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CONSTRUCTION

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W E PRESENT for the consideration of the reader the initial issue of "Construction."

There is need for such a paper in Canada, and this number represents our conception of the general character of publication best calculated to serve the various branches of the building and engineering industries of the country.

The established success of England and American publications of like character demonstrates the value of this class of trade journalism.

Canada is on the threshold of a great construction era, and as there is nothing that reflects the characteristics, tastes and attainments of a people more than the architecture and construction of their buildings, the laying of the foundations of the Canada of one hundred years hence, rests upon the designers and builders of the Canada of to-day.

It is a realization of these facts that has prompted the publishers to undertake the issuing of a high-class twentieth century journal devoted to the interests of Canadian Architects, Engineers, Contractors and Manufacturers of building materials and appliances.

At a time when many of the larger contracts for construction work in Canada are being executed by foreign Engineers and Contractors, it must be obvious to every Canadian that one of two conditions prevail: namely, that Canada is either without Architects, Engineers or Contractors, who have sufficient ability to plan or execute work of any magnitude, or, that the members of the Building Fraternity of Canada have been handicapped through lack of an adequate medium to reflect their accomplishments and capabilities. We maintain that the latter is the real reason for this extraordinary state of affairs, and we believe that these conditions now prevalent in Canada are largely attributable to the fact that heretofore there has been no Canadian journal that has adequately espoused the cause of our Architects and Engineers.

Publications of this character in England and the United States, when intelligently and conscientiously conducted, are considered by the building craft essential to the advancement of their interests.

The purpose of the publishers of "Construction" is to produce a journal that will fill these requirements, and one that will serve the interests of every branch of the building and structural trades. It is necessary in a country such as Canada that a journal of this nature should not be hampered by being confined to too narrow a field. We believe that all the industries directly or indirectly interested in "Construction" (the title we have chosen for our journal) are so closely allied one to the other that what is of interest to one cannot fail to be of interest to the other. Through the patronage possible in a journal covering this broad field, we shall be enabled to secure special articles and comment from the leading members of the Building and Engineering professions in America, thus rendering it invaluable to members of every branch of the building craft.

It is not our intention that the readers of "Construction" shall be confined solely to those connected directly with the Building Industry, but it is our purpose to present without unnecessary technicalities in a bright readable style, a view of the construction movement with accompanying comments, criticism and suggestions, that will be invaluable to the Prospective Builder.

The existing reputation of other journals the Publishers have already produced is a guarantee that no effort or expense will be spared in making "Construction" one of the best, if not the finest of all journals of this nature on the continent.

Directly connected with staff are men who have had sufficient experience in conducting Trade Journals of this particular class to warrant an ably edited production and, while we invite criticism and comment on this our first number, we beg to remind the reader of the many difficulties that are to be overcome in organizing and establishing a new enterprise. We, however, have no apologies to offer, and we believe that we have demonstrated in this number our expressed intention to produce the finest Trade Journals in Canada.

We can give assurance that each succeeding issue will show in its make-up, its printing, and the articles of interest it contains, an improvement over the preceding number.

MANY theories have been advanced by our most eminent engineers as to the real cause of the Quebec bridge disaster, in which some seventy workmen lost their lives. It is contended by some that the material used was defective. Others believe that the method of procedure by the constructing engineers was wrong. Still others believe that too many temporary bolts were withdrawn before being replaced with permanent rivets; while it is contended by others that the cantilever arms should have been completed on each side of the river and supported by temporary cables before the centre span was built. We have still other prominent engineers who maintain that the calculations of the designers were decidedly at fault.

WHY DID THE QUEBEC BRIDGE FALL? permanent rivets; while it is contended by others that the cantilever arms should have been completed on each side of the river and supported by temporary cables before the centre span was built. We have still other prominent engineers who maintain that the calculations of the designers were decidedly at fault.

In spite of all these conflicting views held by various expert engineers *one fact remains, "that is, the bridge fell"* and carried with it the lives of some seventy men, and it is only reasonable to contend that it did not collapse without reason.

The engineering world, which has watched every step in the progress of this marvellous proposed feat of engineering, insists upon knowing the reason for such a collapse. They ask: Is the accepted principle of cantilever bridge construction wrong when applied to great structures? They ask if all their calculations, based upon the successful construction of bridges of like character recently erected are faulty? For the protection of the engineering profession they insist upon knowing as to whether the catastrophe was the result of any miscalculations, incompetence or negligence on the part of the owners, contractors or engineers.

The public rightfully demands that the responsibility for a disaster which takes with it seventy lives, should be placed upon the shoulders of those guilty of incompetence or negligence.

The verdict of the coroner's jury, rendered through O. F. C. Delage, M.P.P., after fifty minutes' deliberation in the case of LaFrance, is peculiarly interesting, as compared with the usual verdict of a jury called to investigate a railway accident. The verdict was as follows:

"That the deceased (LaFrance) died from injuries and nervous shock sustained in the collapse of the Quebec bridge. We have been unable to establish the real cause of the collapse, but we think it our duty to declare that according to the proof furnished during the inquest that all necessary precautions were taken for the construction of the bridge without danger."

It is quite reasonable that the jury was unable to determine the exact cause of the collapse, but why should the jurors deem it their duty to excuse the Quebec Bridge Company, the contractors, or the consulting or superintending engineers?

The least the jury could have done, after having declared how LaFrance came to his end, was to demand a thorough investigation for the purpose

VERDICT OF CORONER'S JURY. of finding a specific cause for the disaster and for the placing of the responsibility upon the shoulders of those who were found to have been guilty of any irregularities in the performance of their duties. If the jury did not feel itself competent to investigate such an intricate matter why should it render such a sweeping verdict?

We say, contrast this verdict with that of the average coroner's jury that is called upon to investigate the cause of the death of an individual in a railway wreck, where every effort is exerted to place the criminal responsibility upon the shoulders of the conductor, engineer or the dispatcher.

Here is a case where more than seventy lives were crushed out in an instant through the fault of miscalculation,

incompetence or negligence of someone, and yet the jury, under O. C. F. Delage, M.P.P., gave a verdict which not only fails to recommend a further investigation, but aims to excuse everybody directly or indirectly connected with the construction of the bridge. There is no more reason why the owners or contractors should be excused before a thorough and competent investigation had been held than should the engineer of a wrecked train go scot free before the degree of his responsibility for the wreck had been determined.

Whether the Government was connected with the affair or not, should have no bearing on the case, nor should the accredited reputation of the designers or builders of the structure influence such a verdict.

It was to be hoped that the Royal Commission, appointed by the Government to investigate the matter, would throw further light upon the cause of the collapse, but the manner in which this Commission has treated the evidence given before it, does not lead us to believe that any effort is being made thus far on their part to fix the criminal responsibility (if there be any) for the loss of some seventy lives.

The interview granted the daily press by Chairman Holgate, before the Commission left for New York, seems to be most significant of this contention. We quote herewith his statement, as published by the daily press:

"As far as we have been able to learn there had been the greatest care taken all along the line to insure the safety and permanency of the Quebec Bridge structure."

"The best engineers on the continent prepared the plans and specifications, and a wonderful care and accuracy in carrying them out was shown."

"We found absolutely no trace of dishonesty or graft in connection with the construction of the bridge. This seems to be the case of the best engineering brains on the continent, and the very best accepted engineering methods being on trial."

"As far as the Government's connection with the enterprise is concerned it seems to us that everything is quite regular, and everything was done that should have been done."

In the face of this statement we have reason to have our doubts as to whether, in its long exhaustive report, the Commission will give us a definite reason for the accident, but it seems impossible that this, the greatest engineering catastrophe of modern times, should blot out the lives of seventy workmen and be chronicled in history only as a great disaster, the cause of which was never determined.

We are prompted to ask the reason for this. Is it because of the contradictory expert evidence given before the Commission?

Can it be that the powers of the Commission are not sufficiently specific?

Or can it be that the Government desires, because of its connection with the affair, to have it recorded in history with as little noise as possible?

Or even worse, has there been an attempt to settle the whole matter as quietly as possible, rather than run the chance that in the course of a thorough investigation to arrive at the exact cause of the fall of the bridge, some earlier history of the Government's whole connection with the enterprise should bring to light some unsavory evidence of the scandal?

While we cannot say that we are satisfied with the manner in which the whole affair has been investigated thus far by the Government, we have every reason to believe that the Commissioners themselves are men of high reputation, both as citizens and members of the engineering profession.

The question is, how far has the Government given the Commission power to proceed in its investigation?

THE architectural profession of Canada was recently shocked to see published in the daily newspapers and other publications, a finding, either made by the Board of Assessors in the recent competition of designs for the proposed Department of Justice Buildings at Ottawa, or issued by the Department of Public Works, in which a complete list of the names of the competing architects were disclosed in their relative standing according to merit.

AN INSULT TO PROFESSIONAL DIGNITY. Of the twenty-nine designs submitted it was only possible that four should be prize winners. The four leading designs became the property of the Government as soon as the awards were made and the Department was at perfect liberty to do as it pleased with them. It was naturally expected that some announcement as to the successful competitors should be made; but it would certainly occur to anyone that decency and good taste would require that the remainder of the designs submitted be returned to their rightful owners without comment.

It is not unnatural that some of the most eminent architects in the country should be excelled in an individual competition by less distinguished competitors, but surely there was no occasion for heralding the fact broadcast over the country.

Certainly there could have been no incentive for this unheard of procedure, but such an outrageous piece of thoughtlessness is inexcusable, and it is little wonder that some of the unsuccessful contestants are indignant as a result of the injustice. It was not the courtesy the dignity of the profession should command.

This point is so plain that it is idle to dilate upon it. *The reflection cast, has made it impossible for the Government to promulgate another successful competition unless it binds itself to preserve ordinary rules of etiquette and have a decent respect for the feelings of the architects in this country.*

**

IN making their report to the Minister of Public Works the judges in the recent architects' competition for the proposed Departmental and Justice Buildings at Ottawa took the liberty of recommending that—should the Maxwell design be followed in the construction of the buildings—the superintendence of the work be given over to the designers instead of devolving upon the Government Architects' department.

DESIGNER SHOULD SUPERVISE ERECTION.

This is a most commendable suggestion, and it is to be hoped the Government will consider it favorably.

In an undertaking of such magnificent proportions it is important that there be no false interpretation of the designer's conception. This is essential both as a matter of despatch in carrying the project to completion, and as a precaution against possible blunders which might prove more or less expensive.

It goes without saying that no man can satisfactorily interpret another man's ideas, especially when the scale of the drawings is too small to give more than a hint of the detail. The successful competitor should be permitted the development of his ideas. A scheme of such importance requires a vast amount of later study which can only be intelligently given by the author himself. If the work is taken up by other hands it cannot but lose its individuality, no matter how sincere the other man is in endeavoring to faithfully carry out the competitor's ideas.

Giving all due credit to the worthy Government Architect and his staff, as being an able and efficient body, it is only reasonable to believe that the firm that worked out the details can best carry the work to completion.

The fact that Mr. D. Ewart, Chief Architect for the Government, appended his name to the recommendation as one of the judges, should also be considered ere the

decision as to who shall superintend the work is made. Mr. Ewart appreciated the fact that it is more satisfactory to allow the designer to also supervise the work of construction.

Besides, if there is a necessity for a Government Architect's department at all, it can be put down for a fact that there is enough regular occurrence work always on tap to keep its hands full without piling onto it these mammoth, out-of-the-ordinary, undertakings.

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THERE may be a possible objection raised to the view as outlined in the previous editorial, even as President Edmund Burke declared at the last annual meeting of the Ontario Association of Architects, in referring to the Ottawa competition while it was still in the embryo.

"The prize design might be the work of a man who would be incompetent, or utterly impossible, regarding either the preparation of the working drawings or the subsequent supervision of the work." **COMPETITORS SHOULD BE LIMITED BY INVITATION.** he declared.

This is a contingency which might easily arise in a competition open to the whole Dominion; but it is just a question if so important a competition should be an open one, or should be, as in case of the proposed Parliament Buildings at Regina, Sask., one in which the competitors are invited.

For the Departmental and Justice Buildings at Ottawa twenty-nine architects of varied ability and repute, expended much time in a competition offering \$15,000 in prizes. The rewards, had they been equally distributed, would not begin to pay for the trouble each individual architect was put to. Only four of the firms were rewarded for their work, which, according to the conditions of the contest, was all that could have been expected.

In the Regina competition, however, seven eminent firms of architects have been invited by the Saskatchewan Government to submit drawings, with the understanding that whether or not they are successful in producing the accepted design, they will be reimbursed for their efforts.

While we do not believe that it was necessary for the Saskatchewan Government to have extended its invitation to two foreign firms of architects, still we are somewhat inclined to favor the latter type of competition. In the first place a competitor when he has the assurance of receiving \$3,000 or \$5,000 for his efforts, whether his design is favored or not, can better afford to devote time and attention, and even go to considerable expense toward the execution of his ideas, than if he is confronted by the uncertain prospect of being recompensed conditionally upon being adjudged favorably; and in the second place, the professional standing of the architects selected should give assurance that one at least of the seven productions will be worthy of the purpose for which it is designed.

The fact that the latter type of competition is considered the most satisfactory in the United States, in so far as legislative buildings are concerned, should be sufficient criterion for this country to take example by. In the erection of the Minnesota State Capitol (recently completed), the Wisconsin and the Iowa State Capitols (both in course of construction), the principle of competition by invitation was adopted. In these instances the programs also specified the conditions under which the plans were to be adjudged—a stipulation which might work to good purpose in Canada. The board of judges, in each case, was not a quorum of architects, but a commission, which was guided in its decision by a small committee of architects who were quietly called in from outside states at the last moment to criticize the plans in the presence of the commissioners.

THE Canadian Institute of Architects proposes to ask the Dominion Government for a charter making the architectural profession in Canada a closed one.

The organizers request the right to debar all architects from practising, who refuse to make application for membership, or who fail to pay their dues into the proposed organization, or who fail to pass the examination to be conducted by the judges appointed by the Institute.

It is asked that it be made a **PROTECTION FOR THE ARCHITECTURAL PROFESSION.** punishable offence for any individual to call him or herself an architect unless a member in good standing of the C. I. of A.

The Government is requested to refuse the individual the right of action in the courts for the recovery of fees for the preparation of plans or specifications for a building, unless he or she be a member of this organization.

The avowed object in asking for such legislation is the raising of the standard and dignity of the profession, and to protect the public against the danger of having their buildings planned by incompetent and dishonest designers.

Every Canadian who gives the matter conscientious and intelligent thought must agree that any measure to accomplish this end without bringing with it other evils, should be gladly welcomed.

We have every reason to believe that the men at the back of this movement stand high in the profession in Canada, and are well-meaning and conscientious in the prosecution of their views.

Nevertheless we are of the opinion that such powers should never be invested in a private corporation. It is perfectly right and proper that no one should be allowed to practice architecture before having qualified before a competent board of examiners, but the conducting of such examinations should be directly in the hands of the Government and should have no more legal connection with an institute of architects than with an association of builders.

There is no reason to believe that such powers as asked for in the proposed by-laws would be abused in any way by the Canadian Institute of Architects, nor have we any reason to believe that the organizers have any desire to ask for powers that would tend to make a monopoly of the profession.

We believe that their object is no other than to protect the profession in Canada, as well as the public, but this serves as no justification for the granting of such powers to a closed corporation. It veritably places the control of the entire building industry in Canada in the hands of this proposed corporation.

No man, it matters not whether he be an artisan or an architect, should be obliged by law to become a member of any union or association before he is permitted to follow his occupation.

It is perfectly right and proper, as we have said, that the Government should require every member of an important profession, such as architecture,

THE JOY AND PITY OF IT. to properly qualify before he is allowed to practice, but after he has so qualified, it should be left to his own discretion as to whether he chooses to associate himself with the Canadian Institute of Architects.

What is known as the "Architects' License Law" exists in three States in the American Union, namely: Illinois, New Jersey, and California. This law has been in force in the first named State for the past ten years, and has worked out most successfully. It provides for a State Board of Examiners to be composed of five competent architects who have practised in the State for at least ten years. These examiners are appointed by the Governor of the State for a period of two years. A

secretary is also appointed, and is paid a salary of \$1,800 a year to devote his entire time to the work of the Board. The Board meets at frequent intervals to consider applications, and the members are paid by the State ten dollars per diem while in session. This Board is directly responsible to the State, and is given all the necessary powers for the successful prosecution of their duties.

When the law went into force every architect practising at that time in the State was granted a license at a nominal fee, and all applicants thereafter were obliged to qualify before the Examiners' Board and pay a fee of twenty-five dollars. Each license must be renewed annually, and a fee of five dollars paid.

GOOD RESULT OF A DIFFERENT PRINCIPLE. At the time the law went into force seven hundred licenses were granted to architects then practising, and the last annual report of the Board shows that, out of seven hundred and fourteen architects now practising, only five hundred and one of the original seven hundred are still holding licenses. This means that one hundred and ninety-nine of the original seven hundred have died or dropped the profession since the law came into force. The report states that most of this number have discontinued their practice because of the rigid enforcement of the law.

All fees reverted to the State and are used for the purpose of meeting the expenses incurred by the establishment and maintenance of this Board of Examiners.

These figures prove, without a doubt, the efficiency of a measure based upon these principles and are worthy of the consideration of the profession in Canada.

The laws of the State of New Jersey and California are along very much the same lines, and have worked out most successfully.

It is a wise and praiseworthy move on the part of the principal members of the profession in Canada in bringing about the formation of a federal association of architects, but we believe that instead of asking the Government for a charter, giving them such sweeping powers, they would work persistently, as a body, for legislation providing for a Dominion Board of Examiners of architects, they would accomplish the desired results in a more practical form, in a shorter period of time and with much less difficulty.



AN effort is being made by the Ontario Association of Architects to hold an exhibit of the complete list of designs submitted in the recent architects' competition for the proposed Departmental and Justice Buildings to be erected on the east side of Major's Hill Park in the city of Ottawa. To this purpose President Burke has written to the Minister of Public Works and has received the reply that should the Association obtain the individual consent of the competing architects, the Government will forward the collection; but only on the understanding that from the time the consignment leaves Ottawa, the Ontario Association must assume full responsibility and restore each set to its rightful owners when finished with them. It is expected the exhibit will be held either in the rooms of the Guild of Civic Arts or the unfinished room on the top floor of the City Hall.



IT is understood that the Guild of Civic Arts, Toronto, will move at the next session of Legislature for the appointment of a permanent commission, which will have charge of all civic improvements, such as the projecting of broadened streets, boulevards, public playgrounds and parks, thus divesting irresponsible aldermanic boards, that are likely to change in personnel each year, of the responsibility.

IN this the first issue of CONSTRUCTION we publish the first of a series of articles dealing with "Dilapidated Buildings in Canadian Cities." A subject we aim to make most interesting before the series has been completed.

The first article deals with the subject in so far as Toronto is concerned, and we believe that the "Queen City" furnishes as good material as could be obtained in any other Canadian city for such a subject.

Recent great conflagrations have had a tendency to arouse municipal authorities in almost every city on the continent to the realization of the necessity for the enactment of more stringent building laws suited to modern requirements and new construction methods.

But while our building inspectors have been all absorbed with the drafting, enacting and enforcing of these new laws governing the erection and alterations of buildings, it remains a fact that too little attention has been paid to the enforced removal of dilapidated firetraps and unsanitary shacks.

If the districts in which these "disease breeding, half fallen down," excuses for buildings existed, were to be found in the outskirts of the city the condition would be bad enough, but they are invariably located in the very heart of the city where their existence militates most effectually against public health and safety, as well as impedes the growth and development of down-town business districts.

In the case of the city of Toronto the worst district of this nature is in the direct neighborhood of the City Hall, the very heart of the city. Here is located block after block of the worst type of half fallen down unsanitary hovels it is possible to conceive of. Houses of four and five rooms have from sixteen to twenty occupants. Many of these buildings are propped up one against the other, and if a tour is made through the backyards the stench that comes from the almost innumerable outhouses reeking with filth and disease will be found almost unbearable.

It seems incredible that land located in such a part of the city, where real estate is so valuable, should be occupied by such a class of buildings. It would appear doubly so when it is learned that the land is held by some of the wealthiest citizens and organizations in Toronto who demand such exorbitant prices for their property that it is impossible to find a purchaser who would improve.

The whole situation is that the rents received from these firetraps, reeking with filth, permit the wealthy and respectable owners to hold the land until such time as the ever-increasing values reach a point where they desire to sell.

Thus the city of Toronto is obliged to sit apparently helpless with a "pest house" directly under its nose because of the unscrupulous greed of its wealthy landowners.

It would be interesting to know to what extent these highly respected landowners would appreciate having their names published in connection with a photo of some of these "beauty spots" that grace their holdings of land.

The reader allows that all we say is true in this connection, but he asks: "Where can we find a remedy?"

We answer that a simple remedy has been found in other cities where this same condition has existed.

If the Health Inspector condemned those buildings that are unsanitary and ordered certain changes to be made to render them fit for human habitation, the City Architect would be justified in refusing to grant a permit for such alterations.

The City Architect could order torn down buildings that for various reasons were unsafe.

These two Departments have such powers, if they so desire to exercise them, and if it is found that these powers are not sufficiently defined, the City Council should see it their duty to enact new measures granting such powers.

This done, the most objectionable buildings would have been put out of the way.

In every city there is a class of poor whose occupations require them to live in the centre of the city, and it may be asked: "What shall we do with these?"

SOLUTION LIES IN APARTMENT HOUSES.

The only successful solution of this problem, as found by other large cities, is the "apartment house." In this issue we describe a structure, now under course of construction in the St. John's Ward, that is designed to fill just such a requirement.

Well constructed, economically planned, sanitary buildings of this character, in which small flats may be obtained at a reasonable figure, are found to yield very profitable returns to the investor.

This latter question will find its own solution. What must be done first is to clean up the district and take away from the landowner his only revenue with which he pays his taxes.

In the opinion of CONSTRUCTION the building fraternity in general has a greater reason than has any other branch of business to take a keen interest in this question.



COMMENTING upon a recent alarming prophecy by George W. Babb, President of the New York Board of Fire Underwriters, that it was only a matter of time when the skyscraper district of New York would be destroyed by fire, Architect Fitzpatrick, the executive officer of the International Building Inspectors' Society, and probably the highest authority on fireproof construction in the country, says that while such a "SKYSCRAPER ALARM UNFOUNDED." thing is not beyond the realm of possibility it is highly improbable under present conditions, and could, at slight expense, be made an utter impossibility.

The skyscraper district of New York cannot be compared to anything there was at Baltimore or San Francisco. In both conflagrations the tall buildings suffered by reason of the vast amount of poor building there was all about them. Fire found but comparatively little to burn within them and in a great many cases though damaged themselves they served as a bulwark, a protection to adjacent and more combustible buildings. In Baltimore, as a matter of fact, as soon as the fire reached the skyscraper district, small as it was, it burned itself out in them and they actually saved the city beyond them, stopping the fire much as a dyke does the irush of flood tide.

In New York the down town district is immeasurably better built generally than is that of any other city. There are more tall buildings and these, serving almost exclusively as offices, contain the minimum of combustible material. Their tall steel frames, protected and enclosed with imperishable brick and hollow tile fireproofing, give a fire in the contents of the building nothing of a structural nature to feed upon and destroy.

No, the skyscraper district of New York is about the safest place from fire in the entire country, and if the owners of the buildings would but go to work and put wired glass in metal sash in the windows where they have not already done so, thus making it absolutely impossible for fire to find ingress into the tall buildings from without, that district would be so safe that little or no insurance would need be carried upon the buildings about which Mr. Babb is so much perturbed.



ROBERT YOUNG, athlete, soldier, yachtsman and architect, who for the past two or three years has been connected with the Building Department of the Board of Education, Toronto, has entered into partnership with Architect Henry Simpson, 17 Toronto street. The firm will be known as Simpson & Young.

Federation of Builders' Exchanges

Canadian National Association of Builders Formed—Toronto
Seems to be on the Fence

DEEMING it essential that a central organization be called into existence as a safeguard to the building interests of Canada against adverse legislation, the harassing efforts of organized labor, and minor difficulties, such as being compelled to erect buildings from poorly drawn plans—and in frequent instances from insufficient specifications—the various Builders' Exchanges of the Dominion convened in the King Edward Hotel, Toronto, on Labor Day, and formed a Canadian National Association of Builders.

Distinctive local organizations were already in existence in Montreal, Quebec, Ottawa, Toronto, London and Winnipeg, but it had long been felt that a closer co-operation of those interested in the building trades was needed. It remained, however, for the Builders' Exchange of Montreal to take the first steps to bring the matter to the attention of the various Builders' Exchanges of Canada. In July, Mr. J. H. Lauer, secretary of the Builders' Exchange of Montreal, approached the Toronto Builders' Exchange with the idea of having them make arrangements for the holding of a convention in Toronto about Labor Day. Owing to the fact that the Builders' Exchange of Toronto was not in a position to look after the Convention, the Toronto Employers' Association was asked to make the necessary arrangements, and, acting in co-operation with the Builders' Exchange of Montreal, a general invitation was sent to the various Builders' Exchanges and Master Builders' Associations from Winnipeg east, to attend a general convention at Toronto on September 2nd.

TORONTO SLIMLY REPRESENTED.

It is to be regretted that out of the one hundred and twenty-five or one hundred and fifty delegates attending, less than a dozen represented the Toronto Builders' Exchange, and that while the Queen City was accorded representation on the Board of Directors, yet there exists an element of uncertainty among the now federated bodies as to the attitude of this organization. If the experiences of the Montreal Exchange, in striving for beneficial legislation, as recounted by Secretary J. H. Lauer farther on in this article, are carefully considered, it is to be hoped that the Toronto organization will yet come to regard this movement more amiably. There may, of course, be something under the surface to have provoked this indifference; but surely if the movement appealed to the far-sighted gentlemen of Toronto as an unwise step it were at least worth while to have sent a representation to at least worth while to have sent a representation to the gathering in an attempt to either balk the movement, or become enlightened as to its possible virtues.

While Toronto may have been selected as a place for the inauguration, solely on account of its central location, still the unanimity of the choice savors of compliment, and it is a pity indeed, even though the local quarters were not at the time in condition to receive the delegates, that some arrangement could not have been made whereby the visitors would have been the guests of their brothers in trade.

The Employers' Association did not demur, because this institution in Toronto, and in fact wherever it exists, is thoroughly alive and anxious at all times to show its merits to employers, whether they be Master Builders or mine operators.

This is something for the Toronto Builders' Exchange to con over. Already the Master Plumbers, the Sheet Metal branch, the Concrete Pavers, Stone Contractors—and Electric Wiremen—all of them eligible to the

Builders' Exchange—are associated with the Employers' Association of Toronto, and it is hinted that even the Boss Carpenters, the strongest branch, have also been in communication with the latter organization of late. Whether through pressure or by invitation, it is a significant fact that at one of the weekly dinners of the Carpentry Branch, certain members of the Employers' Association were given an audience and an affiliation of the bodies was advocated. Two gentlemen from the Builders' Exchange of Australia, who were present, also approved of the suggestion. Nor was the proposition viewed unfavorably, and if a special arrangement could have been agreed upon, whereby the Carpentry Branch should be taken in at a nominal fee, instead of on the somewhat expensive individual basis as set forth in the constitution of the Employers' Association, things might ere now have assumed a sinister aspect. Of course, even this could come to pass without necessarily affecting the membership of the local Builders' Exchange; but it would be up to the latter body to show comparative merit in times of trouble.

KEEP THE EXCHANGE INTACT.

It looks feasible that a distinctive organization should directly legislate for each class of trade (*i.e.*, reckoning builders jointly as a trade), in which case there is great need of local exchanges; but when matters of provincial or federal moment arise, there is need of close co-operation and strong representation.

Since there should, most emphatically, be a central body to look after local affairs in a city so rapidly building up as Toronto, the Toronto Builders' Exchange must see to it that there is no break in its ranks.

If any significance is to be attached to the attitude of the Toronto Builders toward the scheme of federation, and to the supposition that the builders of Toronto are not represented by a unit, some day that section of the Master Builders called the Builders' Exchange may be confronted by a proposition that is too big for it. If there is a disturbing element in the Toronto Exchange it should be sought out. The scheme of federation looks good.

