores or openings equal to 1/3 or 1/2 the total volume, as follows:

Per cu. ft. of block, 1/3 opening	7.7 cts.
Per cu. ft. of block, 1/2 opening	5.8 "

Block 8x9x32 inches, 1/3 opening	10.3 cts.
Block 8x9x32 inches, 1/2 opening	7.7 "
Block 12x9x32 inches, 1/3 opening	15.4 "
Block 12x9x32 inches, 1/2 opening	11.6 "

If one-third of the cement is replaced by hydrate lime the quality of the blocks will be improved, and the cost of material reduced about 10 per cent.

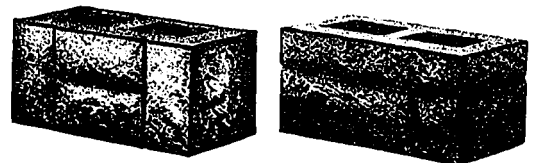
The cost of labor required in manufacturing, handling and delivering blocks will vary with the locality and the size and equipment of factory. With hand-mixing, 3 men at an average of \$1.75 each will easily make 75 8-inch or 50 12-inch blocks, with 1-3 openings, per day. The labor cost for these sizes of blocks will therefore be 7c. and 10 1-2c. respectively. At a factory equipped with power concrete mixer and cars for transporting blocks, in which a number of machines are kept busy, the labor cost will be considerably less. An extensive industry located in a large city is, however, subject to many expenses which are avoided in a small country plant, such as high wages, management, office rent, advertising, etc., so that the cost of production is likely to be about the same in both cases. A fair estimate of total factory cost is as follows:

	Material.	Labor.	Total
8 x 32 inch, 1-3 space	10.3	7	17.3 cts.
8 x 32 inch, 1-2 "	7.7	6	13.7 "
12 x 32 inch, 1-3 "	15.4	10.5	25.9 "
12 x 32 inch, 1-2 "	11.6	9	20.6 "

With fair allowance for outside expenses and profit, 8-inch blocks may be sold at 30c. and 12-inch at 40c. each. For laying 12-in. blocks in the wall, contractors generally figure about 10c. each. Adding 5c. for teaming, the blocks will cost 55c. each, erected, or 27 1-2c. per cubic foot of wall. This is less than the cost of common brick, and the above figures show that this price could be shaded somewhat, if necessary, to meet competition.

APPEARANCE AND USE.

Since concrete blocks are, as has been shown, more convenient, more efficient, and cheaper than any other building material, it would naturally be expected that they would quickly take the place of wood, brick and stone and be generally adopted for all ordinary construction. The growth of the block industry has, indeed, been rapid, but it plays as yet but a small part in the building operations of the country. It is evident on all sides that concrete blocks meet with opposition and suspicion on the part of architects and builders, and in consequence are much less generally adopted than their merits appear to warrant. It is neither just nor expedient to attribute this opposition to prejudice against a new material. Rather should we try to find and remove the grounds on which such opposition is based. My observation leads me to believe that architects and engineers have no prejudice against concrete, but on the contrary, welcome it as a building material by means of which they can obtain results never before within their reach. And they are also keenly watching the block industry, and are ready to adopt block construction as soon as they are offered a product which meets their ideas as to utility and beauty.



HOW VARIETY IS SECURED IN THE BROKEN ASHLER FACE.

Fortunately, no material is so elastic in its capabilities as concrete, and no other can with so little effort be adapted to produce any effect desired. It is hardly to be expected that the block of the present day will be the block

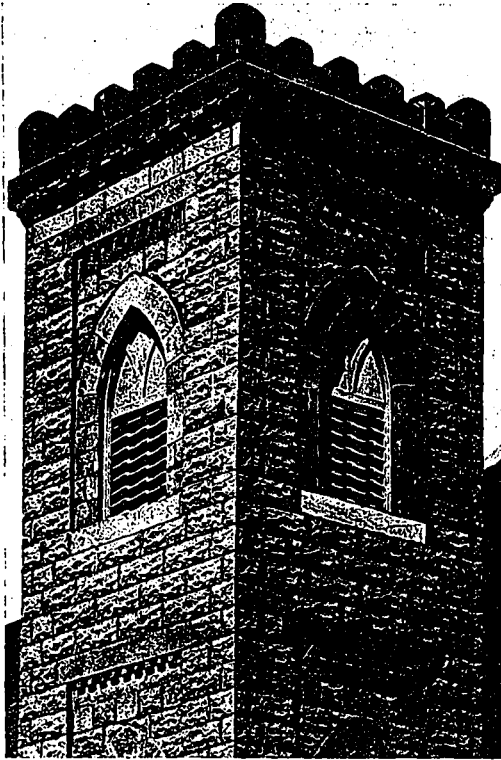
of the future; the type which is most economical, practical and beautiful will gradually come to the front, and that which is costly, clumsy and ugly will become a thing of the past. To make a success of the business we must keep our eyes open, watch what others are doing in the way of invention and improvement, and study the wants of customers. And we must not hesitate to throw our old block machines into the scrap heap when we are sure we have found a better apparatus and process.

The objections which architects and builders make to blocks now on the market are chiefly the following:

- Poor workmanship,
- Fixed dimensions,
- Too great weight,
- Unpleasing appearance.

As to workmanship, shoddy, weak and crumbling blocks are far too often met with. Good concrete should be hard and dense, and should give out a musical tone when struck with a hammer. If your blocks sound dead when struck, and break easily with an earthy fracture, you are using using too poor a mixture or working too dry, probably the latter. It does not pay, for the sake of low factory cost, to turn out work of this kind. If there is any money to be made in the block business it will be made by furnishing a good article at a living price, and in no other way. Will any one argue that it pays to make rotten blocks at a factory cost of two cents less than good ones? My belief is that the tendency of the future will be toward the use of wetter concrete, and the adoption of a process which makes this possible.

As to fixed dimensions of blocks, the standard length of 32 inches, divided into halves, thirds and quarters, is very convenient, and is generally conformed to by architects, for simple work, without much objection. To be fully successful, however, and to overcome all prejudice, the block-maker must be ready to furnish any size or shape that may be called for to suit architects' designs. It would be very pleasant if we could confine ourselves to the standard size and let customers "take it or leave it." But such an attitude bars the way to any wide use of blocks in varied and attractive buildings, and cannot be maintained without loss of trade. Architects want also



RIGID UNIFORMITY AND BAD TASTE—THE MAIN OBJECTION TO ARTIFICIAL STONE BLOCKS. THE CONSTANT EMPLOYMENT OF THE SAME FACE JARS ON THE SENSES, CHEAPENS THE BUILDING AND SAVORS TOO STRONGLY OF IMITATION. THIS HAS BEEN OVERCOME AND MUST BE AVOIDED.

courses of greater or less height than the 9 inch standard, and all manner of cornices, copings, columns and capitals. This may frighten the timid and conservative block maker, but it is in that direction that success lies, and the production of these special shapes requires only ingenuity, courage and mechanical skill. Until we can say to the architect, "Design whatever you like, we'll make it for you," he will shy at us and our product. He will, of course, readily appreciate that special shapes cost more than standard, and if he knows he can get just what he wants he will be more likely to accept, so far as he can, what can be conveniently and cheaply furnished.

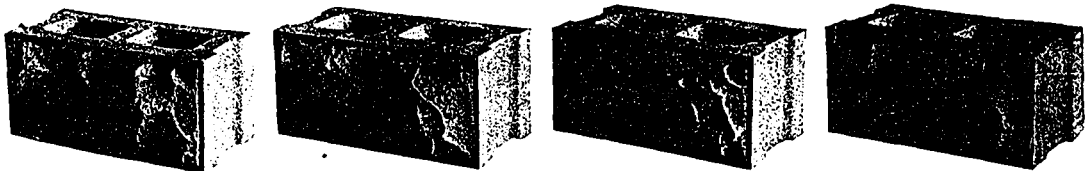
Preference should be given, therefore, to the machine which permits the greatest variety of sizes and shapes to be easily made. And the greatest business success is likely to come to the manufacturer who shows the least inclination to get into a rut, and is most ready to adapt his product to the wants of his patrons.

The objection to the weight of the one-piece block comes chiefly from masons and contractors. Hoisting 12 x 32 inch blocks weighing 180 lbs. to the upper floors

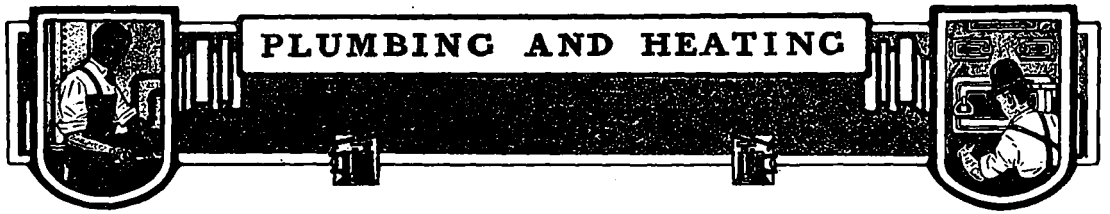
of a building, and handling them onto the wall, is a considerable task, and it is largely on this account that the half-block of the two-piece system, 24 inches long, weighing only 64 lbs., is received with so much favor. It must be remembered, however, that the two-piece blocks make a wall with over 50 per cent. opening, and a one-piece block of the same thickness of walls—2 inches—would also be light to handle and doubtless very popular. My belief is that the one-piece block of the future will be 24 inches long and with a thickness of walls of not over 2 inches. Such a block, 12 inches wide and 9 inches high, will weigh only 97 lbs., and if well and honestly made will bear rough handling and any possible load.

Finally, it is to the appearance of concrete blocks, as ordinarily made and used, that architects and other persons of taste and judgment make the greatest objection. Anything that savors of imitation, that pretends to be what it is not, will always be hated and condemned by

(Continued on page 70).



SOME VARIETIES OF ROCK-FACE BLOCKS, PROVING CONCLUSIVELY THAT SUCH AN UNSIGHTLY AND MONOTONOUS DISPLAY AS IS SHOWN IN THE CHURCH TOWER ABOVE, IS UNWARRANTED.



PLUMBING AND HEATING

Successful Ventilating System

BY MARTIN J. QUINN, CONSULTING ENGINEER

Complete Details of the Solution of a Complicated Problem Presented in the Ventilation of a Building Containing Billiard Rooms, Bowling Alley and Restaurant. Description of Plans Adopted, Methods Employed and Apparatus Used

THE ventilating equipment installed in the premises of Messrs. Orr Brothers, Toronto, presents several features which are at once unique and interesting, and well worthy of the consideration of those who from time to time have to arrange a system to take care of the needs of buildings not entirely new, as was the case in this instance.

The entire building is used for the purpose of a billiard room, bowling alley and restaurant uses, which, as will be obvious, present conditions as difficult as any that have to be dealt with by a ventilating system.

The general arrangement was worked out by Messrs. Orr Brothers, owners, and the results achieved during the last few months that the buildings have been in use, reflect great credit upon them.

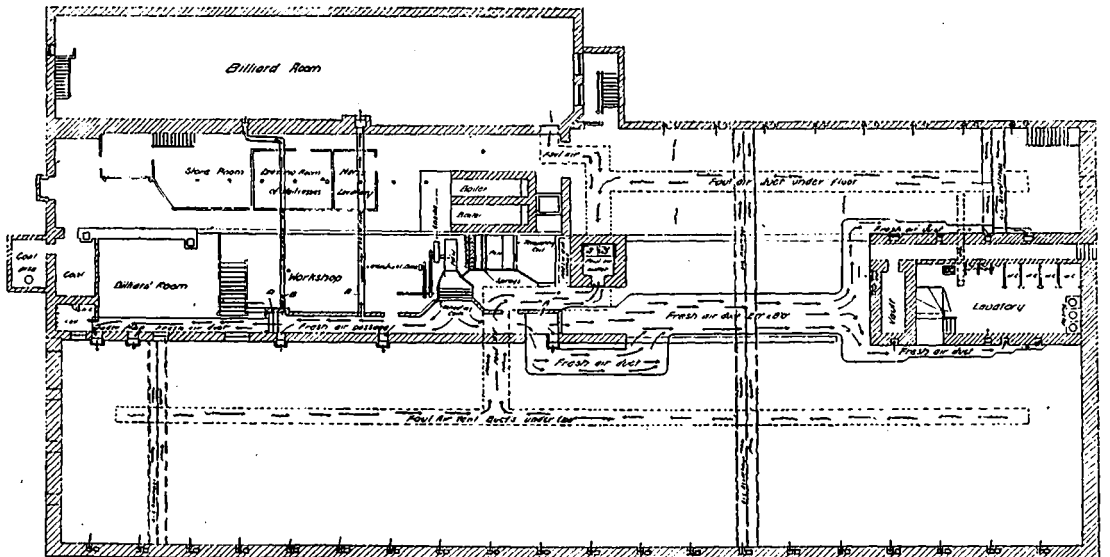
The basement plan shown, indicates the general arrangement of the main foul and fresh air ducts, the former being entirely beneath the basement floor.

Above these main foul air ducts there is laid a one-inch hardwood floor supported on 4x4 scantling, which, in turn are bedded on a previously graded clay bottom. The foul air enters the ducts in the walls, of which there are a considerable number, and is allowed to escape beneath the floor into the space between the scantlings, and passes directly to the main foul air duct, which is of

brick without top or bottom and of sufficient capacity to easily handle the quantity of air which it will receive. These ducts are then carried directly to the main foul air outlet which is a masonry shaft, on one side of which are two smoke flues made of one-quarter inch steel plate, as indicated by the letter "S". These latter flues handle the smoke from the two high pressure steam boilers, and also from the kitchen ranges on the next floor.

The fresh air is pumped through the building by a seventy-two-inch Plenum fan, upper horizontal discharge, the air being drawn from above the roof through the fresh air intake, indicated near the foul air outlet, through a tempering coil air washing device and moisture eliminator in turn, and delivered into the main fresh air passage through the re-heating coils shown. This latter arrangement is better illustrated on one of the accompanying photographs.

At a point marked "A" fresh air is carried in a brick duct below the floor to the lavatory section, and provides fresh air for all the building in that vicinity. It will be noted that this duct had to be divided where it leaves the main fresh air passage and a portion of it run around a brick wall and united on the opposite side because sufficient capacity could not be given on one side. It will be noted, also, that the only galvanized iron ducts to be seen



GENERAL ARRANGEMENT OF PRACTICAL VENTILATING SYSTEM IN ORR BROTHERS' ESTABLISHMENT, TORONTO, SHOWING MAIN FRESH AND FOUL AIR DUCTS AS EMPLOYED IN THE BASEMENT AND COMMUNICATING WITH EVERY PART OF THE BUILDING. THE STRAIGHT ARROWS REPRESENT THE COURSE OF PURE, AND THE IRREGULAR DARTS, THE IMPURE AIR.

anywhere in the building are those marked "B B" and they are of small capacity.

Figure No. 1 shows the face of the main re-heating coils, which are built in four sections, and are capable of delivering air at a very high temperature if necessary. It also shows a passage under the steps, marked "D" on the plan, through which the air is delivered to the ducts near

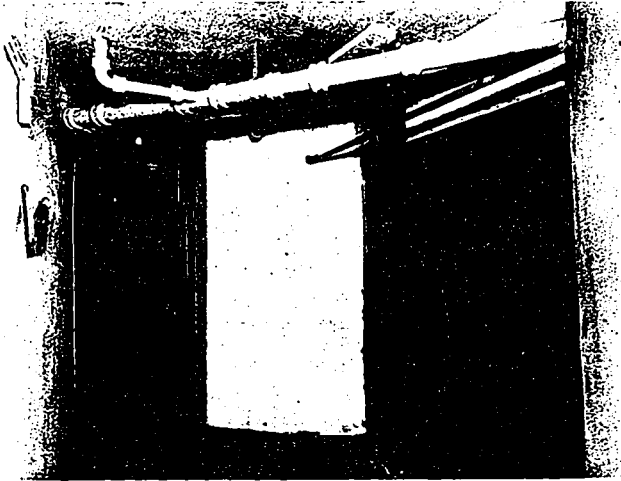


Fig. 1. VIEW OF VENTILATING CHAMBER SHOWING MAIN RE-HEATING COILS WHOSE FUNCTION IT IS TO EITHER RE-WARM OR COOL THE FRESH AIR AFTER IT HAS PASSED THROUGH A WASHING PROCESS AND MOISTURE ELIMINATING DEVICE.

est the front of the building, the floor of the billiard room being considerably higher than that of the ventilating chamber.

Figure No. 2 indicates the engine, which is shown directly connected with the fan. This engine is of twenty horse power, and is supplied with steam from the high pressure boilers, a portion of which may be seen through an opening in the wall to the left. This photograph also shows the exhaust pipe from the engine connected to each of the four sections of re-heating coils, and provision is made for the supplying of live steam from the boilers through a pressure regulating valve, when the quantity of exhaust steam from the engine is not sufficient to heat the air to a proper temperature.

The return connections may be seen taken out of the bottom of the four coil heaters, and these are connected to an automatic pump and receiver and the condensation is therefore entirely saved and automatically returned to the boiler.

It will be noted that the engine is also belted to a countershaft with a return belt to a two and one-half inch centrifugal pump located near the engine. The suction pipe of this pump may be seen entering the fan casing back of the re-heating coils and the discharge passed over the fan in the direction of the air washer.

The air washer is more clearly shown in Fig. 3, though because of the lack of space, it was somewhat difficult to properly focus it. It is a device manufactured by Messrs. Cluff Brothers, of Toronto, and is perfectly adapted for thoroughly washing out any impurities contained in the air, and is built with a view to eliminating many of the difficulties heretofore experienced in air washing devices. It is a simple device, and consists of two main supply pipes at about 12-inch centres, from which supply pipes drop

at proper distances, containing at about 16-inch centres a patent spray head. These heads are capable of throwing a circular sheet of water about thirty inches in diameter and when in operation present at right angles to the flow of incoming air, two complete sheets of water, as is very imperfectly illustrated in Fig. 4.

All of the water pumped by the centrifugal pump through the spray heads, flows into a pan underneath same, from which it is again drawn by the pump so that the water is used over and over again until it must be replaced by fresh water because of the amount of impurities washed out of the air. The spray heads are merely brass nozzles with a 3-8 inch bore drilled through the outer face and having a circular concaved spoon swung on a kind of swivel in front of them so that the movement of the water is suddenly changed to a position at right angles with the movement of air as already stated.

These nozzles are located in rows and are connected together by flat iron bars so that the movement latterly, of these latter will move the spoon from in front of the nozzles and allow any sand or other foreign matter to be washed out of the 3-8 inch bore of the nozzle. This is a very great improvement over the old style nozzle, with an opening scarcely larger than 1-32 of an inch, and which was choked up by a grain of sand.

Photograph 3 also shows a face view of the eliminators which are used for removing the excess of moisture contained in the air, after having passed through the spray. These eliminators are of galvanized iron, and set at such angles as will be required for each individual case, having regard to the velocity with which the air travels through them. Briefly, they operate in much the same manner as an oil separator, and merely by suddenly changing three or four times the direction of the air causes the moisture to be precipitated on their surfaces, from which it drains back into the water pan.

Photograph 5 is a view taken from the passage beside the foul air outlet, and shows the tempering coil and the door to the washing apparatus, containing two panes of



Fig. 2. VIEW TAKEN FROM DIRECTLY BACK OF THE FAN WHICH DRAWS THE FRESH AIR SUCCESSIVELY THROUGH THE INTAKE DUCT IN THE ROOF, THE SPRAY OF THE WASHERS AND FINALLY, THROUGH THE MOISTURE ELIMINATING DEVICE, BEFORE DELIVERING IT TO THE RE-HEATING COILS.

glass. That this system accomplishes the work for which it was designed, will be seen when it is stated that, notwithstanding the volumes of pipe and cigar smoke that have to be handled in the billiard room and bowling alleys, and the heavy odors of cooking from the kitchen, none of these

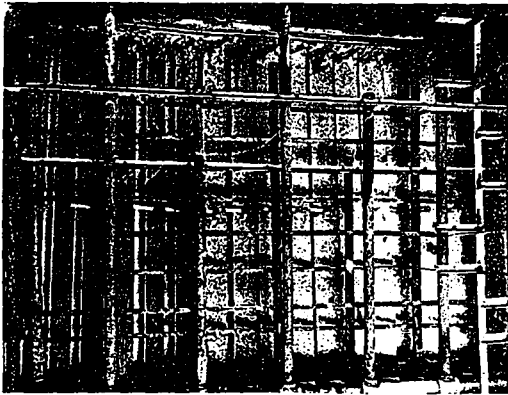


Fig. 3. SHOWING ARRANGEMENT OF AIR WASHING DEVICE THE NUMEROUS NOZZLES, OR ATOMIZERS (IMPERFECTLY SHOWN ATTACHED TO UPRIGHT SUPPLY PIPES) WASH ALL DUST AND IMPURITIES FROM THE AIR BEFORE IT IS DISTRIBUTED THROUGHOUT THE BUILDING.

odors are to be found in any part of the building, except where they are originally generated; and notwithstanding the fact that the doors between the restaurant and kitchen are almost always open, the odor of cooking is never to be found in the former.

Maxwell Designs Favored in Regina Competition

ANOTHER demonstration of the fact that we have architects in Canada who are capable of planning our largest and finest structures was in the success of the firm of E. & W. S. Maxwell, of Montreal, in securing the first place in the Saskatchewan parliament buildings competition. Seven well known firms were invited to prepare preliminary plans for which they were paid \$1,500 each. Five of these were Canadian, one from the United States and one English firm. Cass Gilbert, of New York, the Am-



Fig. 4. WASHING DEVICE THROWING TWO SOLID SHEETS OF WATER AT RIGHT ANGLES WITH THE FLOW OF INCOMING AIR.

erican competitor, is an architect of wide reputation, and he makes a specialty of public buildings. He is also pre-

sident of the American Institute of Architects. Mitchell & Raine, of London, Eng., the English competitors, are a firm of high-class reputation. To have succeeded in the face of such formidable competition should be most gratifying to Messrs. E. & W. S. Maxwell. The assessors in the competition were Prof. Percy E. Nobbs, M.A., A.R. I.B.A., professor of architecture at McGill University, Montreal; Bertram Goodhue, Mem. of A.I.A., of Messrs. Cram, Goodhue and Ferguson, New York, and Frank Miles Day, of Philadelphia, ex-president American Institute of Architects.

The several competitors were:

- Messrs. Darling & Pearson, Winnipeg and Toronto.
- Mr. Cass Gilbert, New York.
- Messrs. Marchand & Haskell, Montreal.
- Messrs. E. & W. S. Maxwell, Montreal.
- Messrs. Mitchell & Raine, London, England.
- Mr. F. N. Rattenbury, Victoria, B. C.
- Messrs. Storey & Von Egmond, Regina.

The site of the building is on the axis of Smith street, Regina, and will face north towards the city. It will have grounds surrounding it of about 160 acres, which are to be laid out in walks and drives and generally beautified, according to plans prepared by Mr. Todd, landscape architect of Montreal. The building will stand from eight to ten feet above the water level of Wascana lake.

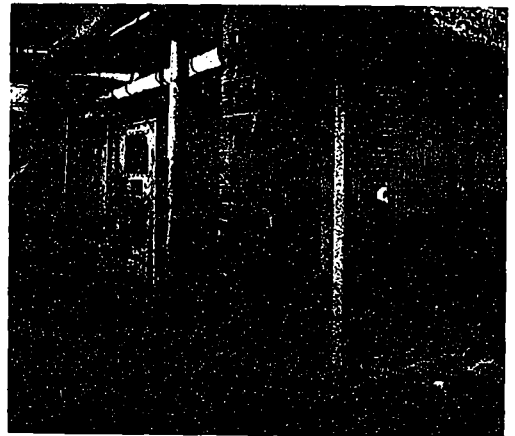


Fig. 5. THE TEMPERING COILS, DESIGNED TO WARM THE AIR SUFFICIENTLY IN EXTREMELY COLD WEATHER TO PREVENT THE NOZZLES OF THE WASHING DEVICE FREEZING. THE DOOR TO THE SPRINKLING CHAMBER MAY BE SEEN TO THE LEFT.

The general conditions governing the competition for the building, called for a design of structure with pale buff limestone trimmings and red brick wall fillings and suggested some dominating feature such as a dome or tower. The conditions further stipulated that the building must be fireproof throughout, and the following general allocation of the various floors was suggested although competitors were free to vary the scheme:

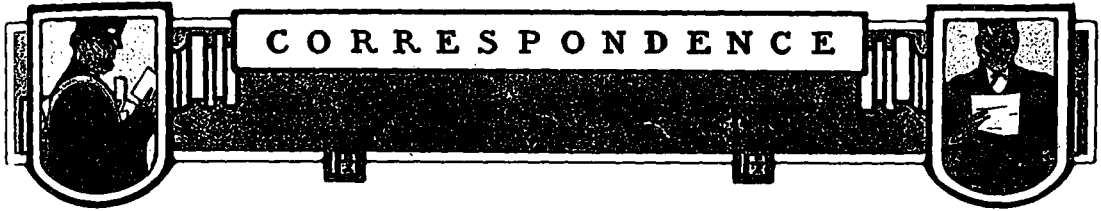
Basement—Storage, archives, patents, news files, restaurant.

Ground Floor.—Offices of main executive departments, etc.

Main Floor—Chamber, council room, committee room, library, etc.

Upper Floor and Wings—Offices of various executive departments.

The floor area for various rooms was stated in round figures, but the exact areas were left to the discretion of the competing architects.



Comment From F. W. Fitzpatrick, Secretary International Association Building Inspectors and Commissioners, on the Subject of Competitions, as Treated in the October Number of "Construction"

CONSTRUCTION has a good deal to say in its first number about competitions and ethical practice, etc. All that constitutes a splendid theme for general discussion, and the journal's pages should be open to everyone who wishes to express an opinion.

Some theories advanced by CONSTRUCTION I heartily endorse, but others do not accord with what at least I have been led to think most practical. I don't believe in limited competitions. The best possible solution of the problem at hand is seldom if ever secured thereby. If a committee has not absolute confidence in some one architect, why not invite a limited number to collaborate, not to work independently of each other and in the dark as to what the other designer is doing, but let them get together and discuss and design the building. This is what was done at the Chicago Exposition, and a better architectural solution of a problem has never been rendered. If competition is desired, then make it open and offer big enough prizes that will serve as sufficient inducement for the best experts. It is a rather sad commentary, by the way, on the most eminent designer that in the last few competitions in the United States, where a select few were invited and then the doors thrown open, seldom, if ever, one of the invited carried off the top prize.

That brings us to the question of the supervision of a building. If a number of invited architects design the building as I suggest, they can't very well all superintend it. Besides to get right down to absolute facts, the two branches are decidedly separate, and call for such vastly different qualifications that one man combining them both in his personality is rarely to be found. The clever designer very seldom excels in constructional knowledge; on the other hand, the skilled engineer, the man who can carry on construction with keen executive ability and intimate knowledge of details and methods, as a rule lacks ability as a designer. The government, for instance, can infinitely better supervise a building than can any private practitioner.

I know this is heterodoxy, but my notion would be to keep the designer off the building. If that doesn't bring communication upon me I don't know what will.

Let the designer supervise the supervisor, that is, let him direct the latter how he wants things, let him interpret his drawings to him and instruct him, but when it comes to the "how" of getting work done, the expert superintendence, that's a specialty of its own and requires the service of an expert, a specialist. And so far as construction goes, practicing economies, handling contractors, etc., etc., I would as willingly entrust the work to the first carpenter foreman I met as to the average practicing architect who thinks that he is competent to handle every branch of the work.

About Architectural Remuneration

THAT takes us up to the next question, the cost of plans, reasonable architectural remuneration. It is a subject to which considerable attention has been given.

For a number of years architects have kept very careful account of the actual cost of their work, and the consensus of opinion is that for a building over \$100,000, except residences, five per cent. is fair compensation and comprehends a reasonable profit. There is no question but that the smaller buildings and residences should command a higher rating. But when you get up into exceedingly large buildings, five per cent. is a good fee, and it is a known fact that very few architects get it. Governmental figures are hardly a fair test. I never could fathom why the supervising architect's office, in Washington, for instance, should cost so much, pro rata, of the buildings, but they have some wonderful ways of criss-crossing the accounts and charging for portions of sites or some other complicated arrangement that puts the percentage away up. By rights government work should cost less than private work. I can only cite one instance, where it came under my personal observation, in which, by careful handling, and in spite of unpreventable leaks incidental to government affairs, a reasonably low rate was attained. That was in a government building costing \$4,000,000. The government paid reasonable salaries and there was nothing more than a fair economy practiced, yet the actual architectural expenditure footed up one and seven-eighth per cent. on the cost of the building, and that included an imaginary amount for rent that, of course, had not to be paid.

You quote what was done on the government printing office here. Over seven per cent. was certainly a pretty big architectural expense, but it should hardly be taken as a standard. The entire building was excessively costly for its nature, for after all it is but a workshop. I believe that on a cubical basis it has cost more than has the average of the very highest type of ornate buildings. Some attribute it to the inexperience of those who handled it. I have no theory to advance but simply know that it was a very expensive morsel for the government.

People make a mistake in comparing pro rata of today with that of years ago. Architects now can do vastly more work than in the old times and the buildings cost vastly more. After all, and I suppose this, too, is heterodox, the hard and fast rule—that is not always lived up to either—savors of the trade union business and is made a vehicle by the incapable ones of undermining or supplanting architects of good repute and ability who feel in duty bound to stick to the schedule. Why should not a man establish his own price, his own rate? If his goods are worth more than his neighbors the public will get onto it in time and pay the difference. Why should John Smith's silk have to sell for the same price as Tom Jones' "shoddy?"

Ottawa Parliament Buildings

YOUR illustrations of the two premiated designs for the Ottawa Parliament Buildings were very interesting. It is to be hoped that you can secure and publishing at least all the prize designs.

I am not particularly impressed by either of these two. The first prize shows a plan in which half the offices are on internal courts. This is to be deplored in as slightly a place as that Major's Hill, where the buildings have a beautiful park on one side and the city on the other. All the rooms could have been so managed as to look out either east or west. Internal light courts should be rele-

gated to where you cannot do anything else, in cramped city blocks.

In neither case has the competitor kept his buildings at all in consonance, at all in harmony with the main group. There is absolutely nothing in either of them that ties this new part to the old. They might just as well be a thousand miles asunder. No one would ever suspect them of being part and parcel of the one grand group. By all means the prizes should be awarded as the judges have decided but the government should insist that the prize-winner revamp his drawings and correct the errors of plan and get the exterior more nearly in harmony with the stately old pile that dominates the hill.

More About Competitions

ARCHITECT J. P. HYNES, of Toronto, suggests an open preliminary competition giving general plan without detail, then the selection of the designers of the more meritorious studies to compete in a final competition.

Editor CONSTRUCTION,

Dear Sir,—Your editorial in the initial issue of CONSTRUCTION, under the heading "Competitions Should Be Limited by Invitation," draws such positive conclusions that I take the liberty of presenting the question from another point of view.

So much has been said of the unsatisfactoriness of competitions from the standpoint of intending builders failing to conduct their competition on proper lines and from unsuccessful competition for many real and supposed reasons, that their advantages have been very much belittled and overlooked.

The advantages of a properly conducted competition are that they give the parties requiring a solution of a problem the opportunity of selecting the best obtainable solution of it, and the party who has solved the problem the opportunity of carrying it into effect.

To the profession of architecture at large they are its great educator. This may be instanced by the past twenty years in the United States where the competitive system has obtained in architectural education, in the selection of architects of Federal Government buildings and for a large number of the architects of the most important public and semi-public buildings, with the result that through these constant efforts the profession at large has been trained to handle problems with ability, as may be seen by the number of excellent solutions presented at every competition of recent years.

Had competitions been more in vogue in Canada, doubtless more than twenty-nine designs would have been submitted from a population of six million people, when an opportunity such as the recent Ottawa competition presented itself, and many more meritorious ones than were presented on that occasion.

Governments and other bodies spending public monies in building have two primary principles confronting them, which can only be met by open competitions, namely:

The government or public body must be given every opportunity to obtain the best available result without any other consideration entering into the selection than the ability to do the work.

The individual citizen with the ability to do the work must be given every opportunity to obtain it.

In the matter of contracting for the erection of public building these principles are recognized in letting the work by public tender, but in the matter of selecting an architect they are neither recognized or acted upon, because the principle has not been pressed to recognition on the one hand, and because the architect with the pull or who has attained a standing prefers to obtain the work on these grounds rather than chance his ability in competition.

The principle, however, is still there and can be worked on in the following manner:

First, a competent adviser should be retained to draw

up the programme for the competition and be retained as the chief judge in making the award.

Second, an open preliminary competition (submitting the scheme with the least possible detail) should be held and a limited number of the most meritorious designs selected, the authors of which should again compete and each receive equal remuneration for doing so, and the author of the design adjudged first should be given the commission subject to having a man of constructive and administrative ability associated with him in circumstances should be such that it be necessary to do so.

Fair play competitions, whether welcomed or not by the profession, would do more to raise the standard of its ability and convince the Canadian public of the capabilities of the Canadian architect than any other influence that could be brought to bear on the profession.

In conclusion let me ask is it not high time that principles should govern in architectural matters in this country, be it in competitions, education or the organization of professional societies, and that your journal now entering this field of activity will strenuously advocate principle in counted distinction to the prevailing attitude of expediency.

Very truly yours,

J. P. HYNES.

Toronto, Dec. 15th, 1907.

Appreciation From a General of U.S. National Guard

Editor CONSTRUCTION,

Gentlemen,—We acknowledge receipt of your favor of the 5th inst., as also copy of your November publication, containing article in reference to the "Bachelor" and "Baby" flats.

We desire to extend to you our appreciation, and our compliments for the splendid article.

We enclose check in payment of a year's subscription for your paper, which kindly mail to Gen. Louis Auer, 283 10th street, Milwaukee, Wis.

Wishing you all success,

Yours truly,

LOUIS AUER & SON.

Milwaukee, Dec. 19, 1907.

Chicago Manufacturer Subscribes

Editor CONSTRUCTION,

Dear Sir,—We are in receipt of your October issue of CONSTRUCTION. We have looked over same with a great deal of pleasure and I must say that we have never seen the first issue of any other magazine which showed so much thought in the compilation and which resulted in such a pleasing aggregate. Kindly enter our name as a subscriber for one year.

Wishing you the best success with your magazine, CONSTRUCTION, we are,

Yours very truly,

MONASH-YOUNKER CO.

Chicago, Dec. 3rd, 1907.

Best Seen in Canada or United States

Editor CONSTRUCTION,

Dear Sir,—I have just seen a copy of your most valuable paper CONSTRUCTION, with my friend, Mr. Hawes, and I consider it one of the best I have ever seen in Canada or the United States.

I am a little behind with my subscription, but I trust you will find it convenient to enter my name as a subscriber, beginning Vol. I, No. 1. Wishing you and your paper a prosperous New Year, I am,

Yours respectfully,

JOHN L. McRAE,

Builder and Contractor.

Port Arthur, Ont., Dec. 6th, 1907.

PROSPECTIVE CONSTRUCTION

The following information is obtained from our correspondents, from architects, and from local papers. These items appear in our daily advance reports and are herein compiled for the use of subscribers to the monthly issue of CONSTRUCTION. Should any of our readers desire this information oftener than once a month, upon receipt of request, we will be pleased to submit prices for its daily service.

Mills and Factories

Toronto, Ont.—P. Cameron, contractor, 75 Brock avenue, Toronto, has been awarded the contract for the erection of a three-story brick factory on Eastern avenue for Lever Bros., Toronto. Architects Sprout & Rolph, 307 Yonge street, prepared the plans. Contract price, \$45,000.

Toronto, Ont.—The Standard Sanitary Mfg. Co., of Pittsburgh, Pa., manufacturers of enamel plumbing ware, will shortly establish a factory in Toronto. They have obtained a charter, and it is reported they are now negotiating the Dominion Radiator plant at the corner of King and Dufferin streets here.

Toronto, Ont.—The Minister-Myles Shoe Co., of west Adelaide street, have secured a permit for the erection of a four-story factory on the corner of Simcoe and Pearl streets, to cost \$30,000.

Toronto, Ont.—The factory and storage room for the Frank H. Fieger Co., of Philadelphia, with a branch in Toronto, will soon be constructed on Sterling road here. It will be built of reinforced concrete and cost about \$75,000. (Second mention.)

Toronto, Ont.—The E. M. Dart Co., of Providence, R.I., U.S.A., state that they will open a branch factory in this city on Niagara street, to manufacture couplings, unions, flanges, etc.

Toronto, Ont.—The factory of Geo. H. Hees, Son & Co., Davenport road, Toronto, was recently damaged to the extent of \$25,000 by the collapse of the platform holding the sprinkler tank above the roof.

Toronto, Ont.—The planning mill of Wm. Williamson, corner King and Woodbine avenue here, was burned Sunday, Dec. 15, entailing a loss of \$18,000 on frame factory and machinery. He will rebuild at once.

Toronto, Ont.—The Elliott Paper Box Mfg. Co.'s plant, corner Richmond and Nelson streets, was totally destroyed by fire Sunday, Dec. 15, causing a loss of \$25,000 on building and \$115,000 on stock and plant, with a total insurance of \$121,000. The St. Andrew's Institute to the extent of \$2,600, owned by New St. Andrew's Church here, and a number of residences were also damaged. It is expected the Elliott Co. will rebuild at once.

Hamilton, Ont.—Hon. Adam Beck has leased a building from Myer Cohen, of this city, and proposes to install a complete box-making plant there.