In the course of the convention, which consummated the federation after Mr. L. S. Humphries, vice-president of the Wellington Builders' and Contractors' Association of New Zealand, had been nominated to act as chairman, and the delegates had been welcomed by Mr. Thos. Roden, of Toronto; Mr. J. Herbert Lauer, secretary of the Builders' Exchange of Montreal, delivered a short address on "The Necessity of Unity as a Legislative Power." He stated that the time had come when there was the greatest necessity for stronger representation before the Dominion and Provincial Houses of Parliament, to prevent injurious legislation being carried and to remove from the statute books such legislation as had been found prejudicial to the interests of the general community. Organized labor was continually endeavoring to have placed on the statute books legislation in their interests which would be harmful to the prosperity of the country at large and to industrial conditions generally. The Montreal Exchange had several times appeared before members of the Dominion Government, seeking to prevent certain legislation being carried, but had been unsuccessful, as they had not been able to bring the necessary weight with them to convince the Government that the general employing interests were strongly opposed to certain measures. If representation from the different cities had been there as the result of strong organization, he was certain that the results would have been different.

He trusted that the convention would result in a strong association that would be capable of bringing the most direct pressure on the Government to safeguard the interests of its members from any legislative encroachments.

In welcoming the delegates Mr. Thos. Roden, president of the Employers' Association, Toronto, dwelt on the necessity of closer co-operation of the employing interests of the country. In other lines of trade many advantages had accrued from association, not only with regard to the control of labor conditions, but for industrial purposes as well. He had heard that there were many abuses in the building trades which needed common effort to remedy and he trusted that the present meeting would be fruitful in paving the way for the foundation of a strong organization.

Mr. J. P. Murray read a paper on "The Principles, Ideas, Uses and Necessity for Employers' Associations." He advised that organizations of this character were not easily formed and that the moral support of the members meant, to a great extent, the usefulness of the organization. Industrial disturbances were an evil which destroyed the prosperity of any community and it should be the purpose of organizations of this character to minimize their effect. Organization did not mean interference in any way with a man's business nor his manner or policy of conducting it, but it did mean the protection of his rights against any individual or organization which threatened the security of his position. The work of an Employers' Association should be one of education, not only for those of the laboring classes but of the general public as well. What was needed in Canada was an awakening of good citizenship. Conditions demanded that industrial peace reign in the community. Employers who refused to assist in the work of organization of this character were either wonderfully short-sighted or tremendously selfish.

What it was hoped to bring about, however, could never be accomplished except through the earnest, cordial, loyal and generous co-operation of every employer and business interest in the country. It needed patriotic work and unselfish devotion to a cause to bring about results. It was for this purpose that organization should be aided in every way possible, by strengthening each Exchange by faithful support and fealty to each member and so bulwark the organization in its efforts for industrial peace.

THE INAUGURATION.

When the forming of an organization was proceeded with it was moved by Mr. Morley, seconded by Mr. Deslauriers, that this meeting of Master Builders, representing the various communities of the Dominion of Canada, pledge itself to form a federated body of Builders' Exchanges, to be known as the Canadian National Association of Builders. This motion was spoken to by Messrs. Miles, Batt, Lauer, S. Harris, B. F. Richardson, J. Armes, Thos. Roden, J. G. Merrick and the chairman. It was finally put to the meeting and carried unanimously.

Mr. Lauer then moved, seconded by Mr. Richardson, that pending the preparation of a constitution, that the Executive Committee be composed of the president, a vice-president from each province and a director from each builders' exchange or builders' section.—Carried.

In accordance with this resolution the following officers were elected:

J. O. Deslauriers, Montreal, president; C. W. Batt, vice-president Ontario; J. W. Morley, vice-president Manitoba; R. D. Clark, vice-president Quebec; J. H. Lauer, general secretary.

Directors of Exchanges: T. Self, Toronto Builders' Exchange; B. F. Richardson, Builders and Contractors' Association of Hamilton; W. H. Yates, Jr. Mason Builders' Association, Hamilton; Wm. Tytler, Builders' Exchange, London; T. W. Murray, Builders' Exchange, Winnipeg; D. W. Ross, Builders' Exchange, Montreal.

It is not unlikely that either Montreal or Winnipeg will be selected as next meeting place.

Projection of G.T.P. and the Boer War Cause of "Tight Money"

REPORTING from Collingwood, Ontario, U. S. Consul A. G. Seyfert gives a most interesting explanation of the stringency now existing in the Canadian money market. The report, as published by the U. S. Department of Trade and Commerce, is as follows:

"It has been an open secret for some time that the financial institutions of the country have not been and are not now willing to comply with all the demands made upon them for loans. The banks and loan companies are not in any way in a bad financial condition, but they are determined to continue business on a conservative, safe basis. The calls made upon the financial institutions are so numerous that it is impossible to satisfy everybody during the present great wave of prosperity in the Dominion. The immense expenditures brought about by the South African war, costing the British people hundreds of millions, turned money from its natural industrial channel, and the effect is only being fully realized now.

"It is perhaps not generally known that no country in the world with a population of only 6,000,000 can point to such a remarkable record of development during the past six years as Canada. In every part of the country the same story of prosperity and expansion seems to exist. The great crowds of new citizens that have poured into the Northwest have had to have their needs supplied. Those who have taken up farming have had to be supplied with machinery and manufactured goods, so that in every industry there has taken place an enormous expansion. In order to keep pace with the demands of the people the manufacturers and merchants have had to enlarge their establishments. To do this the demand for money has been so great that at the present time it is absolutely impossible for the banks to meet them, in spite of the fact that the rates of interest have been increased.

"In other words, Canada's own tremendous development and prosperity affords the chief reason why money is dearer here than in other countries. The transcontinental railroad, known as the Grand Trunk Pacific, which is now under construction, is an enormous enterprise, and will cost upward of a hundred million dollars. This gigantic development is naturally taking millions from other channels of trade, and is perhaps the leading cause of dear money."

Skyscrapers Condemned and Sanctioned

THE conflagration menace and general undesirability of New York's extremely high skyscrapers was warmly discussed during the week ending September 14 in that city at a public hearing before the Committee on Limitation of Light and Area, a part of the Building Code Revision Commission.

George W. Babl, president of the New York Board of Fire Underwriters, said it was the belief of fire underwriters that if a fire started on the upper floors of some of the highest buildings it could not be checked, as the water pressure is insufficient. His board, he said, advocated limiting buildings entirely for office purposes to 125 feet in height, and from 20,000 to 30,000 square feet should be the limit of the floor area.

Commissioner Lantry is reported as declaring "that there is no such danger. We have a pressure of 200 pounds, and with our water towers are able to reach the top stories of any of the buildings at present constructed. When the new salt water mains are opened we will be able to play on a blaze even on the upper stories of the new Singer building. The salt water mains will furnish a pressure of 400 pounds, and will be in operation first in the downtown section—the financial district—and as far north as Twenty-third street west to Fourth avenue."

Trent Canal Hydraulic Lift Locks

By WALTER J. FRANCIS, C. E., M. CAN. SOC. C. E., M. A. M. SOC. C. E.

Thorough and Technical Description of Great Peterborough Lock—Process of Construction, System Applied and Materials Used

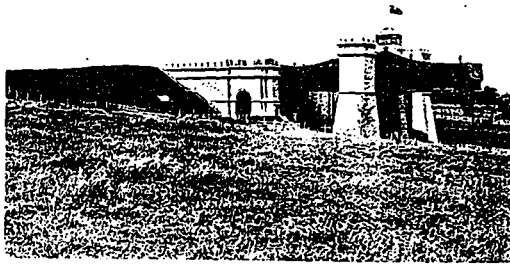
BUILT for the Canadian Government, by Canadian contractors, under the direction of Canadian engineers, the hydraulic locks on the Trent Canal may properly bear the label, "Made in Canada." In view of the fact that the German Government has recently completed a high canal lift at Heinrichsburg, and that the United States Government has made a careful study of the problem of mechanical lifts in connection with the reconstruction of the Erie Canal, a detailed description

independent of the reach and free to move vertically. The box with the water and the floating vessel is then raised or lowered to the other reach. The chamber or box about to descend is loaded with a few inches more water than the other chamber thus giving it the necessary additional load or "sur-charge" to enable it to cause the ascent of the other when water communication is established between the two presses. The construction of the Canadian locks varies materially from those of Europe, and as far as outward appearance goes there is little similarity. The departures are largely due to the climatic conditions and to the different practices adopted by American and European engineers in steel construction.

SELECTION OF SITE.

For purposes of detailed description the Peterborough lock will be dealt with first.

A gradual slope was selected for the site of the Peterborough lock and the excavation was completed in 1899. The location was chosen so that the average depth of excavation was about 40 feet, and the material thus obtained was used in building embankments to carry the level of the upper reach to the back of the structure. The excavated material was found to be hard clay mixed with small stones and boulders, underlying a thin layer of fertile soil. At the upper end of the excavation a small amount of hardpan was encountered, and below this a shaly limestone rock. The rock was in layers of from half inch to 8 inches in thickness, between which were thinner layers of clay and shaly material. The layers of crystallized limestone stand the weather quite well but the shaly parts disintegrate very rapidly under the action of rain and frost. The elevation at which rock was found was exceedingly fortunate, being practically at the bottom of the pits. When the rock was cleaned off less than two feet of concrete brought the floor to its proper grade.



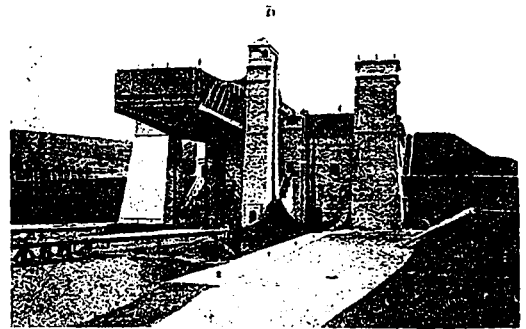
VIEW OF PETERBOROUGH HYDRAULIC LOCK LOOKING FROM LOWER REACH.

of the Canadian hydraulic locks may be considered appropriate at the present time.

The larger of the two Canadian locks is situated on the Trent Canal, within the limits of the corporation of the city of Peterborough, and has been in operation for the past two seasons. The other lock, near the village of Kirkfield is practically completed in a stretch of canal joining Balsam Lake and Lake Simcoe.

The hydraulic lock is theoretically an automatic machine, and is designed to take the place of ordinary locks where a great difference of level is found in a short distance. Besides the Peterborough lock, there are three other locks of this type in operation, one being in England, another in Belgium, and the third in France. The English lock has been in continuous use for over thirty years, while those in France and Belgium have been completed about twelve years. They all have a lift of nearly fifty feet. The depth of water in the French and Belgium locks is 7 feet 10 inches, and the lock chambers are 140 feet long, and 19 feet wide. Several others having similar dimensions are now being built by the Belgium Government. The chief dimensions of the Peterborough lock are 65 feet lift, chambers 140 feet long with 33 feet clear width, and 8 feet normal depth of water. The Kirkfield lock has the same general dimensions with a lift of 50 feet. It will thus be noticed that in the Peterborough lock the water load is double that of the larger European ones, while the height of the lift is increased over thirty per cent.

In principle the hydraulic lock may be likened to two immense hydraulic elevators of the simple plunger type, having their presses connected together so that the descent of the one causes the rise of the other. In place of the ordinary elevator platform we have a large watertight box or tank closed at either end by a gate. The lockage is performed by towing the vessel into this box of water and then closing the gate on the end of the box as well as that of the canal, thus leaving the box



GENERAL SIDE VIEW, PETERBOROUGH HYDRAULIC LOCK.

No footings were required under any of the walls, all being built upon the solid rock.

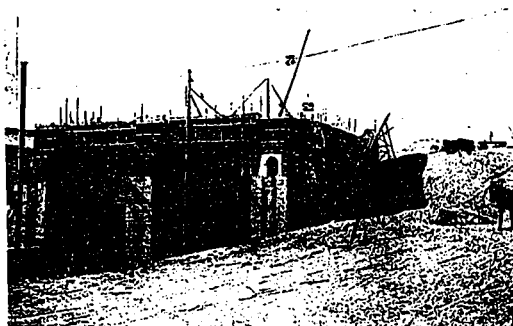
THE PRESS WELLS.

The wells in which the large presses stand were excavated about 75 feet below the floor of the pits, the diameter of the rock excavation being 6 feet 6 inches. The nature of the rock rendered this work comparatively easy. In the bottom of each well there is a foundation of granite, the object of which will be quite apparent since the whole weight of the lock chamber and its burden is concentrated on the bottom of the press and from there

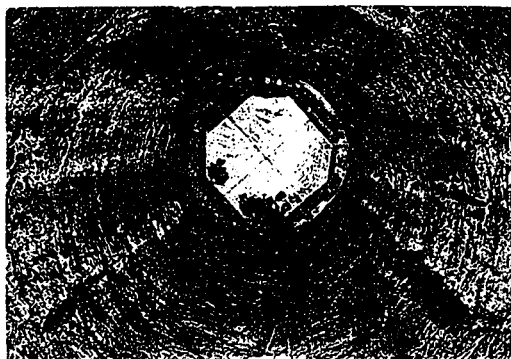
distributed over the rock. When a satisfactory course of rock was found the surface was bush-hammered to a truly level plane in preparation for the granite. The granite blocks composing the foundation were 29 inches and upwards in thickness, and are arranged in three courses, all well bonded, as will be seen by reference to one of the accompanying illustrations. Each stone was carefully dressed and perfectly true in every particular and no joint, either horizontal or vertical, was permitted to be more than 5-16 inch in thickness. Every stone was set on a floating bed and beaten to its proper elevation with a heavy setting maul. Experience showed that the mortar best suited for this work was made of three parts of cement to one of good sharp sand, with which mixture properly tempered the stones could be set to a nicety. The top surface of each granite foundation was brought to a perfectly level plane, no deviation being permitted that could be detected by a ten foot steel straight edge and a specially designed twenty-four inch hand level. The steel straight edge used was planed out of an 8-inch 18-lb. steel I-beam. The hand level has a cast iron base of uniform 1-section, 24 inches long, surmounted by a large bubble similar to those used on a Y-level. The granite stones, many of which weighed over ten tons, were handled from a gantry frame, using a steel hoisting cable with a pair of three-sheave blocks run by an ordinary steam hoist. The stones were brought under the gantry

ing walls for the upper reach; (b) the side walls, being the retaining walls for the earth along the sides of the lock; (c) the towers, the duty of which is to maintain the lock chambers in their vertical motion; (d) the lower gateways which end the lower reach. These walls form a dry pit or rather two dry pits, into which the metal lock chambers descend.

The breast wall is 40 feet thick, and about 80 feet high, the length being 126 feet at the base. At about 15 feet



CONSTRUCTING BREAST WALL AND WINGS.



LOOKING DOWN PRESS WELL, SHOWING GRANITE FOUNDATION.

on a small lorry. The blocks were attached, the stones raised, and the lorry moved from under it. The stone was then lowered to the bottom of the well, the multiple blocks giving a very slow and uniform lowering. The most satisfactory way of taking hold of the stones was found to be by a 1½ inch eye-bolt inserted through a hole in the stone and screwed into a nut countersunk in the under bed. After setting the stone the eye-bolt was unscrewed, leaving the nut below. After the granite work was finished the wells were lined with concrete about 14 inches thick, bringing the diameter to 14 feet 2 inches. No great difficulty was experienced from water, but in order to render the concrete linings as tight as possible the water in the well was allowed to follow close up to the finished work, thus balancing the back pressure and saving the new concrete from being scoured before setting by water percolating through the rock. This method proved quite satisfactory and during the placing of the presses the linings were found to be quite water-tight. The form or mould used in making the concrete lining was a collapsible cylinder about 6 inches in length, and was moved about 5 feet vertically at a time.

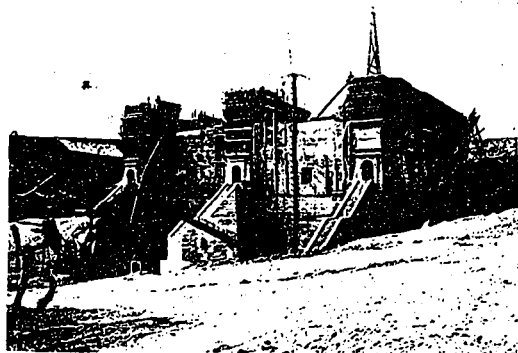
CONCRETE SUBSTRUCTURE.

The substructure of the lock is built entirely of concrete, and contains a little over 26,000 cubic yards. For purposes of description the substructure may be divided into (a) the breast wall and wings which serve as retain-

ing walls for the upper reach; (b) the side walls, being the retaining walls for the earth along the sides of the lock; (c) the towers, the duty of which is to maintain the lock chambers in their vertical motion; (d) the lower gateways which end the lower reach. These walls form a dry pit or rather two dry pits, into which the metal lock chambers descend.

above the rock foundation there is formed within it a chamber or room, called the pump room, in which the pressure pumps and turbines are installed. This room is 12 feet wide, 17 feet high, and 110 feet long. At about the original natural surface of the ground the breast wall is pierced longitudinally by a roadway, which will form a continuation of the main street running through the city of Peterborough. This roadway is 14 feet wide and 21 feet high. In the top of the wall there are formed recesses for the gates which close the ends of the upper reach. Stairways are provided to give convenient access to the various parts of the structure. In order to avoid a bare look in so large a wall, as well as to obtain some architectural effect, pilasters, string courses, and cornices have been formed. All ornamentation of this character was made as the work progressed, the mouldings or forms being erected as received from the planing mill.

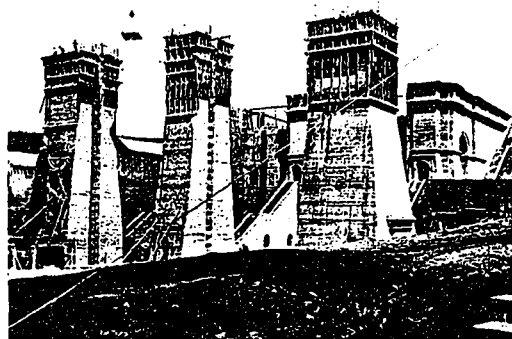
The towers, three in number, are on the same transverse centre line as the wells. In round numbers, the total



AS THE WORK PROGRESSED.

height of each tower from rock bottom to the top is 100 feet. Each of the side towers has a base 29 feet 6 inches by 40 feet 8 inches, decreasing to 24 feet 6 inches by 39 feet 6 inches at the top of the side wall. From this point upwards the base has a batter for a height of 45 feet, and above this the shaft is vertical, being 18 feet x 18 feet 6 inches. For operating purposes it is necessary to build the inside face of the towers plumb from bottom to top. The centre tower has for the same reason to be

plumb on the two sides next the lock chamber, while its other two sides conform to the same lines as those of the side towers. Its width throughout is 12 feet. The towers



TOWERS WHICH GUIDE THE CHAMBERS IN VERTICAL MOTION.

have been treated in the same architectural manner as the breast wall.

The lower gateways extend from rock bottom to the top of the side wall, and are built to accommodate the steel gates which close the ends of the lower reach. In the centre wall between the gates is a small room which contains the gate-operating machinery.

As far as possible the substructure has been built in sections to make provision for expansion and contraction, and to obtain as nearly as possible evenly distributed pressure on the foundation of each part. An effort was made to have the sections not exceed 40 feet in length.

Machine-mixed concrete was used throughout the work. About one-half was made in a continuous mixer and the remainder in a cubical mixer. The machines were located on one side of the work, the concrete being delivered to the walls by a cableway, which deposited it in place in batches of one and a third cubic yards at a time. This arrangement proved economical and quite satisfactory.

The proportions of the ingredients of the concrete were generally one of cement to two and a half of sand, with as much gravel and broken stone as could be thoroughly embedded by the mortar. For very important parts as strength of the mortar was increased by using one of cement to two of sand, while in less important places the mixture was made as weak as one to four. All exposed faces were made by depositing from two to three inches of mortar against the forming simultaneously with the concrete course. The courses or layers of concrete were always kept horizontal, and were generally 10 inches deep. The closest watch was kept on all operations of mixing and placing the concrete, and on the alignment of the forming. Laboratory tests were constantly made on the cement. About 95 per cent. of the cement used in the work was Canadian Portland, and was very satisfactory.

The forming for important faces of the walls was made of three inch pine plank, dressed on one side to the proper thickness. All joints in the forming were rabbeted or ship-lapped. The studs were made of 6 inch x 8 inch timbers at about 4 feet centres, backed up by heavy horizontal walings. The walings were held in place by 5-8

inch rods embedded in the concrete as the work progressed. On the backs of the walls, against which earth was filled, alignment was kept with a forming of rough 1 inch pine boards.

In order to obtain the greatest possible accuracy in the alignment of the concrete walls, so as to insure the proper working of the finished lock, a large engineer's transit was used in truing up the forming. At the outset of the work a well-braced wooden tower of the requisite height, surmounted by a screen, in which the instrument was placed, was built over a carefully-determined hub, the foresight on the line having been previously determined and referenced on the opposite hillside. In this manner the plumb walls were built with unusual accuracy for a height of nearly 100 feet.

The earth embankment upon which the canal is carried up to the back of the breast wall was built in layers about 8 inches in thickness, thoroughly compacted and rolled. During the hot and dry season the earth filling was liberally watered. The material was clay containing small stones. This method produced an embankment having the remarkable record for settlement of only about 1-10 feet in a period of nearly a year where the depth of made earth was upwards of 40 feet.

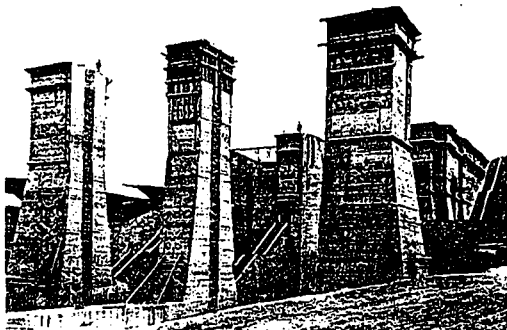
The contract for the embankment and substructure was executed by Messrs. Corry & Laverdure, of Ottawa, and completed in 1902.

SUPERSTRUCTURE.

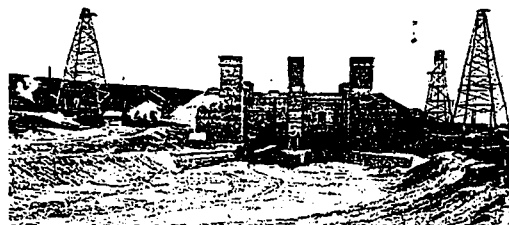
The superstructure of the Peterborough lock was built by the Dominion Bridge Company, of Montreal. This work was commenced in the summer of 1901, and the structure was completed early in July, 1904. The cost of the superstructure was \$244,000.00.

Each of the lock chambers is 139 feet x 33 feet, with 9 feet 10 inches of plating on the sides. These dimensions, with the exception of the depth of water, were fixed by a Government Commission. It is also necessary

that a clear headway of 25 feet be left above the water level. The depth of water for which the lock is constructed would, in ordinary navigation language, be called 8 feet on the sills. The load of water which each of the lock chambers contains is 1,700 tons, and this is the maximum load which it is



GENERAL VIEW OF ALMOST COMPLETED WORK.



ARRANGEMENT OF CONCRETE PLANT AND TRANSIT TOWERS.

necessary to provide for, since a floating vessel displaces only her own weight of water.

STRUCTURAL STEELWORK.

The trusses which carry the load of the chambers are double cantilevers, having curved top and bottom chords.

The depth of the trusses at the centre is 32 feet, this depth having been chosen with a view to preventing the teetering of the chambers. The trusses are simple, and it is unnecessary to provide for alternate stresses in any of the members, the load being constant and always in the same direction. All the connections are riveted. The top chord cover plate is 30 inches wide. The diagonals are universal mill plates. The floor beams and stringers for a very stiff system. The plating of the chambers is 3-8 inch thick on the floor and 5-16 inch on the side, the floor plating also doing duty as a system of lateral bracing to look after the wind loads and add to the general stiffness. All the joints of the plating are made with single butt-splice plates planed level on both edges and caulked, and the rivetting is similar to boiler work.

The whole load of the chambers is brought directly upon the top of the rams by plate girders 9 feet deep.

Victoria's Fire Limits Extended and Explicitly Defined in New By-law

SINCE the big fire wiped out a large section of the city of Victoria, B.C., the city council has greatly increased its fire-limits, taking in the following area as outlined in clause 2:

"Commencing at a point on the shore line of Victoria harbor at the westerly end of Herald street; thence following the shore line northerly to the centre of the westerly end of Discovery street; thence easterly along the centre of Discovery street to Store street; thence northerly along the centre of Store street to Pembroke street; thence easterly along the southerly line of Pembroke street to the northeast corner of lot 770, Block O; thence southerly in a line parallel with the eastern line of Douglas distant 120 feet (or the width of two lots) from such street line to the centre of Fisguard street; thence easterly along the centre of Fisguard street to the point of intersection of the centre lines of Fisguard street and Blanchard avenue; thence southerly along the centre line of Blanchard avenue to the point of intersection of the centre lines of Blanchard avenue and Pandora avenue; thence easterly along the centre lines of Pandora avenue and Blanchard street; thence southerly along the centre line of Blanchard street to the point of intersection of the centre lines of Blanchard street and Courtney street (Rac); thence westerly to the point of intersection of the centre line of Courtney street and Douglas street; thence southerly along the centre line of Douglas street to the point of intersection of the centre lines of Douglas street and Humboldt street; thence easterly along the centre of Humboldt street to the point of intersection of the centre lines of Humboldt street and McClure street and Belleville street; thence westerly along the centre line of Belleville street across Government street to the centre line of the James Bay Causeway; thence northerly and westerly along the James Bay Causeway outer wall and the shore line of Victoria harbor to the point of commencement."

All buildings erected, or the erection of which was commenced within the amended fire limits, before the by-law came into force, are not subject to the new by-law, but for all structures commenced after that date, the owners or builders of same shall apply to the Building Inspector for a permit, and upon filing with him sufficient plans, together with the estimated cost, he may at his discretion issue a permit, after the paying of an inspection fee, according to the cost of the proposed building.

The above requirements do not apply to buildings of concrete or other non-combustible material, the construction of which, in the opinion of the Building Inspector, is sufficiently strong, or equal in strength to brick.

Any infraction of the above regulations entails a penalty not exceeding two hundred dollars, in addition to which the Building Inspector is empowered to enter upon the premises and have the building demolished, the costs of same being chargeable against the owner.



DETAIL OF SMALL CONCRETE PORTAL.

There are four of these girders to each chamber, each girder taking practically an equal share of the load.

In order to maintain the chambers in their vertical courses, guides are provided at the towers and the breast wall, the anchorage having been embedded during the construction of the concrete work. Corresponding slides are attached to the chamber. All the guides combine to counteract the rotating tendency due to the unbalanced wind forces, while the teetering tendency is overcome by the central slides which are fastened to the top and bottom chords of the trusses. The central slides are of bronze, and provision has been made for adjustment in every case.

[NOTE]—The above is an extract from a paper read at the last annual meeting of the Canadian Society of Civil Engineers, and deals with the Peterboro lock from a constructional standpoint. In our next issue the subject will be taken up along equipment and mechanical lines, with detailed illustrations.—Ed.

AN electrical generating plant has been installed at Chignecto, N.S., close to the mouth of the coal mines. The fuel used is the waste screenings from the sorting of the coal, the electrical current being transmitted at a very low cost, over high tension wires to Anhurst, N.S., about six miles away. Upon hearing of this, the first practical application of what he has repeatedly advocated, Mr. Thomas A. Edison sent the projectors of this successful undertaking a telegram of congratulation.

TAKING example from the devastating fire in Victoria, Edmonton, Alta., has framed a new building by-law looking to the better regulation of building operations. It provides that only buildings of two or more storeys and constructed of brick, stone or concrete with a full basement may be erected within the fire limits. Outside of the business district fire limit the regulations are not so strict, but all buildings must have roofs of incombustible material.

Another feature of this by-law is the clause providing for a charge of ten cents per day per foot frontage for the use of the streets where building material is piled.

Skyscraper Alarm Unfounded

By F. W. FITZPATRICK, CONSULTING ARCHITECT

Conclusive Argument on the Advantages of the Tall Fireproof Building by the Executive Officer of the International Association of Building Inspectors and Commissioners.

THE President of the New York Board of Fire Underwriters' prophecy that it was only a question of time when New York's skyscraper district will be devastated by fire in the upper storeys of those tall buildings is naturally attracting much attention. To a degree it is calculated to do good, but broadly considered it is harmful and of the genus purely alarmist. Of course, such a thing is possible, on the assumption that there is nothing impossible, but even with the buildings as they are, the contingency is extremely remote, and with a few additional precautions added to what have already been taken, such a thing is utterly impossible.

To compare New York with Baltimore or San Francisco is folly. The conditions are as dissimilar as they possibly could be. In both those cities there were but a few skyscrapers and entirely surrounded by a most inferior class of buildings. In neither city were the skyscrapers at all comparable to the New York ones in as far as construction and fire-prevention are concerned. In Baltimore the tall buildings were a little more compactly grouped than in San Francisco, and the fire there soon spent itself, and they actually acted as a barrier to its further progress and undoubtedly saved the city beyond them. In neither case was there adequate or really any attempt at local fire-fighting, yet fire soon expended its fury within those buildings and, I may say, that all the damage was caused to them by what might be termed relays of fires in the exceedingly combustible buildings surrounding them, and that made attacks at all points and at different times possible.