Hamilton, Ont.—Architect A. W. Peene has awarded the contract for the rebuilding of the burned portion of Burrow, Stewart & Milne's factory, recently damaged by fire, to P. McKinn, contractor of this city. (Second mention.)

London, Ont.—Messrs. Armstrong & Manton, of Springfield, Conn., are considering the establishment of a match factory here, giving employment to at least 75 hands at the start. L. Nelles, secretary of Trade, London, is conducting the negotiations for that city.

London, Ont.—The Greene Swift Co., of St. Thomas, propose removing their works to London and will erect a large building to accommodate their factory for men's garments. An effort is being made to retain them in St. Thomas.

London, Ont.—The Heintz Pickle Co., of Pittsburgh, Pa., are negotiating with the council of London, Ont., with a view to establishing a branch factory here to cost in the neighborhood of \$25,000.

St. Mary's, Ont.—The by-law to authorize the loaning of \$1,000 to Mr. Donohue, to induce him to build a \$10,000 factory here for the manufacture of wood specialties, passed Nov. 20th.

Deseronto, Ont.—The ratepayers of this town have passed a by-law granting the Deseronto Furniture Co. a bonus of \$20,000 in return for which the company agrees to erect and operate a furniture factory here.

Meaford, Ont.—Seaman, Kent & Co., of this place, whose factory for the manufacture of hardwood flooring was recently destroyed by fire, state that they will rebuild at once, so as to be running again by the end of February.

Niagara Falls, Ont.—G. J. Seale, president of the Board of Trade of this place, has written to the City Council stating that he has received a proposition from a company with \$40,000 capital, which will erect a paper box factory and equip same with modern machinery. This company is applying for a charter under the name, Imperial Paper Box Co. of Niagara Falls. The Council is favorable.

Owen Sound, Ont.—The Island Granite Co., of Toronto, composed of Dr. Thos. Wylie, Dr. B. Fraser Bowie, and John Grant, of that city, have asked the town of Owen Sound for a loan of \$15,000, which, if granted, will be devoted towards the erection and operation of a granite quarry on Croker Island in Georgian Bay, to cost \$15,000. The council here agreed to this, and a by-law covering same will be voted on on January 6th.

Markdale, Ont.—J. Graham, of Toronto, is negotiating with the council here, with a view to securing inducements looking to the establishment of a cement plant to cost \$1,500,000 at Bell's Lake, five miles from here, where there are large marl beds.

Orangeville, Ont.—The Terra Cotta Brick Co., of this place, propose spending \$30,000 in improvements to their present plant early next spring.

Dreadon, Ont.—The Council of this place will submit a by-law to the ratepayers at the next elections to loan the Chatham Carriage Co. \$20,000 for a term of years, to induce that company to establish their works here.

Ridgeway, Ont.—George Arnold, of this place, has been authorized by the Canadian Cannery, Limited, to purchase six acres of land here on which the company propose to erect a factory costing \$10,000.

Arnprior, Ont.—The Montreal Suspender & Umbrella Co.'s four-story solid brick factory at Arnprior was burned to the ground on the night of Dec. 22nd, entailing a loss of \$50,000. This firm, it is understood, will rebuild at once.

Berlin, Ont.—Mr. Seellen, secretary of the Board of Trade of Berlin, Ont., has received a communication from a large corset manufacturer in Pennsylvania, stating that they are favorably considering Berlin as a site for a branch factory.

Sarnia, Ont.—Thos. Holliday, Jr., trustee of the Perth Flax & Gordage Co. here, has received an offer from an English firm to take over this factory and erect buildings and install machinery, doubling its former capacity. Nothing definite has been decided upon.

Fort William, Ont.—The details of the agreement between the city of Fort William and the Fort William Car Co., represented by Albert H. Sissons, of the St. Louis Car Co., St. Louis, Mo., U.S.A., ask that the city give \$50,000 towards a site and guarantee the company's bonds to the extent of \$60,000. The by-law will be submitted in January.

Kinston, Ont.—The Stanley Smelting Co., of Goderich, Ont., have been granted a site and tax exemption for a lead smelter which they propose erecting here, commencing January 2nd.

Ridgetown, Ont.—The apple evaporator and fruit factory here, owned by F. B. Mahler, was destroyed Nov. 22nd, entailing a loss of \$5,000. It is expected this factory will be rebuilt at once.

Dundas, Ont.—The Morris Piano Co., of this place will shortly erect a large kiln for drying lumber.

Petrolia, Ont.—The foundry in connection with the Stevenson Boiler Works here was destroyed by fire recently. The total loss has not yet been ascertained, but as it is fully covered by insurance the company propose rebuilding at once.

Ottawa, Ont.—The W. C. Edwards Co., of this city, have taken out a permit for the erection of a \$10,000 factory.

Springfield, Ont.—J. R. McGarvie, formerly of Chatham, had his sawmill here totally destroyed by fire, entailing a loss of \$10,000, partially covered by insurance. He will probably rebuild.

Markdale, Ont.—The Council here have entered into a provisional agreement with the Markdale Furniture Co., to take \$10,000 in the stock of this company if they will erect a factory which they will in all probability do.

Niagara Falls, Ont.—C. S. White, manager of the Niagara Falls Brass Works Co., of this city, has had plans and specifications completed for the erection of a factory here, which will be contracted for in the near future. Tenderers, however, have not yet been let. (Second mention.)

Bath, Ont.—Sharp & Riecky, of this place, propose erecting large grist, saw and planing mills and a box factory here, if the Council will grant them exemption from taxes. A by-law will be submitted to the ratepayers here on January 6th concerning this. Max Robinson is clerk of the municipality.

Adolphustown, Ont.—The council here is considering the granting of a bonus to assist in the establishment of a canning factory in this place.

Deseronto, Ont.—The by-law granting the Deseronto Furniture Co. a bonus of \$20,000, to enable them to establish a woodcrafter factory carried.

Chatham, Ont.—Alderman Harry Westman, one of the directors of the Chatham Malleable Iron Works, states that the company propose erecting a new factory building 100 x 30 feet, to be of brick and stone.

Barrie, Ont.—The Grand Trunk Railway system propose erecting large car shops here for their northern division, if the town of Barrie will grant them a fixed assessment. This the town is willing to do according to the reports of Messrs. Bennett, Boyd and Boardley, of the Council here. Plans and estimated cost of the proposed shops will be furnished by the railway company soon.

Georgetown, Ont.—J. B. Mackenzie, of this place, has been awarded the contract for the erection of an addition to the Sykes Woollen Mills here, to be 62x82 feet, two stories, with engine house 16x40 feet adjoining. (Third mention.)

Port Arthur, Ont.—R. A. Burris, of the Council of this city, has received a communication from an eastern pulp company who wish to establish a large pulp mill here. The name of this company not yet ascertained.

London, Ont.—The Warner Gibson Co., manufacturers of agricultural implements, will build a large factory here in the near future.

Ottawa, Ont.—The city Board of Health of Ottawa, Ont., has renewed its proposal for the erection of a public abattoir here, to cost \$25,000. Dr. Hollingshead and Dr. Bryce of this city, are on the board.

Hamilton, Ont.—The P. L. Robertson Co., Limited, of Hamilton, have recently secured fire-insurance for \$230,000 on a paper factory and tack and screw factory here. The provisional directors are: P. L. Robertson, W. G. Reid, A. E. Guidal, H. B. Evel, of Hamilton, and Stephen Agar, and George Harvey, of Newark, N.J., and Russell Bowly, of Waterford, Ont. (Second mention.)

Welland, Ont.—The ratepayers of Humberstone Township, near Welland, passed a by-law fixing for ten years the assessment of the Canadian Portland Cement Co. at \$10,000. The proposed mill will have a capacity of 3,500 barrels a day.

Montreal, P.Q.—The Tomlyll Upholstering and Frame Mfg. Company's factory on St. James street here was totally destroyed by fire, entailing a loss of \$60,000. The factory was a large four-story brick structure. It is understood they will rebuild at once.

Montreal, P.Q.—The Canadian Wadding Co.'s premises on Visitation street here were damaged by fire to the extent of \$20,000. The damage will be at once repaired.

Montreal, P.Q.—The Montreal Park & Island Railway, of this city, have purchased 75 acres from Nelson Bickerdike here on which they propose erecting large car shops and construction works. They will obtain possession of the land on May 1 next.

Montreal, P.Q.—The jewelry factory of the Richard Hensley Mfg. Co., 255 St. James street, was damaged recently to the extent of \$10,000 to the machinery and \$2,000 to the building, owned by the Fisher estate. Covered by insurance. The damage will at once be repaired.

Quebec, P.Q.—The Clément & Marchand Tannery Co. plant was burned to the ground Dec. 4. The plant will be rebuilt in the near future. The loss is estimated at \$13,000.

Quebec, P.Q.—The St. Lawrence Saw & Steel Works Co. has offered to build a large plant in this city, removing from their present location in Sorel, P.Q., if the city would grant them certain exemptions. The Council are considering the proposal and will in all probability meet their request.

Regaud, P.Q.—Detonite Explosives, Limited, composed of J. E. Redpath, H. E. Borredale, W. B. L. Ward and E. A. Mackay, of Montreal, propose erecting a factory for the manufacture of a new explosive, known as "Detonite," at Regaud, near Montreal, P.Q., to cost \$50,000. Walter G. Trench, superintendent.

Lambert, P.Q.—The citizens of this place have passed a by-law granting certain concessions to the Waterman Fountain Pen Co., and this company will in the near future commence the erection of a factory for the manufacture of their goods, at a cost of about \$30,000.

Lynard's Cove, P.Q.—F. G. Conson, of Colebrook, N.B., is preparing to build a large lumber and shingle mill with crossing mill attached, to be constructed on wharves over the Caspédia River. The output is estimated at 6,000,000 feet per year.

Winnipeg, Man.—The steel plant of Kelly Bros. & Mitchell, of this city, was burned to the ground Dec. 6, entailing a loss of \$11,000, part of which is covered by insurance. This firm will rebuild at once.

Winnipeg, Man.—A. H. Sisson, manager of the St. Louis Car Co., St. Louis, Mo., states that he is considering the establishment of the Canadian branch of their works in Winnipeg, instead of Fort William. Nothing definite has been done as yet, but he states that probably \$1,000,000 will be expended in the erection of these works in whichever location they choose.

Winnipeg, Man.—T. H. Graham, W. H. Graham, C. H. Dingle and W. T. Stead, through their agent, John McLean, of this city, have sold a large tract of land in Winnipeg to the west, to the city, who propose erecting a large biscuit and confectionery factory here within the next year.

Winnipeg, Man.—The Canadian Northern Railway Co. have taken out a permit to erect a power house 160 x 53 feet to cost \$25,000, and a foundry 129x100 feet to cost \$30,000. Contracts for the work to be done by day labor, will be called in the near future.

Winnipeg, Man.—The Winnipeg Safe Works has been incorporated for \$50,000 with head office here. The incorporators are Frank H. Robinson, Sarah L. Robinson, Walter P. Page, J. H. McLaughlin and D. R. White, barrister, all of Winnipeg. It is understood they will erect a safe works here in the near future.

Edmonton, Alta.—The Canadian Northern Railway propose erecting large car shops here early next spring, to employ 250 men.

Calgary, Alta.—The Dominion Match Co. will shortly commence the erection of a match factory here. The company is capitalized at \$175,000.

Edmonton, Alta.—W. J. Webster has entered into an agreement with city to establish a woollen mill here by May 1, 1908. He has the machinery and proposes erecting a new building to accommodate same.

Baltimore, Alta.—The Rocky Mountain Cement Co. have proposed erecting a large cement plant with a capacity of 1,200 barrels a day. Mr. Morino, of Macleod, has been awarded the contract for the stone work. Mr. Budd is manager for the company. The main building will be 275 x 74, boiler house 100 x 60, engine room 68 x 67, crushing mill 100 x 48, stock house 200 x 67 feet, machine shop 80 x 40, all of stone.

Saskatoon, Sask.—Mr. John Daak, of this place, is purchasing property here in the Munro-Wiggins sub-division, on which he proposes erecting a planing mill.

Felding, Sask.—The Stratford Milling Co., of Stratford, Ont., propose erecting a flour mill here in the early spring, with a capacity of 100 barrels per day.

Saskatoon, Sask.—The Wilson-Leslie Co., Limited, of this city, has been incorporated with a capital of \$500,000, and they propose erecting a 200 barrel flour mill and an elevator. They anticipate that the elevator will be ready next spring. Tenders will be called in the near future.

Victoria, B.C.—Mr. Morley, mayor of this city, is fathering a by-law which will likely be submitted to the ratepayers here on January 6th next, to authorize the expenditure of \$54,000 to erect and equip a public incinerator and for this city to be complete with horses and wagons for the handling of the garbage.

Vancouver, B.C.—The British Canadian Wood Pulp & Paper Co., of Victoria, B.C., members of the company as follows: Col. F. H. Tracey, George Cotes, J. M. Jenns, Mr. Colister and J. S. Burnett, has been incorporated with a capital of \$1,000,000. They propose erecting a large wood pulp mill to make newspaper, box boards, wrapping paper, building paper. Capt. H. A. McEwen, of Melton & Scott, Vancouver, has been instrumental in forming the company.

Victoria, B.C.—The Redcliffe Lumber Co., of Wisconsin, U.S.A., one of the largest firms in America, will remove their works to Victoria, B.C., where they propose erecting a large plant to cut 250,000 ft. a day.

Vancouver, B.C.—C. L. Wiley, of Bellingham, Wash., contemplates the erection of a shingle mill in Vancouver or vicinity early next year.

Vancouver, B.C.—Major Barwis, of Vancouver, and Mr. S. A. Skead, of Calgary, Alta., have secured timber limits and a site for a shingle and lumber mill which they purpose erecting early next spring in Burrard Inlet.

Vancouver, B.C.—The Otis-Pensum Elevator Co., of Toronto, Mr. Thomas Niven, engr., will early next spring erect a factory for the manufacture of their product here. Building to be 25x90 ft., stone foundation, brick superstructure, built over structural steel frame, four stories and basement, at cost \$10,000. Ex-Ald. E. Cook is the agent of the company for Vancouver.

Vancouver, B.C.—The Steger Sand Lime Brick Co., of this city, propose erecting in the near future a sand brick manufacturing plant, to be in operation early next spring. Merritt, Lawler & Merritt, 410 Homer Street, are financial agents for the company.

Victoria, B.C.—Mr. Simon Leiser, of this city, has made arrangements to purchase the sawing machinery and a saw mill at Skidegate, near here, and will at once expend a considerable amount in extensions to this plant.

Koestall River, B.C.—J. J. Sloan, superintendent of the Northwest Commercial Co.'s stores and residing in Vancouver, associated with Mr. K. B. Birkhead, of Minneapolis, Minn., have formed a company which proposes erecting a lumber mill at Koestall River, near Skeena, B.C., to cost about \$40,000.

New Westminster, B.C.—The British Columbia Electric Co., with head offices at Vancouver, are preparing plans for the enlargement to double their present capacity and size of their present car building works in New Westminster. As soon as these plans are completed tenders will be called for the work.

Rock Creek, B.C.—The Kluake Machine Works, of New Westminster, B.C., have been awarded the contract for the iron work for the proposed bridge across the Kettle River here for the British Columbia Government.

Michel, B.C.—Frank Zwick and Otto Meyer, of this place, will in the near future erect a large brewery known as the Elk Valley Brewery. They have purchased a ten-acre piece of land for building.

Vancouver, B.C.—G. Jenkins, of Morrisburg, Ont., has written the Council here asking what inducement they could get for the establishment of a tin-plate factory here, paying in salaries and wages from \$100,000 to \$200,000 annually. The Council is considering it.

Campbell River, B.C.—The International Lumber Co., of Vancouver, propose building a large lumber mill on Campbell River, near here, early next spring, to employ two hundred men.

Alberni, B.C.—The British Columbian Cedar Co. propose erecting a large lumber mill here in the near future. Mr. M. R. Marpole, of the B. C. Government, has charge of the granting of the water lot.

Halifax, N.S.—The Nova Scotia Garment Mfg. Co., of this city, propose adding a third story and a 75 ft. wing to their building. Tenders will be called for in the near future for this work.

St. John, N.B.—The Overall factory of the Deakin's Co. here was damaged by fire on Dec. 6 to the extent of \$3,000. Repairs will be made at once.

Norton, N.B.—Elias Harmer & Sons, of this city, propose erecting a large flour mill here. The proposed structure will be thoroughly modern.

Chesley, Ont.—The County Council of the 10th Concession, Brant, Ont., intend erecting a bridge over the Sauguen River here to replace the present structure. The proposed cost is \$8,000. This work will be commenced in the near future.

Peterboro', Ont.—The Chemong Indians here have decided to ask R. K. Hall, M.P., and T. E. Bradburn, M.P., to take up the matter of building a bridge from their island to the mainland near here. The County Council here will at likely make a grant for this purpose. Plans are being prepared for this proposed bridge, upon instructions from the Chemong Indian Council.

St. John, N.B.—The main factory of the Standard Drain Pipe Co. here was totally destroyed on the night of Dec. 22, entailing a loss of about \$125,000. This firm intend rebuilding at once.

Dalhousie, N.B.—The Dalhousie Lumber Co., whose planning and shingle mill was destroyed some time ago, have reorganized the company and propose re-erecting these mills on a larger scale.

Bathurst, N.B.—The directors of the Bathurst Lumber Co., who propose erecting a large lumber mill here, are: Angus McLeann, J. P. French, Walter Jackson, C. M. Carrier and Hugh McLeann, all of Dufalo, N.Y. Capital, \$100,000.

Bathurst, N.B.—The Drummond Mining Co., of Montreal, have acquired large mining leases in Gloucester County and they are now preparing plans for the erection of a large smelter in this place to be operated from a power plant on the Nipisiquit River.

Moncton, N.B.—Mr. L. Higgins, of the L. Higgins Co., of Yarmouth, has accepted the loan offer of the town and has finally decided to erect a 3-story brick and stone factory here early in the spring.

Gas Plants, Elevators and Warehouses

Toronto.—The Consumers' Gas Co. of this city, have taken out a permit for the erection of a two storey brick office and meter building to be erected on Eastern Avenue, to cost \$40,000. Architect E. H. Herberth has prepared the plans and Messrs. Wickett Bros., of Toronto, have been awarded the contract.

Toronto.—The Ontario Jockey Association propose to erect a number of new stables in connection with the Woodbine Race Track in the near future.

Toronto.—Architects Burke & Horwood, 28 Toronto Street, Toronto, are preparing plans for a \$50,000 warehouse for the M. G. Samuel Benjamin Co., of this city, to be erected at the corner of King Street and Spadina Avenue, to be of mill construction, four stories high, faced with pressed brick, foundations styled to permit of additional stories. Tenders will be called for shortly.

Montreal, P.Q.—H. R. Ives & Co.'s Montreal warehouse was damaged by fire to the extent of \$50,000. A considerable proportion of this loss is in the machinery and plant destroyed, the fire originating in the Japanese room. Total insurance of \$115,000 covers an \$75,000 on buildings and plant. Repairs will be made at once.

Montreal.—Fire recently did \$20,000 damage to the building 144-146 Craig Street, owned and occupied by the Dominion Radiator Co. The damage will be repaired at once.

Hull, P.Q.—The Hamilton Powder Co. here has been ordered by the Council of this place to either build a fire-proof building for their explosives or remove their works to another site. They have refused to erect such a magazine.

Hamilton, Ont.—James Thompson has awarded the contract for the erection of a brick stable on Napier Street, to cost \$6,000, to E. B. Patterson, of this city.

Peterboro', Ont.—George Bennett, of Rockport, N.Y., Jas. Rath, P. Stabler, H. C. Stabler, of this city, are considering the erection of a cold storage plant here.

Waterloo, Ont.—The ratepayers of this town will vote at the next elections on three by-laws, aggregating \$24,000, as follows: New gas-holder, \$10,000; gas works, \$10,000, and \$5,000 for sanitary arrangements at Centre School, the balance for civic improvements.

Port Arthur, Ont.—The flour and feed warehouse owned by Mayor Clavel, of this place, which recently collapsed, will be at once rebuilt. The proposed structure will be 33x120 feet and will cost \$18,000.

Port William, Ont.—Barnett & McQueen, of Duluth, Minn., have been awarded the contract for the rebuilding of elevator "D" in Port William, Ont., for the amount of \$100,000, to cost about \$600,000. The working house will be built of tile and the elevator itself will be sheathed with metal. Chas. Nohr, of Duluth, will be in charge, with office in Port William.

Winnipeg.—The warehouse of the Monney Biscuit and Candy Co., of this city, was damaged by fire to the extent of \$5,000 Dec. 3, fully covered by insurance. The damage will be at once repaired.

Winnipeg, Man.—The following warehouses which were burned to the ground on Dec. 20 will be rebuilt: Dyson Pickle Factory, \$8,000; Frost & Wood warehouse, \$1,000; Rat Portage Lumber Co., \$25,000, stock of lumber, \$85,000; Merrick & Anderson warehouse, \$5,000, all fully insured.

Vancouver, B.C.—Messrs. Boyd & Burns, of this city, propose erecting a five story warehouse and office building here in the near future, to cost \$100,000.

Vancouver, B.C.—Mr. A. G. Potts, of Victoria, B.C., is at the head of a company who propose erecting a large building on a piece of land and purchasing two steamers and equipping them with cold storage plants to bring fish to Vancouver and Victoria markets.

Victoria, B.C.—F. C. Winkler, of this city, has obtained a permit allowing him to erect a warehouse for the storing of mining supplies and explosives on Coblin Island, near here. It will be constructed of concrete, with corrugated iron roof. Estimated cost, \$4,000.

Saskatoon, Sask.—Mr. Sharp, of the Imperial Oil Co., Winnipeg, is in this city with a view to erecting a warehouse for his company here.

Saskatoon, Sask.—The Sawyer-Massey Co., of Hamilton, Ont., will shortly call for tenders for the erection of a warehouse here to cost about \$30,000.

Saskatoon, Sask.—Mr. Wilson, Mayor of Saskatoon, Sask., has formed a company with a capitalization of \$100,000, to build and operate grain elevators and a flour mill here.

Lethbridge, Alta.—The ratepayers of this town, on November 27, have passed a by-law to spend \$30,000 in boring for natural gas, and to purchase the gas well at present opened up for \$13,000.

Northfield, B.C.—The storehouse of the Union Powder Works at Northfield, B.C., was utterly destroyed by an explosion recently. The company propose rebuilding on entirely newproof lines.

Edmonton, Alta.—Messrs. Powell & Handly, of this city, have secured a permit for alterations and additions to their present warehouse, to the value of \$5,000, including the installation of a steam heating system.

Prince Rupert.—The Canadian Fish and Cold Storage Co., of Prince Rupert, has just been incorporated with a capital of \$1,500,000, with which they propose erecting and operating a cold storage plant with a capacity of 5,000,000 lbs. of fish. The officers are: Andrew Kelley, of the Western Flour Mills Co., Winnipeg, President; James Caruthers, Montreal, Managing Director.

Langham, Sask.—The Massey-Harris Co., with head offices in Toronto, intend building a brick addition to their warehouse here next spring. The dimensions will probably be 10x100.

Bridges and Wharves

Toronto.—The City Council of Toronto will at the next Legislature, if the Council of York County and of York Township agree on their portion of the cost, ask for power to build a bridge from the end of Bloor street to continue this street through to Danforth Avenue. This scheme will in all probability carry through successfully.

Toronto.—The contract for the erection of the proposed steel foot bridge in Riverdale Park here has been awarded to Dickson Brothers, of Campbellford, at a cost of \$3,121.

Montreal, P.Q.—Alderman Sadler, chairman of the Level Crossings Committee of the City Council here, states that the Council is considering the expenditure of at least \$2,000,000 for the purpose of assisting the railways to abolish all level crossings here. An effort will be made to have the matter decided before next elections.

Niagara Falls, Ont.—Hon. H. A. McKeown, Attorney General in the Dominion Government, states that the Government will secure the services of W. Hildenbrand, C.E., of New York City, to prepare plans and specifications for a bridge across the Niagara River. The length of the bridge will be not less than \$150,000. James Lowell, M.P.P., has been instrumental in getting the Government interested in this project.

Espanola, Ont.—Dickson Bros., of Campbellford, Ont., have been awarded the contract, by the Dominion Government, for the erection of a bridge over the Spanish River at Espanola, to cost \$25,000; bridge to be about 500 feet long.

Dundas, Ont.—The Council of this place are considering the request of Mr. Linton, manager of Jones Bros.' factory here, that a bridge be built by the town to accommodate a switch over to the works, and also, also, also, for pedestrian traffic. Probable cost, \$2,000.

Port Stanley, Ont.—The Public Works Department, Ottawa, will shortly call for tenders for the erection of a concrete revetment wall 200 feet long to protect the beach at this place. Fred Gelinas, secretary of the department, will doubtless have full particulars.

Warton, Ont.—Kastner & Porter, of Warton, have been awarded the contract for the extension of the dock in this harbor for the Dominion Government.

L'Original, Ont.—Abbot Johnson, clerk of the Counties of Prescott and Russell, L'Original, Ont., will receive tenders until January 21st for the construction of a 120 or 125 foot span over the Big Caster River and for building masonry work for same. Bridge to be of iron. Also for removing the present 80 ft. bridge to a spot about a mile distant from its present location and setting same on masonry.

Warton, Ont.—Johnson, Hunter & Crawford, of Warton, have been awarded the contract for the erection of the proposed dock at White Cloud Island, near here, for the Public Works Department, Ottawa.

Bayfield, Ont.—Messrs. A. Hill & Co., of Mitchell, have been awarded the contract for the erection of an iron bridge over the Maitland River, at Bayfield, to cost \$10,000. Work will commence at once.

Chatham, Ont.—The management of the Michigan Central Railway here propose constructing a subway in the Raleigh side of the town line. This work will probably be commenced at once. Wilson, Pike & Co. are the solicitors for the city of Chatham.

Wingham, Ont.—The Council of this place propose replacing the bridge known as Mackenzie's bridge, by a steel structure on concrete abutments early next year.

Massey, Ont.—The Algoma Steel Bridge Co., of Sault Ste. Marie, Ont., have been awarded the contract for the erection of a bridge at Massey, Ont., to cost \$25,000, to be 500 ft. long.

Kingston, Ont.—J. W. Edwards, County Clerk, Court House, Kingston, has received tenders for filling and the construction of piers in connection with Longhorn Lake bridge.

Brant County, Ont.—The Council of Brant County, Ont., at St. George, Ont., have passed a by-law authorizing the raising of \$14,000 for the building of a steel bridge on concrete abutments.

Canadian Government Work.—The Hon. Mr. Fielding, Minister of Finance, Ottawa, has issued a report on the amount to be expended next year, including the following: Railways and Canals, \$36,987,620; Public Works, \$6,278,000; to include—New wing to Parliament Buildings, Ottawa, \$150,000; Victoria Memorial Museum, \$300,000; Addition to eastern Departmental Block, \$75,000; Quebec Harbor Improvements, \$500,000; Port Arthur and Port William Harbor Improvements, \$600,000; Red River Improvements at St. Andrew's Rapids, \$300,000; Georgian Bay Canal survey (additional), \$40,000; Port Colborne Harbor Improvements, \$20,000. Altogether \$119,000,000 is to be spent in public improvements.

Peterboro'.—L. K. Jones, Secretary Department of Railways and Canals, Ottawa, will receive tenders until February 1st, 1908, for work in connection with Section No. 2 Ontario Rice Lake Division of the Canal. Plans and specifications can be seen at the office of the Chief Engineer of the Department at Ottawa, and the Chief Engineer of the Trent Canal, Peterboro', from whom forms of tender may be had.

Vancouver, B.C.—Ironside, Rennie & Campbell, of this city, have been awarded the contract for the erection of the addition and trestle across False Creek for the trucks of the British Columbia Electric Ry. Co. (Second mention.)

Winnipeg, Man.—The Canadian Northern Railway intend erecting a railway bridge over the Red River here and they are now having plans prepared for submission of the project now in progress between the Canadian Northern Ry., the City of Winnipeg, the City of St. Boniface and the Winnipeg Street Ry. Co., to build a joint railway, electric car, and passenger bridge.

Vancouver, B.C.—The North Vancouver Ferry Co., of this city, will shortly build a pier dock and warehouse and reconstruction at North Vancouver. Mr. C. E. Hope, of Hope, Gravelly & Co., of this city, is authority for this statement.

Victoria, B.C.—J. W. Shafroth, M.P.P. for Victoria, states that the Government will shortly call for tenders for the erection of a bridge 330 ft. long over Rock Creek, near here.

Vancouver, B.C.—The City Council of this city have finally decided to submit a by-law to the ratepayers here at the next election, for the expenditure of \$120,000 for various bridges to be erected in this city.

Mission, B.C.—The Council of this place propose petitioning Premier McBride to have his Government order the erection of a traffic bridge in connection with the railway bridge across the Fraser River here.

Northarm, B.C.—The Hon. Chief Commissioner of Lands and Works, Victoria, B.C., has received tenders for the supplying and erecting of the superstructure of a steel swing span bridge according to plans and specifications with C. Gamble, Chief Engineer, Victoria, B.C.

Sumnerland, B.C.—The Council of the municipality of Sumnerland, near Salmon Arm, B.C., is raising \$15,000 to be expended in the repair of roadways, streets and bridges.

North Arm, B.C.—Sealed tenders will be received by E. Gamble, Public Works Engineer, tenders to be addressed to the Honorable the Chief Commissioner of Land and Works, Victoria, B.C., for the supplying of 600 piles, 10 inches at the small end, 4 1/2 ft. long. Tenders received until December 31st.

Pembina River, Alta.—J. G. Legrand, chief engineer of the Grand Trunk Pacific, with offices in Montreal, estimates the cost of the bridge across the Pembina River to be \$250,000. It is expected the company will shortly call for tenders for the erection of this structure.

Edmonton, Alta.—The Canadian Pacific Railway and the City of Edmonton propose to build a bridge across the company's tracks here to cost \$275,000. Aldermen Manson, Picard and Bellamy form the committee in charge of negotiations for the city, and Vice-President Whyte for the company. This agreement is subject to the city's approval of the plans.

Pointe Aux Trembles, P.Q.—Fred Gelinas, Secretary Public Works Department, will receive tenders until January 7th, 1908, for the completion of the landing pier at Pointe Aux Trembles, P.Q., according to plans with Chas. Decary, Resident Engineer; Chas. Desjardins, Clerk of Works, Post Office, Montreal; and the Postmaster at Pointe Aux Trembles, P.Q., from whom forms of tender may be obtained. L'Anse a la Barbe, P.Q., Secretary Public Works Department, Ottawa, has received tenders for the erection of a wharf at L'Anse a la Barbe, Bonaventure County, P.Q., according to plans with the Department, and with J. L. Michaud, Resident Engineer, Merchants' Bank Building, Montreal, and Ph. Beland, Post Office, Quebec, P.Q.

Hull-Gatineau Point, P.Q.—Mr. Vales, Public Works Engineer for Quebec, has condemned and ordered to be repaired the bridge between Hull and Gatineau Point, P.Q. Mr. Roy is Acting Minister of Public Works for Quebec.

Chicoutimi, P.Q.—Honey & Smith, of Ottawa, have been awarded the contract for the erection of a wharf at St. Alban, Chicoutimi County, P.Q. The work will take about two years to complete and will be commenced at once.

Piche Point, P.Q.—Fred Gelinas, Secretary Public Works Department, Ottawa, will receive tenders until January 8th for the construction of a wharf at Piche Point, Pontiac County, P.Q., according to plans with the Department at Ottawa, with the Resident Engineer at Montreal, and Quebec, and with the Postmaster at Gignee, P.Q.

Mills Point, N.B.—Fred Gelinas, Secretary Public Works Department, Ottawa, will receive tenders until January 10th for the construction of a wharf at Mills Point, Northumberland County, N.B. Plans and specifications, and forms of tender with the Department, Ottawa, with E. T. Shewan, Resident Engineer, St. John, N.B.; Geoffrey Reid, Resident Engineer, station, N.B.; with the Postmaster at Hardwicke, N.B.

St. John, N.B.—Mr. Sears, Mayor, Messrs. Frink, McGoldrick, Baxter and Custing, Aldermen of St. John; Hon. H. R. Emmerson and others deputized the Government to complete wharfage to the extent of 1,500 ft. in St. John harbor. The Government will send an engineer from the Public Works Department to report.

St. John, N.B.—Hon. Mr. McKeown, Attorney General of the Dominion Government, states that the Government intends replacing the suspension bridge at the mouth of the St. John River with a steel arch bridge. In all probability Mr. Hilderbrand, engineer, of New York, will be called upon to prepare plans for this structure. Jas. Lowell, M.P.P. of Lancaster, N.B., has fathered this project.

Prince Edward Island.—Hon. Alexander A. Martin, along with other members representing Prince Edward Island in the Dominion Parliament, will, at the coming session, endeavor to have the Government build a tunnel connecting P. E. I. with the mainland.

St. John, N.B.—The Council of this city propose asking the Dominion Government to build the Clarke and Adams wharf here. Aldermen McGoldrick, Baxter and Bullock are the committee in charge of the negotiations.

Municipal Improvements

Toronto, Ont.—Engineer Rust has recommended the laying of new concrete sidewalks along various streets here to the extent of \$26,850.

Ottawa, Ont.—On January 7 the ratepayers here will vote on a by-law to raise \$33,000 for the purpose of laying a permanent pavement on Byward Market Square here.

Medicine Hat.—On December 10 the ratepayers here passed a by-law to raise the expenditure of \$40,000 for granolithic sidewalks in this place.

Woodstock, Ont.—The Oxford County Council at Woodstock will raise \$350,000 for the purpose of building roads in the County of Oxford.

Fort William, Ont.—A by-law will be submitted to the ratepayers of this place at the next elections authorizing the raising of \$62,000 for improvements next year. The fire water and light committee also propose asking the council for sufficient funds to establish an electric fire alarm telegraph system, a new fire hall, extension of central hall, purchase of chemical engine, etc., according to plans being prepared by them. Medicine Hat.—The Council of this place will submit a by-law to the ratepayers authorizing the raising of money for the purpose of laying cement sidewalks throughout the town.

Ottawa, Ont.—The Council of this city have decided to purchase the necessary property and widen Sussex Street here to a width of 100 feet, at a cost of \$60,000.

Water Works and Sewers

Toronto.—Mr. Rust, City Engineer of Toronto, has reported that the work of constructing the sewer in the Don River Creek cannot be commenced this winter, as the question of the intersecting sewers has first to be ascertained.

East Toronto.—The Town Council here, at the instigation of Councillor Berry, will submit a by-law to ratepayers authorizing the expenditure of \$10,000 for improvements to the waterworks system. By-law will be voted on in January.

Toronto.—The Board of Control of Toronto has sent on to the next year's Board a recommendation to the effect that \$200,000 be expended to construct a storm sewer running from University Avenue to the Don River to prevent the flooding of sewers now down. Mr. Rust, City Engineer, reports that much of this work could go on this winter, which will likely be done.

Toronto.—The Board of Control of this city have passed a motion to devote \$10,000 for building a sewer for a house in the city. Tenders will likely be called for this work soon.

Toronto.—Rutherford Cummings, contractor, Toronto, 15 North Street, was awarded the contract for the erection of a corrugated iron building for a house in the city for testing of sewage, for the Dominion Government Building. Will cost about \$3,000; equipment, \$4,500.

Montreal, P.Q.—The Finance Committee of the City Council of Montreal have recommended that the city purchase as soon as possible a pumping engine with a capacity of 12,000,000 gallons. Mayor Ekers, Alderman Robinson favored it. Mr. Jannin is superintendent of the Waterworks Department.

Montreal, P.Q.—The Council of this city have voted \$40,000 to lay a sewer in Villavray, a suburb recently annexed to Montreal. Work will commence in the near future, according to plans with the City Engineer.

Montreal, P.Q.—The Road Commission proposes asking the City Council to provide for the purpose of constructing sewers and laying pavements in this city next year early in the spring.

London, Ont.—The Council of the City of London will submit a by-law to the ratepayers on January 15th providing for the expenditure of \$93,500 for extension to the supply and distribution of this city's water supply.

Napanee, Ont.—Mr. Davis, civil engineer, of Berlin, Ont., has been engaged by the Council of this town to prepare a report on either a sewage disposal system to cost at least \$10,000, or a system of mechanical water filters.

Burlington Beach, Ont.—The Commissioners of Burlington, Ont., have called for tenders to be received until January 1 for a waterworks system, according to plans and specifications at their office, Federal Life Building, Hamilton. Tenders received in bulk or separate envelopes.

Port Arthur, Ont.—The contract for the installation of the waterworks system of this town has been awarded to Bengston & Johnston here.

Brantford, Ont.—The City Council here will shortly have plans and specifications prepared for the erection of additional galleries for the enlarging of the city's water supply, to cost between \$20,000 and \$30,000. Tenders will be called for in the near future.

Guelph, Ont.—The Engineer for the City of Guelph has presented to the Waterworks Commissioners a report on the proposed water supply for this place, at a cost of \$125,000. The Council have decided to submit a by-law to the ratepayers at the next elections to raise this amount.

Ottawa, Ont.—Mr. Ker, Chief Engineer, and Mr. Parsons, Assistant Engineer, of the City of Ottawa, Ont., have presented a report to the Waterworks Committee here recommending the laying of a new duct, the laying of a new clear-water pipe, and the laying of a high pressure waterworks fire protection system in the business section here. The Council will consider the matter.