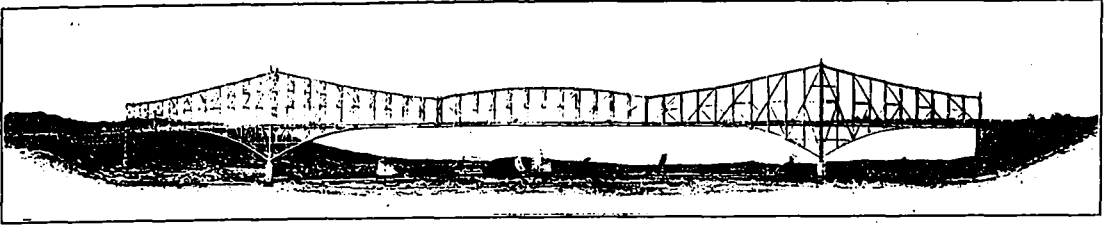
In New York the tall buildings are in a reasonably well-built district, the general character of the older and lower ones is vastly superior to the average of what existed in either Baltimore or San Francisco, and in themselves the skyscrapers are superior, too. Their tall frames of steel, thoroughly protected with brick and tile fireproofing, offer absolutely no structural prey for flames, and the management of the buildings, the nature of their contents, as well as their general finish, are such that the probability of any extensive internal fire is indeed remote. Add to that the fact that there are so many tall buildings together and of the same general character and you have reduced the possibility of external attack to the very minimum. It may seem paradoxical, but is a fact nevertheless that, if you could have a city or an entire district of well-built buildings, they would need be only of incombustible rather than absolutely fireproof construction, because you would have eliminated the danger of fire by eliminating material that would burn. So here, having so many of these tall buildings congested in one district, constitutes one of their greatest elements of safety.

Rather than generally condemning the skyscraper as a dangerous structure, Mr. Babh, the Board of Underwriters and the others who feel at all alarmed, had better join forces with this society, the leading engineers of the country, and the local building departments in urging not that skyscrapers be not built, but that they be even better devised than they are now. Many of the big New York structures are well-nigh perfect as they are but in many of them some one thing or another has been neglected that makes grave damage by fire possible, though hardly probable. Similar or generally worse conditions obtain in nearly all the modern, tall and so-called "fireproof" buildings in the United States and Canada, and, of course, in the "ordinary," the old and low buildings of both

countries, little or no provision against fire has even been thought of. The safeguards are few, inexpensive, possible to be introduced in any and every existent structure, and are absolutely infallible in that they would render those tall buildings beyond any question of a doubt the safest place in New York or anywhere else in which anyone could have his abode.

First and foremost, absolutely cut off all vertical openings by thoroughly enclosing stairway and elevator shafts, so that each storey constitutes a unit or a separate building by itself. In buildings where this has not been done originally, light iron frame and wire glass enclosures, with self-closing doors, would make a most excellent substitute for the tile or other fireproof divisions that should have been used in the first instance. Where much of the interior finish has mistakenly been made of wood or other combustible materials, a self-closing fireproof door here and there in the corridors would greatly help in cutting down the possibility of the spread of fire by making the units of floor space still smaller. In new buildings good brick or tile partitions, with self-closing fire doors should be planned at frequent intervals so as to secure that end. Small units of space are the greatest safeguard. Next, look to the windows. Therein lies the most imminent peril. Eighty per cent. of all the damage done in buildings in which fire did not have its origin was the fault of insufficient window protection; full ninety per cent. of San Francisco's loss and forty-four per cent. of our yearly fire losses are directly attributable to the same cause. Therefore wherever good and sufficient window protection has not been provided in New York's skyscrapers the matter should be attended to *at once*. New window frames could easily be substituted for the old and at no great inconvenience to the occupants of the buildings, and the cost would be the very best and most highly protective insurance the owners could indulge in. Every frame and sash should be of metal or other incombustible material, glazed with wire glass and preferably made automatically closing. Wherever the provision has not already been made abundant local water should be installed, big tanks, plenty of hose and individual appliances. Then, the employees of the building should be thoroughly trained in fire drill so that each one of those buildings becomes an independent factor that relies to a degree on the city department and water for assistance, but not for initiative, and in ninety-nine cases out of a hundred, sufficient protection.

Of course, when it comes to a discussion of light and air, why that's another matter. Tall buildings should have so many storeys on the street line and then so many more stepped back a certain distance, and then another step, and so on up, so that streets shall not become veritable canyons and there should be allowances made for light and air spaces between the buildings. That is all a matter of importance that deserves the most thorough consideration and final adjustment by the authorities. But in so far as panics in buildings and all that sort of thing is concerned, it is of course advisable to minimize possible dangers, but the curtailment of the height of buildings hardly constitutes a complete solution of the question. We live in the midst of danger and have to take certain chances. True, some miscreant might explode a bomb in the cellar of one of these buildings. But what is to prevent him from doing the same thing in the middle of the Brooklyn Bridge? Yet to forestall any such possibility you would not say "abolish the bridges."

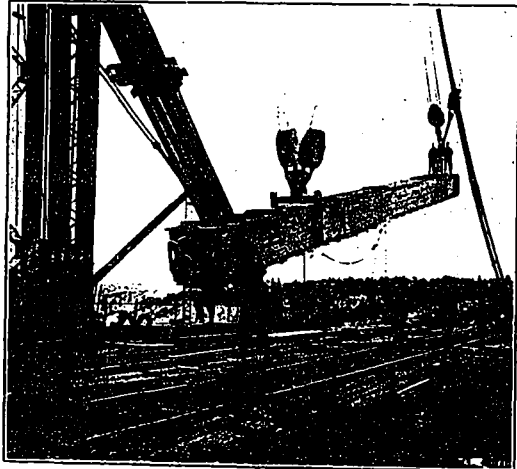


PERSPECTIVE VIEW SHOWING QUEBEC BRIDGE AS IT WOULD HAVE APPEARED WHEN COMPLETED.

Failure of Greatest Cantilever in the World

Detailed Description of the Quebec Bridge; Progress of Erection and Story of the Collapse, the Suddenness of Which Has Given Rise to Innumerable Theories as to a Possible Cause

DURING the summer of A.D. 1900, work was begun on the Quebec bridge. For seven years, minus intermittent periods of from four to five months on account of the severity of Canadian winters, the work of construction was prosecuted vigorously. Tons upon tons of iron and steel were bolted into



HOISTING MAIN END POST CANTILEVER ARM: FOUR FEET SQUARE, ONE HUNDRED FEET LONG, WEIGHT 80 TONS.

position until one of the gigantic cantilever arms projected out over the water for a distance of 560 feet.

On August 29th, 1907, the almost half-completed structure, comprising 17,000 tons of steel, swayed, settled, and crashed into the St. Lawrence River, carrying with it the lives of over eighty workmen, the fondest hope of the Canadian Government, and administering a shock to the whole engineering world.

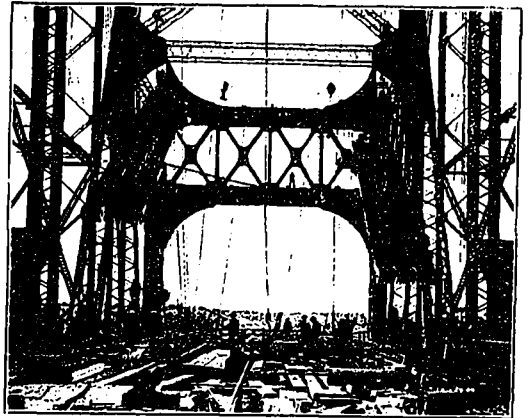
The design and calculations throughout were of such detailed character that unless there was some blunder in the making of this analysis or in carrying out its provisions, there were no stresses existing in the structure which could reasonably have caused failure.

The Canadian Government immediately appointed a commission composed of Mr. H. Holgate and Mr. Kerry, of Montreal, and Professor Galbraith, of Toronto, to investigate the accident, and every effort is being made to determine the cause of the disaster and fix the responsibility where it belongs, regardless of who may be at fault.

The Quebec bridge was to have been considerably the longest span cantilever bridge in the world (1,800 feet).

the nearest approach to this great engineering attempt being the Forth bridge across the Firth of Forth, in Scotland, which has two shore arms of 680 feet and two main cantilever spans of 1,710 feet. Both bridges were designed on the cantilever principle. The total length of the Quebec structure was to have been 3,240 feet, including two approach deck spans of 220 feet each. The cantilever structure of 1,800 feet was to have been composed of two 500 feet anchor arms, two cantilever arms of 562½ feet, and these connected in the centre by a suspended span of 675 feet. The south section at the time of the collapse, was completed to a distance of within 168 feet 9 inches of the centre (9.30 feet from the shore pier), giving an enormous structure of 731 feet 3 inches overhanging the water at a height of 150 feet, supported by the anchor arm which acted as a lever over the pier.

An idea of the enormity of the framework can best be given when it is stated that the bridge was designed for double railway tracks, double electric car tracks, two roadways and two footways, all to be on the same level. It was 67 feet wide, centre to centre of trusses. Its total weight was computed at 38,500 tons. The main towers or posts, 315 feet long between end pin centres, rose to a



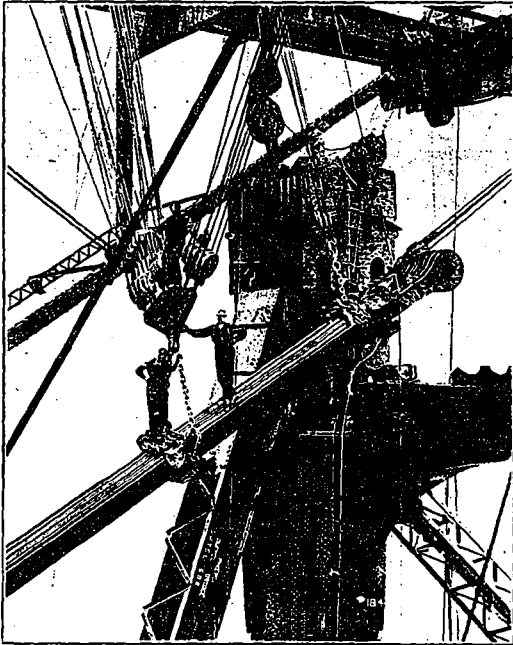
VIEW SHOWING TWO COMPLETE UPPER CHORD PANELS BEING HOISTED INTO POSITION. THESE EYE-BARS, AS WILL BE SEEN IN THE VIEWS OF THE WRECK, WERE TWISTED AND BENT INTO ALMOST EVERY CONCEIVABLE SHAPE.

height of 400 feet. In general the structure was pin-connected, employing rows of 15-inch eye-bars for its top chord chain and all other members had riveted connections, save the posts were pin-connected to the bottom

chords and the latter were similarly connected to the shoes, resting on the 24-inch pin which carried the main post.

PROGRESS OF ERECTION.

The piers having been built under a separate contract, the falsework for the south anchor arm was built in 1905, and in 1906 the entire south cantilever, i.e., the anchor



HOISTING CENTRE PANEL TOP CHORD EYEBARS INTO POSITION.

arm and the cantilever arm, was erected. In the present season, 1907, the falsework for the north anchor arm was built. It had been intended to continue on the south side to erect the south half of the suspended span by means of the main traveller, a great outside-running gantry structure, weighing 1,100 tons, and large enough to embrace the highest portion of the 315 foot tower-bent over the main pier. But desire of the Government to see the bridge completed in 1908, the tercentenary of the founding of Quebec, caused the contractor, the Phoenix Bridge Co., to start dismantling the main traveller so as to move it over to the north side and begin erecting the north cantilever. A smaller traveller, weighing 250 tons, and running on the top chords, was built for erecting the suspended span. This traveller was prosecuting the erection of the suspended span at the time of the accident.

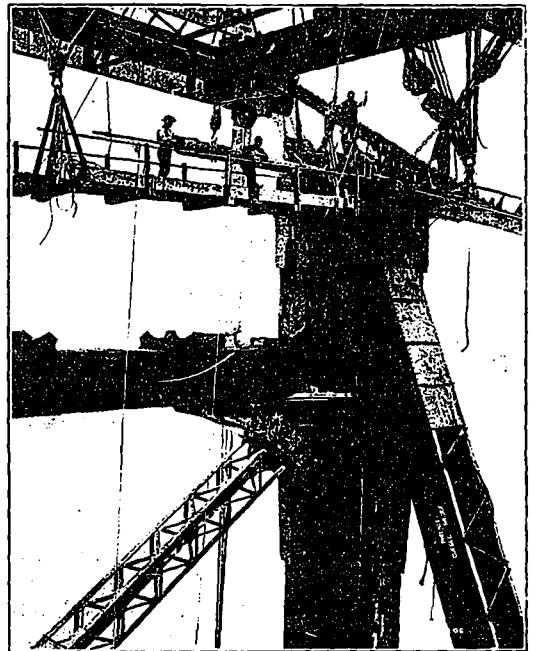
For this reason no part of the north half of the bridge was concerned in the accident, only the south half, which, as we have already stated, was almost completed.

All of the work for the Quebec bridge was fabricated by the Phoenix Bridge Company at Phoenixville, Pa., after the design of Paul L. Szlapka, a German, and the process of erection was being carried on by the same company, under the direction of Chief Engineer John Sterling Deans, with Theodore Cooper as Consulting Engineer. Mr. A. B. Milliken superintended the erection, while A. B. Yenser acted in the capacity of general foreman. The latter lost his life in the catastrophe.

When the accident occurred (5.30 p.m., August 29th) all the erectors and their foreman and the engineer were on the bridge making everything secure for quitting at 5.45. Three four-men gangs of riveters and one hoisting engine man were on the anchor arm, and six gangs of riveters were on the cantilever arm, the erecting gang was busy on the travellers and everything is said to have been

in normal condition. Mr. E. J. Wickzer, an experienced foreman who had been on this bridge three years in charge of the erection of false work and travellers, was 1,200 feet or more away in the axis of the bridge on the north side of the river, where he was erecting the steel and wooden falsework for the anchor arm. He was watching the foreman directing the fitting of the splices on the 34-ton lower chord pieces still suspended from the traveller, when he heard a very loud noise like the report of a cannon or explosion and saw the end of the cantilever and centre span commence to descend, moving somewhat up and down stream as it did so. As it seemed to approach near the surface of the water the main traveller tilted forward, the main vertical posts collapsed and the entire structure instantly disappeared. This account was corroborated by one of the workmen who was on the south shore about 500 feet west of the bridge and had his attention attracted by a loud explosion. He looked up and saw what seemed to him to be a cloud of smoke and saw the cantilever arm descend and the traveller fall before the collapse of the main post.

Most of the bridge fell into the water, nothing of the wreck being visible beyond about 100 feet out from the main pier. Soundings near the middle of the river indicate some 140 feet of water on the steelwork. The foreshore, however, is piled high with the tangled metalwork from a point about 30 feet out from the anchor pier to the main pier, and about 100 feet beyond. The destruction and mutilation of members was most terrific on the main pier, across which fell the 3,000,000 pound vertical bent with 4 x 10 feet four-web vertical posts 315 feet high on centres with stresses of over 10,000,000 pounds



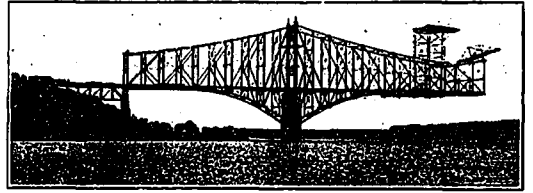
DRIVING MAIN 12 FOOT TOP CENTRE PIN, 375 FEET ABOVE WATER. VIEW ALSO SHOWS TOP OF STEEL TRAVELLER UPON WHICH ONE OF THE SURVIVORS WAS WORKING AT THE TIME OF THE COLLAPSE.

each. Each post was made in five sections and weighed 712,000 pounds, exclusive of the top and bottom pin connection pieces. The wrecked portion weighed about 17,000 tons. But little of that on the river side of the main pier can be recovered. Most of the anchor arm eyebars have little or no injuries except bending; many are still

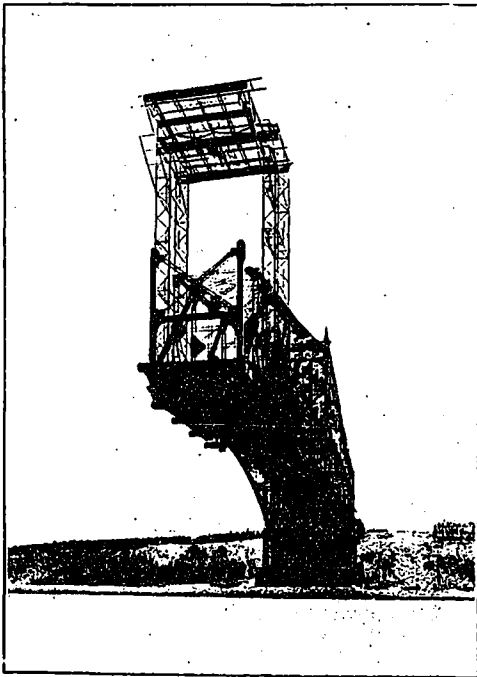
perfect. Most connections endured when their members were destroyed. Many of the heaviest members were completely shattered by the fall.

That anybody on the bridge should have escaped alive is miraculous, when it is considered that the least distance any part fell was over 150 feet and that some of them fell over 400 feet, the bulk falling over 150 feet. Notwithstanding, eleven of the men who went down with the steelwork escaped alive and will probably recover from their injuries. Two brothers were riveting at the top of post P, over 200 feet above the rocky ground, one was inside the post and the other inside the transverse strut, both holding on rivets. The massive post was bent, crumpled and torn to pieces and the men escaped. Another riveter who was also holding on inside the lower chord near the main pier, more than 50 feet above the ground, went down in it and emerged alive. One man on top of the main traveller fell with it about 400 feet into the water and was rescued. Another on top of the small traveller fell about 250 feet into the water and was also rescued. An engine-runner, working a steam locomotive out to the outer end of the cantilever, was thrown

dian Portland Cement Company. It would be of great value to the constructional world if the exact nature and quantity of the aggregates employed in the mortar for these piers were made public, as it is highly probable that



VIEW TAKEN 15 DAYS BEFORE THE WRECK OCCURRED, SHOWING THE 1,100 TON TRAVELLING GANTRY BEING DISMANTLED AND THE SMALL TOP-CHORD TRAVELLER PLACING PANELS IN THE CENTRE SPAN.



SOUTH CANTILEVER ARM AT CLOSE OF SEASON 1906. WHEN THE BRIDGE FELL THIS PORTION HAD BEEN COMPLETED AND 231 FT. 3 IN. OF THE CENTRE SPAN HAD BEEN ADDED ON MAKING A TOTAL 731 FT. 3 IN. OVERHANGING THE WATER.

into the river, but rescued. He says that he felt the structure sink, and he shut off steam, but the engine continued to run out toward the open end, and soon afterwards bridge and engine were in the river.

It is a particularly noteworthy fact that the masonry piers stood the impact of the thousands of tons of falling steel without one piece of stone being displaced, which not only stands as a credit to Mr. A. A. Stewart, constructing engineer of the masonry work, but is a refreshing indication of honest and efficient efforts on the part of the masonry contractor, M. P. Davis. What is even more significant than all this, is the exemplification of the fact that Canadian Portland cement is unexcelled—the cement used in the piers was supplied by the Cana-

any individual piers of masonry have ever been subjected to such a severe test, beyond what they were designed to have stood.

Many theories have been advanced as to the cause of the disaster in the evidence brought out by the Royal Commission. It appears that certain deflections existed in some of the more important members of the structure, and that these weaknesses were known to the engineers in charge. The evidence produced further shows that not only the engineers, but the workmen as well were greatly wrought up over these defects, and yet work was not suspended, although it is averred that these conditions were about to be investigated when the collapse came.

Several of the surviving workmen gave testimony along the line of that sworn to by E. B. Haley, who testified as to having seen a defect outside of the main pier on the cantilever arm and at the second splice from the pier in the webs of the lower chord. The webs, he stated, were bulged both on the Quebec side and in a corresponding chord on the Montreal side, indicating the immense weight on them.

A number of the bridge hands had heard talk of the defects, while others had seen nothing. All, however, felt more or less uneasy.

As evidence that the lower chords had settled under the tremendous weight to which they were subjected, it was stated that the top chords when struck with a sledge



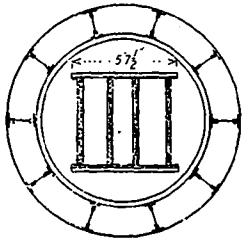
WRECKAGE BETWEEN SOUTH ANCHOR ARM AND SOUTH SHORE PIER. THE 500 FOOT CANTILEVER ARM AND 231 FEET OF THE CENTRE SPAN ARE SUBMERGED IN THE RIVER.

hammer gave a sharp high-keyed sound indicating a very high tension.

It was also stated that when an occasional heavy piece of constructional material dropped upon the main strut,

and when the pneumatic riveters were at work, the great structure vibrated to an alarming extent.

While the Commission thus far has been handicapped by a great amount of contradictory evidence, one fact still



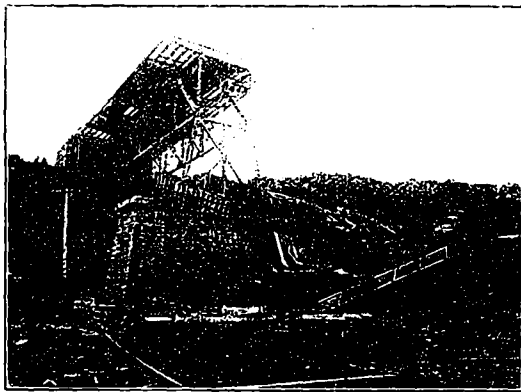
Comparative cross section of bottom chord of Forth and Quebec bridges at relative points near main pier.

remains: the bridge showed weaknesses in some of its most important members while in course of construction, and it is only reasonable to assume that the whole calculations of the designing engineers were at fault, in so far as they attempted to erect this great span with too few tons of steel. In other words, it appears that the important members of the structure were not sufficiently strong to carry

the loads they were required to support. In this connection it is interesting to note by comparison the much larger dimensions of the compression members in the Forth bridge, the only comparable precedent we have in the form of great cantilever spans. Although the span of the Quebec bridge was 90 feet longer than each of the single spans in the Forth bridge, the accompanying sketch showing the comparative size of chord No. 9 of the Quebec bridge and a similarly located chord of the Forth bridge will clearly illustrate the superior strength and character of the latter.

More than this, it is contended by many engineers that the cylindrical form of compression members is much superior to that of the rectangular shape, although it is more difficult to make joints in the former type.

The question of supreme interest to the engineer is not the primary one of what member failed first, or the legal one of why work was continued regardless of these evidences of distress, but why the chords were distressed at all, why they behaved as they did. The fact must be recognized that the design of these great struts was not at all abnormal, except that they were of unprecedented size; and their unit-stresses were not high at the time of the collapse. Calculations have been made, based on an



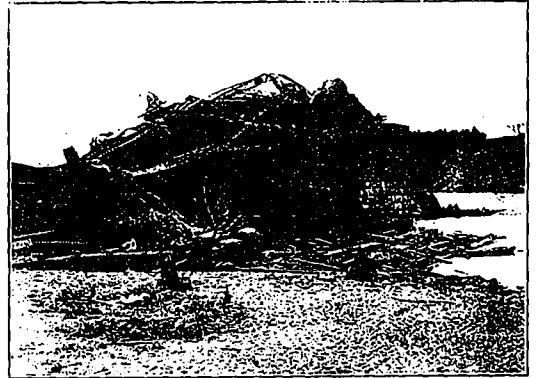
LOOKING SOUTHWARD TOWARD THE ANCHOR PIER, SHOWING BUCKLED EYEBARS OF UPPER CHORD, OVERTURNED ANCHOR ARM AND UNDISTURBED MASONRY.

estimate of the difference between the loading on August 29 and the full dead-load, of the stresses in the anchor-arm chords; they indicate that the highest compression in these chords was not far from 12,000 lbs. per sq. in. The question then is: under what conditions can a short, thick strut, loaded to only 12,000 lbs. per sq. in., exhibit clear signs of straining out of its designed shape? The

nature of the shop processes used in building and finishing these chords, and of the procedure followed in riveting up the field-splices, have an important bearing on this problem.

Although the Commissioners appointed by the Dominion Government to investigate the Quebec bridge disaster have completed the taking of evidence in Quebec itself, the most important part of their work remains to be done—their personal investigation of the plans of the bridge and that portion of the wreck that lies exposed on the shore of the St. Lawrence River at Cap Rouge. From this inquiry and a review of the evidence it is hoped that the Commission will be able not only to indicate the cause of the disaster, but to suggest what steps should be taken to prevent any recurrence of this national calamity.

Their report will go before Parliament at its approaching session, and it is a foregone conclusion that when the bridge is rebuilt it will be not by any private company, as it was before, but by the Dominion of Canada, as a link



DEBRIS AT MAIN PIER OVER WHICH THE MAIN TOWER POSTS ARE BROKEN AND VISIBLE ABOVE THE SURFACE OF THE WATER.

in the new transcontinental system. Doubtless when the report is presented and the whole matter comes up for review it will be ascertained whether it would not be better to have the new bridge built at such an elevation as would afford a clearance of two hundred feet from high tide for the masts of passing steamships. The Montreal Shipping Federation, the Board of Trade, the Chambre de Commerce are agitating for an increased height. Already, it is argued, the masts of some of the larger vessels have passed the 150 foot mark, which would have meant, that whatever the improvements in the ship channel, the largest steamers would forever have been barred from traveling up the St. Lawrence to Montreal if the bridge was built at the old elevation.

The raising of the bridge elevation another fifty feet would make the railway approaches heavier than is desirable for a high class line, but if the matter is only one of dollars and cents nothing should be done that will cripple the development of the ports of Montreal, Three Rivers and Sorel, and of the enormous traffic which may some day find its way direct from the Great Lakes to the Atlantic seaboard.

The bridge over the Thames is 143 feet high; over the East River, New York, 135; over the Manchester Ship Canal, 75 feet.

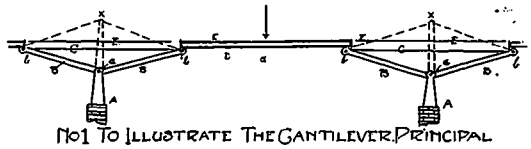
CANTILEVER NOT PRACTICAL.

Referring to the great bridge accident, Mr. Allen G. Ingalls, of Laprairie, suggests that the strict cantilever principle should not have been applied in the case of so long a span as that proposed for the St. Lawrence River at Quebec, and advances the theory that a combination of cantilever, suspension and arch would have been more practical. He further hints at a possible defect in the

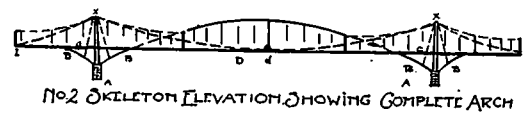
design after which the structure was being built, even should the cantilever type have been adequate for a span of 1,800 feet.

His argument, which is accompanied by designs and precluded by a simple explanation of the cantilever principle, is as follows:

"AA are solid supports or piers provided at their upper ends with holes aa. Articulated to these parts AA are beams BBBB arranged to move freely upon down pins thrust through these holes aa. The beams BBBB are also provided at their upper ends with holes bbbb also provided with pins, which engage eyes formed on the ends of the rods or ties CC. In such a structure ABC, the only stable or stationary part is A. The other member B.C.B. may be tilted over either way up or down, but the upper ends of these beams or arms BB must always occupy the same relative position so long as the rods or ties C lie horizontally. Upon the upper ends of these arms BBBB are placed the beams DDD, which simply rest on these arms. Any suitable superstructure as EE, completes the bridge by forming a roadway. It is therefore evident that the piers AA, support the entire structure, and must be strong enough to withstand any crushing pressure. The part BB must be rigid to prevent them from bending, though the rods CC, have no strain upon them ex-



cept an endwise pull and require stiffness. Furthermore, that the material from which such a bridge is built must have relation to the weight that is to pass over it, whether ordinary pedestains or elephants dragging heavy siege guns. It is also to be observed that the beams DDD, must be rigid and that their place of greatest strain must be equidistant between their end supports. I have marked this point with the arrow at d. It is not necessary to derive the term, but if one consider a weight moving across such a bridge, such weight must tilt or cant the structure B.C.B, down at one corner and "lever" it back again as the weight passes over to the opposite corner on the middle beam D. In the Quebec bridge (No. 2) the designer reinforced the structure B.C.B., as shown in his plan, by lengthening his pier A up to a point high enough to add another element, that of the suspension of the two arms BB, and thus reinforce the tie C. Referring to the designer's plan, it is seen that his superstructure could afford no support whatever to the points bb, of the arms bb. It starts from the apex X, of the elongation of the pier and terminates, not as it should, at the point b, but at a point very materially above it; so far above it, in fact, as to be the equivalent of one-fifth of the entire dis-



tance to the pier. What he ought to have done was to tie the points x with either rods, links or cables in as nearly as possible a straight line between these points x and b. It was much better that the collapse occurred before this radial defect of plan had brought about a greater calamity, calamity.

What might have happened at the accident is the following: The tie C (or its equivalent in the actual structure) parted from the arms BB. Whether the pins broke or the ties themselves matters little, for the outer ends of the arms began to fall, placing the strain to uphold these arms wholly upon the superstructure the most outward post of which fell against the next inward until they all lay towards the centre in that line which is short-

est from x to b. Then the leverage of the falling arms, adding terrible strain to the elongation of the pier A, this elongation crumbled and the wreck was complete.

Since it is always easier to criticize than to build, it is perhaps in order to show how this Quebec bridge might have been built so as to stay put, and fulfil its purpose, as have done the Victoria and the Brooklyn bridges. Conditions being such as they are, it seems to me that the best possible construction would be that of a combination of suspension, cantilever and arch. I have drawn a dotted line on the plan to indicate how the suspending cables would hang. Of course the bracing of the superstructure would have to be correspondingly changed and the extension of the piers should be made extraordinarily strong.

By making the incomplete arch continuous, which springs from the central piers (as marked on the designer's plan), the bridge would be enormously strengthened. Making these changes would not add to the weight of the bridge, as what is added in one place would be taken from another."

Evolution of the Cantilever Bridge

CANTILEVER bridges are, strictly speaking, hinged continuous girders. They were not much used until the last quarter of the nineteenth century, when the building of the Kentucky Viaduct (1876) and the Niagara Cantilever (1883) demonstrated the practicability of erecting such bridges without the use of supporting false works. Since these dates numerous cantilever bridges have been constructed in both Europe and America. Briefly defined, a cantilever bridge consists of a continuous truss span starting from an abutment and extending over and beyond a second support on each side of the stream. The two projecting ends are connected by a truss span suspended from them. The shore ends of the spans are anchored to the abutments. The Niagara Cantilever Bridge, completed in 1883, has a total length between abutments of 910 feet. The projecting arms, or cantilevers are each 175 feet and the truss span which they support is 175 feet long. The Saint John River (New Brunswick) Cantilever, built in 1895, has a total length of 813 feet and a main span of 477 feet. The Poughkeepsie Bridge, built in 1889, has a total length of 6,761 feet, with five river spans, of which the first and fifth are cantilever spans and 548 feet, 546 feet and 548 feet respectively. The Red Rock Cantilever Bridge, built in 1890, Red River, Cal., has a total length of 990 feet and a centre span of 660 feet. The Memphis Bridge built in 1892, over the Mississippi River, at Memphis, Tenn., has a truss-span of 621 feet and two cantilever spans of 799 feet, which are the longest cantilever spans in the United States. The longest cantilever span in Continental Europe is the 623 feet span of the Danube Bridge, near Czernadova, in Roumania. Great Britain still has the honor of having at present the longest cantilever span in the world, in the Great Forth Bridge across the Firth of Forth, in Scotland. This bridge has two cantilever shore arms of 680 feet, and two main cantilever spans of 1,710 feet. It was begun in 1883 and completed in 1890. The Quebec bridge across the St. Lawrence River, upon which construction was begun in 1900 was to have had a main cantilever span of 1,800 feet.

A NON-INFLAMMABLE material for use in inside work on fireproof buildings is found in asbestos wood, a substance resembling soapstone, which is a by-product of asbestos. In addition to the fireproof qualities of this material, the distorting influence of heat is very slight. Ordinary wood surface finishes can be applied with success. Its use in hotels and public buildings would help substantiate their claim to "fireproof" construction.—Concrete Engineering.

American Theories in Bridge Design Are Faulty

Eminent English and American Journals Take Strong Stand Editorially Against the "False Economy" Methods Practiced by United States Engineers.

ENGINEERING (London), in an article on the Quebec Bridge disaster acknowledges the great experience of the builders and of the consulting engineer, Mr. Theodore Cooper, of New York, who is, perhaps, the leading bridge consultant of the United States. In this connection it is, says Engineering, of some interest to recall that at the completion of the Forth Bridge, Mr. Cooper is reported to have declared that if the latter had been built on American lines it would have been completed in half the time, and at a substantial saving in cost. The Quebec Bridge was to have been built on the same general system as the great Scotch structure, but the details were very different. In the Forth Bridge the main compression members are tubes 12 feet in diameter, and the main tension members riveted lattice girders. Such features are not well adapted to the American system of bridge construction, in which every endeavor is made to reduce the amount of work done at the bridge site to a minimum, everything possible being done in the bridgeyard. This procedure had some special advantages in the present instance, as the severe Canadian winter makes it imperative to stop all work on the actual bridge site for five months of the year. The Quebec Bridge was, therefore, designed, in accordance with the ordinary American practice, as a pin-connected structure, the top chord of the cantilever consisting of eye-bars, and the lower chords are not hollow tubes, as at the Forth Bridge, but are rectangular boxes, having four webs, through which pass the pins for the main verticals. The outside dimensions of these struts are given as 4 1-2 feet by 5 1-2 feet over all, and they were, therefore, much less rigid than the 12-foot tubes, used at the Forth Bridge. Great advantages are claimed for the American system of construction in the matter of lightness, and in comparing the Scotch and the Quebec bridges it has been pointed out that the dead load in the case of the former is 9 1-2 times the live load, whilst the corresponding figures for the St. Lawrence structure are 4 1-3 to 1, an apparent economy of some 50 per cent., or even more, since the span is larger. The claim that this difference is due to the adoption of the American system of construction is, however, ridiculous, continues Engineering, since the weight of a large bridge is fixed almost wholly by the ratio of depth to span, and is very little affected by differences in structural detail. Since there is no great difference in this ratio in the case of the Forth and the Quebec bridges, the above comparison merely shows that a very much lighter factor of safety was adopted at the Forth than at the St. Lawrence. In fact, the live load on the Forth Bridge could be doubled without bringing up the stress on the material of the main trusses to the figures adopted in its rival. At the Forth Bridge the steel used in the compression members was, adds Engineering, not strained in any case to more than 7 1-2 tons per square inch, inclusive of a wind load of 56 lbs. per square foot, reckoned on twice the vertical projection of the structure. The struts were, moreover, 12-foot tubes, as stated, and thus enormously stiffer than the corresponding members of the St. Lawrence Bridge; whilst the steel used had a strength of 34 to 37 tons per square inch. At the St. Lawrence the steel used has an ultimate strength of 63,000 lbs. (28 tons) only, yet it appears from the drawings to be strained to a very much higher degree. In one other respect the bridge was undoubtedly less safe than that at the Forth. The latter is a double intersection structure and could still stand even if one member showed signs of weakness. Mr. Theodore Cooper, is, however, strongly opposed to this system of

construction, though it undoubtedly gives greater security than the single intersection system adopted by him.

"The Scientific American" on the Subject

THE following excerpts are from an article on the Quebec Bridge disaster appearing in the last issue of the Scientific American:

The tremendous significance of this disaster lies in the suspicion, which to-day is staring every engineer coldly in the face, that there is something wrong with our theories of bridge design, at least as applied to a structure of the size of the Quebec bridge.

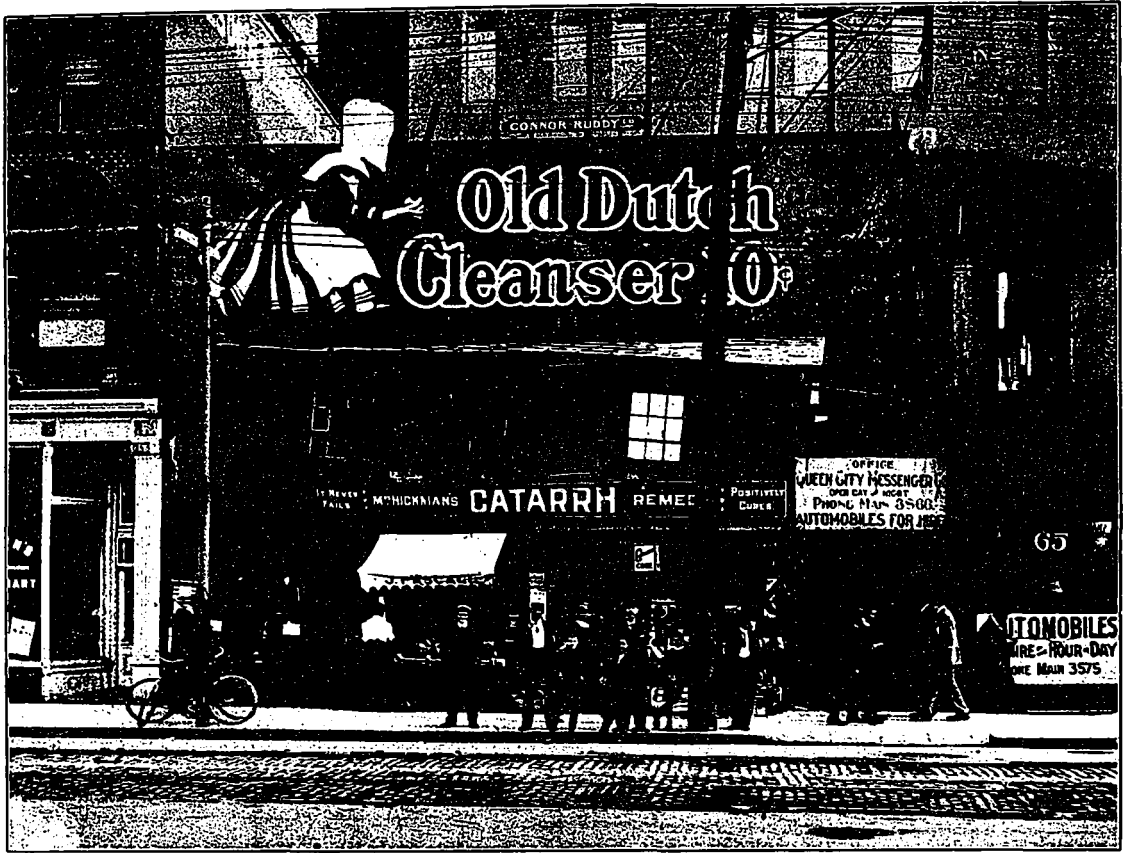
It would be a mighty consolation if only there were some evidence that faulty material or poor construction had entered into a vital part of the bridge; but thus far everything points to the contrary. There would be comfort also in the fact, if it could be proved, that the sudden fall of some massive member which was being lifted into place, or a sudden displacement of one of the erecting gantries weighing several hundred tons, had produced a dynamic shock throughout the huge framework, which had caused the stresses to rise beyond the maximum calculated stresses, and so had brought the bridge down. But, alas! there is no evidence to show that sudden dynamic stress or anything approaching it occurred.

Are we to conclude, then, that those theories, those formulae, upon which we have been building our bridges so successfully during the past quarter of a century, are inapplicable when the structure exceeds a certain magnitude? Can it be that for some unsuspected reason a stress per square inch which is perfectly safe in the end-post of a 500-foot railway truss becomes perilous when used in the bottom chord of an 1,800 foot cantilever? As far as our engineering knowledge goes, there is no reason whatever why this disparity should exist. But if not, why is the Quebec bridge now lying at the bottom of the St. Lawrence river?

When we first heard of the fall of the bridge, we were satisfied that the failure was not due to the breaking of any of the tension members. Eye-bars, if the heads be carefully welded (and great attention is always paid to this point) are the most reliable portions of a framed structure. They are never known to give way. It was our expectation that the cause of failure would be found in the compression members, and the breakdown seems to have begun in one of these, namely, the bottom chord of the anchor arm of the cantilever. Two or three days before the accident it had been observed that this particular member was showing incipient signs of yielding, by springing from an inch and a half to two inches out of line, the deflection being toward the inside of the truss. We confess to profound astonishment that upon this discovery work was not instantly suspended. Instead of this, an engineer was despatched to New York to see the Consulting Engineer, and another was sent to Phoenixville to the works of the bridge company. At about the very hour that instructions were being forwarded to suspend work, the bridge fell.

The methods of calculation of the strength of posts, struts and chords, that is, of all the members subject to compression, are based upon combined theory and experiment. Many years ago large posts which had been built upon the accepted formula were placed in a testing machine, and subjected to compression until failure occurred. These tests thoroughly verified the correctness of

[Continued on page 49.]



A "BEAUTY SPOT" IN FRONT OF TORONTO'S CITY HALL, COMPRISING A RESIDENCE, WORK-SHOP, TWO STORES AND A SIGN-BOARD, WHOSE GROSS RENTAL BARELY DEFRAYS THE TAX ASSESSMENT. A HEAVY BRACE TO THE ADJOINING WALL MAINTAINS THE BUILDING IN ITS SEMI-UPRIGHT POSITION.

Delapidated Buildings in Canadian Cities

A Few Timely Suggestions as to a Possible Abatement of a Condition Which is Holding up the Progress of Our Cities and Breeding Calamity

Building Inspector Jarrett and Medical Health Officer Underhill, of Vancouver, recently inspected a number of old buildings on the north side of Water street, between Abbott and Carroll streets, of that city. The result was the condemnation of the structures, as not only unfit for human habitation, but also a menace to the public interests. The agents were notified to have the tenants vacate the premises at once and the buildings demolished. To back up the behest the city threatened to take a hand in the tearing down process, and charge the expenditure up against the tax assessment.—News Item.

VANCOUVER is on the right tack. More power to the efforts of the health officer and city architect.

The prevalence of tottering old shacks that are a menace to public safety and health—festered eye-sores—in the larger and fast expanding cities of Canada is most deplorable. Commercial progress has been more or less hampered in our older eastern cities by the passive tolerance on the part of the authorities of ramshackle old shells; and certainly this toleration has been largely responsible for the existing scattered state of big office buildings and business houses whose natural tendency should be to group about one down-town hub.

"Why!" someone says, "if such sites are desirable for business purposes, what is to hinder the would-be purchasers buying up these properties and establishing upon them new buildings suited to their enterprises?"

The fact is: it isn't the unsightliness of the location that turns the prospective buyer away, but the miserly owners of the properties themselves that are the stumbling-blocks to municipal progress through maintenance of unworthy buildings. The owners are not particularly anxious about selling just at present—which has been their attitude for the last score of years—and they would be almost insulted if anyone made a serious proposition to buy. They are content to hold the sites so long as they can find tenants who are willing to pay barely enough rental to assure the taxes from year to year, knowing that the tendency in these localities is for prices to go up.

This condition of affairs is not uncommon in Canadian cities and Toronto furnishes some striking examples, even within easy hailing distance of the \$2,000,000 City Hall.

It is not our intention to promulgate a campaign of building reform, nor yet to upbraid the civic officials for lethargy in the discharge of their respective duties; but it might not be amiss, just by way of suggestion, to hint that the City Architect's and Medical Health Officer's departments should get into closer touch with each other in an harmonious and legitimate endeavor to assure of mor-

creditable structures on our busy thoroughfares than some that are now in existence.

For instance, directly in front of the City Hall on Queen street there are frame buildings that have the appearance of being ready to tumble down and no doubt they would collapse if it were not for the support they get from adjoining walls. It would be unreasonable to suppose that these shells have escaped the notice of the city officers, who must be brought face to face with them every time they go to and from their work. The City Architect may, justly enough, be harboring the idea that they are reasonably substantial for the class of business they are housing; that it is none of his concern as to whether or not the living apartments on the first floor are sanitary, and so long as no alterations or extensions are made to the present framework, they are entitled to remain standing unmolested.

But it is just a question if the Health Inspector could

abolish these nuisances and install adequate lavatory facilities and other accommodations to meet the demands nature must make on his tenants. These alterations would, in turn, call for the sanction of the City Architect's department, and it wouldn't require much argument on the part of the latter before the building would be condemned as too rotten to admit of the prescribed repairs.

The tenants being ordered to move out, the proprietors are confronted with an enormous tax bill with no sustaining revenue, and they will be either compelled to erect suitable buildings or sell the properties to someone who would be only too eager to improve.

But it should not require all this maneuvering to secure a speedy replacement of dilapidated frame buildings in congested portions of a city such as Toronto. By the revised city by-law which has recently been carefully compiled, annotated, and bound in booklet form by Architect McCallum, the City Architect is given a wonderfully free



REAR VIEW OF THE "BEAUTY SPOT," AFFORDING A GLIMPSE OF THE CITY HALL IN THE BACKGROUND, AND ALSO SHOWING TWO UNSAVORY OUT-HOUSES, THE ARRANGEMENT OF WHICH WILL NOT IN THE LEAST CONFORM WITH THE CITY BY-LAWS.

conjure up such a feasible excuse for the part he is not playing.

If the buildings recently condemned in Vancouver were more "unfit for human habitation" than the ones here in referred to and illustrated, it is a wonder that they were habitable at all.

A BLOT ON THE LOCALITY.

The front view of the "beauty spot" gives a meagre comprehension of the cheery and wholesome flat over the stores, in which people are expected to live.

To a health inspector, who is even active in the prosecution of his duties, there may be nothing in this view to invite his attention; but let him take the trouble to visit the rear court-yard and he will find, in the presence of two filthy outhouses, plenty to warrant the exercise of his vested authority.

With this as a basis for his argument, he could compel the over-capitalized owners of the property to at least

hand in the matter of tearing down, or ordering to be torn down, at any time buildings which in relation to their surroundings or for various other reasons may be considered unsafe.

Let us quote from clause 11 of by-law 4861 in the section touching upon the inspection of buildings:

"Wherever in the opinion of the Inspector of Buildings any building or part of any building, from any cause or defect, is in a dangerous condition, or when he shall deem any building unsafe for the purpose for which it is being used, or in danger of being set on fire from any defect in its construction, the said Inspector shall notify the owner or his agent in writing, specifying wherein such building is unsafe or defective. If the owner or agent neglects to proceed to at once put such building in a safe condition, or forthwith to pull down or secure such building or the dangerous

parts thereof, he shall render himself liable to the penalties of this by-law.

"12. If the Inspector of Buildings finds any building or part of any building in such condition as to endanger life or be liable to cause serious accident; and so that such danger may be averted by the immediate application of precautionary measures, he shall have power to take such precautionary measures as in his opinion may be

WILL NEITHER IMPROVE NOR SELL.

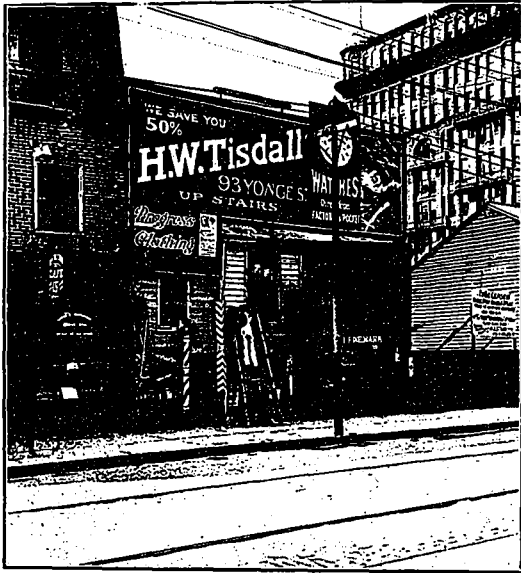
The man who collects the rents from these promises would not tell how much the tenants paid in monthly rentals, but he vouchsafed the opinion that the revenue, including that derived from No. 65, would not pay the taxes on the place. Yet by no means did he think the insurance company which held the deed, would sell. The company had refused \$75,000 for the site, which comprises a 70-foot frontage, a year ago. He had an idea that they would some day erect a six storey building on the spot; but in view of the fact that this same company put up a large office building last year, this yarn is quite generally discredited.

Leaving this wretched spot, a person needs to walk but a few yards east toward the busy corner of Queen and Yonge streets ere he is confronted by another sickening spectacle. It likewise supports a mammoth sign-board which plays considerable part in keeping the landlord out of debt for taxes on the property.

It so chanced that our photographer happened along just when a brush artist was doing a little local improvement work, which goes to show that the owner was not considering the idea of any immediate sale. That portion of the subject upon which the painter is applying his art, is the front of a residence. The eave and upper window sash were touched up from a stepladder. For the cornice over the the store windows the stepladder had to give way to a shorter bit of scaffolding, being too long and cumbersome. Perhaps if the structure had been allowed another year to settle, the upper flat could have been painted from the sidewalk.

On the day after the photograph was taken a man, representing himself to be a prospective builder called upon the owner to ascertain what figure the land was held at.

Actually, the deed-holder didn't know! He had advanced the price so often in his frequent mental calculations as to how much more valuable his property was, this month in comparison to last, that he forgot just where he had left off. When the stranger hinted that it ought to sell for \$2,000 per foot, the owner frankly declared that he really didn't know whether he wanted to sell or not. He was figuring on holding it for another three years, when the lease governing the business house he at present occupied would expire. He was making money at his business, and the shabby property in Queen street was costing



ANOTHER MARVEL OF BEAUTY FACING THE CITY HALL.—NOTE THE PAINTER "COVERING A MULTITUDE OF SINS." THE MAGNIFICENT I.O.F. TEMPLE CAN BE SEEN TO THE RIGHT.

necessary to render said building or any part thereof safe, provided the owner, lessee, occupant, or agent of said building refuses to do so immediately after being notified in writing of the condition of the building, and the decision and order of the said Inspector shall in such case be absolute and final."

The statute goes on to say that if the work is attended to by the Building Inspector, he shall render a bill of the cost to the owner, who will not be permitted to reconstruct or repair until he has squared accounts with the City Treasurer. The Inspector of Buildings, or his Assistants, has the right to visit, enter and inspect at all reasonable hours "any building which he has reason to believe is in a dangerous or defective condition in regard to its construction, or through damage by fire or accident."



MONUMENTS OF MISERY ON UNIVERSITY AVENUE. SIX HOUSES (4 IN FRONT, 2 IN REAR) HELD BY A REALTY COMPANY, WHOSE AGENT DECLARES THAT THE RENTALS WILL NOT MORE THAN PAY THE TAXES, YET THE COMPANY IS NOT DESIROUS OF SELLING.

him nothing to maintain, and by the end of three years he would know whether he wanted to sell his land and retire or lease it to someone and retire anyway. The property was bound to increase in value on account of its magnificent location, and he couldn't attempt to prophesy where its value would soar to. No. He didn't care about selling.

A MISLEADING SIGN.

Some people believe in signs. Some don't. It depends upon conditions. Look at the sign on the fence of the vacant property just west of the edifice last referred to. This is one of the signs you are not supposed to believe in. It reads:

"To be leased. Three storey double store, which will be erected immediately upon this site. Suitable for house furnishings, clothing, etc. Floor area, 6,000 sq. ft. Plans and full particulars given at office of"—so and so.

The three storey building which was to have been erected immediately, is not yet in sight. And the people who intend to build have not yet been located. The idea of the agents is to get inquiries, through this medium, from people who are interested in these lines of trade, and who would be willing to lease at a stiff price, if a building were put up. Then some thought might be given to construction.

The owners of the site hold the title to 135 x 135 feet on Queen and Bay streets upon which none of the buildings are creditable to this section of the city. But they do not intend to sell. They acquired the land about eight months ago for \$160,000, and have since refused \$185,000 for it. Should they sell, they would not take a cent less than \$2,500 per foot, or, \$337,500 for the lump.

While the cases referred to may be among the most conspicuous dishonourments to the city of Toronto in the way of deplorable buildings, they are by no means individual or selected. The very heart of the city is full of them. Teraulay street, Elizabeth street, Chestnut street, Centre avenue, Armoury street, including all the intersecting streets and even University avenue—a magnificent drive leading direct to the Parliament Buildings—are all reeking with unsanitary places of abode and buildings that are veritable fire-traps.

WHAT IS THE REASON?

And all because of what?

Not because every city of any magnitude must have its "slum"; but because the city by-laws are not worded positively and definitely enough to ensure against the slippery argument of a slick lawyer in defence of a counter action which might be brought by an avaricious landlord; or, because of sluggishness on the part of the Building Inspectors; or, because the City Architect, who is conscientiously endeavoring to keep pace with the city's immediate needs, is denied adequate backing and office help.

Let the city councils be influenced to look into these things,—and just here by way of suggestion, is something to occupy the sentimental architects and citizens who have organized themselves into Guilds of Civic Art and Municipal Clubs with the object of evolving schemes for the beautification of Canadian municipalities.

The Councillors, like the City Architects, may be so intensely occupied with keeping pace with items of the moment, that they will not take the time to look into stagnant problems which might require a revision of the by-laws or desultory litigation, unless these problems are put right up to them.

Architects, as we find them are an intellectual lot of men, who by concerted action, might carry considerable weight with them in deputizing a bunch of aldermen who are dependent largely upon the sentiment of the masses as against the ill-will of a few, for their next year's office.

It should not necessarily follow that architects would jeopardize the dignity of their profession in advocating a reform that would obviously result in more extensive building operations for themselves. According to the ratio of latter day construction in Canada it is clear on the face of the thing that reputable architects don't need

to go a-pegging for work. The lay public would never frown on the proposition we have suggested and the well intending "city beautiful" advocates would at least be showing some material effort to justify their periodical holding of meetings for parley and discussion.

WHAT HAS, AND CAN BE DONE.

The City Architect's and Medical Health Officer's joint condemnation of a few old structures in Vancouver is not a unique incident in the West.

Let our eastern cities take further example from the peaceful city of Victoria, where recently the aldermanic board instituted a vigorous crusade against all the notorious danger spots in the city, with the result that no less than forty-six old buildings have been condemned to absolute destruction. In addition to this a supplementary report referring to fire-traps and wood-yards was adopted as follows:

"We would also state that there are a great many wooden buildings still in the limits and on nearly every street, for which we think there ought to be some means devised whereby these buildings could be removed, for wherever there is a wooden building situated between brick buildings, they certainly endanger the surrounding property in case of fire.

Many people believed that this action was taken as a result of the recent conflagration, but this impression is false. We are informed that the Mayor had suggested, two months and a half ago, that the City Assessor prepare a report on all the old buildings which had depreciated to such extent that the council could take a hand in their demolition.

A number of property owners made loud protest against the removal of so many old buildings but in all cases, where insufficient reasons were given for the preservation of these old premises, an order was made demanding their destruction within five days.

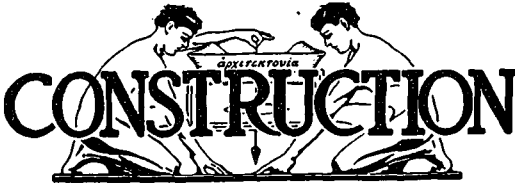
Mayor Morley gave out the statement that the destruction of these old shacks was imperative. Not only were they eye sores of the worst kind, and thus a bad advertisement to the city, but they were a standing danger in case of fire. He thought that the council had made a very good move in the way of improving the city's appearance when it ordered the demolition of the old buildings named in the Assessor's report.

AN EXPLICIT BY-LAW.

Since there is a plausibility to the suggestion that the latitude of the Building Inspectors is not set forth definitely enough, in the by-laws of our eastern cities, we present for comparison an extract from the perspicuous Victoria code.

The clause under which the city council's action was taken reads:

"Whenever any building in the said city is, by reason of age, fire, decay, accident or from any other cause, in danger of falling or being set on fire, and endangers the surrounding property or the lives of the citizens, or SHALL HAVE BECOME DECAYED OR INJURED TO THE EXTENT OF ONE-HALF OR MORE OF ITS ORIGINAL VALUE OR COST, it shall be the duty of the said Building Inspector to notify the owner, agent or other person having charge or possession thereof of such building, to put the same at once in a safe condition to guard against such fire or dangerous accident or to entirely pull down and demolish the same, and if such owner, agent or other person in charge or in possession of such building, for twenty-four hours after the receipt of such notice, neglects to comply with the same, he shall be subject to the penalties of this by-law, and every similar subsequent offence shall be deemed a new and subsequent offence, and shall render the owner, agent or other person having charge or in possession of such building as aforesaid so notified and making default liable again to the penalties of this by-law."



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tion. Advertising rates on application.

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

Vol. 1 October, 1907 No. 1

OUR CONTRIBUTORS



WALTER J. FRANCIS, C. E.
M. Can. Soc. C. E.
M. Am. Soc. C. E.