Collingwood, Ont.—The Council of this place will shortly submit a by-law to the ratepayers authorizing the expenditure of \$3,800 in improvements to the waterworks system.

Hintonburg, Ont.—The ratepayers of this place have defeated a by-law to raise \$10,000 for waterworks improvements.

London, Ont.—A by-law will be submitted to the ratepayers here authorizing the raising by debentures of \$395,500 for the purpose of securing an additional water supply and installing a waterworks system for same, on January 2nd, 1908. S. Baker is City Clerk.

Hamilton, Ont.—On January 6th the ratepayers here will vote on a by-law to authorize the expenditure of \$50,000 for the purpose of installing electric pumps and extensions to waterworks system here.

Wolland, Ont.—The Council of this town will shortly submit a by-law to the ratepayers providing for the expenditure of \$12,000 towards the construction of a sewer to the Bonis Bag Factory of this place.

Brantford, Ont.—A by-law has been passed here authorizing the expenditure of \$65,000 for improvements and extensions to the waterworks system.

Guelph, Ont.—January 6th is the date on which the ratepayers here will vote on a by-law to raise \$125,000 for additions and extensions to the waterworks system here. Richard Mitchell is City Engineer.

Winnipeg, Man.—M. Peterson, Secretary Board of Control, Winnipeg, will receive tenders until January 15th, for delivery May 15th, of 15 miles of assorted water pipe. Forms of tender and specifications with H. N. Rutan, Engineer of the City of Winnipeg.

Winnipeg, Man.—M. Peterson, Secretary Board of Control, Winnipeg, Man., will receive tenders until January 15th next for the supply of 200 six-inch and 25 eight-inch waterworks hydrants, according to specifications at the office of the City Engineer, Mr. H. N. Rutan, from whom forms of tender may be obtained.

Winnipeg, Man.—The following contracts have been awarded: Dobson & Jackson, sewer connections, \$8,121; E. L. Stephenson, plumbing, \$1,017.77; sewers, Dobson & Jackson, \$2,703.35. All these firms are located in Winnipeg, and tenders are as advertised for under head: "Construction of sewer connections and installation of plumbing in certain properties in the City of Winnipeg."

Winnipeg, Man.—M. Peterson, Secretary Board of Control, Winnipeg, Man., will receive tenders until Thursday, January 2nd, for pumping and air compressing machinery for Well No. 7. Engineer and tenderer and specifications with H. N. Rutan, Chief Engineer, City of Winnipeg.

Winnipeg, Man.—F. L. Drewry, chairman Parks Committee of the City of Winnipeg, has received tenders for the erection and construction of a water tank and tower in Assiniboine Park here. Forms of tender, plans and specifications with J. H. Blackwood, secretary of above committee.

Vancouver, B.C.—The Council of this city has recommended the purchase of 20 acres of land from the C. P. R. for \$5,000 for the purpose of erecting a large water reservoir of concrete. If this deal is put through, as it probably will be, plans will be prepared and tenders called for in the near future for this work.

Vancouver, B.C.—The Commissioner of Lands and Works, Victoria, B.C., has received an application from the C. P. R. for the rebuilding of the dyke originally erected by this company to keep the water of the Fraser River from the Maritime Prairies, near here. The Commissioner will deal with this application at an early date.

Vancouver, B.C.—Wm. McQueen, City Clerk, here, will receive tenders until Jan. 2nd for areas goods and galvanized iron pipe, according to specifications at the Waterworks Office here.

Edmonton, Alta.—The Dominion Government has granted a site of two acres of land to the City Commissioners here on which they propose erecting a water tank, a septic tank for the disposal of sewage from the penitentiary, also a septic tank at the mouth of the trunk sewer and the Saskatchewan Ave. sewer in this city.

Regina, Sask.—R. S. Lee and O. W. Smith, of this city, are at present engaged in formulating a report on the cost of a waterworks and sewage system for this city. These engineers state that the sewage system will be very costly, including contact beds and septic tanks for the treatment of the sewage.

Revelstoke, B.C.—The Council of the City of Revelstoke, B.C., received tenders until December 17th for the construction of a sewage system for the city. H. A. Floyd, City Clerk.

New Westminster, B.C.—The Council of this place have finally decided to construct a reservoir here, probably in Queen's Park. A committee has been appointed to report on a suitable site, prepare estimates of cost and plans. Mr. Shand, of New Westminster, engineer of the New Westminster-Richmond-Delta water scheme, has been asked to submit figures on a supply through an 18 inch pipe, for same.

Ladner, B.C.—A committee appointed by the Council of this place, consisting of H. N. Rich, N. Knight, John McKee, H. D. Bouson, L. W. Embree and H. J. Hutchison, will secure figures and estimates of cost of the proposed waterworks system which this town proposes installing in the near future.

Railway Construction

Toronto.—The Board of Control of Toronto have notified the Street Railway Co. that they must erect waiting rooms at the corner of Main and Bannerman Aves., at the corner of Selkirk and McGregor Streets, and at the city limits, St. James.

Toronto.—The Grand Trunk Railway Co. has offered to supply the city of Toronto with the rails necessary to build the spur line to Ashbridge's Marsh at cost price. This offer was accepted by the city, and a contract will shortly be drawn up covering same.

Toronto.—The Union Station train-shed here will be improved by the placing of a new roof thereon, at a proposed cost of \$5,000.

Toronto-Quebec.—The Canadian Pacific Railway Co. are preparing plans and will start work as soon as possible on the proposed double tracking of their line between Toronto, Montreal and Montreal and Quebec City, which will involve considerable grading and new bridge work.

Montreal, P.Q.—The Grand Trunk Railway Co. propose erecting an extensive terminal station at St. Lambert, on the south shore of the St. Lawrence, opposite Montreal.

St. Mary's, Sarnia, Ont.—The St. Mary's Railway Co. of this city, here, have been asked by the C. P. R. to survey and build a line from this place to Sarnia, the C. P. R. promising to back the proposed railway, which will be 70 miles in length. **Edmonton, Ont.**—The boiler in the Grande Prairie Railway pumping house exploded on Nov. 25, causing considerable damage to the building. The building will be repaired and a new boiler installed.

Sidney-Orillia.—The Canadian Northern Ontario Railway is seeking power from the Dominion Parliament to build a railway from Rathbun, or Sidney, to Orillia, Ont., and also to increase the capital stock of the company by \$19,250,000 to build a line from Ottawa to Montreal, as well as various branches throughout the west.

Kincardine, Ont.—The by-law guaranteeing their share of the bonds of the West Shore Electric Railway has been passed by the ratepayers of Kincardine, Ont. The company will in the near future commence the erection of an electric railway from here to Amherly, to cost \$50,000.

Guelph, Ont.—The C.P.R. propose erecting a large station at Guelph next summer, probably located near the Brunson Road crossing. Details of the building are not yet ready.

Port Arthur, Ont.—The C. P. Ry. Co. propose adding 300 feet to their present freight sheds this winter.

Berlin, Ont.—The Special Committee on Level Crossings appointed by the Council here, has reported against the proposal of the Grand Trunk Ry. for this city to close certain streets and pay a portion of the cost of a subway.

St. Thomas, Ont.—The Council of this city and the Michigan Central Ry. Co. have come to an agreement whereby the city shall pay \$20,000 as their share of the cost of a subway under the M.C.R. tracks here. This by-law will be voted on on January 4th; estimated cost \$66,000.

London, Ont.—The South Western Traction Co. will at once erect a large freight and express shed here, to have concrete foundation and brick superstructure.

Vancouver, B.C.—The Canadian Pacific Railway Co. propose erecting in the near future an extensive series of wharves and freight sheds.

Victoria, B.C.—The Canadian Pacific Railway Co. propose erecting a large terminal freight sheds here. Mr. Marpole, superintendent of this division, is in charge of arrangements.

Cordova, Alaska.—M. J. Haney, of Ottawa, and Toronto, Ont., has been awarded a contract amounting to \$25,000,000 by the Guggenheim Bros., of New York, to build a railway from the Tumn and Nahulna Rivers to Cordova, Alaska. Mr. Haney will commence operations at once. His present address is Seattle, Wash.

Edmonton, Alta.—Mr. P. Crandall, timber purchasing agent for timber west of Winnipeg, will receive offers at Edmonton for the supplying of 600,000 cedar ties, but tamarac, jackpine and spruce ties will be accepted.

Calgary, Alta.—The Alberta Northwestern Ry. Co., with offices in Calgary, will seek power at the next session of the Alberta Legislature to build a line from Calgary to a point on the line of the Grand Trunk Pacific near the Rocky Mountains along the Macleod River.

Edmonton, Alta.—The Grand Trunk Pacific Co. will receive tenders December 23, at their head office, Montreal, for the construction of 120 miles of their railway west from Edmonton. Tenders for further sections of this railway will be also called early next spring.

Newcastle, N.B.—D. Pottinger, General manager Intercolonial Ry. Co., Moncton, N.B., received tenders for the erection of an engine house at Newcastle, N.B., according to plans at the office of the chief engineer, Moncton, N.B., and with the station master at Newcastle, N.B.

Public Buildings

Toronto, Ont.—George Henry, Rushmore road, Toronto, has been awarded the contract for the proposed improvements to the post office of the City of Toronto, at a cost of \$20,000.

Toronto, Ont.—The Provincial Secretary intimated to the members of the Board of Control, to wit: Mayor Coatsworth, Controller Hubbard and Tocken, of Toronto, that in the near future he would approach the Council of Toronto with a view to building a new jail for this city. This will probably not be definitely taken up until the Board or Control for 1908 is elected. The Province of Ontario Public Works Department will finally handle the matter.

Toronto, Ont.—Mr. McCallum, architect, of the City of Toronto, is calling for tenders for the completion of a preservation chamber in the city morgue now being erected on Lombard street here. The probable cost will be between \$8,000 and \$30,000. Tenders were received by Mr. McCallum, but these have been thrown out.

Toronto, Ont.—The chairman of the Board of Control, Emerson Coatsworth, received tenders for the supply of hardware for the Central Fire Station on West Adelaide St., and for the supply of hardware for the City Morgue, Lombard street.

Ottawa, Ont.—The Militia Department at Ottawa has recommended that an appropriation of \$110,000 be placed in the estimates of the Public Works Department towards the erection of a new drill hall at Ottawa, Ont.

Cornwall, Ont.—Fred Gelinus, secretary Public Works Department, Ottawa, has received tenders for alterations to buildings and fittings, post office, Cornwall.

Welland, Ont.—The Public Works Department, Ottawa, has purchased a site in Welland on which they propose erecting a post office. Tenders will be invited shortly.

Kingston, Ont.—The proposed servants' quarters of the R.M.C., Kingston, for which Architect H. J. Smith, of this city, prepared plans, will have stone foundation, brick superstructure, stone front, felt and gravel roof, iron enamel plumbing. Specifications include mantels, drop-proof doors, reinforced concrete, structural iron, metallic lath, metal ceiling, and will be 168x32 feet.

Port Elgin, Ont.—H. Hilker, reeve of Port Elgin, Ont., is calling tenders for the erection of the proposed Carnegie library to be erected here, according to plans prepared by G. S. Kinsey, Architect, Port Elgin, Ont. Mr. Carnegie has donated \$8,000 for this purpose.

Galt, Ont.—The two steam boilers used for heating the post office here exploded. They will be replaced.

Peterboro, Ont.—The Northumberland and Durham county councils here have made application to the Ontario Legislature for confirmation of a by-law to raise \$20,000 for the purpose of building a house of refuge for these two counties. As soon as this is obtained bids will be invited for it.

St. Catharines, Ont.—Mr. Lovelace, the postmaster here, states that he has received blue prints of plans for the refitting and alterations to the post office here. The work will be commenced in the near future by the Public Works Department, Ottawa, Fred Gelinus, secretary.

Ottawa, Ont.—Mr. Scott, chairman of the property committee and mayor of Ottawa, states that the Council will submit a by-law at the next meeting providing for the expenditure of \$8,000 for the purpose of constructing a covered way 82½ feet long to accommodate 200 teams, constructed of steel skeleton work and corrugated iron.

Port Elgin, Ont.—H. Hilker, reeve of Port Elgin, Ont., has bids for the erection of the Carnegie library building here, to cost \$8,000, grant for which amount has been made by Mr. Carnegie. Architect S. G. Kinsey, Port Elgin, prepared the plans.

Chester, Ont.—The Council of this place are agitating, through the member of Parliament for North Bruce in the Dominion House, to induce the Government to build a post office here, similar to the one in Kincardine, to cost at least \$17,000.

London, Ont.—H. F. McNaughten, secretary Public Works Department, Toronto, Ont., will receive tenders until December 19 for the erection of a Hygienic Institute Building for London, Ont., according to plans with the architects, Moore & Henry, London, and with the department.

Michell, Ont.—Mr. Broderick, president of the Board of Trade, has petitioned the postmaster-general at Ottawa to erect a new post office here. He is confident that this request will be granted.

Brew, Ont.—A. A. Wright, M.P., for Renfrew, received a skeleton plan of the post office the Public Works Department of the Dominion Government propose erecting there in the near future. The structure will be three storeys high, full basement, 42 feet square. Tenders will be invited shortly.

London, Ont.—On January 6 next the Council of the City of London, Ont., will submit a by-law to the ratepayers here authorizing the expenditure of \$19,000 for the erection and equipping of two new fire halls to cost \$19,000.

Niagara Falls, Ont.—The City Council are agitating for a new armory for this city. They offer a site if the Dominion Government will erect a \$20,000 armory.

Montreal, Ont.—The Council of this town propose erecting a two-storey brick town hall here to cost in the neighborhood of \$10,000, for which Architects Ellis & Convery, Manning Chambers, Toronto, are preparing the plans. It is expected the proposition will be gone ahead with about March 1 next.

St. Mary's, Ont.—McDonald & Henry, plumbers, of this city, have been awarded the contract for the installation of a heating system here in the post office building.

Peterboro, Ont.—The Council of this place have received a grant of building and land from the Nichols Estate here which they will sell for \$20,000. They propose asking Andrew Carnegie to donate \$15,000 towards the erection of a library.

Petrolia, Ont.—The Council of this place have accepted the gift of \$10,000 from Andrew Carnegie towards the establishment of a library to cost \$20,000 here and as soon as plans have been prepared and approved tenders will be invited for the work.

Montreal, P.Q.—The Canadian Pacific Railway Co. have entered into an agreement whereby the company undertakes to expend \$180,000 in rebuilding the present cattle market here May 3 next.

Sherbrooke, P.Q.—Lamondeau & Dion, of this place, have been awarded the contract for the erection of the proposed drill hall and armory here, at a contract price of \$82,500.

Longueuil, P.Q.—The town hall here was destroyed by fire December 2, entailing a loss of \$5,000. It is insured by insurance. The building will be rebuilt at once.

Brandon, Man.—Resident Architect Sinclair, of this place, has been instructed to prepare plans for a modern rifle gallery, to be added to the armory which the Dominion Government propose to erect here, to cost \$60,000.

Winnipeg, Man.—The Government of Manitoba announces to-day that a new jail will be erected in Winnipeg early next spring, to cost \$150,000.

Regina, Sask.—E. & W. S. Maxwell, 6 Beaver Hall Square, Montreal, P.Q., are the architects whose plans have been accepted for the new parliament buildings to be erected at Regina, Sask., to cost \$1,250,000, to be in the style of the English renaissance. Work will start next spring.

Balgownie, Sask.—The Council of this town (Major Hyde, mayor) is seeking plans and estimates of cost of a combined town hall, fire hall and lock-up, here.

Greenwood, Ont.—The Liberal Association of this place, headed by Mr. MacLaren, M.P., for this constituency, will ask the Dominion Government at the next session to erect a public building here to accommodate the post office, customs, inland revenue departments, etc. In all probability this will be granted.

Langham, Sask.—Mr. Mathew Reid, of this city, has been awarded the contract for the erection of the town hall here. The proposed structure will cost about \$3,000, exclusive of furniture.

Moose Jaw, Sask.—The Council of this city have granted land to the Dominion Government on which the Public Works Department propose to erect an armory to cost at least \$25,000.

North Battleford, Sask.—The Saskatchewan Building & Construction Co., of Regina, Sask., have been awarded the contract for the erection of the proposed court House to be erected here for the Saskatchewan Government. Architects Storey & Von Egmond of Regina, prepared the plans.

Maple Creek, Sask.—Snyder Bros., of Regina, were awarded the contract for building the proposed post office here for the Dominion Government.

Rosthern, Sask.—The Council of this place have had plans prepared and will start operations in the near future on the erection of a town hall and municipal offices here. George Currie, of this place, is in charge of arrangements.

Calgary, Alta.—The directors of the Exhibition here propose to expend \$50,000 in the erection of a 100-foot addition to the present grandstand, and repainting and re-modelling the present buildings. A by-law for the city's share of \$35,000 has been passed by the ratepayers.

Dawson, Y.T.—S. A. D. Bertrand, superintendent of public works of the Yukon, will lay before the Department of Public Works at Ottawa, plans for the rebuilding of Government House in this place.

New Westminster, B.C.—Mr. Kearny, mayor of this place, has been authorized by the Council to do all in his power to induce the Dominion Government to build a fireproof land registry office here.

Vancouver, B.C.—Layfield & Williams, of this city, have been awarded the contract for the erection of the proposed market building in False Creek here, at a price of \$25,000. The structure is to be completed by May 1, 1908.

Ladysmith, B.C.—The Public Works Department, Fred Gelinus, secretary, Ottawa, is calling tenders for the erection of the proposed post office to be erected here, according to plans with the department at Ottawa.

Vancouver, B.C.—McDonald, Wilson & Snyder, of this city, have been awarded the contract for the erection of the proposed court house here, at a price of about \$500,000.

Kamloops, B.C.—The Honorable the Chief Commissioner of Lands and Works, Victoria, B.C., received tenders with reference to the construction and completion of a court house at Kamloops, B.C. Honeyman & Curtis, of Vancouver, are the architects.

Kamloops, B.C.—The Dominion Government have completed plans for the proposed provincial land registry office building, at an estimated cost of \$20,000. Tenders will shortly be called for this work.

Truro, N.S.—Fred Gelinus, secretary Public Works Department, Ottawa, will receive tenders until January 1 for the installation of the new armory building at Truro, N.S., according to plans and specifications with the Department, Ottawa, and with Mr. D. Henderson, clerk of works, Truro, N.S.

St. John, N.B.—Architect F. Neil Bradie, of this town, has been appointed by the committee of Public Safety here to prepare plans for alteration and improvement of the city hall. It is proposed to install an elevator, two lavatories, and redecorate and furnish the top flat of this building for the water works office.

Halifax, N.S.—The S. M. Brookfield Co., of this city, have been awarded the contract for the erection of an addition to the County Court House here at a cost of \$25,000.