AN article in this number, which will no doubt prove of great interest to our readers, is that contributed by Walter J. Francis, C. E., of Montreal, treating of the hydraulic lift locks employed in the Trent Canal project. It is a portion of a paper especially prepared for the Canadian Society of Civil Engineers, which was awarded the Gzowski Medal for the year 1906. In this issue the subject has been taken up from a constructional standpoint. It will be

dealt with along equipment and mechanical lines in our November number.

It will be gratifying to the readers of CONSTRUCTION to learn further that, by special arrangement, Mr. Francis has agreed to contribute articles to our columns from time to time, touching upon the latest improved methods of concrete construction, upon which subject he is a recognized authority, having acted in an advisory capacity upon some of the largest works in Canada.

Born in Toronto, in 1872, Mr. Francis enjoys the distinction of high rank among the engineers of America at the early age of thirty-five years. His academical standing includes an honor graduate diploma from the School

of Practical Science, Toronto, and a "C.E." from the University of Toronto. He is a member of the Canadian Society of Civil Engineers and of the American Society of Civil Engineers. Since 1888 Mr. Francis has been engaged upon railway, canal, bridge, power development and building work, and for seven years as engineer of hydraulic lift locks for the Canadian Government. His achievements in this latter capacity have been watched intently by masters of the engineering craft in all parts of the world.

It will interest our readers to learn that Mr. Francis was retained by the Government Commission on the Quebec Bridge Inquiry to prepare a report for them on this unusually important and interesting case.



MARTIN J. QUINN
Consulting Engineer

Martin J. Quinn, Consulting Engineer.

Mr. Quinn was born in Gananoque in 1874. In 1886 he entered the service of the Ontario Government as Assistant Plumber. Subsequently he became Sanitary Inspector for the province of Ontario, and was later appointed Mechanical Superintendent, in connection with which office there was a variety of duties, more particularly the designing of plumbing and heating systems. In May, 1906, he became associated with the firm of Cliff Brothers, Toronto, in the capacity of Consulting Engineer.

Mr. Quinn has been a contributor to both American and Canadian trade journals on the subjects of heating, sanitation and cold storage, and has edited several pamphlets on sewage disposal, upon which subject he is an accepted authority. He is also patentee of several inventions for the facilitating of the disposal of sewage, among them being the Quinn Automatic Flushing Valve used in conjunction with septic tanks.

A REGULAR contributor to the columns of CONSTRUCTION will be F. W. Fitzpatrick, Consulting Architect, of Washington, D.C., who is considered one of the best informed men in America on matters appertaining to almost every branch of construction and who, beyond question, ranks among the most eminent authorities in the world on fireproof methods and materials. A man of indomitable energy, he has devoted a great deal of time in the promotion of adequate state and municipal building laws, in his capacity as executive officer of the International Association of Building Inspectors and Commissioners.

Mr. Fitzpatrick was born in Montreal in 1863; trained for military life while studying engineering; did much of the Canadian Pacific construction work and later practised architecture in the Western States. In 1893 he was engaged in an official capacity by the U. S. Federal Government in the Building Department at Washington, during which term he designed the Chicago Post Office. In 1903 he resigned the service to take up the consultation practice and has since been instrumental in organizing many societies for the improvement of buildings.



TOM O. MARTEN, ARTIST.

REALIZING the importance of high class illustrating in a journal such as CONSTRUCTION, we have retained the services of Mr. Tom O. Marten as art director.

Mr. Marten is a young Canadian artist whose work has attracted considerable attention since his return to Canada about a year ago. Many of the finest cover designs reproduced on Canadian journals in the past year were executed by him, as well as some commendable pieces of work in commercial art.

The decorating of CONSTRUCTION has been done exclusively by Mr. Marten.

It may be stated that there are few journals of this character maintaining an associated art director, and the announcement that Mr. Marten has been engaged to act in this capacity should meet with the appreciation of our readers.



MR. FREDERICK CHALLENGER, R.C.A., O.S.A.

MR. FREDERICK CHALLENGER, R.C.A., O.S.A., whose work as a mural decorator has done so much to beautify and enhance the value of many of our more prominent buildings, needs no introduction to the building profession in Canada, and the announcement that he has been retained as a contributor to the columns of this journal will be heartily received by our readers.

In our department devoted to interior decoration we hope to give the subscribers to CONSTRUCTION a rare insight into and a tangible appreciation of the mural painter's art as well as the relationship of mural decoration to architecture generally. Mr. Challener is a comprehensive descriptive writer—not tediously technical—and the absoluteness which has characterized his artistic efforts is likewise discernible in his writings. His views are far-reaching, and when chronicled should prove a great stimulus to architectural decorating in this country.

Items of Interest

THE new St. Dunstan's Cathedral at Charlottetown, P. E. I., which was dedicated on September 13th, cost in the neighborhood of \$200,000.

* * *

A JOINT stock company has been formed in Warman, Saskatchewan, by Mr. A. A. Logan, of Morrisburg, for the purpose of operating a butter and cheese factory. It is proposed to erect an extensive building.

* * *

R. A. LAWTHER, of the firm of Lawther, Latta & Co., of London, England, intends projecting a railway from Dawson to Edmonton, providing he can secure Dominion Government endorsement of the bonds of the proposed road.

* * *

UP to the present writing, the number of permits issued in the city of Brantford, Ont., for the erection of new buildings has exceeded 319 permits, the estimated cost represented by these permits being \$429,145.

* * *

THE packing plant being erected for the J. Y. Griffin Co., at Edmonton, Alta., will be of concrete and brick construction, the contract for which was let to the May-Sharp Construction Co. The equipment will be very complete, the capacity being 5,000 cattle a day.

* * *

OWING to the high price and scarcity of labor the council of St. John, N.B., has decided to discontinue new work in various civic departments, as the appropriations have been pretty well used up without producing the expected results in work done.

* * *

ESTIMATES from St. John, N. B., indicate that the total value in brick and stone buildings erected, or in course of erection, this year will amount to \$400,000. This amount, added to the large sums expended in harbor improvements, show a gratifying progressiveness on the part of the city of St. John.

* * *

THE new V. M. C. A. building being erected in Edmonton, Alta., at a cost of \$90,000, will be opened January 1st. It will be of solid brick, four storeys and basement. The dimensions are 50x100 feet, and the equipment will be very complete, including eight shower baths and a plunge bath 16x32 feet, and dormitories on the top floor.

* * *

THE new seven storey brick and cement building for Messrs. Pither & Leiser, in Victoria, B. C., has been completed. The plans were prepared by Messrs. Hooper & Watkins, of Vancouver, and the contract work was executed by Gribble & Skene. This modern warehouse is unique in that every ounce of material entering into its construction is native to the province.

* * *

GPARKER WOODBURY, a Wall Street financier, is erecting at Brooklyn, N.Y., after the plans of Architect Albert Swasey, of New York, a house constructed entirely of glass blocks. These blocks will be twelve inches long and ten inches thick, hollow inside, of a cream color, so that while they will be translucent, they will not be transparent. The proposed structure will be about the size of a fifteen-roomed dwelling, and instead of having interior walls dividing it into rooms, the two floors will be divided by bamboo partitions covered with Japanese paper, to suit the occupant's fancy. The total cost of the building will be about \$20,000.

A unique feature of this house, in addition to the novel material used in its construction, will be the bizarre effect obtained at night when the house is lit up, causing it to resemble a gigantic glow worm.

BUILDING operations in Guelph for the year 1907 up to the present writing have totalled over \$500,000.

* * *

CONSTRUCTION work on the new C. P. R. station at Edmonton, which is to cost \$250,000, has already commenced. McDiarmid Bros., of Winnipeg, are the contractors for this work.

* * *

A CHARACTERISTIC example of the rapid growth of the West is afforded by comparative figures of building operations in Edmonton, Alta. In 1905 they amounted to \$750,000; in 1906, \$1,868,069; in 1907, \$2,027,375, an increase in three years of \$1,277,375, or nearly two and one-half times that of 1905.

* * *

THE Railway Commission will look into the whole question of the relations between the railway companies and the city of Toronto this month. The problem is a complicated one. It not only involves the plans for the Union depot, but includes the whole question of access and egress of railways to and from the city along the waterfront.

* * *

MESSRS. HANEY & MILLER, contractors for the big tunnel which the city of Toronto is having put under the bay for the purpose of adding to the city's water supply have been forced to abandon their boring machine and resort to the ordinary method of getting through the rock by drilling and blasting. The time for the contract will expire this month, but it is probable that the work will not be finished for a year or more.

* * *

CHIEF JUSTICE MOSS and Justice Garrow, sitting as a court of appeal, gave judgment, in Toronto, Sept. 17th, upholding Justice Anglin's decision, which made the Grand Trunk and Canadian Pacific railways liable for the full cost of the proposed Yonge street bridge. The court held that Yonge street was a thoroughfare across the tracks to the water's edge, thus disposing of the companies' claim that the street ended at the tracks. The court also declares that the whole muddle is due to the vague and bungling terms of the Dominion Railway Act of 1903.

* * *

A UNIQUE theory has been advanced by a citizen of Winnipeg to account for the settling of the foundations of the Osler Block there. The contention is that Winnipeg is floating on a large lake of quicksand and that the dredges which have been accustomed to take sand from the Red river are gradually undermining the city. He suggests as a remedy that this dredging be stopped and rows of piling placed along the water's edge to prevent this stratum of quicksand from washing into the Red river, thus allowing the superstratum of firm earth to sink evenly.

* * *

IN addition to the \$8,000,000 already spent in improvement to the harbor of Montreal, in the last few years, Mr. Stevens, of the Harbor Commission, is authority for the statement that several millions more will be spent within the next year in the consummation of an extended plan of improvement now being prepared by Mr. Davidson, a noted English expert on this subject. The iron sheds now in course of erection on several docks will be speedily completed and as soon as the plans are received from England they will be submitted to the Dominion Government for approval. It is the aim of the commissioners to make Montreal the national shipping point to the East.

FOR its size, Stratheona, Alta., is making a remarkably good showing in the value of buildings erected or in course of erection. So far this year, in all probability, the total will exceed \$600,000.

* * *

CALGARY is adding its share to the industry and prosperity of the West. In building operations alone, permits to the extent of \$1,023,820 have been issued in the past eight months.

* * *

LONDON, Ont., is agitating for a new City Hall and Court House. A suggestion has been made that it would be advisable for the city and county authorities to get together and erect a structure capable of accommodating the offices of both.

* * *

AMHERST, N.S., makes the unique claim that with all the industries in full operation there, never has a bonus of any nature been given to a manufacturer to locate in that thriving town.

* * *

VAST improvements will be made in the buildings and faculty of the University of St. John, N.B., if the plans now on foot there carry through successfully. John D. Rockefeller has promised a donation of \$100,000 and Andrew Carnegie \$30,000 to this movement, providing the parties interested succeed in raising \$100,000 themselves. \$75,000 of this amount has already been collected in St. John, and the other \$25,000 is in sight. The amount total is to be used in the erection of a science building and the establishment of an adequate science course, as well as to provide an endowment fund for the maintenance of same.

* * *

A COMPARATIVE statement of the number and value of building permits issued in Toronto from January 1st to September 30th, for the years 1906 and 1907, shows an increase of 366 permits, representing a value of \$2,637,752.

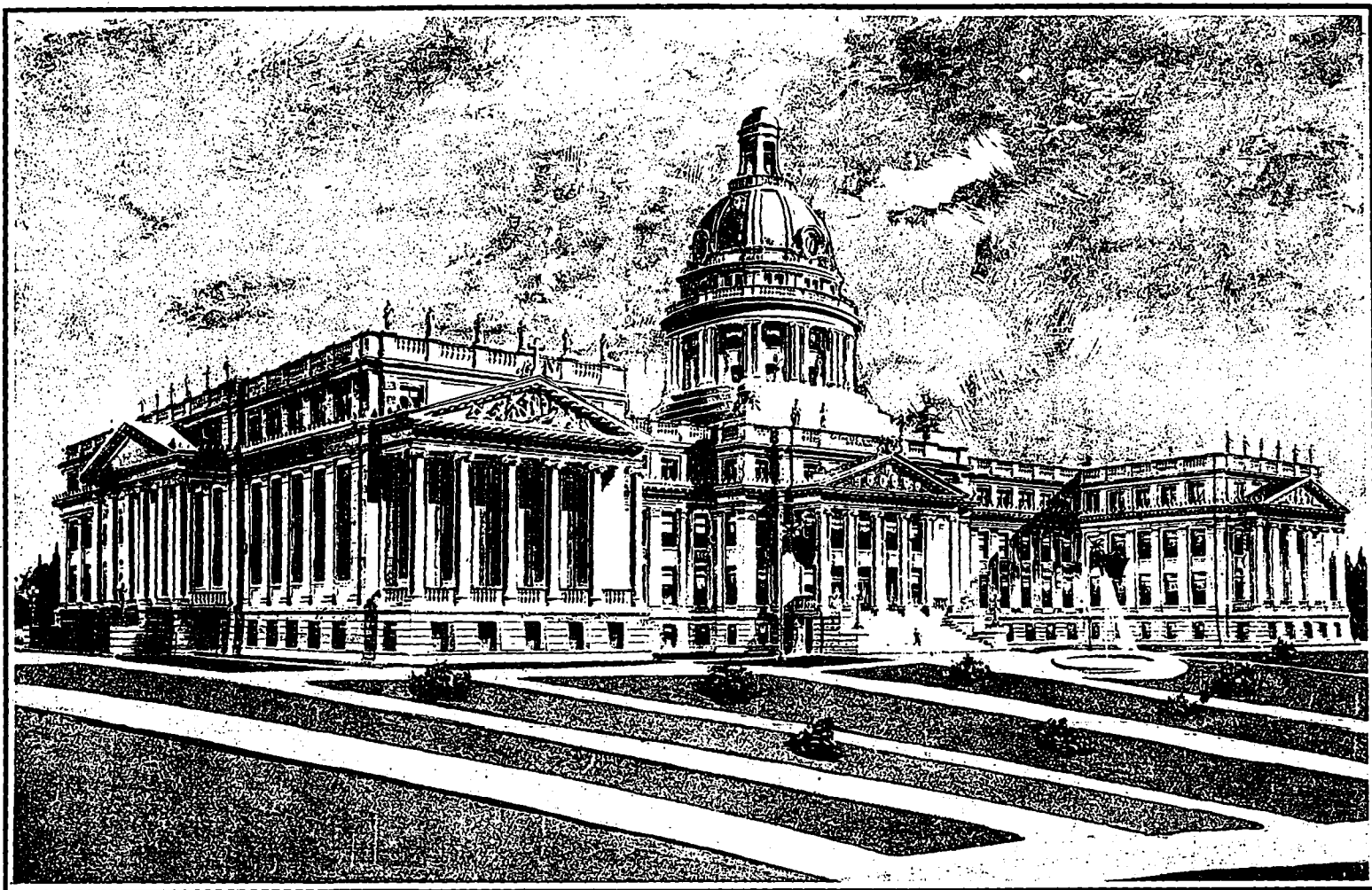
The month of September, however, shows a falling off, as compared with the same month last year, of 183 permits, representing a value of \$139,363. This is no doubt due to money being very tight at the present time, contractors having second mortgages on buildings being unable to realize on them to reinvest in further building operations.

* * *

THE Government of the Province of Saskatchewan has issued invitations to seven firms of architects to submit competitive designs and plans for the local Provincial, Executive and Administrative Building at Regina, which will cost in the neighborhood of \$1,500,000. Being an exclusive competition the programme of conditions by which the competitors are to be guided has not been made public, but it is known that the unsuccessful, as well as the successful, competitor will be remunerated for his time and trouble in preparing the plans. It is further understood that no particular style or type of architecture has been specified, and it is expected that the latest date for submitting designs will be in the early part of December.

The competition is restricted to the following invited firms: Messrs. Darling & Pearson, Winnipeg and Toronto; Mr. Cass Gilbert, New York, U.S.A.; Messrs. Marchand & Haskell, Montreal; Messrs. E. & W. S. Maxwell, Montreal; Messrs. Mitchell & Raine, London, Eng.; Mr. F. Rattenbury, Victoria, B.C.; Messrs. Storey & Van Egmond, Regina.

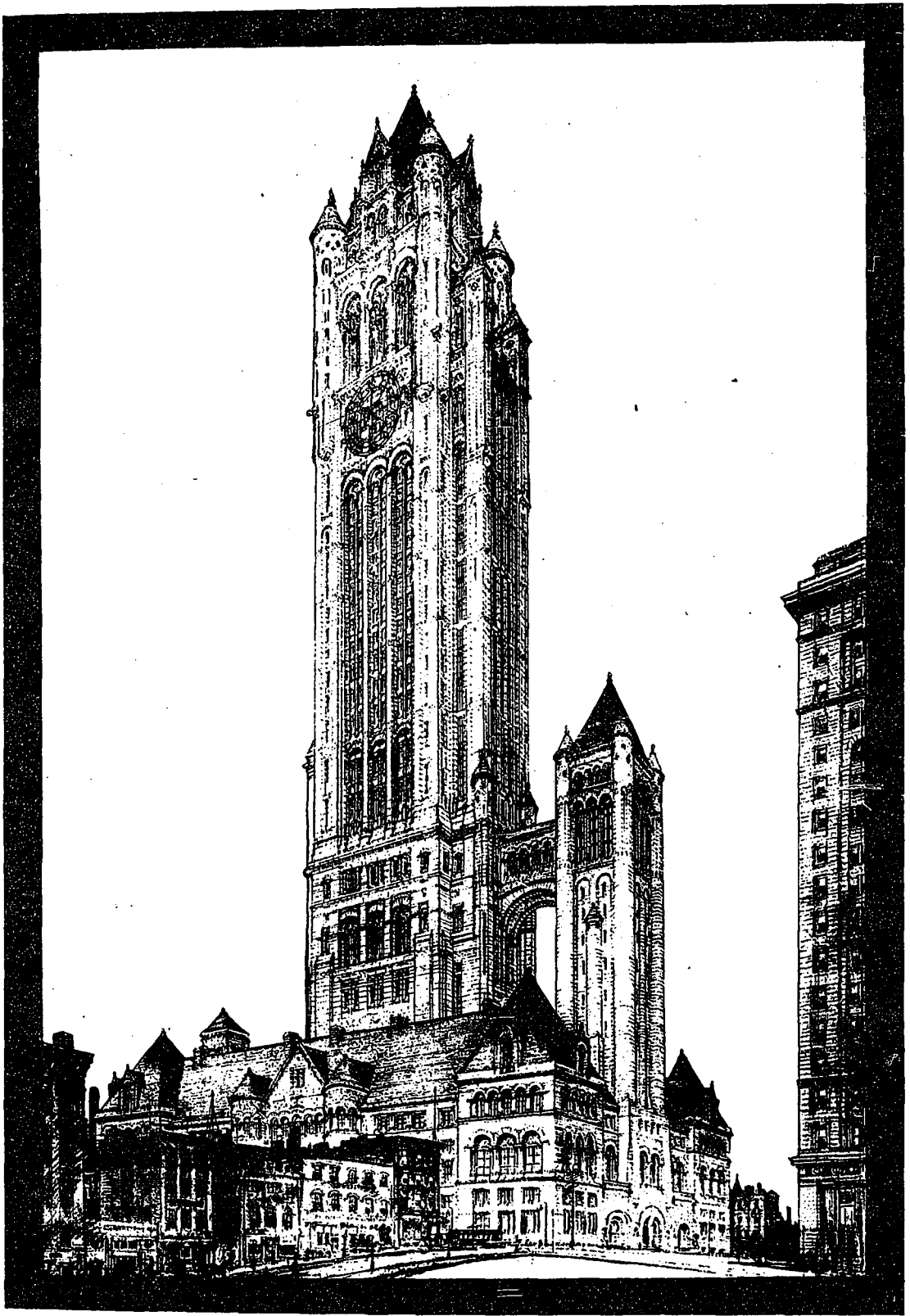
The assessors are to be Mr. Bertram Goodhue, of Messrs. Cram, Goodhue & Ferguson, New York; and Mr. Percy E. Nobbs, professor of architecture, McGill University.



New Arts Building of Ottawa University, Ottawa, Canada, now in Course of Construction

THIS IS ONE OF THE FEW LARGE BUILDINGS IN CANADA OF THE CLASSIC GREEK STYLE OF ARCHITECTURE, AND IS, AS WELL, ONE OF THE LARGEST REINFORCED CONCRETE STRUCTURES IN THE DOMINION. IT HAS SOLID MONOLITHIC COLUMNS WITH IONIC CAPITALS, AND IS FACED WITH INDIANA LIME STONE ON A GRANITE BASE. ONE OF THE DISTINCTIVE FEATURES OF THE BUILDING IS THE LARGE NUMBER OF STATUES THAT ADORN ITS DOME AND PARAPETS. THE OPENINGS BETWEEN THE COLUMNS IN THE DOME DISCLOSE STATUES OF THE TWELVE APOSTLES, WHILE THE PARAPETS WILL BE DECORATED WITH FIGURES OF CANADA'S GREAT MEN, THUS SYMBOLIZING BOTH RELIGION AND PATRIOTISM. THE PLANS WERE PREPARED BY ARCHITECT A. O. VON HERBULIS, OF WASHINGTON, U.S.A.

Subscriptions to cover the cost of this edifice are being solicited from adherents to the church in Canada, while the plans have been prepared by an American architect. This is one of the glories of Ottawa in which more of Canada's foreign-born have crossed into their hands than Canadian Architects and Engineers.



Highest Office Building in the World

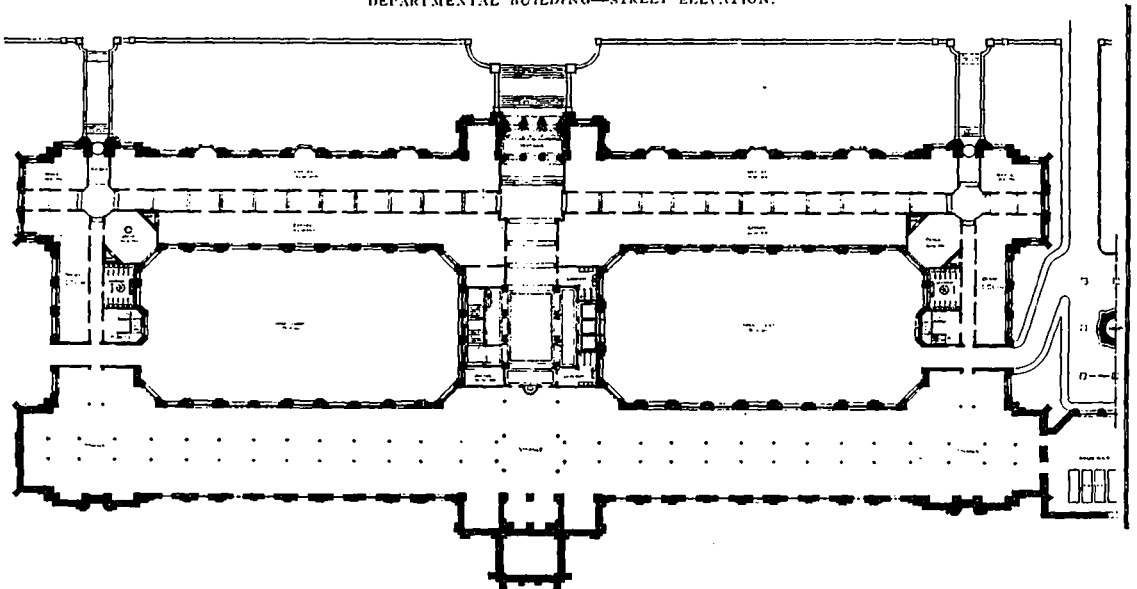
PROPOSED TOWER, 725 FEET (113 FEET HIGHER THAN THE SINGER BUILDING), TO BE ERECTED AS AN ADDITION TO THE ALLEGHENY COUNTY COURT HOUSE, AT PITTSBURG, PA. DESIGNED BY ARCHITECTS PALMER & HORNBOSTEL, PITTSBURG—FOR DESCRIPTION, SEE PAGE 47.



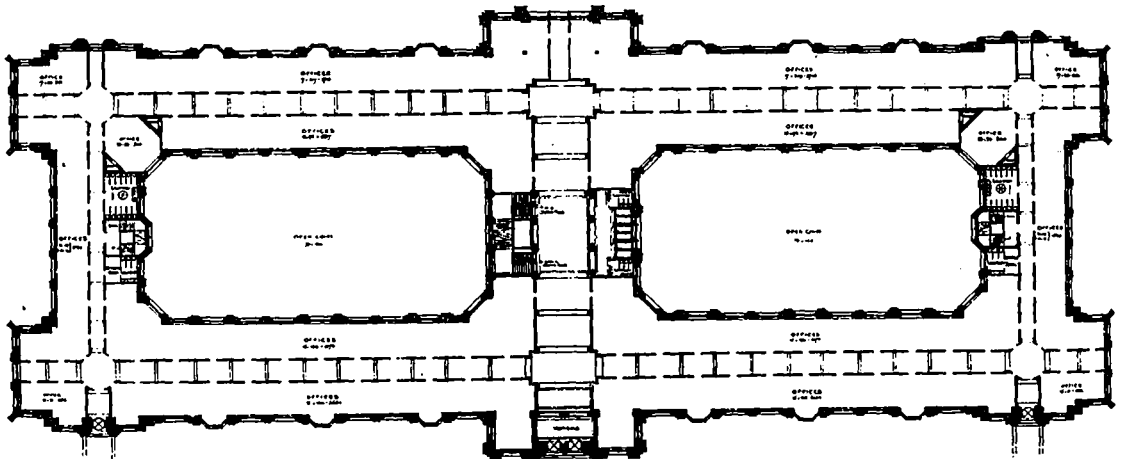
DEPARTMENTAL BUILDING—PARK ELEVATION.



DEPARTMENTAL BUILDING—STREET ELEVATION.



DEPARTMENTAL BUILDING—GROUND FLOOR.



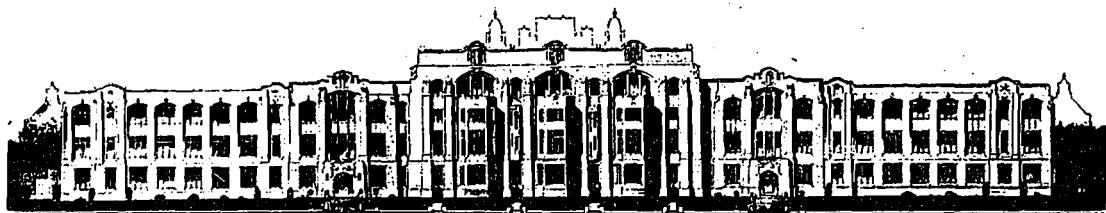
DEPARTMENTAL BUILDING—FIRST FLOOR.

Prize Design, Proposed Government Bldgs., Ottawa

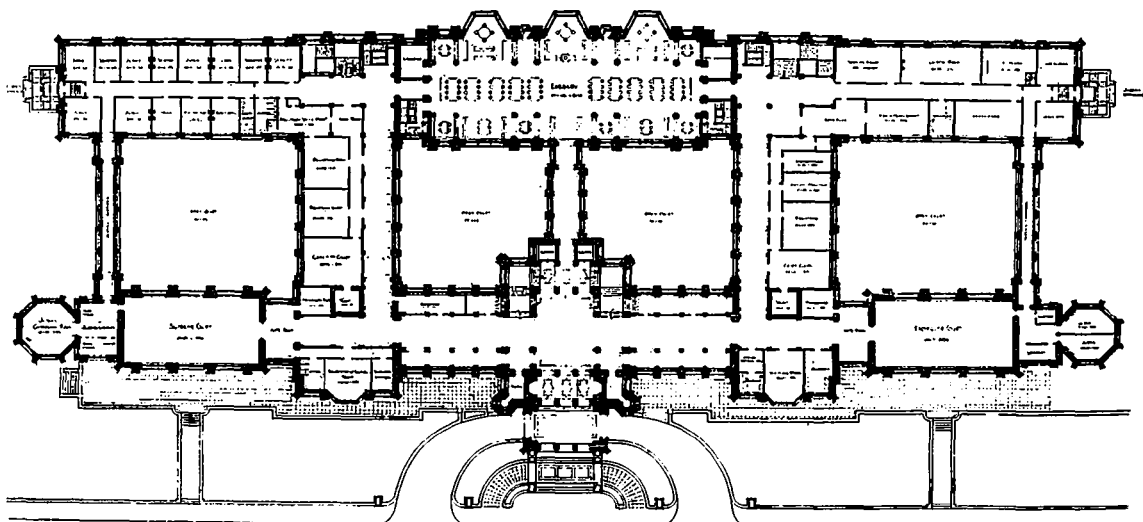
E. and S. W. Maxwell
Architects



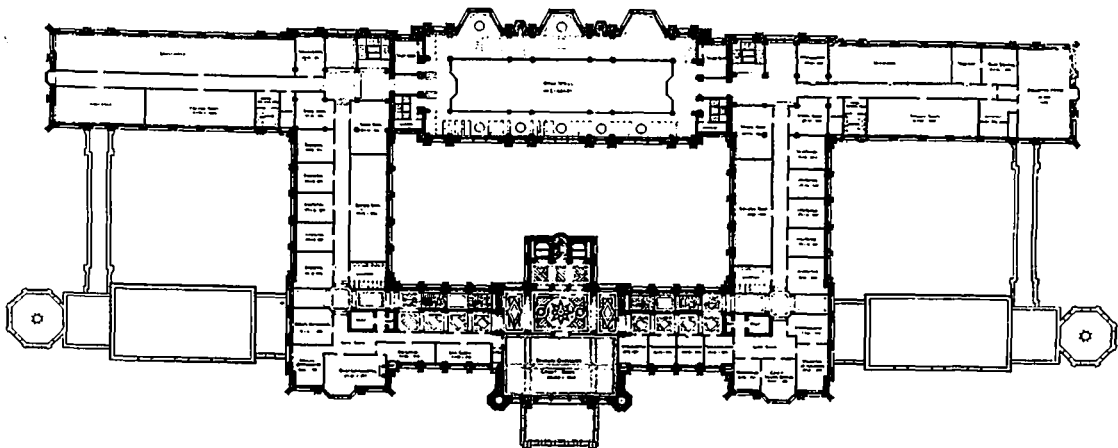
JUSTICE BUILDING—PARK ELEVATION.