Business Buildings

Toronto, Ont.—The Property Committee of the City Council have approved plans for the proposed ferry across the street in place of those destroyed by fire. They will be constructed of wood sheathed with galvanized iron, two-storeys high to permit of passengers' debarking from the upper deck of ferries. The dimensions are 70 x 150 feet, cost \$15,000. Tenders will be called in the near future.

Toronto, Ont.—Mr. Harris, property commissioner, of Toronto, has been instructed by the City Council here to report on a suitable site, preferably Bayside Park, for the erection of a Union Fruit Market, here.

Toronto, Ont.—The manager of the Toronto Industrial Exhibition states that a new entrance to the Fair Grounds will be erected across the foot of Dufferin street at an estimated cost of \$7,000.

Toronto, Ont.—W. H. Cavithra, 48 Wellington street east, has secured a permit to erect two three-storey brick stores at 297-299 Yonge street here, to cost \$19,000. Mr. A. H. Chapman, 59 York street, is the architect. Contracts have not yet been let.

Toronto, Ont.—The York Pioneer and Historical Society, of this city, will ask the Exhibition directors and the Board of Control of this city, to effect the erection of a building to house their relics, to cost \$20,000 or more.

Toronto, Ont.—The Trusts & Guarantee Co. of this city, have purchased No. 43-45 King street west, on which they propose to locate their offices. A new front will be put in, and the building remodelled.

Toronto, Ont.—The Colonial Investment & Loan Co., Toronto, propose erecting a large office building here.

Toronto, Ont.—J. D. McCaul, of this city, has taken out a permit to erect a three-storey store on Jarvis street here, to cost \$60,000.

Chatham, Ont.—The Alexandra block, owned by Stringer & Co., of this place, was burned to the ground on December 23; loss about \$10,000 to four stores on the ground floor and two storeys above for living purposes. Stringer & Co. state they will rebuild at once.

Thomas, Ont.—Dr. C. Fitzsimmons, of this place, has purchased a site on which he proposes erecting a modern store and office building in the near future.

Omeneo, Ont.—The business block here owned by Mrs. Dr. Norris, was burned Dec. 10, loss \$10,000. It will be rebuilt.

Welland, Ont.—James Rankin, of this place, intends to double the length of his present store here and make it two storeys high, early in the near year.

Niagara Falls, Ont.—W. E. McCredie, 66 Barker street, here, has been awarded the contract for the erection of the proposed Ferguson block here for Mr. Ferguson, Messrs. Cole & McMurray, of this place, have been awarded the contract for plumbing.

Brampton, Ont.—T. A. Ivey & Sons, of this city, have had prepared a plan for an extensive range of greenhouses, to be erected covering 30,000 feet of glass, to cost about \$12,000. This work will be commenced at once, and the accommodation doubled in the spring.

Barnford, Ont.—Mr. A. J. Wilkes, of this city, is considering the erection of a block of stores and offices on Market street here. No plans have been prepared as yet.

Montreal, P.Q.—Mr. Fred Scroggie, of the firm of W. H. Scroggie, Limited, states that his firm has secured the erection of a large block of land here on which they propose erecting a departmental store.

Winnipeg, Man.—Architects Wardell & Nichols, 499 Main street, Winnipeg, will receive tenders until January 15 for the erection of an office building, corner of Portage avenue and Carlton street in this city, for the Ontario, Manitoba & Western Land Co.

Saltirk, Man.—The building occupied by Charles Eberhart as a grocery store and attended by J. K. McKenzie, here, was damaged to the extent of \$4,000 on December 22.

Alameda, Sask.—On December 5 the business district of this town was burned, entailing a loss of \$200,000, with insurance of \$25,000. The following firms are affected: Broadfoot's American Hotel, \$20,000; Emerson's Livery Stable, \$4,000; R. T. Gibson, store, \$14,000; Hopper Bros., general store, \$25,000; Crook & McDowell, \$15,000; Farmers' Elevator & Trading Co., \$50,000; Crown Lumber & Hardware Co., \$20,000; Brighton Hotel, \$20,000.

Saskatoon, Sask.—Strong Bros., of this place will shortly call tenders for the erection of a three-storey brick business block 24 x 50 feet, on Main street, here.

Vancouver, B.C.—Alderman D. M. Stewart, of this city, proposes to erect a three-storey fireproof building, with foundations to admit an additional storey in the future, to be 75 x 120 feet. The plans for the same are in the hands of the architect.

Victoria, B.C.—The contract for the erection of the brick stables for the Victoria Transfer Co. has been awarded to the Westholm Lumber Co., the plans for which were prepared by Architect F. M. Rutenbury, of this city.

Victoria, B.C.—Thomas & Martin, contractors, Vancouver, have been awarded the contract for the erection of brick buildings, two-stories high, for a bakery and stables for Bakeries, Limited, in this city, according to plans prepared by Architects Hooper & Watkins, Vancouver.

Vancouver, B.C.—Architects Parr & Fee, of this city, have prepared plans for the erection of a six story office building for Martin & Robertson, to cost \$100,000. Tenders will shortly be called.

Vancouver, B.C.—Architects Parr & Fee, of this city, have taken out permits for the erection of three new office and warehouse buildings to be constructed of stone and brick. One for Martin & Robertson, is to be 52x120 ft., six stories, to be equipped with thirty lifts. One for Bowser & Wilson, 52x120 ft., to cost \$100,000, and one for Boyd & Burns, six stories, 86x120, to cost \$60,000.

Vancouver, B.C.—Messrs. H. C. & L. Elliott, of this city, state that they will shortly start out a project for the erection of a three story apartment house at the corner of Richards and Drake Streets. Plans for the building are now being prepared.

Vancouver, B.C.—Mr. Auld, contractor, of this city, has been awarded the contract for erection of the Horne Block, corner of Esplanade and Lonsdale Avenue, and he will commence work at once. Mr. Horne, of this city, is the owner. The proposed structure will be five stories and basement high.

Vancouver, B.C.—W. H. Gallagher, of this city, will shortly commence a six story business block at the southeast corner of Seymour and Drake Streets.

Vancouver, B.C.—A. Gressman, of this city, will erect, in March, 1908, a ten-story office and store building, to cost \$175,000, on the site of the present Buchanan & Co. Department Store. The ground floor will be fitted up for stores, the balance to be used for office purposes.

Vancouver, B.C.—Cameron Bros., of this city, propose erecting in the near future a business block at the corner of Broadway Street and Ninth Avenue, to be devoted to stores on the ground floor, with apartments above, to cost \$5,100, to be three storeys high.

Vancouver, B.C.—Messrs. Martin & Robson, of this city, are calling tenders for the erection of a six story office building, according to plans and specifications at the offices of Architects Parr & Fee, of this city.

Vancouver, B.C.—Luo Gee Wing, of this city, has had plans prepared for a six story store and office building on the corner of Hastings and Abbot Street here, to cost \$125,000. The structure will be of reinforced concrete construction throughout.

Halifax, N.S.—Architect Herbert B. Gates, Halifax, S.S., has received tenders until December 24th for an office building for the Eastern Fruit Co., Halifax, building to be of brick and stone, hardwood interior finish.

Banks

Montreal, P.Q.—The Montreal City and District Savings Bank has purchased property on the northwest corner of Vinot and St. James St., 42x89 ft., on which they propose to erect a branch bank, beginning May 1st next. Plans now in course of preparation.

St. Thomas, Ont.—The Masbun's Bank have purchased what is known as the Arkell property here, which they propose to erect a branch bank.

St. Thomas, Ont.—Architect N. R. Darrah, of this city, has awarded the contract for the remodeling of the Home Bank Building for the mason work; Green & Sons, carpenter work; Hamilton & Stott, the plumbing and heating; and W. Rose, painting and paperhanging, all of St. Thomas, Ont.

Vancouver, B.C.—Mr. Dewar, manager of the Monarch Bank, at present of Toronto, Ont., states that his company propose moving their head office to Vancouver, where they will amalgamate with another bank and build a head office building.

Victoria, B.C.—The management of the Northern Bank here finally decided to accept the plans of Architect J. C. McKeith, of Victoria, B.C., and will call for tenders in the near future for the erection of a five story and basement bank and office building on the site of the old "Adolph" Block here.

Portage la Prairie, B.C.—Architect Frank Peters, of Portage la Prairie, and Winnipeg, has awarded the contract to Chas. Jeffrey, contractor, Portage la Prairie, Man., for a bank building for the Bank of Montreal at Portage la Prairie. The building will have a stone foundation, brick and stone superstructure, felt and gravel roof, hot water heating, electric lighting, hardwood interior finish, to be two stories high.

Clubs and Societies

Toronto.—The Western District of the Orange Society, at present quarters on Berti Street, have decided to erect a large hall for their use, to be fitted with stores on the ground floor and lodge quarters above, on the corner of Euclid Avenue and College Street. Robert Armstrong, Berti Street, is secretary.

Toronto.—The members of the Toronto Club, at the corner of Wellington and York Streets, are considering the advisability of erecting a suitable building and moving the club headquarters up town, possibly on College Street.

Toronto.—W. M. Mackay, 120 Hazelton Avenue, Toronto, has been appointed General Secretary of the Federal Executive of the University Y. M. C. A., and he will actively canvass for funds for the erection of the proposed Y. M. C. A. in connection with the University of Toronto. Considerable money has already been raised. It is expected the building will cost \$100,000.

Toronto Junction, Ont.—Architects Ellis & Conroy Manning Chambers, Toronto, are preparing plans for a \$35,000 brick and stone Masonic Temple, to be erected here early next spring.

Port Arthur, Ont.—The Masonic Hall, which was burned to the ground recently, will be rebuilt. It was owned by "Shunim" and consisted of a Masonic Hall and they are having plans prepared for the proposed new structure.

Cobalt, Ont.—The Young Men's Christian Association here propose erecting a new building, to cost \$25,000.

North Bay, Ont.—The citizens of this town have decided to establish a Y. M. C. A. building, to cost at least \$50,000. A committee consisting of A. C. Bunting, George Lee, E. E. Eddy, J. Treford, Dr. Brandon, Mr. Dudley, Mr. Hopkins, Provincial Secretary of Y. M. C. A. buildings, and General Superintendent McBrady, of the C. P. R. here, are to obtain data re plans and cost.

Swift Current, Sask.—E. E. Hutchinson, of the firm of Hutchinson-McLishen & Co., Sask., architect, has been commissioned by the Masonic Order here to prepare plans for a Masonic Temple, 25x85 ft., of pressed brick construction. The ground floor will contain stores and offices and the second the Masonic lodge rooms.

Moncton, N.B.—Architect W. C. Barnes, Moncton, N.B., has prepared plans for a Brotherhood Hall, to cost \$5,000, for the First Moncton Baptist Church, to be two stories high, of frame construction, stone foundation, shingle roof, hot air heating, electric lighting, modern plumbing, hard plaster interior finish, two large brick fire-places, two dumb waiters, art glass, prismatic glass. Building by day work, superintended by the Building Committee.

Vancouver, B.C.—The Masonic Temple Co., of this city, composed of H. H. Watson, W. J. Bowser, F. Bowser, S. N. Jarrett, Alex. Bethune and J. W. Prescott, secretary, have had plans prepared and are calling tenders for the erection of a new Masonic Temple. Plans and specifications will be with the Secretary, Masonic Temple, Granville Street.

Victoria, B.C.—The Committee of the Y. M. C. A. here are considering the purchase of two lots on the water front on which they propose erecting a building for the use of the association to cost \$10,000.

New Westminster, B.C.—The Masonic Order here, who recently sold their block on Columbia Street, are negotiating for a site on the corner of Lorne and Aznes Streets, on which to erect a Masonic Hall, with site work on the ground floor, to cost at least \$5,000.

Opera Houses, Rinks, Etc.

Port Arthur, Ont.—Aldermen Horriagan and Carrick, and the Mayor of this city, have been appointed a committee to secure plans and estimate for a skating house. The town hall here to replace the Masonic Hall destroyed by fire recently.

Sudbury, Ont.—The Sudbury Opera House Co., of this place, has been incorporated with a capital of \$50,000 for the purpose of erecting an opera house here. Tenders will be called for this work in the near future.

Ottawa, Ont.—Ambrose J. Small, manager, of the Grand Opera House, Toronto, has had plans prepared for a theatre which he proposes to erect on the site of the Sussex Hotel. Ottawa to be five stories high, and cost \$200,000. It is understood that this work will be rushed forward without delay, so as to be completed within one year.

Winnipeg, Man.—The Imperial Theatre Co. have accepted the plans of Architect L. O. T. Bristow, of this city. Tenders will be called for the work shortly, which will commence as soon as the frost is out of the ground. The cost will be \$80,000.

Edmonton, Alta.—Messrs. Willis & Cosgrove, of Calgary, have secured control of the theatre here and they propose to spend at least \$5,000 in improvements to same.

Orillia, Ont.—Mr. Peter Fletcher, of this place, will erect a covered rink here, 200x95 feet.

Amherstburg, Ont.—John Fraser, of this place, proposes to erect a roller rink here in the near future.

Midland, Ont.—The people of this place are applying for a provincial charter to incorporate them to erect a roller rink.

Saskatoon, Sask.—Messrs. Elford & Cornish, of this place, have agreed to accept a bonus of \$450 from the town, in consideration of which they propose to erect a rink to cost about \$5,000.

Forno, B.C.—C. J. Digbie, of this place, has been awarded a contract for the erection of the proposed rink for the Fernie Ink Co., at a cost of \$18,700. Mr. G. G. Moffat is manager for the company.

Asylums and Hospitals

Toronto.—Mr. Frederick Roper, of the Board of Grace Hospital, states that the Board has purchased property 250x150 ft. in the rear of the hospital on which they propose erecting a large addition to the hospital as soon as funds can be raised.

Toronto.—The City Council has voted \$6,500 for the erection of an addition to the Children's Shelter on Simcoe Street. J. K. Macdonald, of the Confederation Life Assurance Co., is interested in the work.

Toronto.—A. P. Miller, secretary Toronto General Hospital, Toronto, has prepared plans for the erection of a one-story brick building on Bay Street.

Belleville, Ont.—The Council of the City of Belleville, Ont., has finally decided to proceed with the erection of an isolation hospital here.

Hamilton.—Miss Jeanette Lewis, the eugenist, is endeavoring to raise funds for the erection of a sick children's hospital here.

Belleville, Ont.—The Women's Christian Temperance Union of this place, who own the hospital in Belleville, have asked the City Council to grant them \$25,000 for the purpose of building additions to and improving the hospital.

Belleville, Ont.—The Council of this city are about to let the contract for the proposed Isolation Hospital at a proposed cost of about \$4,000.

London, Ont.—Architects Moore & Henry, of this city, are preparing plans for an addition to St. Joseph's Hospital, to be erected early next spring.

London, Ont.—The Hospital which the City of London and the County authorities propose erecting will cost in the neighborhood of \$20,000. Mr. James Blair has donated \$20,000 toward the scheme.

London, Ont.—In conjunction with the County of Middlesex the Council of this city propose erecting a Tuberculosis Hospital here to cost \$10,000, near the City of London, and the Council of this city will, on January 6th, submit a by-law to the ratemayers to raise \$6,000 as the city's share of this hospital expenditure.

Peterboro.—Mr. Eyles, chairman of the Board of Health, and Mayor McWilliams, of this place, will appoint a committee to fully consider plans for the establishment of an Isolation Hospital here.

Welland, Ont.—Architects Langley & Howland, Continental Life Building, Toronto, are preparing plans for an hospital for the town of Welland, Ont., to be of brick and stone construction. Tenders will be called for early in March.

Calgary, Alta.—M. C. Bernard, of the Hospital Board here, states that the Board proposes taking the four best plans recently submitted in competition and asking for tenders for an hospital building to cost not more than \$140,000, bids to be in by February 1st.

Strathcona, Alta.—The Council of this town has purchased a site for \$10,000 for an hospital. Plans have been prepared and approved, and in a short time tenders will be called. A by-law to raise \$100,000 is being introduced. The date on which the ratemayers of this city will vote on a by-law to authorize the raising of \$100,000 for the purpose of establishing a city hospital here.

Vancouver, B.C.—Alderman Ramsay, of the Finance Committee of the Council of this city, has asked permission on behalf of the Committee of the Hospital Board, to submit a by-law to raise \$130,000 for a new wing, a new boiler, electric dynamo and motor, an extension to chimney and a cold storage plant. This by-law will be submitted at next elections.

North Vancouver, B.C.—Councillors Nye and McNaught have been appointed by the Council of this place to secure plans looking to the erection of the hospital here.

Vancouver, B.C.—The ratemayers here will vote on a by-law on January 9th to raise \$130,000 for the purpose of erecting an addition to the Vancouver General Hospital. Wm. McNaught, Vancouver, is City Clerk.

Halifax, N.S.—Mr. F. D. Corbett, of this city, has donated \$10,000 towards the erection of a sick children's hospital here. \$10,000 has been raised by subscriptions and the City Council have donated \$5,000. Mrs. J. Morrow, of this city, states that plans will be prepared at once for a building to cost at least \$10,000. Work will be begun early next spring.

Schools

Toronto.—The Kent School, contracts for which the Board of Education have let may have to be enlarged from the original estimate of eight rooms to over twelve rooms. The plans of this school provide for an eventual building of 32 rooms.

Calgary, Ont.—John S. McDonald, Galstan P.O. Office, received tenders until December 24th for the erection of a frame, brick veneered, schoolhouse in S.S. No. 2, Calvin, Ont., according to plans with the above, or at the "Times" office, North Bay, Ont.

Churches

Kincardine, Ont.—John Mills, of Kincardine, has been awarded the contract for extensions to Central School in this place, at a figure of \$7,810. It will proceed with the work early next year, if the by-law carries.

Sault Ste. Marie, Ont.—The Ontario Government has donated \$5,000 towards the erection of a schoolhouse which the Council of Sault Ste. Marie propose erecting in the near future, to cost between \$15,000 and \$25,000.

Dundas, Ont.—The Council of this town gave the necessary two readings to, and will submit a by-law to the ratepayers at the next elections authorizing the raising of \$25,000 for the purpose of building a high school here.

Dundas, Ont.—A committee composed of Chairman Steele, Trustees Peterson, Smith, Douglas, Minty, Collinson and Davidson, of the local School Board, will examine and report on sites for a new high school, after which the Council will be asked to raise \$25,000 for the work.

Peterboro, Ont.—Rev. Father Twomey, bishop of St. Michael's Parish, states that it is the intention of his people to erect a \$50,000 Separate School in connection with their church.

Picton, Ont.—The Collegiate Institute here, now in course of erection, was damaged by a falling pediment to the extent of \$2,000.

Winona, Ont.—The trustees of the Public School Board here have received orders to enlarge the school here. Building operations will commence this spring.

Paris, Ont.—The Board of Education of this place will receive tenders until January 14th for the erection of a school, according to plans submitted by, and seen at the office of the Secretary of the Board of Education. Mr. Penman, of the Penman Mfg. Co., has offered to bear one-fifth of the cost.

Lafontaine, Ont.—The Roman Catholic convent at Lafontaine, near Penoulang, Ont., was badly damaged by fire, the roof being totally destroyed. Fully insured.

Kincora, Ont.—Architect James S. Russell, Stratford, Ont., has prepared plans for the addition to the Roman Catholic School at Kincora, Ont., to be 23x43 1/2 ft., erected of concrete and white brick. Sealed tenders were received by the architect and Rev. Father Emery, at Kincora, Ont., until November 30th. Awards not yet made.

Toronto, Ont.—Contracts will be let shortly after January 1st by the Board of Education for the erection of a new \$100,000 Technical School.

Kincardine, Ont.—J. H. Seonall, Secretary Kincardine Board of Education, received tenders until December 1st for the remodelling of the Central School, Kincardine, Ont.

Ottawa, Ont.—James J. Smith, of this city, has been awarded the contract for erecting fire escapes in connection with the Osgoode and First Avenue schools here at a cost of \$1,250.

Bellefleur, Ont.—The Catholic Convent School at Bellefleur was completely destroyed by fire on November 24th; loss, \$25,000. It will be at once rebuilt.

Montreal, P.Q.—E. G. Cape, of this city, has been awarded the contract for the erection of three story fire-proof school on Ottawa and Avenue St. Louis, at a cost of \$40,000, for the Protestant School Board, according to plans prepared by Architects Edward and W. S. Maxwell, 6 Beaver Hall Square, Montreal. The structure will be built entirely of iron, steel and brick.

Winnipeg, Man.—The committee appointed by the Provincial Government of Manitoba is looking over sites with a view to securing a suitable one for the erection of a Provincial University.

Kildonan, Man.—This municipality is considering the construction of a school to cost \$7,000.

Strathcona, Alta.—The Public Works Department of the Alberta Government propose to erect a Provincial University here in the near future.

Francis, Sask.—Wm. Anderson, W. Dynes, A. McDonald, N. Woods and W. G. Robinson, School Trustees of this place, are making arrangements for the erection of a four-roomed brick schoolhouse, to be erected here early next spring.

Edmonton, Alta.—Architect R. W. Lines, of this city, has prepared plans for two temporary schools, to cost \$1,800 each, which will be erected by the city.

Langdon, Alta.—The Council of this place propose erecting a church to cost \$5,000.

Regina, Sask.—The Public School Board here, composed of S. Jamieson, chairman; J. A. McLachlan, secretary; W. Mollard, R. Martin and W. M. Williamson, have decided to secure a site on which to erect a Collegiate Institute.

Saskatoon, Sask.—The Board of Education here, composed of J. E. Cairns, C. W. Duran, W. J. Bell, John Ashworth and D. P. Mackintosh, for the High School Board have decided to erect a new school here early next year, to cost at least \$25,000. The Public School Board, composed of J. E. Paul, A. J. Sparling, Vancouver, B.C.—The Diocese of the Anglican Church here will shortly have plans prepared for a theological college here, \$10,000 has already been donated for the work and it is quite possible active operations will begin in the coming spring.

Toronto, Ont.—Rev. Father Walsh, of this city, pastor of St. Helen's Catholic Church, Dundas street, Toronto, has decided to call tenders for the erection of proposed new St. Helen's Church, work to be commenced early next April; cost \$50,000.

Toronto, Ont.—The Christian Scientists, Toronto, propose erecting a new church to cost \$150,000. The committee in charge claim they have the plans prepared, and that they will commence erection in the near future, a site having already been purchased.

Toronto, Ont.—The congregation of North Parkdale Methodist Church here propose erecting a new church if they can dispose of the present structure to the Masons of Alpha Lodge, who propose purchasing and remodeling it for quarters for their lodge.

Toronto, Ont.—Arthur W. Holmes, architect, 10 East Bloor street, Toronto, has received tenders for all trades, except heating, for the erection of the proposed St. Helen's Church on Dundas street, Toronto.

Toronto, Ont.—Rev. Father Hinn, of St. Paul's Roman Catholic Church here, states that he has decided to have a new marble altar installed in his church to cost at least \$7,000.

Brussels, Ont.—The Presbyterian congregation here, Mr. Wishart, B.A., pastor, are considering the erection of a new church to replace their present old structure.

New Liskeard, Ont.—The Methodist Church on Elm avenue, in this place, was burned and the ground recently it is understood that the edifice will be rebuilt.

Ottawa, Ont.—St. Bridget's Catholic Church is to be redecorated and renovated according to plans prepared by Architect Renaud, of Montreal. The altars, railings, wainscoting and pews are to be renovated and a new hardwood floor laid. Estimated cost \$4,000.

French River, Ont.—The residents of Bleheim, Ont., and the students of Knox College are endeavoring to collect sufficient funds to build a memorial church at French River, to commemorate the death of Mr. Cyril Jamieson.

St. Thomas, Ont.—The Trustee Board of Grace Methodist Church here have decided to solicit subscriptions with a view to building a new church. Rev. Dr. Gundry is pastor.

Geolph, Ont.—Architect H. P. Smith, the Lutheran Congregation, states that his congregation will build a church here in the spring.

Erinville, Ont.—Architect H. P. Smith, Kitchener, is preparing plans for a stone tower to the Church of the Assumption, Erinville, Ont.

Geolph, Ont.—The Lutheran Congregation of this city have decided to build a new church next spring.

Ottawa, Ont.—Rev. F. G. Robinson, pastor of the Ottawa South Methodist Congregation, is present canvassing for funds for the erection of a church for this congregation.

St. Thomas, Ont.—The Latter Day Saints here have appointed a committee of S. Pearson, J. E. Shroyer and J. H. Birr, to secure plans, specifications, etc., of an addition to their church.

Clinton, Ont.—The congregation of St. Joseph's, under Rev. Father Hanlon, will erect a new church on the site of the present structure, next spring, to cost in the neighborhood of \$20,000.

Ottawa, Ont.—Archbishop Duhamel, Ottawa, has secured a lot of two acres from Mr. Thos. C. Keefer near Clarkson, Ont., on which the Roman Catholic Congregation of this district will erect a church in the near future.

Vancouver, B.C.—The congregation of Christ Church here decided to have plans prepared for alterations and additions to their present edifice. Work will not be commenced until early next spring.

Vancouver, B.C.—The congregation of Christ Church here propose making alterations to their church to increase the present seating capacity one third.

Black Lake, P.Q.—The Roman Catholic Congregation of this place propose erecting a church to cost \$60,000. The site has already been purchased.

Langdon, Alta.—The Presbyterians of this place propose erecting a church in the near future to be constructed mainly of concrete at an estimated cost of \$5,000.

Nelson, B.C.—Architect Thomas Hooper, Vancouver, is preparing plans for the proposed Methodist Church to be erected here.

Black Lake, P.Q.—Architects Ouellet and Levesque, 117 St. John street, Quebec city, have prepared plans and specifications for the interior finishing and decoration of the Roman Catholic Church at Black Lake, Que., and will receive tenders for this work about May.

Black Lake, P.Q.—Architects Ouellet and Levesque, 117 St. John street, Quebec city, have prepared plans and will receive tenders until January 9 for the enlargement of the Roman Catholic Church at Black Lake, P.Q., to be of wooden clapboard construction, galvanized iron roofing, stone foundation, hot air heating, electric light.

Quebec, P.Q.—Adjutant Snow and Capt. Chas. Snow, Richards of the Salvation Army, state that they have completed plans and will start operations on January 1 for remodeling the present barracks at a cost of \$15,000. This will include the installation of extensive bathing equipment and improved sanitation.

Residences and Flats

Toronto.—The Civic Committee, including Controller Hocken, of the Board of Control of Toronto, will seek legislation from the Ontario Government empowering them to build houses for workmen in St. John's Ward. They propose starting with an amount of \$100,000.

London, Ont.—Architect Wm. G. Murray, Masonic Temple, London, Ont., prepared the plans for a \$4,500 residence for H. A. Kompas, London, to be of brick construction, cut stone trimmings, mantels, hot water heating, electric lighting, modern plumbing, state roof, dumb waiter, and refrigerator.

Burgessville, Ont.—Mr. S. Threlwell, architect, of Woodstock, Ont., has been instructed to prepare plans and estimated cost of a parsonage which the Methodist congregation of Burgessville propose erecting in the near future.

Notre Dame, P.Q.—Architects Ouellet & Levesque, 117 St. John Street, Quebec, have prepared plans and awarded contracts to Jns. Couture, of Levis, P.Q., and Yandry & Matte, of Quebec City, for a residence to cost \$4,500, for Rev. P. Begin, Limoilou, P.Q., to have stone foundation, brick superstructure, galvanized iron roof, hot water heating, electric lighting and up-to-date plumbing.

Vancouver, B.C.—Architects Parr & Fee, of this city, have prepared plans for a \$50,000 residence and estate after the manner of the landed gentry's estates in France. In addition over twenty cottages will be built to employ that number of families in tilling the land. The city for which these plans are prepared and for whom the work will be done is stopping at the Hotel Vancouver, but his name has not as yet been ascertained.

Victoria, B.C.—Mr. Dunsmuir, Lieutenant-Governor of British Columbia, has purchased the Hatley Park property here of 250 acres, on which he proposes erecting a large residence for himself.

Vancouver, B.C.—Hood Bros., of this place, have filed plans and will call for tenders in the near future for the erection of an apartment house, corner of Davie and Horby Sts. here, 50x120 ft., frontage of 75 ft., to cost about \$22,000.

Hotels

Toronto.—Improvements to cost \$30,000 are to be made in the Walker House. A permit has been applied for to the City Architect. This improvement work includes a new entrance, and remodelling of the interior.

Montreal, P.Q.—Quinlan & Co., of Montreal, have been awarded the contract for the foundations of the proposed Grand Trunk Hotel here, and they will commence work in a day or so. The tunnel from the station to the hotel under Rideau Street will also be constructed during the winter by this firm.

Montreal.—The Queen's Hotel here propose making alterations and additions to their hotel premises to cost at least \$1,500,000, according to the statement of the manager.

Geolph, Ont.—The Royal Hotel here was damaged by fire to the extent of \$2,000 in the basement only.

London, Ont.—The King Edward Hotel Co., composed of George Christie, Geo. C. Gibbons, K.C., Edward Meredith, K.C., Thos. Beattie, M.P., and Philip Pascoe, all of London, has been formed here, with the intention of building a new hotel, to cost \$500,000.

Lake of Bays, Ont.—Architect George W. Gaultier, Temple Building, Toronto, has prepared plans for a two story summer hotel to be erected on Lake of Bays, opposite Big-man's Island, to cost \$50,000.

Ottawa, Ont.—Architect B. L. Gilbert, of New York City, with offices in Ottawa, who has charge of the proposed hotel for the Grand Trunk here, states that he is now preparing preliminary plans preparatory to calling tenders for the superstructure of this structure. He expects to be ready for tenders about the first week in January.

London, Ont.—John P. Evans has obtained control of the Grigg House here and intends spending \$10,000 in remodeling it.

Peterboro, Ont.—Architects Stroud & Saunders, of Toronto, are preparing plans for extensive additions to the Hotel National here, under orders from W. Young Kinley-side, manager of the North American Investment Co. of Toronto.

Vancouver, B.C.—Architect E. E. Blackmore, of this city, has prepared plans for a two-story bathroom of 148 rooms, 100 ft. long, to be equipped with shower baths, sanitary conveniences, etc., to cost about \$5,000. This structure will contain the boat division on the ground floor and will be erected by the City Council at Kitsilano Beach here in the near future.

Frank, B.C.—The Canadian American Coal and Coke Co. of Frank, B.C., propose erecting a four-storey hotel and sanitarium on the site of the present sanitarium at Sulphur Springs, near here. Mr. S. M. Moore is the manager of the company.

Red Deer, Alta.—Charles, Reed and Wm. Stickland, of this place, have taken over the Windsor Hotel here, which they intend to considerably enlarge next spring.

Vegreville, Alta.—\$50,000 damage was caused by fire to the Alberta Hotel, J. J. Mohr's store, and Mr. A. Dutcher's store. They will be repaired at once.

Quebec, P.Q.—The hotel here owned by M. Duran was burned to the ground, entailing a loss of \$15,000, with insurance of \$10,000. It will be rebuilt at once.

Quebec, P.Q.—The Provincial Construction Co., 23 Jordan Street, Toronto, has been awarded the contract for the first addition of the proposed enlargement of the Chateau Frontenac, Quebec, owned by the C. P. R. W. S. Paynter is the architect for the company, with office at 100, St. James Street, Montreal. Other additions to complete the plan of enlargement will be constructed after this first portion is finished.

Beausjour, Man.—The Beausjour Hotel here, owned by Mr. Beausjour, was burned to the ground last night, causing a loss of \$20,000, with insurance of \$12,000. It will be rebuilt. The hotel was owned by Mr. Vass, and operated by Mr. Berger.

Electrical Construction

Montreal-Toronto.—Through the efforts of Mr. Rodolphe Forget, 3713 Notre Dame St., Montreal, and the Montreal capitalists has been formed to develop electrical power in Quebec and Ontario, to assist in the development of the Montreal Light, Heat & Power Co., and the Toronto Street Railway and the Quebec Railway Light & Power Co.

Toronto, Ont.—Dr. J. O. Orr, manager Toronto Industrial Exhibition, will collect in the city hall a number of having plans and specifications prepared for the proposed electric plant to light the Fair Grounds. As soon as these are complete tenders will be called for the work.

Toronto, Ont.—The Board of Control of the City of Toronto decided to expend \$4,000 in additions to the fire alarm signal telegraph installation of this city.

Port Hope, Ont.—January 5 is the date on which the ratepayers of Port Hope, Ont., will vote on a by-law to raise \$7,500 for the purpose of installing an electric light plant here.

New Hamburg, Ont.—The ratepayers of this place will on January 6 vote on a by-law to raise \$10,000 for the purpose of installing a distributing system for hydro-electric power.

Brantford, Ont.—A by-law will be submitted to the ratepayers here on January 7 to authorize the expenditure of \$55,000 for a distributing system for hydro-electric power purposes only. H. F. Leonard is city clerk.

Woodstock, Ont.—The Council of this city have secured the approval of the water and light commission and they will submit a by-law to the ratepayers at the next election providing for the expenditure of \$13,500 for a distribution plant, \$9,000 for an electric motor for the water and light plant, and \$5,000 for an electric pump.

Perry Sound, Ont.—The Board of Railways and Canals will be solicited by this town for permission to build a \$20,000 power plant and to raise debentures for the purpose. The Government has been petitioned to send an engineer to the Equin River, where the power is generated, to see if the water supply cannot be improved. Hon. Frank Cochrane, of the Ontario Government, will see what can be done. J. B. Miller, of the Perry Sound Lumber Co., is interested in this request.

Hamilton, Ont.—The City Council have decided to submit a by-law to the people at the next municipal elections in January, authorizing the expenditure of \$225,000 for a system of distribution of hydro-electric power. A by-law for water works pumps will also be submitted, authorizing the expenditure of \$50,000 for this purpose.

Hamilton, Ont.—The fire and water committee of the Council of this city have decided to call for tenders for supplying and installing of the proposed electric pumping engines, to be operated by power from the Hydro-Electric Power Commission. This work will be open to foreign as well as domestic concerns.

Dundas, Ont.—The substitution of the Cataract Power Co. of Hamilton, was burned out recently, entailing considerable loss. The damage to be at once repaired.

Ottawa, Ont.—The Metropolitan Electric Co. have refused to sell their electric generating plant at Ottawa to the Ottawa City Council for \$175,000, consequently the by-law authorizing the raising of this amount will have to be withdrawn. The Council proposed purchasing this plant and enlarging it.

Napance, Ont.—The ratepayers of this place will vote on a by-law on January 7 next to authorize the expenditure of \$10,000 for extending and improving the electric light plant here.

Parliament Buildings, Toronto.—H. F. McNaughton, secretary Public Works Department, Parliament Buildings, Toronto, Ont., will receive tenders until January 9, 1908, for the rewiring of the Parliament Buildings, Toronto, according to plans and specifications with the approved cheque for \$5 per cent. of tender, payable to the Hon. J. O. Reaume, Minister of Public Works, must accompany each tender.

Ottawa, Ont.—On January 3 the Council of this place will submit a by-law to the ratepayers authorizing the expenditure of \$175,000 for a purchase of works and lands of the Metropolitan Electric Co., Ottawa, with works at Britannia, Ont.

Guelph, Ont.—Jos. McCartney, clerk of the Corporation of the Town of Guelph, states that the by-law to raise \$60,000 for installing a distribution system for hydro-electric power, will be submitted to the people of Guelph, Ont., on January 7 next.

St. Thomas, Ont.—The Council of this city have decided to submit a by-law to raise \$12,000 for a distribution plant for hydro-electric power, at the next elections.

Borlin, Ont.—The Council of this place will submit by-laws to the people approximating \$40,000, possibly \$50,000, for improvements to the electrical system of the street railways and lighting plants, and sundry municipal improvements. Mr. Breithaupt, chairman.

Welland, Ont.—The Ontario Power Co. have had plans prepared and will soon call tenders for the erection of a transformer house 30 x 50 feet, two storeys high, with full basement, to be constructed of brick, concrete foundations.

Ingersoll, Ont.—The Council of this place will submit a by-law to the ratepayers at the next municipal election to raise \$50,000 to buy out the Ingersoll Electric Power & Light Co., after which the Council will consist of a contract to be entered into with the Hydro-Electric Power Commission.

Welland, Ont.—Edward C. Mason, of Boston, Mass., is asking the Town of Welland to grant him a franchise for twenty years to add to his company to build and operate an electric railway system there. The Council are considering the alteration of the by-law previously drawn up, which was read a first time.

Halleybury, Ont.—Hon. Frank Litchford, James C. M. Stone of Cleveland, Ohio; J. O'Brien, Renfrew; J. W. Fitzpatrick, Ottawa, and Mr. Fitzpatrick, New Liskeard, Ont., have been granted a franchise to build and operate an electric railway between Cobalt and Halleybury, work to be finished within eighteen months and July 1st next. At least 12 miles of road will be built.

Hamilton, Ont.—The Cataract Power Co.'s power house here was damaged by fire to the extent of \$1,500.

London, Ont.—The Council here have decided to submit a by-law to the ratepayers of this city at the next elections on January 6, to provide for the raising of \$235,000 for the installation of a distributing system for Niagara power from the Ontario Hydro-Electric Power Commission.

Montreal, P.Q.—Messrs. Ross & Bolgate, electrical engineers, have submitted a report to the City Council to the effect that, by using the garbage of the city as fuel in conjunction with coal, in a remodelled incinerator plant, which would cost \$102,000, and an electric engine, cost \$182,100, power could be produced at a less cost than the charges of the Montreal Light & Power Company.

Montreal, P.Q.—The Council of this city will shortly submit a by-law to the ratepayers intended to provide for the expenditure of a large sum for the purpose of laying conduits through the business district for the doing away with all overhead electric wires. Alderman Martin, of the city council, will submit the by-law to the Council first.