JUSTICE BUILDING—STREET ELEVATION.



JUSTICE BUILDING—GROUND FLOOR.

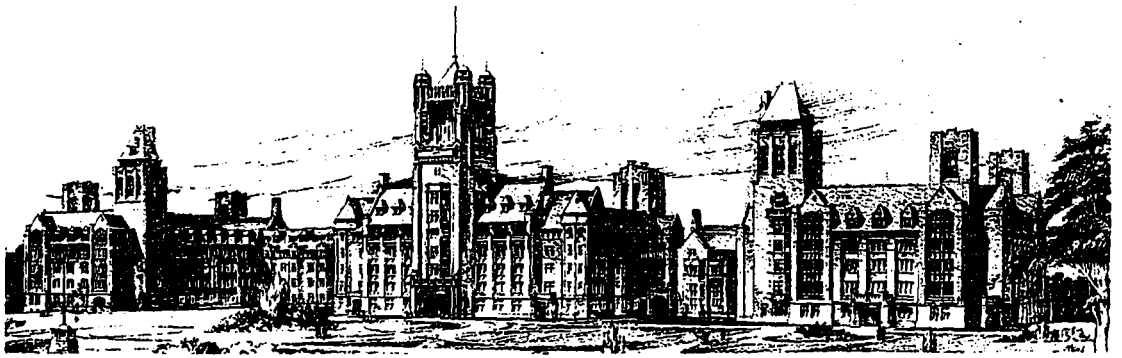


JUSTICE BUILDING—FIRST FLOOR.

Prize Design, Proposed Government Bldgs., Ottawa

E. and S. W. Maxwell
Architects

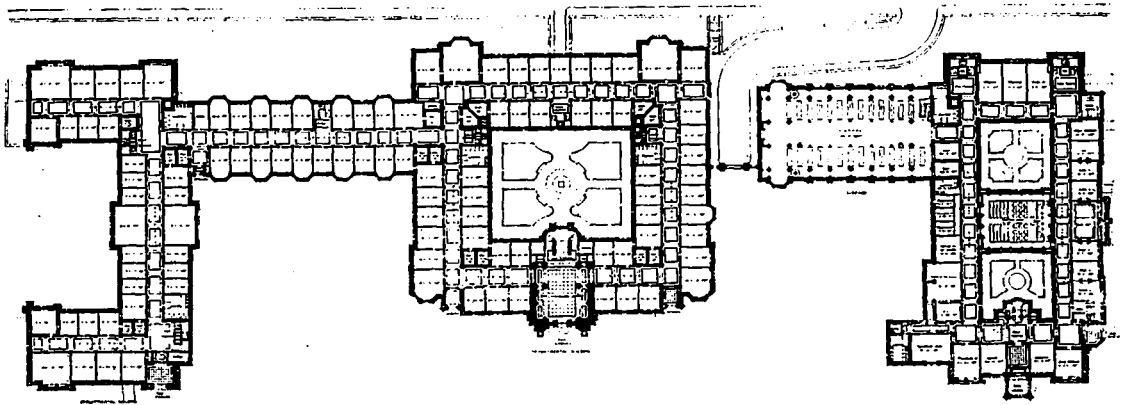
Construction, October 1907



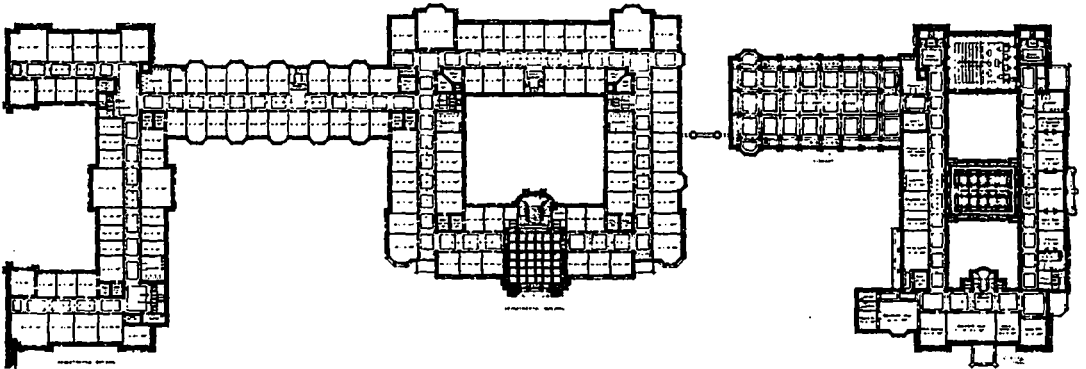
PERSPECTIVE VIEW, DEPARTMENTAL AND JUSTICE BUILDINGS.



FRONT ELEVATION.



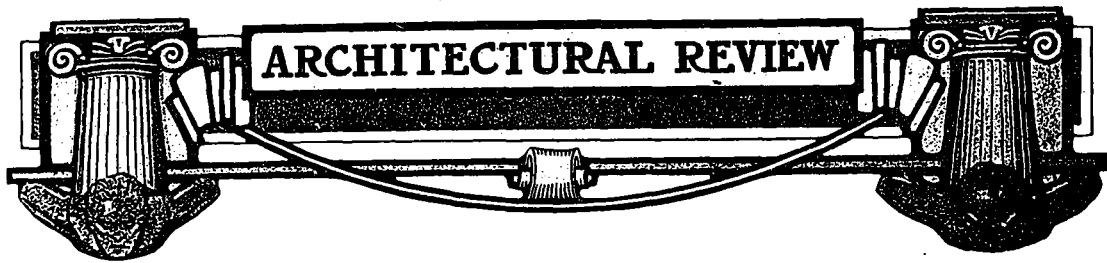
GROUND FLOORS.



FIRST FLOORS.

Second Design, Proposed Government Bldgs., Ottawa

Darling and Pearson
Architects



The Canadian Institute of Architects

By J. W. FITZPATRICK, CONSULTING ARCHITECT

Admirable Features and Regrettable Phases of the Proposed Act of Incorporation Discussed by an Ex-Canadian Architect, Now Residing in Washington, D. C.
—“Clause No. 3 Sufficient to Blast the Whole Thing!”

THE architects of the Dominion have lately assembled at Montréal and formed a corporation under the above name. It was a most commendable move and its purposes, as set forth in the preamble of the proposed Act of Incorporation, are noble, praiseworthy and deserve that every right-minded man, be he architect or layman, assist, co-operate, in their attainment. But, if an old Canadian particularly, and an old practitioner generally, an old chap who has seen the profession go up and down in many places, may be permitted to express a candid opinion and give a word of advice to a number of confreres he esteems and admires, I would say that I doubt the success of the venture simply because I firmly believe that its promoters are starting out wrong.

As I say, the preamble of the proposed Act of Incorporation is admirable. It says that the objects of the Society are to “Facilitate the acquirement and interchange of professional knowledge among its members, and more particularly to promote the acquisition of that species of knowledge which has special reference to the profession of architecture, and further to encourage investigation in connection with all branches and departments of knowledge connected with the profession.” Most of its following articles and clauses are also beyond criticism, but article 3 is a mistake and is sufficient to, and if persisted in ought to damn the whole thing. “On and after such date no person shall be entitled, with the Dominion of Canada, 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 to act or practice as Architect within the meaning of this Act.*”

There are then given a few immaterial exceptions, but the fact remains, and it is made palpably evident that the main, real purpose of the Institute is to, what is popularly known in this country, “hog” the whole thing. These gentlemen wish to obtain certain rights and privileges from which they also wish to bar all who are not of them. Even if the Act should pass in that form, I am satisfied that if any one would take the trouble to carry the matter into court, the Act would be pronounced unconstitutional, an undue curtailment of personal freedom and a turning over of a public function to a private corporation and to private greed. If the Committee before which that Act is presented has any legal luminaries upon it, I am convinced that the Institute will be requested to revise it, or the whole thing will be thrown out.

But if it should pass, there is still a court from which there is no appeal, and that has a way of its own of carrying out its sentences, the public. And to the public the true inwardness of the proposed legislation is quite apparent. It is not a move to raise to a higher plane the standard of general practice; it is not a means of securing better buildings for the people who will build, but it is an endeavor to organize a monopoly. It is a scheme closely akin to a labor union. It says in plain language: “We don't

want anyone else to come in here, we want all the work we want to force you, the people, to come to us, and, when we have you we will make you pay what we think is right and you have no alternative, for we have been smart enough to get the Government to back us up.” It is a confession of cowardice, a fear of American and foreign competition. It is not worthy of the men whose names are appended as charter members.

Here, the American Institute and the various state organizations have been infinitely more circumspect, more tactful. Just see how simple it would be for the Canadian Institute to reach virtually the same ends as it proposes, but without antagonizing the public and belittling itself. Why did it not organize purely for the purposes set forth in its preamble? Then as the Institute gained strength and influence it would have been a small matter to get an Act passed purporting to raise the general standard of practice in Canada and compelling anyone who desired to practice, be he native or foreigner, to first pass a Governmental examination to establish his fitness to carry on work that would not become a danger to life and property and an eyesore to the aesthetic people of Canada. The Government certainly can, and most assuredly should, insist upon such examination. An architect has no more business to erect buildings, upon which and in which human life is so exposed, than has a doctor to operate and give medicine and kill without license or a lawyer to defend the rights and life of a citizen without authority that will have examined into his fitness for that high function. Having obtained such legislation, it would have been easy, indeed, for the Institute to have the Examining Board made up of its own members. Then that Board could very readily have agreed that since examination for admission to the Institute was so rigid, anyone that could pass it would need no further examination at their hands, and, presto! there you would have the whole thing, just as they wanted it and without the stigma of class legislation, usurpation of Governmental functions, dangerous monopolistic tendencies and the baser labor union proclivities.

THE city of Cleveland has ordered the erection of a number of concrete voting booths as a result of a recent competition among local architects for designs for such a building, which should be artistic in design and suited for permanent location. A number of designs were submitted and from these the board of elections chose one to be used in the construction of two trial booths. It is thought that much of the opposition to the location of these booths by owners of abutting property will be averted by getting rid of the unsightly corrugated iron affairs which have been heretofore carted from one location to another. The result of the construction of the trial booths has been so satisfactory that the board of elections has decided to take further steps in the matter.

Architect's Remuneration Insufficient

The Five per cent. Commission Paid in This Country on Public Buildings and Structures of Great Cost is Not Adequate Reimbursement For the Time and Trouble of Professional Men. Comparative Statistics From Foreign Countries Give Credence to This Statement

THERE is a strong feeling among Canadian architects, as well as those of the United States, that a five per cent. commission is not sufficient remuneration for preparing plans and supervising the erection of large structures.

Five per cent. is the scheduled rate quite generally throughout the North American continent, while it is argued that in foreign countries the commissions range from five to eight and even ten per cent. It is also a known fact that in Government work prosecuted by the Departmental staffs, in both Canada and the United States, the cost of preparing plans and supervising has usually exceeded eight per cent. Then, again, as compared to the remuneration commanded by professional men in other avocations, and taking into consideration the careful attentions and heavy responsibility devolving upon the architect, the latter profession falls considerably short. While very little dissatisfaction has been expressed by the Canadian profession as a body, yet the matter has been quite seriously discussed in the distinctive association meetings.

In the United States an agitation is now in progress with the sole motive of increasing the allotted commission on churches, schools, opera houses, office buildings, and public buildings. Something definite along this line may be looked for very shortly, and as conditions in Canada differ but slightly from those now holding across the border, the issue will be keenly looked for by every Canadian architect.

In support of the cause, Secretary Glenn Brown, of the American Institute of Architects, has prepared the following commentary, in which he cites conditions as they exist in a half dozen European countries as compared to the United States:

In England the office of works, one of the recognized ministries of the country, is in charge of all Government buildings, except military barracks, local admiralty buildings and police stations. The great Government buildings in England have been erected by architects who have no connection with the Government.

The remuneration of an architect for his services by sufficient sums to reimburse him for the most careful study of the problem, the most explicit and elaborate preparation of drawings, and efficient supervision of the construction, will secure the client or Government the best result in the completed building. Anything less should not be considered.

The proper sum for such services can only be ascertained by what experience has proved to be the cost of producing the work by architects in charge of large buildings and who have given the study, prepared the drawings and conducted business so as to produce good results in completed structures. The expenditure of millions in structures which must permanently beautify or mar the landscape are not proper fields for experimenting with untried methods or inexperienced men.

By an inquiry among the various architects of the country who have been doing such work, I find that the actual office expenses amounts to from 2½ to 3 per cent. on the cost of the building; out of this percentage the architect receives nothing. As five per cent is the amount usually paid, the 2 or 2½ per cent. which remains after paying expenses of the office covers the actual cost of supervision and the remuneration to the architect. If he secure one per cent. out of this for his service he is fortunate.

The cost of production stated is only for large work, small monumental work costs approximately more.

In this connection, as a proof of what such service costs, and the remuneration usually paid in this country and abroad, the reports of the United States Government officials and statements from foreign countries go to prove that instead of architects receiving less than the usual 5 per cent. they should, to properly compensate them, get a greater percentage in most cases.

REPORTS OF GOVERNMENT OFFICIALS.

Taking the Supervising Architect's office, which in recent years has been conducted in a thoroughly efficient manner, we find that the office expenses of producing drawings and conducting the work, exclusive of the cost of sites and the cost of buildings erected under the Tarsney Act and exclusive of superintendence we find that the average has been for three years 6.3 per cent. for the office work, on the amount expended in building, while superintendence during the same period cost 2.4 per cent. on the amount expended in building, making the total for the preparation of plans and supervision on an average for the past three years of 8.7 per cent. on the amount expended by this office, excluding the buildings which have been erected under the Tarsney Act.

Captain John B. Sewell, under whose efficient management the Government Printing Office at Washington has been built, in his report of November 3, 1903, states the architect's services, draftsmen and office expenses amounted to \$146,199.89, making 6.6 per cent. on the cost of the work. This is exclusive of cost of experts in heating, ventilation, plumbing, electrical installation and his own salary. When these items, which would approximate about \$20,000 during the period of the building covered by the report, are added to the expenditures, it would bring the percentage of the cost of the building up to more than 7.5 per cent. for drawings and superintendence. The report of the Superintendent for the Capitol for 1902 shows that his own salary not being included, the reconstruction or fireproofing the central portion of the Capitol cost \$153,500, and that the pay rolls in the Superintendent's office relating to this branch of the work, together with the fee for Consulting Engineer was \$25,813, or a percentage on the cost of work, more than 16½ per cent. The fee of the Consulting Engineer, \$4,760.28, amounts to over 3 per cent. on the total cost of the work and 7.7 per cent. on the cost of structural steel and general contract, as shown in the report of the Superintendent of the Capitol Building and Grounds, June 30, 1902.

In this connection the fees paid by foreign governments to architects for large pieces of construction show that our architects receive less personal remuneration for similar work done in the United States at the same rate of compensation. The American architect, with higher salaries paid to draftsmen, higher rents and no architectural pupils paying for the privilege of doing work, is receiving smaller remuneration than his professional brother across the water.

FOREIGN SYSTEMS.

In England 5 per cent. on the cost of the work is paid to the architect, while much of the time and labor is saved to him by the limited sets of drawings he is expected to furnish and the bills of quantities which are made by the surveyor, and for which the owner pays 2 per cent. A clerk of works and an inspector is provided by the owner or Government. They are selected by and under the orders of the architect.

In France the same system is in vogue as to payments. The municipality of Paris has recently established a sched-

ule of fees for the payment of architects on municipal work, paying 6 per cent. on the first 200,000, 5½ per cent. on the second 200,000, and 5 per cent. on the third 200,000 francs 4½ per cent. on the fourth 200,000, and 4 per cent. on all additional cost. Thus the fee on the largest building is between 4 and 5 per cent. and the Government provides, subject to the order and on the indorsement of the architect, a superintendent and a clerk of works as well as the inspection given by the Building Council, while his office expenses and draftsmen's wages are from one-third to one-half what is paid by the American architect.

In Germany the rates paid by the Government on the work when private architects are employed is in accordance with the schedule of the Society of Architects and Engineers. These rates vary according to the character of the building and the cost of the structure, simple buildings, like sheds or factories, being done at a less rate than more ornate structures. A separate increased rate is charged for decoration in the class under which Government buildings are placed. The rate for the most expensive building in their schedule is given at \$2,000,000, and the rate for \$250,000 worth of decoration and \$250,000 worth of furniture makes the rate on the total sum a fraction over 5 per cent. The schedule provides for numerous extra charges for heating, lighting, ventilating, water, sewerage and electrical arrangements and salary for building foreman and inspector. Travelling expenses, acquisition of building site and per diem to the architect while travelling.

The Russian Government pays the architect on the building being erected by the Minister of Marine at the new port of Liban on the Baltic 8 per cent. on the cost of the building.

In Italy when an architect or engineer is not working on a salary he receives a 2 per cent. retainer, 4 per cent. on the completion of his drawings and 8 per cent. for the total direction of the works.

The Swiss architects and engineers have a very carefully prepared schedule of charges. The buildings are divided into classes, factories, sheds, etc., being in the first class and for which the smallest percentage is paid. The commission is also graded according to the cost of the structure. In the class to which Government buildings belong 5 per cent. on the total cost is the smallest percentage paid for the largest structure, while it runs up to 8 per cent. for small structures of this class.

The clerk of works or superintendent is employed or paid by the owner, but he is under the direction of the architect: all travelling expenses and an additional per diem are charged while travelling in addition to the percentage. Some of the special regulations of this schedule are interesting.

By the various schedules it will be seen that the foreign architect protects his interests more carefully than we do usually in this country against both the Government or the owner and the contractor, demanding payment for extra services for many items which an architect does in this country without extra compensation.

In every instance the answer from foreign countries has been that the architect who designs the building supervises it until completion, although in many countries the Government is represented by technical commissions and inspectors and employs superintendents and clerks of works, they are all, with the exception of the commissions, under the direction of the architect, and the architect is responsible both for design and construction of the building.

After a building of importance is completed, its maintenance, repair and additions thereto are not left to the tender mercies of men unfamiliar with design and construction, but the architect who designed the building is retained at a small yearly salary to maintain or add to the building until his death, when another architect, familiar with the structure, fills his place. In some coun-

tries a technical board of works, on which a majority of the members are architects, have charge of the maintenance of Government buildings.

It seems necessary to add that from the foregoing data the architects in this country do more for less compensation than do the profession in the other civilized countries of the world.

COMPARED TO OTHER PROFESSIONS.

The cost of work in the engineering profession, which is to a certain extent similar to the work of an architect may be considered in making a comparison with the cost of producing drawings in an architect's office. It must be remembered that the drawings made by engineers are not so numerous and are less elaborate than those made by architects. The data received from engineers shows that government engineers usually allow 10 per cent. on the cost of work for the items of superintendence, field engineering and office expenses. A prominent railroad engineer states that office work and supervision in engineering has cost him from 5 to 7½ per cent. on the total cost of the work.

It is customary for contractors when they do work by the day to charge 10 per cent. on the cost of material and workmanship. This appears to be a time-honored custom to which no one objects.

The value of services can be measured by the prices paid by capable business men; it has been the custom for years for business men and large corporations to pay architects in this country and Europe 5 per cent. on the cost of buildings. This is an old custom, which has in the last few years become a burden upon architects, as building has been rapidly becoming more and more complicated with the introduction of mechanical plants for elevators, electric lights, telephone service, heating and ventilating plants, all of which must come under the control of the architect and be considered by him in relation to the building as a whole. The employment of experts, paid by the client in these various branches, only partially relieves the architect.

Highest Office Building in the World

On page 41 is reproduced a very interesting perspective of the proposed addition to the Allegheny County Court House, Pittsburg, Pa.

The existing court house covers an entire block just at the crest of the hill on Fifth avenue. The foundation of this building as well as the Frick building, the Carnegie building and other large structures in the immediate neighborhood have been built to such a depth as to permit of the cutting away of the hill at some future time, on this, Pittsburg's most important thoroughfare. Of late years existing accommodations have been found entirely inadequate for the rapidly increasing business of Allegheny county. In view of the fact that the present magnificent building occupies an entire block and is entirely hedged in in such a way by large buildings as to prevent surface extension, the county authorities must either abandon the present site and build elsewhere, or build into the air. The fact that a very solid formation of rock is to be found only a few feet below the surface at Pittsburg, provides for an ideal base for the foundations of high buildings. It has therefore been decided to erect a tower along the lines of the design submitted by Architects Palmer and Hornbostel, of Pittsburgh and New York.

This design provides for a tower 75 feet square and 725 feet high to be erected within the court of the existing building. This, when completed, will be considerably the highest building in the world and the methods employed in the construction should be of great interest to all architects and engineers. According to the proposed plans the tower is to be of steel frame construction faced with Vermont granite.

Prize Designs, Proposed Departmental and Justice Buildings, Ottawa

(For Illustrations see Pages 42, 43 and 44.)

Messrs. E. and S. W. Maxwell of Montreal, Capture Prime Award of \$8,000; Darling and Pearson of Toronto accorded Second Prize of \$4,000, in the Recent Architects' Competition for New Government Buildings in Major's Hill Park

ARCHITECTS E. and S. W. Maxwell, of Montreal, were awarded the first prize of \$8,000 in the recent competition of designs for the proposed Departmental and Justice Buildings at Ottawa. We reproduce in this issue a complete set of these drawings, also, a perspective and front elevation with the floor plans of the design submitted by Messrs. Darling & Pearson of Toronto, which were adjudged next in merit.

In making their report to the Hon. Minister of Public Works the judges commended highly the successful designs as a truly masterly piece of work. The selection of these designs had been unanimous, their superiority over all others being quite pronounced. While not adhering so closely as others of the competitors to the exterior aspect of the present Government buildings, yet the authors of the prize drawings had produced designs which would not be inharmonious in effect.

As compared to the present structures, the Maxwell designs presented an increased window-space which is generally pronounced a decided improvement.

In general arrangement, the floor plans superceded every other scheme presented, being at once more compact and better adapted for all purposes. The precision with which every detail had been wrought out gave evidence of the designer's absolute command of the task at issue.

The assessors further recommended that, should the favorite design be adhered to in the erection of the buildings, the superintendence of the work of construction be given to the authors.

Messrs. Edward and W. S. Maxwell's drawings were accompanied by the following description addressed to the Honorable Minister of Public Works and the Board of Assessors:

"We have the honor to submit for your consideration designs for the proposed new Departmental and Justice buildings, consisting of plans, elevations, sections, a bird's eye view and a plan of the grounds showing the location of the proposed buildings with reference to the existing Parliament and Departmental blocks and the approaches thereto.

"These notes are intended to make their intention more clear to you with regard to planning of the various departments to be accommodated, in a manner suitable to their importance, and to their accommodation to the site available, with due regard to an abundance of light, air and ventilation, as well as architectural setting and effect.

"**GENERAL SCHEME:**—A careful study of the survey sheet and a personal inspection of the site results in the formulation of a scheme incorporating a reasonable acceptance of existing grades, the accentuation of a main axis; and the acceptance of the fact that the Justice building present a rare opportunity for a really monumental composition, capable of a distinct character and a truly Gothic treatment, in plan as well as elevation.

"The acceptance first of all of the fact that the ideal conditions of the lighting and plan should be accepted for the courts and library, hence the court rooms have lighting on both sides, a comparatively flat treatment of ceiling and plenty of light admitted at a low as well as a high level. These conditions are accepted by authorities as the ideal ones to obtain for important courts wherever possible. (See Gaudet's *Elements et theorie d'Architecture*, 1905.)

"The library is arranged with windows on both sides, and conditions of convenience for special studies are arranged for, while the large windows at the upper part admit of an ideal condition of lighting.

"The isolation of judges with a special corridor, entrance, etc., entirely distinct from any other entrance or department of the Justice building, but still accessible from the main portion of the building, when occasion arises.

"On the ground floor of the Justice building is accommodated the Department of the Minister of Justice, facing on Sussex street, and at an average elevation of 12 feet above the street level.

"The approach is by two entrances on Sussex street; from hence stairways and elevators give access to the first and second floors above, as well as by the main central stairs and elevators leading from the Parliament entrance to this building.

"The accommodation furnished is approximately 20,228 square feet of office space, with convenient lavatories, vaults, etc. The balance of this floor is devoted to the storage of records, etc., a receiving room for the library, and one for the restaurant and kitchen above.

"Under the whole of this floor is a basement to be devoted to storage purposes, and for the distribution of the various pipes, ducts, etc., required throughout the building.

"The first floor is devoted to the Supreme Court and the Exchequer Court, together with their dependencies, and the library. It will be noted that the accommodation provided is almost identically the same as that required by your conditions, viz: 24,600 square feet, with the addition of a limited amount of space for future growth and expansion.

"On the second floor is located the Railway Commissioners and their dependencies, all in accordance with your requirements of 16,000 square feet, with a very moderate amount of space available for expansion. It is felt that due provision should be made in this respect to a limited extent.

"It will be noted that every room, corridor, etc., in both buildings is amply and well lighted. The aim has been to produce, first and foremost, buildings that would fulfil their practical requirements in the best possible manner, and in no case has convenience or light been sacrificed to secure an artificial architectural effect.

"The Justice building has practically but one large court yard, as the judges' passages and the library passage are in the nature of cloisters, not interfering in any way with the circulation of air and light. Driveways are provided so that access is had to all portions of the court-yards.

"The Departmental building has been along with the Justice building placed on the larger plot of ground. It is felt that there is ample room for both buildings here, and as a matter of convenience, it is a distinct advantage to be in closer touch with the existing Parliament and Departmental blocks, than if the new Departmental building has been placed on the smaller plot where it would have the additional disadvantage of being obscured by the Printing Bureau.

"Another strong point in favor of this location is the great practical advantage of having one power plant to serve both buildings, located as it is midway between the

two, where the heat, noise and dust, incident to its operation, will be least objectionable, and still be at the most convenient point for the distribution of heat, light, power, etc. It will be noted that the coal is delivered and dumped through pockets in the roof of the fuel storage chamber, without any handling, when it is then available for the boilers, which are on the same level. The boiler and engine house are lofty and well lighted by both windows and skylights.

"The Departmental building, it is felt, needs but a scant description, as the drawings clearly indicate it as a practical example of a monumental office building, embodying all the features that would enter into the best type of a modern commercial structure of this type.

"It will be noted that the park elevation shows but four storeys in height, while the Sussex street elevation accommodates six storeys, the building is thus accommodated to the inequalities of the ground to the best advantage, and at the same time provides an elevation on the park front that does not overpower or dominate the Justice building.

"The bridge level, in order not to ruin perspective from Spark street and park grounds, is kept at grade 118. It would be a strain to anyone to walk up steps from grade 118 to 153.6, so easy ramps are introduced, thus permitting of easy ascent and a treatment which avoids the thread-like result which a straight line would produce, if carried from the hill on which the Parliament buildings rest, to the Justice building opposite.

"It is felt that the acceptance of climatic conditions is a most essential feature, which demands flat roofs, drained in the center, as being the best type.

"In the design a type of Gothic architecture has been adopted, freely and individually treated which permits of lighting the rooms and offices in a manner equal to the best traditions of practical architecture. For this reason the perpendicular and decorative styles have been avoided as not being practicable, especially for the Departmental building. The new buildings will thus be in harmony with the existing structures.

"**GROUNDS**—The Justice building is accentuated by a formal treatment, being located on the axis of the pavilion of the Parliament building, while opposite the new Departmental building a freer and more naturalistic treatment is observed, as being more in accord with the existing landscape. Thus from the ground one would not find the effect of the Justice building injured by the Departmental building, being in places higher.

"A full recognition of the bank of the ravine is considered as very important. The formal planting of the banks by poplars as shown is advocated as not interfering with the vista, but recognizing the bank of the ravine and the gradual change from the formal to the naturalistic treatment.

"In conclusion we may say that it has been the aim of the authors of this design to produce a group of buildings that shall supplement and still be a part of the noble group on Parliament Hill, connected to them in a formal and serviceable manner, the old and the new forming as it were one grand connected design that might have been planned at one time by a master mind.

"The group will be impressive as seen from any point of view, varied only as the Gothic style can be varied, but without restlessness, rich without ostentation or undue ornamentation, with simple masses, logical composition, and the purpose of the plan unmistakable, a general character of distinction and refinement has been sought that shall live and be an added attraction for the future."

American Theories Faulty

(Continued from Page 32.)

the accepted formula, and the latter has since been used universally in determining the dimensions of compression members necessary to carry any given load. This

formula was used in designing the chords of the Quebec bridge. They were designed to carry, under the most severe conditions of full live load and maximum wind strain, a stress of 24,000 pounds on each square inch of metal. This is two-thirds of the elastic limit, or the limit at which the metal would begin to stretch. At the time of failure, this member was carrying only about 16,000 pounds per square inch, or less than one-half the elastic limit. Evidently, when compression members are built up according to the present methods, in sizes such as those in the Quebec bridge, there is a failure of the separate pieces to act together as a whole, and present that resistance to buckling which members built up in the same way have invariably presented when constructed in smaller sizes for bridges of less dimension.

It is too early to predict that, as the result of these investigations, we may be led to adopt the circular sections (by far the most effective form for long compression members) used by the late Sir Benjamin Baker for the Forth bridge, but we do believe that in future bridges of this size, the ratio of diameter to length of compression members will be greatly increased, and continuous cover plates will be used in place of the present open lattice-work reinforcement.

A Word About the German Who Designed the Ill-fated Quebec Bridge

FOR Paul L. Szlapka, its designer, eighteen years of diligent toil counted for nought, and the ambition of his life was dashed to pieces when the Quebec bridge fell into the St. Lawrence River. As a result he was nearly heart-broken as he boarded the train the day after the accident to hasten to the scene to examine into the cause of the accident.

Mr. Szlapka has been with the Phoenix Bridge Company since 1882, having come to the United States from Germany in 1880. He is a man about 55 years of age and has devoted his life to the study of engineering. He was educated in the University of Hanover, in the province of Prussia, Germany, and took post-graduate courses at Posen and other celebrated institutions.

Eighteen years ago the energetic engineer began to draft the outlines of the bridge which he hoped would place his name among the engineers of the world. The contract for the Quebec bridge was obtained by the Phoenix Bridge Company in 1901, and with renewed efforts Szlapka entered into the work of calculating to the smallest fraction of an inch the details of the big structure. Almost night and day he and his corps of assistants bent to the task.

Finally the working plans were completed and submitted to the engineers of the Quebec Bridge Company and the Canadian Government. They were promptly approved with commendation for their execution. Szlapka watched with great personal pride the work as it progressed. Continually he was devising wonderful machinery with which the heavy pieces of steel could be put into position. Much of this machinery was built for this work.

Mr. Szlapka made frequent trips to the bridge and watched it grow panel by panel. Only a short time ago he returned from a trip of inspection to tell his wife that the object of his highest ambition in life took even more pride in hearing the details of the bridge's erection. Everything seemed to be going better than planned.

It was no wonder then that the expert designer laughed and called it all a joke when he was called to the telephone Thursday night, August 29, and told that the bridge lay a mass of twisted steel at the bottom of the St. Lawrence River. He laughed heartily, then hysterically, as the news was impressed upon him as real. Tears coursed down his cheeks as he realized what it all meant. Determined to find the cause, the German engineer and designer sorrowfully took up his travelling bag, boarded the train and started on his journey.



HOUSE NO. 1. WELL DESIGNED, MODERATE PRICED DWELLING OF THE GAMBREL ROOF TYPE—DESIGNED BY ARCHITECTS ELLIS AND CONNERY, OF TORONTO, FOR MR. A. J. MERCER.

The Gambrel Roof Dwelling

The Artistic and Economical Possibilities for Variety in design Which This Type of Residence Affords the Architect are Practically Unlimited

IT is only of very recent years that the idea of building gambrel roofed houses has met with anything like approval in Canada; but there is no getting away from the fact that in all future residence construction the gambrel roof will figure extensively—not solely on account of its economical features, but more particularly because of the many attractive variations of design the gambrel roof gives opportunity of.

The gambrel roof design, like any utility that "comes to stay," has known much evolution. Its introduction into this country was in the construction of large barns and mills requiring extensive loft or attic space. It was later applied to moderate priced dwellings as an economic improvement over the jogged-off ceiling obtained by lathing and plastering against the rafters of the common storey-and-a-half house.

Now, however, the suggestion of a gambrel roofed house does not strike one with the idea of cheapness or plainness, nor convey any impression of the owner's avocation or station in social or commercial life. The type is elaborated by the architect into a fashionable residence or modified into a comely home to accommodate the family of limited means, and may be designed to readily admit of and produce splendid effects in field stone, cobble stone,

clinker brick, common brick, shingle, concrete block, English timbered cement plaster and monolithic construction. Its outline may be regular, or it may be relieved by projected bays, Dutch, English or Spanish windows with splendid effect, and beautiful results may also be produced by extending massive English chimneys on the outside of the side-walls and by relieving the face of the roof with dormers or niche-like windows. The opportunities for creating variety are unlimited and the tastes of the conservative or the fastidious, the humble or the lofty may be adequately catered to by the architect in exercising his license upon the gambrel roof design.

In house design No. 1 we show a good example of a well proportioned, moderate priced residence in which numerous economic features of the gambrel-roof type are clearly defined. This dwelling was designed by Architects Ellis & Company of Toronto, and built by Contractor A. J. Mercer for himself at a cost of \$3,000.

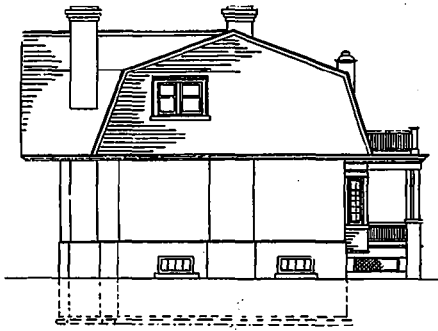
From the floor of the basement to the roof, the foundations and walls are built of vitrified clinker brick the idea of the gambrel roof proving a source of great economy, as it reduced the requirement of brick to only one storey, and thereby minimized the thickness of the foundation walls to 9 inches. The basement covers the full dimen-



HOUSE NO. 1—FRONT ELEVATION.



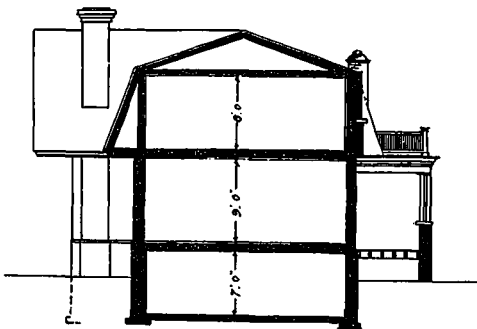
HOUSE NO. 1—REAR ELEVATION.



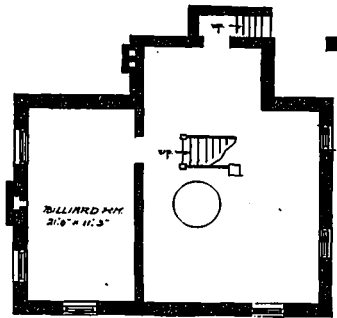
HOUSE NO. 1—LEFT ELEVATION.



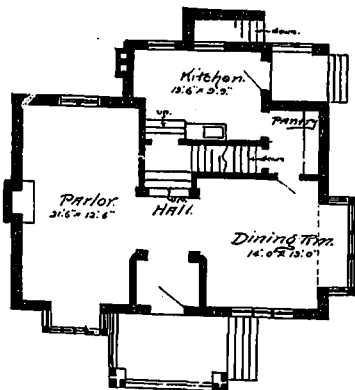
HOUSE NO. 1—RIGHT ELEVATION.



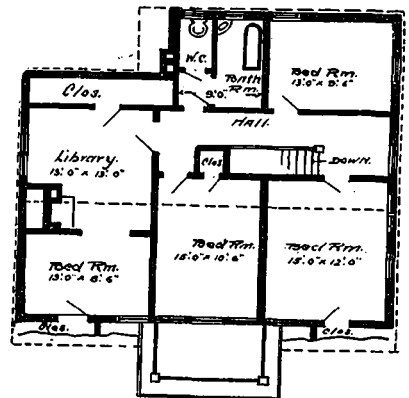
HOUSE NO. 1—LEFT SECTION.



HOUSE NO. 1—BASEMENT PLAN.



HOUSE NO. 1—1ST FLOOR PLAN.



HOUSE NO. 1—2ND FLOOR PLAN.

sions of the first floor (27 ft. 9 in. x 31 ft.). One section has been partitioned off, plastered and otherwise finished with hardwood wainscoting and ceiling to provide a billiard room. The remainder of the excavation is divided into a furnace room vegetable cellar and fuel room. With the idea of giving a somewhat convenient entrance to the billiard room, the doorway leading to the basement was placed in the pantry-way on the ground floor, instead of communicating with the kitchen as was originally intended; thus permitting the guests to reach the recreation room below, from the dining-room, as it were.

The little square porch with its surmounting balcony is nicely proportioned in relation to size of the house, and the porch pillars, being constructed of brick from the surface of the ground to the top of the railing and capped with Indiana limestone squares, are quite in keeping with the general idea of the whole exterior.

proportioned French window of six lights planted in door sash. This window is extended beyond the front wall and contains a full width built-in seat. Opposite the French bay is a broad window of three short lights, the bottom of which is 4 ft. 8 in. above the floor to provide a good location for the piano. The old English fireplace with green tile facing and hearth, is cased in Flemish oak, but aside from this the trimmings of the parlor are ash of antique finish with a slight tinge of green.

The feature of the dining-room is the immense window space, which should be a first consideration in planning any home. Looking out on the front lawn is an old English window of three large lights, built to swing in over each of which a lead traceried fanlight is disclosed. Probably the most attractive feature of the dining-room is the Dutch bay, which extends three feet beyond the right wall and is quite suitable for a flower conservatory. While no



HOUSE NO. 2. ANOTHER STRIKING EXAMPLE OF THE EFFECTIVE VARIETY OF DESIGN TO WHICH THE GAMBREL ROOF TYPE LENDS ITSELF READILY. RESIDENCE OF CAPT. ROYCE, TORONTO JUNCTION. BOND AND SMITH, ARCHITECTS.

The main entrance opens directly into a hall 7 feet wide, approaching a second narrower hall-way by means of an arch looking onto a second arch leading directly to the three bottom steps of the hardwood stairway and first landing, which arrangement obviates the necessity of a vestibule and at the same time gives the appearance of one being present. At the right and left of the two arches are two square curtained openings 5 ft. 6 in. wide, flanked by moulded ash pillars with square pedestals, affording a direct passageway through the hall between the dining-room and parlor. Considering the size of the house, the parlor is spacious, being 21 ft. 6 in. x 12 ft. 6 in. It is provided with light and made cheery by the presence of a neatly

provision has been made in this plan for a built-in side-board which has become quite an item of consideration in the now-a-day home, it is intended to install a displaceable cabinet in the angle of the partition wall of the cellar-way and the stair flight.

An entrance from the kitchen to the dining-room is effected through a neat little pantry, which arrangement is not only an economical one, considering the shape of the house, but it works to good purpose in shutting off the view into the kitchen. The kitchen is nicely isolated, and is at once convenient to the front door second floor, dining-room, pantry and basement. The second floor is accessible from the kitchen by means of three steps leading to

the first landing of the stairs, which also provides a direct communication between the kitchen and entrance hall, eliminating the necessity of the maid's traversing the dining-room in answering the door bell. The kitchen is well lighted by two full sized windows from the rear and a glass door opening upon a rear porch where the tradesmen's goods and provisions are received.

Owing to the roof extension of 2 ft. 6 in. on all sides of the ground floor walls, the upstairs is almost one-third as large again as the main floor, which means that a great amount of additional sleeping space was acquired at practically no extra cost. This is another great advantage of the gambrel roof design, which readily admits of such extensions. It will be observed that every inch of floor space is put to use, the angles of the deep pitched roof being utilized as closets, giving thereby straight walls and unbroken ceilings in the various rooms. The lay-out of this floor is good, in that it provides for three front bedrooms, all amply lighted. The centre one has an exit to the balcony. The room to the left is a combination library, dressing-room and bedroom, made cosy and inviting by the presence of a fireplace. The mantel in this case is built comparatively low to serve as a dresser in conjunction with a six-foot mirror placed at one side of the wide chimney. The archway between the library and bedroom is intended to display curtains.

SINCE the use of illustrations is, perhaps, the most comprehensive method of conveying ideas we have undertaken by way of further enlargement upon the subject of the Gambrel roofed house, to present views (without plans) of a very striking example of this extremely practical type. Our second subject is the residence of Captain George Royce, of Toronto Junction, designed by Architects Bond and Smith, Toronto, which is considered one of the worthiest attempts ever made in Canada along this line.

House No. 1 possessed its economic phases with just enough relieving features to make it attractive and take away the idea of plainness, working in advantageously at the same time with the general scheme of convenience and economy. House No. 2, while arranged with a careful eye to convenience, is replete with attractive features

of moisture. The broad three-flued English chimney capped with common sewer tiles, the projecting Old English casement windows with leaded transom lights, the small leaded angle nook windows flanking the chimney, the hooded doorway and the cunning upper floor windows, as worked into the general effect, cannot but strike one congenially, while in proportion to the size of the house, were these features applied to any known regular type of dwelling, they would be considered *extremum*.

The rooms are not large, yet by the arrangement of



HOUSE NO. 2—LIVING ROOM, FROM REAR.

the extended bays they are made to appear quite commodious.

The hallway is of necessity fairly broad as is indicated in the wide doorway. The finish is natural oak with an oak stairway broken by a square landing, the second flight of steps leading toward the front of the house to the upper floor. On either side of the hall and directly opposite each other are two panelled glass French doors curtained. To the left is the reception and living room made doubly cheerful and inviting by the presence of the Elizabethan window and a large angle nook set back five feet from and darkened by a broad low elliptical arch in the front wall. The angle nook is provided with two built-in seats, and the entire floor of this enclosure is tiled with a dark red composition. The reception room is finished in hardwood, stained a dark green, and has a coved ceiling.

In the angle of the wall opposite the fireplace and the rear wing is built a spacious verandah, accessible by a French door from the reception room and surmounted by a full-sized balcony communicating with the library and sitting room on the second floor.

The dining room is situated at the right side of the hallway on the ground floor. It is finished in the typical mission style with the beamed ceiling. The woodwork of this room is white pine, stained to imitate flemish oak. A built-in sideboard is provided in the wall opposite the front bay window. A built-in china closet is located in the pantry, built-in shelves and range mark the kitchen, and a built-in refrigerator perfects the rear porch, which, with the kitchen occupies the entire ground floor space of the rear wing. An outside entrance to the cellar is effected through the rear porch.

On the second floor, the library, also containing a fireplace; the main bedroom, with the "babe's" little chamber adjoining; the guest's bedroom, maid's bedroom, separate bath and toilet, and linen closet, complete the abode, although provision is made in the attic for additional bedrooms or closet space if required at any future time.

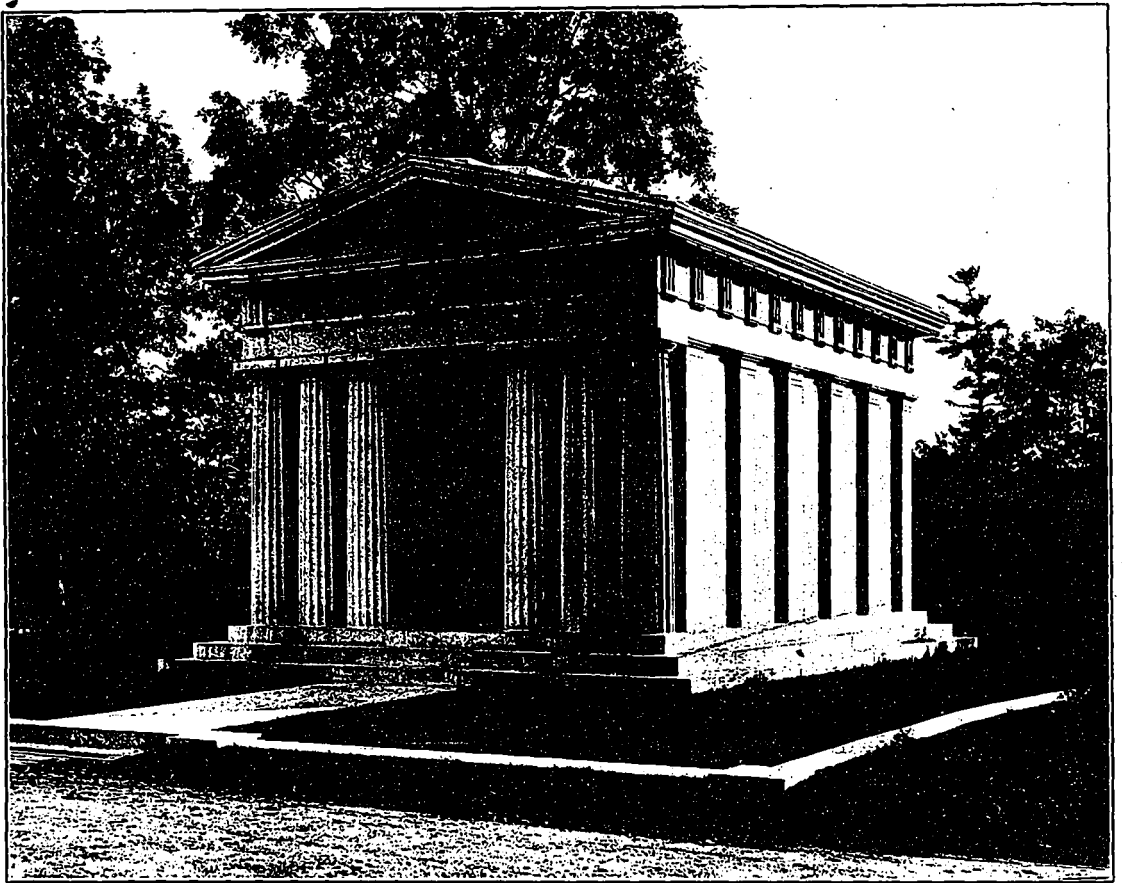
On the whole this house is about as complete a production as the man of average means and luxurious tendencies could wish for. It is heated with hot water and complete, cost \$5,500.



HOUSE NO. 2—DINING ROOM.

from a picturesque standpoint, and is at once a choice combination of all that could be desired in the way of Old World atmosphere, Colonial cheerfulness and domestic comfort.

One glance at the exterior is sufficient index of the coziness of the abode, and the interior does not belie the impression gained from without. It is constructed of the roughest clinker paving brick procurable, with brick foundation fourteen inches thick, faced on the outside with a thick layer of cement to prevent any ingress



MAUSOLEUM OF CLASSIC GREEK DORIC DESIGN, LATELY ERECTED FOR HON. SENATOR COX IN MOUNT PLEASANT CEMETERY. MESSRS. SPROAT & ROLPH, TORONTO, ARCHITECTS; MACINTOSH & GULLETT, TORONTO, CONTRACTORS.

Senator Cox's Mausoleum

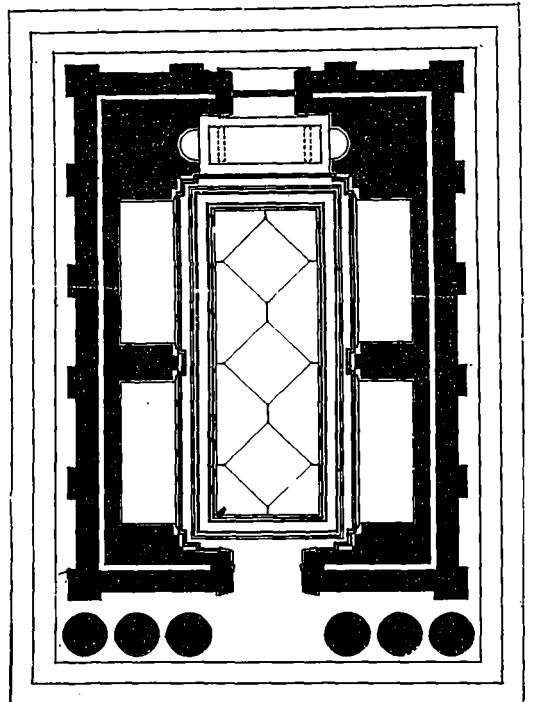
Purely Greek Classic Design Said to be Architecturally and Mathematically Correct in Every Detail

MAUSOLEUM construction affords to the new world architect possibly the best opportunity of producing purely classic effects of any type of structure erected in the present day; not even excepting church architecture, which at best is never—beyond the renaissance—strictly adherent to the old school designs. Time necessarily brings evolution in architectural design, as conditions and tastes change, hence this deviation from ancient principles in the draughting of modern habitations.

With the tomb, however, it is different, and while our cemeteries contain tombs of various types, and some even that are not characteristic of any country or era, still there is nothing objectionable to their being constructed along purely classic ideas where means will permit.

We reproduce herewith a very interesting structure in the mausoleum recently erected for Hon. Senator Cox in Mount Pleasant cemetery, which is, in effect and detail, the nearest approach to the purely classic Greek (Doric) style of architecture in Canada. The design is the production of Architects Sproat & Rolph, and it is considered architecturally and mathematically correct in every detail.

From the size, number and location of the alternate triglyphs and metope squares in the massive frieze and cornice, the relationship and dimensions of the monolith columns and pilasters surrounding the building was ascertained. Necessarily, therefore, the area of the roof was



Scale of feet

decided upon before the dimensions of the foundation could be determined.

The foundation is of solid concrete laid on the rock strata at a depth varying from 8 to 12 feet and carried up even with the ground line. Three pyramidal granite steps, tapering from dimensions of 26 x 36 feet, to 20 x 77 feet, form the base of the building.

With the exception of the roof the material employed throughout is Troy white granite.

Six columns (monoliths), 15 feet high and 2 feet in diameter, adorn the front of the building giving support to the massive frieze and cornice, and the same effect is maintained around the entire structure by means of plasters.

Seven pieces of Canadian granite comprise the roof, which feature is probably more in strict accordance with the classic idea than any proportionate attempt heretofore made in the Dominion. Certainly these are the largest monoliths ever utilized in building construction in this country. Each stone before dressed measured 36 feet in length, 4 feet 9 inches in width, 1 foot 6 inches in thickness, and weighed 23 tons. Our second illustration shows one of these huge monoliths loaded upon a truck for transportation. It required 22 horses to draw the load. These stones are grooved and overlap each other, making the roof absolutely storm-proof.

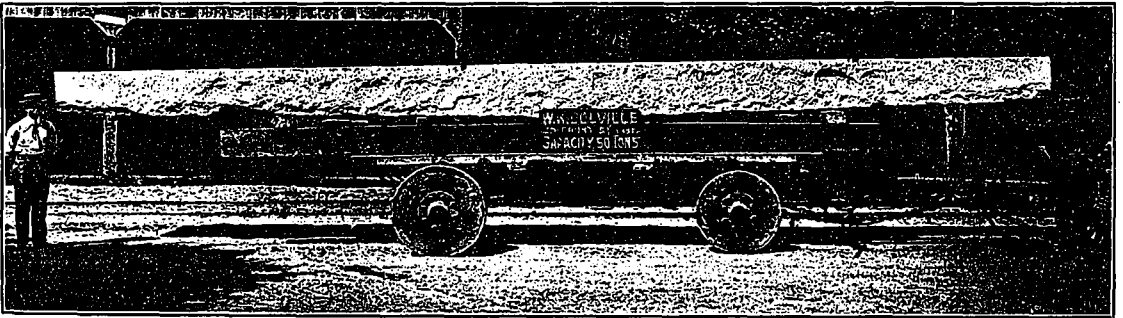
In order to guard against any possible moisture forming upon the interior walls a distinct and separate reinforced concrete structure—a complete building in itself—

Proposed Spiral Tunnel 3,800 Feet Long to Reduce Grade of 70 Feet in British Columbia

A RADICAL departure in railway construction will shortly be commenced on the C. P. R. main line, between Hector and Field, B. C., whereby the grade percentage will be reduced from 4½ to 2.1-5 per cent., which will prove a great saving in coal. A million and a half dollars will be expended in the undertaking. It will be a difficult engineering problem. The plans approved by the railway company include eight miles of rock work and one and one-eighth miles of tunnelling. The scene of the operations is the main line between Hector and Field.

The Big Hill, as it is called, is known to railway men all over the continent and is one of the heaviest grades on any transcontinental line. It will be lowered in part by going around Cathedral mountain in a circle, but instead of going around the outside of the mountain it will be driven around the inside. A tunnel 3,800 feet in length will describe practically a complete spiral circle in the heart of the mountain and its western end. The entrance for westbound trains will be 70 feet higher than its eastern end. On leaving the tunnel westbound trains will pass under and across the track which took them into the mountain 70 feet above.

Another tunnel on the northern side of the Kicking Horse river will be driven 3,400 feet in a gigantic circle in the bosom of the mountain, and between the two will be another about 200 feet in length.



GIGANTIC GRANITE MONOLITH EMPLOYED IN ROOF OF HON. SENATOR COX'S MAUSOLEUM—36 FT. LONG, 4 FT. 9 IN. WIDE, 18 IN. THICK, AND WEIGHING 23 TONS.

has been built inside this granite enclosure, with an air space of about 6 inches separating the walls and draining into the sub-tank on the cemetery grounds. Inside of this smaller compartment 16 sarcophodies—8 on either side-wall—are located, which leaves a clear channel space 9 x 18 feet. In the wall opposite the entrance door is a stained glass window 3 feet wide and five feet over all. Beneath this a marble seat 2 x 6 feet has been provided.

The interior walls are of pure white marble, while the ceiling is of marble in two squares. The floor is laid in white vitreous tile with a green border. The doors are of bronze.

The building cost \$50,000. McIntosh, Gillett Co., Limited, of Toronto, were the contractors.

The famous loop sinks almost into insignificance beside this magnificent piece of engineering work.

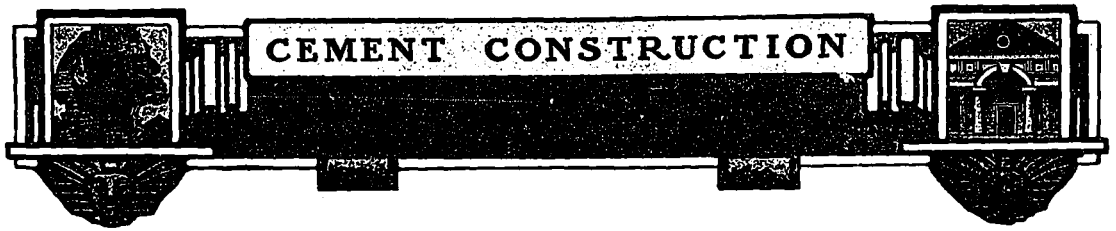
Messrs. Macdonell & Gzowski, engineers and contractors, of Vancouver, have secured the contract for this work taking it in the face of competition from all similar firms in the United States and Canada. It is one of the biggest contracts let on the Pacific slope for many years.

A Competition

AMBITIOUS architects, and members of their staff, will find an opportunity to earn easily some Christmas money in the advertising pages of this issue. The Colonial Dolomont Company, makers of the really sanitary seamless flooring, a vast improvement over the familiar 'stone-wood' floor, are offering seven liberal prizes in gold coin for drawings suggesting the best color scheme and design for that part of a bank floor used by the public. As the editor of CONSTRUCTION will select the jury of award, and the conditions of the contest are remarkably simple and easy, here is one competition which will be conducted in a spirit of absolute fairness and in which each reader of this publication should feel a direct concern. The announcement of the competition appears on page 76.