Thetford Mines, P.Q.—J. W. Barrette, contractor of Quebec City, has been awarded the contract for the electric lighting of the Roman Catholic Church here at a cost of \$1,350. The architects were Ouellet and Lesieur, 117 St. John's street, Quebec.

St. Vital, Winnipeg.—The ratepayers of Winnipeg voted on a by-law, December 17, to raise \$80,000 for a generating plant and electric railway for the purpose of running the city street lighting at St. Vital. This electric trial unit is proposed to run by producer gas in connection with gas engines.

Point Du Bois, Man.—Prof. Louis Herdt, Wm. Kennedy, Jr., of Montreal, and Col. H. S. Rutten, chief engineer of the City of Winnipeg, have been instructed by Mayor Ashdown and the Council to make what changes are necessary in the plans for the Point Du Bois power development plant, preparatory to calling for new tenders.

Saskatchewan Government.—According to Hon. Walter Scott, premier of Saskatchewan, his government have decided to establish a Government controlled long distance telephone service in the province, in the near future.

Calgary, Alta.—The Council of this city is considering the establishment of a new \$250,000 electric power and light generating plant. The city now operates its own system, but the town is increasing in size and a new plant is considered to be the best way to meet the demand. The Council will welcome plans and estimates.

Jordan River, B.C.—The British Columbia Electric Ry., of Vancouver, B.C., has staked water rights on the Jordan River, near here, on which they propose erecting an hydro-electric power house to develop 29,000 h.p. for supplying power to the City of Victoria, B.C. Mr. A. T. Goward is the local manager, with offices at Vancouver.

Vancouver, B.C.—The British Columbia Electric Railway Co., announce that immediately upon the completion of their present 10,000 h.p. unit at Lake Buntzen, B.C., they will install another 10,000 h.p. unit to cost \$300,000, and when this is installed they will erect still another unit of the same power immediately after.

Vancouver, B.C.—The Canadian Pacific Railway has prepared plans for the electrification of the Columbia & Western Ry., controlled by them. They propose using power from the West Kootenay Light & Power Co.

Kamloops, B.C.—The City Council here have accepted the tender of the Canadian General Electric Co., of Toronto, to supply and erect a gas producer electric light plant for the sum of \$8,300.

Torbrook, N.S.—The Londonderry Iron Mining Co., of Londonderry and Torbrook, N.S., will install an electrical power and light plant at their mines in Torbrook, N.S., to cost \$10,000.

Fredericton, N.B.—The Drummond Mines Co., John J. Drummond, of Montreal, with present headquarters at Londonderry, N.S., has been granted power by the government of New Brunswick to build a dam over the Nepisiguit River near here for power to run their iron mines. They propose spending \$500,000 within the next year on the mines and dam.

Sidewalks of Lava Flags

THE system generally in use for road laying in Greece is macadam, or a layer of an average depth of about 6 inches of rough cobbles with uneven edges of a diameter of about 1 to 2 inches, covered with a layer of sand of a depth of 1.5 to 2.5 inches and pressed by a steam road roller.

The preference is given to the latter system on account of its cheapness, to cost per square meter (1 square meter or square = 1.196 square yards) being 5 to 6 drachmas (5.45 drachmas = \$1), except in the Thessaly district where a dam over the Peneios, the cost amount to 10 drachmas per square meter. Lately some of the streets and squares of Athens and Piræus, covering an area of about 150,000 square meters, have been laid with artificial asphalt at a cost of about 15 francs (15 francs = 19.2 cents) per square meter. This work has been done by foreign contractors. The seaside walk of Piræus, representing an area of 20,000 square meters (about 8 square miles), is being laid with Vesuvius lava flags at a cost of 13 drachmas per square meter.

Ry. From Moose Mine

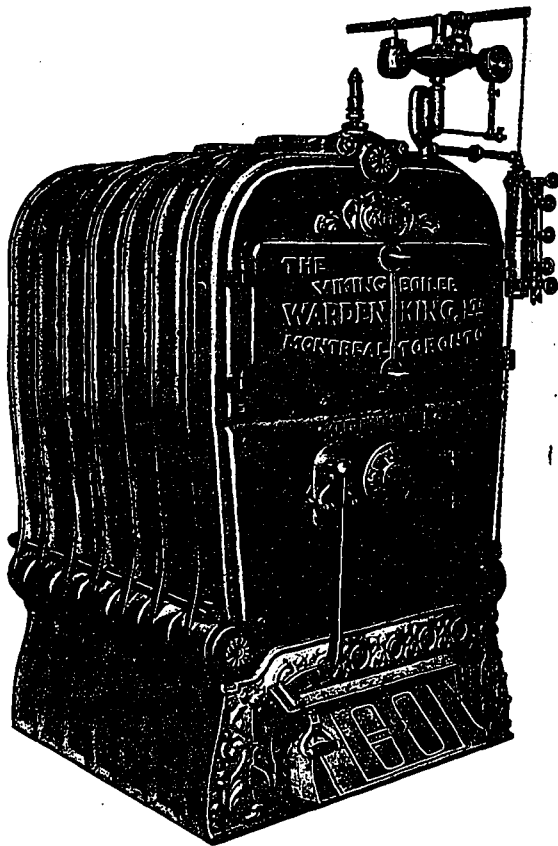
THE railway from Sudbury to the new Moose Mine, which is said to be the largest and best deposit of iron ore yet discovered in Ontario, will be completed in January. The company is negotiating with the authorities for the establishment of a smelter at Ashbridge's Bay, Toronto, which is to have a capacity of 1,400 tons of ore daily, to be followed by the establishment of plants for manufacturing the pig into various products—a steel plant, a steel-plate plant, rolling mills, and steel plate works, to employ about 15,000 men. A large shipping dock will be constructed as convenient rail connections with the works.

Built of Concrete Blocks

THE congregation of the Calvary Baptist Church in Victoria, B. C., are going ahead with the work of reconstructing their church which was recently destroyed by fire. The new building will cost from \$20,000 to \$25,000, and an interesting feature in connection with its construction is the concrete use which is to be made of hollow concrete building blocks. An "Ideal" concrete block machine has been bought for this purpose.

The new church is to be of a handsome appearance, and the wide range of sizes and shapes of the concrete blocks which are being used lends itself readily to the details of the work.

Concrete blocks seem to be rapidly coming into favor for buildings of this kind, owing to the substantial appearance, strength, and fire resisting qualities of the material.



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For Steam or
Hot Water**

Economical:—The Fire Box and Fire Travel insure the maximum degree of Combustion.

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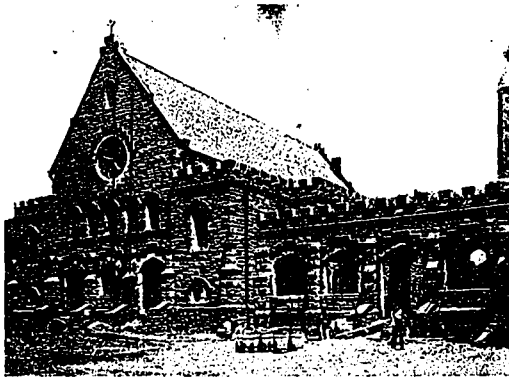
We have the best equipped plant of its kind in America and are manufacturing in the "Viking" what has proven to be the most practical and economical Steam and Hot Water Boiler on the market.

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SELLING AGENTS

Notable Development in Artificial Stone Machines

AMONG the many improvements that have taken place in manufactured building materials and appliances, none are more important than some of the recent developments in concrete blocks or artificial stone. While this material has been gradually coming in for more and more popular usage by builders—being undeniably a practical element in the constructional world, durable, of great strength and cheap—yet it owes little or none of its popularity to the architect or contracting mason, because of its hitherto unavoidable *artificial stamp*, when it came to an attempt at producing a rock face. Practically the only surfaces recognized by masters of the building craft were smooth, ribbed and panelled, because, even if you have half a dozen rock-face plates of the same size of block, and strive as you will to shuffle them up, you will never see a wall in which here or there, blocks of the same surface are not found one above or beside the other; and it is surprising how unerringly the eye will pick out these spots and how it jars on the senses.

But it would appear that this chief objection to manufactured building stone has at last been absolutely over-



BUILDING CONSTRUCTED OF BLOCKS MADE BY THE "CALIFORNIA" SYSTEM—MONOTONY SUCCESSFULLY OVERCOME.

come in the use of moulds made from a plastic composition, which take impression from the face of actual stone and are rapidly adjusted to any size or requirement, permitting, if desired, a different face for every piece of material in a wall. This invention is part of a new artificial stone machine manufactured by a company recently incorporated in Canada, namely: The Canadian Concrete Machinery Co., Limited, with offices 510 Board of Trade Building, Toronto.

The company will exhibit the "California" machines at the Cement Users' convention to be held at Buffalo, Jan. 20 to 25. This machine has been designed to obviate the monotonous and unsightly appearance of walls, and to produce artificial stone, to the satisfaction of the mason, architect and customer.

The face plates are made of composition, which when mixed, hardens to the toughness of iron. The brittleness of plaster is entirely eliminated. It is mixed to a plastic pulp and poured over a stone, and can be removed and used inside of 36 hours. The cost is as nothing compared with iron. As a criterion a 12x36 face plate will cost about \$1.00.

With a stock of faces of different designs and by using care in setting your stone, the wall has the appearance of the natural cut stone, *i.e.*, no two stones looking alike, thereby overcoming the popular prejudice against the concrete block. The machine is adjustable to any size in two minutes, and is built solid and substantial, all wearing parts of steel, mould box of machined iron and utterly impossible to get out of square. There are no attachments, and no time is lost for each change of course. The face plates for all kinds of stone work are entirely free from the machine, making it possible to change the surface of every stone, without loss of time.

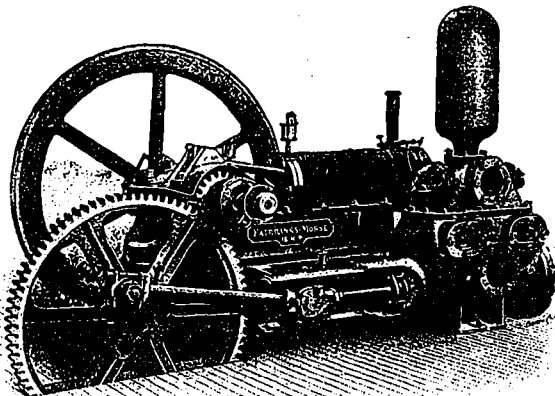
Architects and builders the country over are very radical in their prejudice against the imitative appearance of cast stones, and they are entirely right. People want individuality in their homes and buildings. The architect wants his ideas and designs put into effect. No self-respecting architect, builder or owner, wants his ideas thrown to one side because of the lack of proper materials to carry out their designs. Composition plates overcome this difficulty.

But the plain work plays only a small part in the appearance of a building. The real architectural effect is in the trimming and ornamentation. It is a well known fact that ornaments made with a "draft" are dead and flat. It requires all the deep shadows, undercuts and overhangs regardless of the draft, to produce "life" and artistic beauty in the ornamental work. Balusters and enrichments made from listed patterns, will not satisfy an architect. He has his own designs and ideas for each job, and what looks well in one is out of place in another. The system of composition mould, such as employed in the California machine, should eliminate this difficulty entirely. Moulds can be made for each design at a minimum cost.

The display of the Canadian Concrete Machinery Co. at the Buffalo convention will consist of the California machines, London brick machines, face plates, and ornamental moulds. There will also be a sample exhibit of the work that can be done by the California system, competent men will be in attendance to demonstrate fully the merits of this system. The London brick machine now manufactured and sold in the United States by the California Artificial Stone Supply Co., will also be fully demonstrated.

Fireproof Building Construction

WE publish elsewhere in this issue a complete description of the Gayety Theatre, lately erected in Toronto by the Engineering-Contracting Co., of Baltimore, Md., and Toronto. This is the first building erected by this company in Canada and the manner in which they so successfully completed the erection of this structure in so short a space of time has demonstrated that they are highly capable of executing constructional work of almost any magnitude. This new fireproof theatre building, in the construction of which many new methods and appliances were employed is a decided credit to the constructing engineers, and proves beyond a doubt that the Engineering-Contracting Co. is a highly efficient institution in the matter of fireproof construction. This company has also secured the contract for the erection of the Birkbeck building now under course of construction on Adelaide street, Toronto. This structure, which will be four storeys high with a foundation to permit of the erection of additional floors, is to be of steel frame construction, fireproofed



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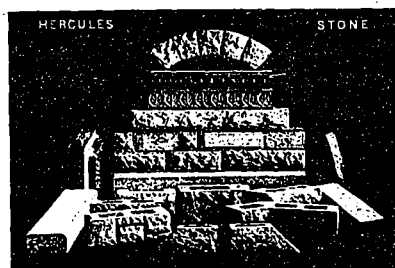
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Hercules Cement Stone Machines

are capable of producing a greater variety of sizes and designs than any other machine. In addition to regular blocks, sills and lintels up to six feet long can be made.

McKelvey Concrete Mixers
Stuebner Bottom Dumping Buckets
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Railway and Contractors' Supplies



THE CANADIAN FAIRBANKS CO., Ltd.

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Vancouver

with porous terra cotta supplied by the Don Valley Brick Works, Toronto.

The Engineering-Contracting Co. was formed in Baltimore shortly after the Baltimore fire for the purpose of erecting strictly fireproof buildings, the experience of this city furnished by the great conflagration being that the modern structure should be made as absolutely fireproof as possible. Mr. Pearson, the energetic president of the company, is a constructing engineer of long experience, having been superintendent for the George Fuller Construction Co., of New York and Chicago for several years, during which time he had charge of the constructional work on some of the largest buildings in the United States. Mr. Pearson favors two types of fireproof construction above all others, namely, steel encased in concrete or steel fireproofed with porous terra cotta. The Gayety Theatre is an example of the former type and the Birkbeck building of the latter. System, Mr. Pearson believes to be a most essential factor in the conducting of a large contracting business. He has no use for long drawn-out jobs and maintains that rapid construction is the only practical method in modern building.

In explaining the system employed by the Engineering-Contracting Co., Mr. Pearson stated that they aimed to use any good system of building construction that applies best to needs and conditions. The company is prepared to follow architectural designs in all steel and fireproof building construction, wharves, bridges and heavy work. All work is undertaken on an equitable percentage basis and the office system employed enables the owner to find out just what his operations are going to cost him, and at any time during the progress what it is costing. The Engineering-Contracting Co. have erected many large buildings during the past few years, among which were the White Office Building, Baltimore; the American Newspaper Building, Baltimore, in addition to four theatres. The firm has come to Canada to stay and will make a strong bid for a good share of the prospective work for 1908.

Practical Reinforcement for Concrete Construction

IN the November issue of CONSTRUCTION there appeared an advertisement for Pitt & Robinson, of Toronto, construction engineers, containing illustrations showing several views of the new tannery of Clarke & Clarke, Limited, Toronto, lately erected by the above engineers which is an excellent example of reinforced concrete factory building. The system of reinforcement used throughout is known as the "Niagara system," of which Messrs. Pitt & Robinson are the patentees. This tannery is the first building erected in Canada in which the "Niagara Bar" was used and the excellence of its construction not only says much for the practicability of the "Niagara" system, but is proof of the fact that the constructing engineers are highly capable in the execution of this class of work.

Messrs. Pitt & Robinson claim many advantages for their bar. First, because of it being made from plain steel bars, with the stirrups fastened on by unskilled labor on the site of the proposed structure, it is contended that the "Niagara" system is the most economical system on the market. In talking to CONSTRUCTION on the comparative merits of the various systems of concrete reinforcement now in use, Mr. Pitt of the firm said: "We are not attempting to establish new principles of reinforcement, for the reason that the "Niagara" system is directly in line with well established principles, but we believe it to have additional features that are calculated to perform the functions of an ideal reinforcement in the most perfect manner." Continuing, he said: "One of the great features of our bar is the perfect distribution of metal in accordance with the best principles of reinforced concrete design and the elasticity of application made possible by the adjustable nature of the shear member. Another point is the

adjustable lock joint connection of shear members to the tension member which properly transmits web stress to the main tension member. The simplicity of assembling members is worthy of note. It may be done on the job, or shipped complete from the factory, and last, but not least, we firmly maintain that we have the cheapest and most economical system in use to-day."

Both Messrs. Pitt and Robinson are energetic young men with an excellent engineering experience in factory building construction, and indications point toward a busy year for them in 1908. They have lately issued an attractive circular describing the features of the "Niagara" system and showing exterior and interior views of the tannery of Clarke & Clarke, Toronto, which they maintain to be the largest reinforced concrete factory building in Canada. This circular will be mailed upon request.

A Handsome Catalogue

WE are in receipt of the handsome new catalogue just issued by the firm of McCormack & Carroll, Toronto, architectural carvers and designers and manufacturers of staff and stucco work. It is beautifully illustrated with high-class half tones showing the various styles of ornamentation kept in stock, and is excellently printed on the best quality of coated book paper. In all, it is a very attractive and instructive booklet that no architect should be without. This firm has long enjoyed an enviable reputation for the high quality of their work, having executed some of the finest ornament work in many of the largest buildings in Canada. Architects, especially in the West who have been accustomed to get this class of work done by American firms in Chicago and Minneapolis, would do well to send for a copy of this new catalogue and acquaint themselves with the facilities this Canadian firm possess for giving them the quality of work desired at prices in keeping with their requirements.

Manufactured Building Stone (Continued from page 53).

all who know the difference between the good and the bad. The common rock-faced block is an imitation of the cheapest form of quarry stone, and a poor imitation at that, for no two natural stone blocks are alike in surface; while even if you have half a dozen rock-face plates of the same size of block, and strive to shuffle up the product of these plates in the yard and on the work, you will never see a building in which, here and there, blocks from the same plate are not found one above or beside the other. And it is surprising how unerringly the eye will pick out the spots where this occurs, and what a feeling of "something lacking" is awakened. It is bad art, and quite indefensible. The "rock-faced galvanized iron" of our country store fronts is a no more glaring fraud.

Now let us inquire what constitutes imitation, and how concrete may be made to stand on its merits and look like what it really is. In the first place, concrete must always look like stone, because it is stone. An artificial stone, consisting of grains of sand and gravel or limestone crystals bound together by a little Portland cement, cannot help looking like natural sandstone or limestone made up of the same materials bound together by carbonate of lime or soluble silicates slowly deposited in its pores. We need never be afraid that concrete will be condemned for its stony look, since that is its nature. All we need to avoid is giving the work an appearance which is unnatural to concrete, such as the rock-face. Smooth, ribbed and panelled surfaces, also good ornamental patterns for friezes or cornices, are entirely legitimate, and equally characteristic of stone, metal, terra cotta or concrete. Forms of beauty may properly be reproduced in any material; the only thing to be avoided is pretense—the attempt to deceive the observer into the belief that the material he sees is something different from what it really is.