EDITOR'S NOTE

Owing to lack of space in this issue it has been found necessary to withhold the four page article referred to in our editorial columns, treating of apartment-house construction as an alleviation of the "slum" problem. This will be one of the features, however, of our November number, and will include perspectives, elevations and plans of several types of modern apartment houses.



Hamilton Terminal Electric Railway Station

Good Example of Reinforced Concrete Construction in a Structure
to Cost About \$250,000



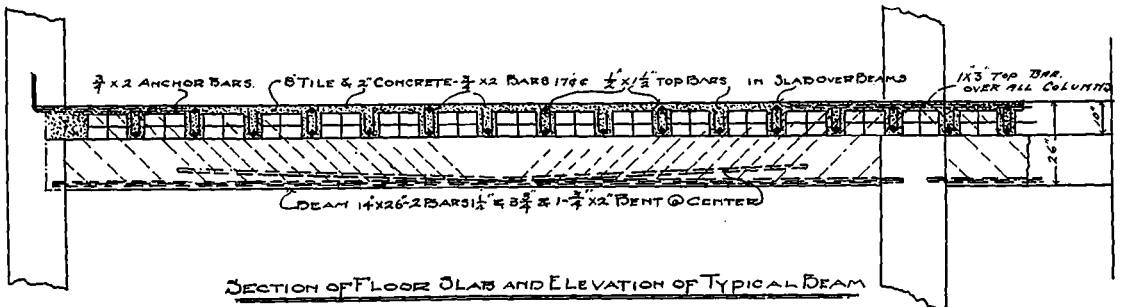
PERSPECTIVE VIEW OF HAMILTON TERMINAL STATION—CHARLES MILLS, HAMILTON, ARCHITECT.

A MAGNIFICENT block of buildings has been added to the streets of Hamilton during the past year in the presence of the new Bennett Theatre and the Hamilton Terminal Station built adjacent to each other in the very centre of the business and mercantile section of the city.

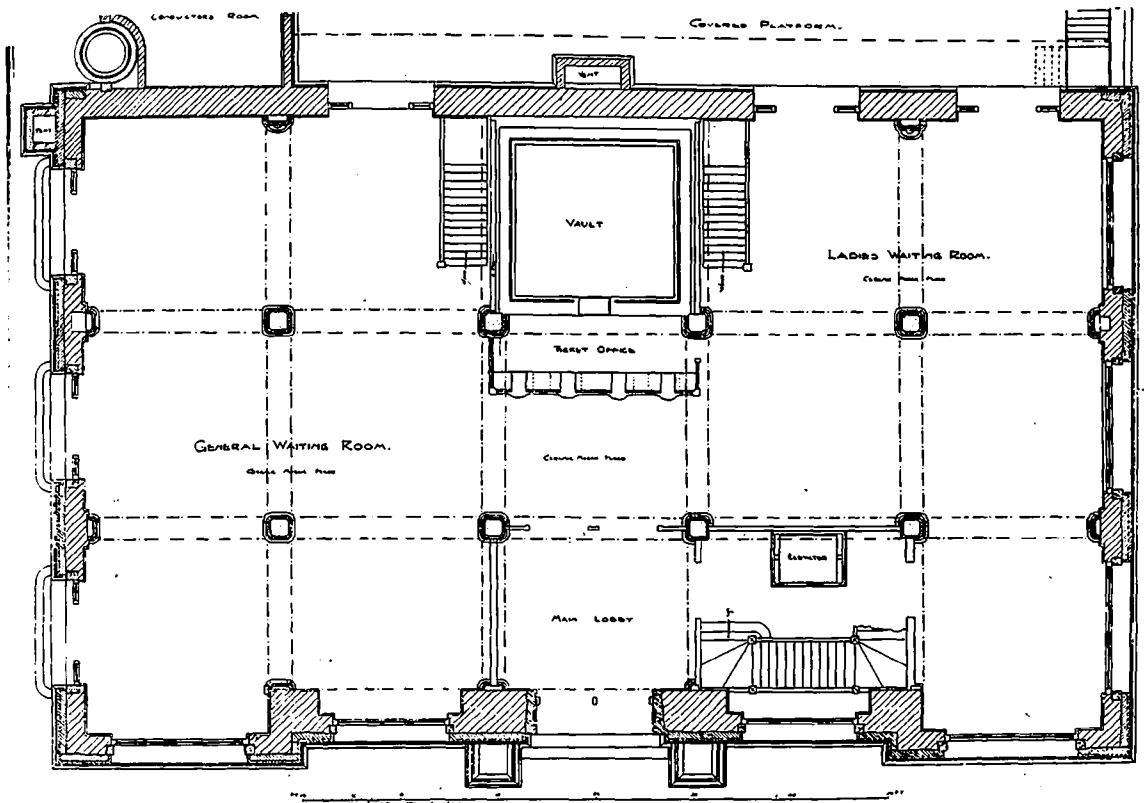
While the two structures were erected by distinctive interests, their relationship to each other was taken into consideration, at least by the depot authorities, in providing a covered passageway to the theatre along the west wall, thus affording shelter in inclement weather to pedestrians desiring to reach King street. The theatre was opened

September 3. The depot is now approaching completion.

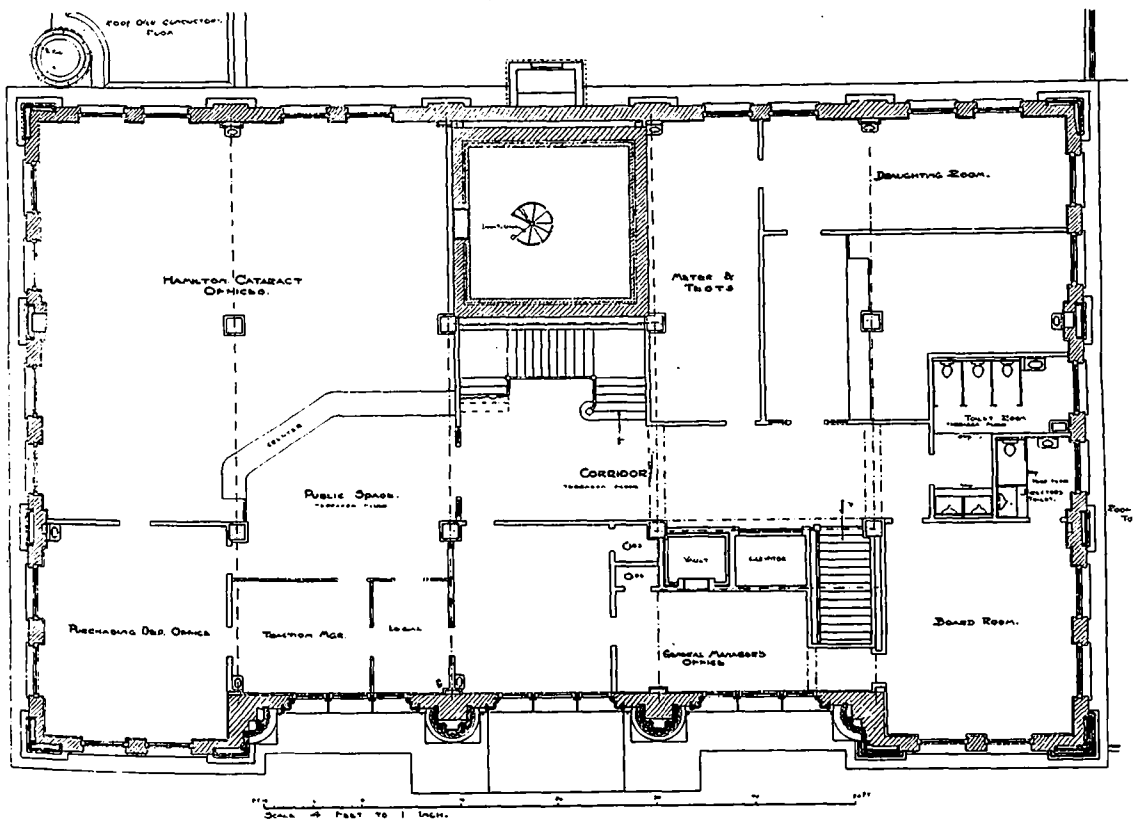
This building has attracted considerable attention, not only from an architectural standpoint but from a constructional one as well. It has been pronounced an excellent type of reinforced concrete construction. The beams and columns are all of concrete, reinforced with the Kahn bar and fireproofed with vitreous tile 2 in. thick. The floors are built of reinforced concrete beams 5 inches wide, alternately laid with 10 inch tile on edge as shown in the detail sketch—a system which is being used quite extensively of late because it admits of large spans being employed. In this particular case, the floor slabs are



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



STATION FLOOR PLAN.



SECOND FLOOR PLAN.

22 feet x 22 feet, the result being most satisfactory and standing out as an excellent example of concrete and tile construction. The weight of the floor is about 60 pounds per square foot, and has a carrying capacity for a live load of 70 to 75 pounds for office work.

It may be of interest to note that although the foundation were put in during freezing weather, they show absolutely no signs of frost destruction in any particular. It became necessary as the building operations progressed to cut two or three holes through the foundations, and the concrete was found to be perfectly set and like a granolithic mass. The aggregates employed were: four of crushed stone, two of sand and one of cement, thoroughly mixed with a machine and poured into the forms. The only precaution taken against freezing was in covering the work over night with straw to a thickness of about two feet.

The station is 72 feet x 112 feet dimensions.

Bedford Indiana stone was used in the lower storey, while the upper storeys are of fire-clay brick and terra cotta, including the immense cornice and parapet. Aside from these materials absolutely nothing but concrete was used, making the building as proof against outside attacks of fire as modern invention will admit.

The ground or station floor is laid with ceramic mosaic tile in patterns, and the walls are lined with Italian marble up to a height of ten feet. The main floor ceiling is 20 feet high with heavily enriched cornices.

All exits have been carefully worked out after the fashion adopted by the larger terminal railroads in the United States with all provisions for the handling of large crowds. The woodwork trimmings of the doors and windows are of quarter cut oak, the floors are maple, the staircases are of iron and marble, and the commodious toilets are lined with enamel brick.

The Dominion Power and Transmission Company will occupy the entire second floor, while the two upper floors will be arranged as office quarters for the other companies connected therewith.

When completed, the structure will have cost approximately \$250,000, and will rank among the finest electric terminal stations on the continent.

The despatch with which the building was reared and its undoubted stability reflects much credit upon Architect Charles Mills, a resident of Hamilton, who designed it and supervised the work of construction. It was likewise Mr. Mills who handled the rebuilding of the fifteen storey Bank of Hamilton building of that city last year, which is accredited with being one of the most difficult pieces of work ever carried to completion in Canada.

It is stated that the Portland & Seattle Railroad is about to utilize reinforced concrete in the construction of a viaduct at Vancouver and a bridge over the Klikitat River. It will be a single arch of 160 ft. span.

At a recent convention of painters the following instance of painting a concrete wall was cited: The building had become discolored in places, and the joints were of a different color from the surface of the blocks. Two parts of Portland cement were mixed with one part of marble dust and mixed with water to the consistency of wet paint or a thick whitewash. The wall was well wetted before the application of this paint and kept constantly wet while the material was applied, and then was kept for a day longer, in order to make the cement wash adhere to the surface. The wash was applied with ordinary whitewash or calcimine brushes, and a man was kept busy playing a hose on it while the work was being done. The secret of success lay in keeping the wall constantly wet.—Concrete Engineering.

The fourth annual convention of the National Association of Cement Users will be held at Buffalo, N. Y., January 20 to 25, 1908. The old Sixty-fifth Regiment

Armory has been engaged for the exhibition, and the convention probably will be held in the same building.

In overhauling the big steamer "Queen," the plates, protected by cement, were found (next to the coating) to be just as bright and sound as the day they were put on. For twenty-two years the plates had been thus protected. The outside portions were badly pitted.—Concrete.

The preservative effects of cement on iron, steel and other kinds of metal, when the latter material is encased and excluded from the action of the elements, is well known. Along marine and shipping lines this has been very conclusively shown.

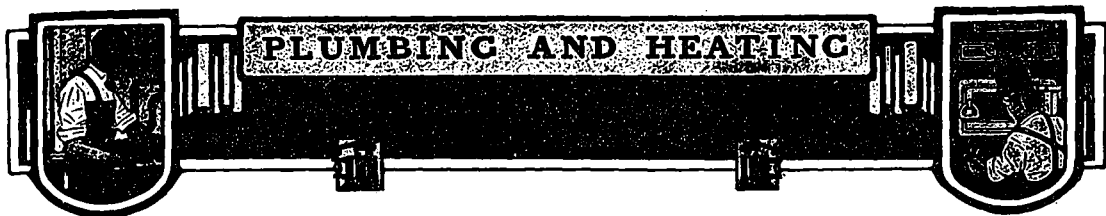
Australia is clamoring for imported cement and is getting it, in spite of the fact that the domestic article is protected by an import duty of 18c. per cwt. Prices having advanced with a rush, to the extent of \$1.50 per ton, the import duty cuts little figure at present. Every consignment of cement for Australian ports is said to be sold at full rates before it can be landed. Australia at present is producing 90,000 tons of cement per annum, of which 70,000 tons are made in New South Wales and 10,000 tons each in Victoria and South Australia.—Concrete.

In the past year many large steam vessels have been repaired at San Francisco. In some instances portions of the hull plating were removed and new plates substituted. Cement linings had, in most cases, been used on the inside of the hulls. When the cement coating was removed the plates on the inward side were invariably found to be in a perfectly sound condition. The cement lining had preserved the metal. This was not the case in all steel vessels where no cement coatings were used. In all such cases the pitting or honeycombing extended clear through the plates.

A composition resembling concrete is known technically as "pise." One of its principal ingredients is the slag of blast furnaces or some volcanic scoria of similar nature. In districts where the volcanic scoria or blast furnace slag are available, it is pulverized and mixed with Portland cement in the proportion of 400 to 500 lbs. of cement to a cubic meter of scoria. The usual method of mixing is combined with that of grinding or pulverizing the slag in a large circular trough around which travel two heavy stone disks driven by steam, water, or horse power. The cement and slag, after having been thoroughly ground and mixed, are withdrawn from the mill, mixed with water to the proper consistency, and used at once for the construction of barns, inclosing walls for fields and gardens, and even for ordinary dwellings in villages or the country.

In building division walls with this material a common method is to use a frame or mold, consisting of two planks set vertically and held together by adjustable iron braces, which are lengthened or shortened by set-screws, the space between the two planks being the thickness of the wall. This frame is set upon the foundation, already prepared, and the mortar (pise) shoveled in and rammed down firmly. The frame is then loosened by the set-screws and raised to receive the next layer of concrete. Walls of this character, especially in buildings, usually receive an outer surface coating of plaster made of finer sand, lime, and hydraulic cement.

Formerly stiff clay mixed with straw or tough wild grass was used in country districts for pige work in the cheapest class of construction, but such walls are available only in dry locations and soon disintegrate under the influence of continued moisture.—Consul-General F. H. Mason, on French Building Materials.



Problem of Heating the House

BY MARTIN J. QUINN, CONSULTING ENGINEER

Attention Called to Mistakes of Oversight in Selecting and Installing Heating Appliances
—Importance of Complete Plans and Specifications

THERE is no question of greater importance to the architect, contractor or home builder than that which arises when the time comes to finally decide by what method the home is to be heated; hearing in mind the three conditions which, particularly in this country, have to be considered, namely, the period of time during each year that a heating system must be used, the low degree which the temperature very frequently reaches, and the high cost of fuel.

For the average home there are three systems of heating, each having special features to commend them, namely, hot air, steam and hot water; but in the better class of houses during recent years, and particularly in those owned by men who have given the question serious thought, the first named, notwithstanding its comparatively low cost, is not very often used. There are several reasons why this is so, but chief among them is the practical impossibility of providing the heated air with anything approaching the property degree of humidity, because of its previous contact with the exceedingly hot surface of the fire pot; the great difficulty which is almost without exception experienced in heating every portion of the building evenly, because of the influence upon the hot currents by exterior atmospheric conditions; and, added to both of these objections, is a third, which is also important, and that is the comparatively large amount of space taken up in the basement by a hot air heating apparatus.

DIFFICULTY OF CONTROLLING HEAT.

With reference to the second objection, the difficulty of controlling the heat in such a manner as to produce the desired temperature not only in every apartment of the building, but also in every portion of each apartment, it may be explained that the power of the up-coming currents through the heated air ducts is extremely limited, and that where the slightest opposition is met with the movement of the air will be retarded if not entirely stopped, and in a great many instances actually reversed. For example, if a hot air register is placed under a window, or against a very cold wall, the result would be that the rapidly falling cold currents of air, coming into contact with the rising warm currents which weigh less and do not travel with any greater velocity, would likely result in a complete stoppage of the flow of warm air, and for that reason warm air registers are invariably placed in a protected position, so that the warm air may rise unimpeded to the ceiling of the room, the direct result of which is, that a circulation of cold air is permitted to pass down the outside walls and across the floor to the rising hot air currents, producing a temperature at the floor line, very much lower than would be the case if the heating agent were placed in a position where these cold currents could be counteracted.

It therefore follows that any heating agent, such as steam or hot water, entirely encased in metal, and for that reason having its movement entirely uninterfered with by external atmospheric conditions, is certain to produce

very much better results than are possible with the system just referred to; and, while steam has many advantages under certain conditions, and in certain classes of buildings not possessed by hot water, and which will be discussed at length at some future time, experience has proven that in a country like this, where we have great and rapid fluctuations in temperature, that hot water as a heating medium has everything to commend it, and has been found by the experience of many years to be the very best system which can be used for the heating of homes, hospitals, hot-houses, and indeed wherever a moderate, steady, even and summer-like temperature is required.

It is a remarkable fact, however, that in connection with so important a matter as the heating of a building, the owner or builder as a rule fails to give it anything like the attention that it deserves, and not infrequently awards the contract for its installation to the lowest tenderer without regard to either the quantity or the quality of the work which the latter intends to install, with the direct result, and one which under the conditions is not surprising, that the contractors, feeling that in competition with others, the lowest price is likely to be the successful one, are compelled in their own interests, to reduce to the lowest possible point the amount of surface, piping, covering, etc., which they will install, and it is therefore not to be wondered at that in so many instances nothing but disappointment awaits those who have adopted this policy.

IMPORTANCE OF HEATING PLANS.

The point, then, is this: that in dealing with the question of the heating of buildings, at least the same degree of care and thought should be devoted to it as is given to that of brick work, carpenter work, painting, roofing, etc.; and that the services of someone thoroughly familiar with the requirements of the situation be engaged to draw up a proper plan and specification upon which tenders could be invited from reputable heating men. In this way the success of a heating system is assured, and success in this case means comfort and health to the inmates of the building, and economy in the use of fuel, to those who are operating it.

In order that the reader may the more thoroughly understand the importance of having his heating system designed by competent men, it may be well to explain some of the real conditions which have to be met, the method by which difficulties are overcome, and the inconsistencies of some of the old-fashioned theories upon which even at this late date, heating systems are in so many cases worked out.

For example, it is a common practice to arrive at the amount of radiating surface which is to be installed in a building, by computing the air space in all of the apartments, and allowing a certain percentage of radiator surface in accordance with the results so obtained. It is the purpose of the writer to show that this method, particularly when it is adopted by men who have had no actual experience in the heating business, is likely to result in

failure in a great many instances; and while it may be said that heating men having had a large practical experience, and for that reason are in a better position to "guess" what a room of a given size will require, it is still true that the system of computing the amount of surface required for any given apartment from the basis of its cubic contents, is a bad one, and will almost invariably fail to give precisely the results aimed at.

It will not be surprising if the statement that the size of a building or any apartment therein has absolutely no relation to the heating surface that will be required to heat it, is received by a great many people with incredulity, but such is indeed the fact, as we shall endeavor to show.

A PLAIN DEMONSTRATION.

For the purpose of demonstration, let us take a square ten gallon can, fill it with boiling water, cover all of its external surface with a good, non-conducting material one foot thick and place it in an exposed position on a cold day. It will undoubtedly, protected as it is, take several hours to cool.

If, however, one side of the can is laid bare to the cold atmosphere, a great difference will be found, while if two sides are exposed, it will naturally cool twice as quickly, three sides, three times as quickly, and so on.

Let us try the experiment in another way. Assuming that the water in the first place was heated to two hundred and twelve degrees (boiling point) and that we had connected to the can two circulation pipes running from a small heater in which gas was the fuel used, and we desired to retain the temperature at the point named, it would be seen at once that with the whole surface of the can covered with a non-conducting material, one foot thick, very little heat from the gas flame would be likely to keep the water at the original temperature. It will also be quite obvious that if, as in the other instance, one side of the can is uncovered and exposed to the cold winds, that the gas flame will have to be increased in size, and will have to be increased twice as much if two sides are exposed, and so on until the largest amount of heat is being lost through the sides of the can, and in consequence the more heat that is supplied, the more gas is consumed.

The point, then, is, that heat is lost from a building, or an apartment in a building, just in proportion to the amount of exposure or cooling surface the building or apartment presents to the outside air; and that while a room with one exposure and a given amount of window space will require a certain amount of heating surface to maintain a given temperature, a room of the same size with three times the amount of exposure and three times the amount of glass surface will require three times the amount of heating surface to maintain the same temperature; proving the statement that the size of an apartment has absolutely nothing to do with the size of the radiator that should be used.

CALCULATIONS BASED UPON ILLUSTRATION.

On reference to the illustration, we have the ground floor of an ordinary dwelling, showing the main hall, drawing-room, library, dining-room and kitchen, and usually all of these apartments should be heated to seventy degrees. The figures hereafter given are based on the

assumption that the lowest temperature will be ten degrees below zero, and a small addition or reduction may be made if the lowest temperature is either below or above this point.

The first thing to do, then, is to find the total amount of glass in each room, then the total amount of exposed wall, and assuming that the desired temperature be seventy degrees, allow one square foot of heating surface for each square foot of glass (counting the outside doors also glass), and one square foot of heating surface for every ten square feet of exposed wall, then, having regard to the fact that a change of air is constantly taking place, allow one square foot of heating surface to every one hundred cubic feet of air; these three amounts added together, plus five per cent. for north and west exposures, and minus five per cent. for south and east exposures, will give an even temperature without effort on the part of the boiler, and with an economical consumption of fuel.

	Glass	Exposed Walls	Cubic Contents	Temperature	Radiation	Add 5 p. c.	Deduct 5 p. c.	Radiation Required
Drawing Room..	72	440	4050	70°	159	5.20	.....	167
Hall	27½	150	2030	70°	62	.....	.....	62
Library	25	325	2500	70°	92	.....	4.60	87
Dining Room .	30	370	2700	70°	94	.....	.....	94
Kitchen	40½	440	210°	70°	108	.....	.....	108

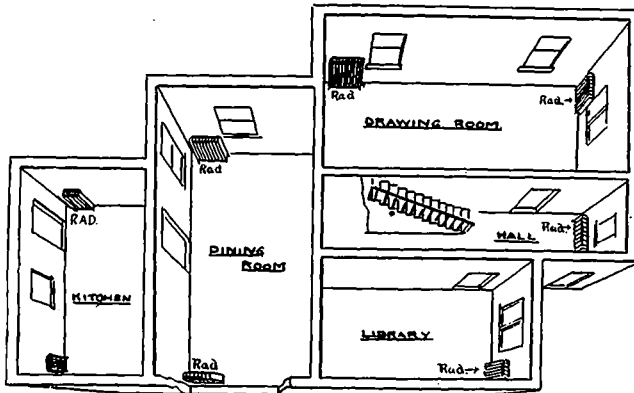


FIGURE ILLUSTRATING PRACTICAL DISTRIBUTION OF RADIATION

If the temperature required is, say 68 degrees, allow one square foot of heating surface for every one hundred and twenty-five cubic feet of air, or, if 72 degrees, eighty cubic feet of air for each square foot of heating surface.

This rule, which applies to ordinary, well constructed buildings has been found to work out admirably, and usually results, having regard to the contents of the whole building, in about 11

per cent. of one inch piping for every 100 cubic feet of air. A printed form such as is shown, is recommended for working out the heating surface required, in any building, for the reason that while it simplifies the work and gives the heating engineer or architect a knowledge of not only the amount of heating surface in each room, but also the reason for placing it there, it also provides complete information respecting every building, in a condensed form, which may be kept on file.

PRACTICAL CONCLUSIONS ARRIVED AT.

A comparison of the figures given will show that based upon the cubic contents, the drawing room and library require a fraction less than 12 per cent., the hall, a fraction over 9 per cent., the dining room, a little over 10 per cent., and the kitchen nearly 14 per cent.; and it will also be noted that while the kitchen and library are practically the same size, that the former requires a considerable amount more surface than the latter.

A word should be said here also respecting the locating of the heating surface.

It will be noted that it invariably is shown close to the most exposed portion of the room, for the two-fold reason, that first, the greater the difference in temperature between the water in the radiator, and the surrounding air the greater the amount of heat units will be given up

(Continued on page 72.)

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.—The Laidlaw-Watson Shoe Co., of Aylmer, will shortly build a factory on Atlantic avenue here to cost \$12,000. They will employ 150 hands at the start.

Peterboro.—The Peterboro Lock Co. will, it is expected, erect a factory addition to their present premises here.

Hampden, Ont.—Messrs. Miller & Seim, whose sawmill was burned down, intend to rebuild at once.

St. Thomas, Ont.—The St. Thomas Pork Packing Co. will erect a large packing house and abattoir at a cost exceeding \$15,000. Mr. Wm. H. Moody will be manager.

George Ponsford, of this city, has been awarded the contract for the cement foundation. The dimensions of the proposed structure are 100x100 feet.

Gait, Ont.—Messrs. Shury & Dietrich of this place will erect a sheet metal building 63 feet long, equipped with every modern device for the tempering of saws.

Hamilton, Ont.—Architect Chas. Mills, of this city, has awarded the contract for the erection of a large addition to the Engle Spinning Co.'s works here, to the Provincial Construction Co., of Toronto, at a cost of \$50,000.

Welland, Ont.—The Benis Bag Co., of Boston, has signed an agreement with the corporation of the town of Welland to begin the immediate erection of a factory to cost about \$1,500,000.

Welland, Ont.—J. S. Peaslee & Son, formerly of Niagara Falls, have bought thirty acres of land on which they propose to erect a large shoe factory.

Mitchell, Ont.—A by-law will be submitted to the ratepayers of Mitchell to authorize the loaning of \$10,000 to J. H. Waterhouse, and F. Dutton of this town, and E. T. Dutton, of Stratford, who propose erecting a large factory for the manufacture of men's underwear.

Ottawa, Ont.—An asphalt and bituminous paving plant is to be erected on a site provided by the city.

Berlin, Ont.—Messrs. Jos. Dain, George Swartz and F. M. Woods, of Ottumwa, Iowa, and F. R. Shantz, of Preston, their Canadian representatives, are considering the erection of a large harvesting tool plant in this city. They are at present considering a number of sites in this place.

Berlin, Ont.—The Kaufman Rubber Co., the principal officers of which are A. K. Kaufman and A. Voelker, propose establishing a large rubber boot and shoe factory at Berlin, with a capacity of 3,000 pairs daily, if the town of Berlin will grant them certain concessions. The council is considering it.

Berlin, Ont.—Messrs. McGeorge, Hoffman & Roos, of Grand Bond, Indiana, will shortly commence the erection of three factories here. The first will be a go-cart factory with a large output. The dimensions of the proposed brick structures are 300x60 ft. A brick machine and concrete mixer factory 70x30 ft., and a water motor washing machine factory of the same dimensions will be added.

Niagara Falls, Ont.—Messrs. Fitzgerald & Bennie, of this city, the Canadian representatives of the American Electrical Furnace Co. state that they have made arrangements for the erection of a large foundry for the electrical reduction of metals. The proposed plant will be constructed on Buttery avenue.

Niagara Falls, Ont.—W. S. Homan has been awarded the contract for the erection of a factory building 60x175 ft. for the Sanitary Can Co. The proposed structure will be three storeys high.

Clinton, Ont.—The Clinton Thrasher Co. have obtained the guarantee of the council of this place on \$20,000 bonds of their stock on the strength of which they propose to build a large addition to their present works.

Strathroy, Ont.—The W. P. Demond Upholstering Co. are asking the town of Strathroy for a loan of \$12,000 to warrant them building a factory here.

Portage la Praelrie, Man.—At a recent meeting of the shareholders of the London Fence Co., whose premises were destroyed by fire some time ago, it was decided to rebuild same at once.

Saskatoon, Sask.—E. H. Erb, of the New Prague Milling Co., New Prague, Minn., intends to build a large flour mill here, which will be one of a line of mills throughout the West. The capacity will be about 3,000 barrels a day.

Edmonton.—I. S. G. VanWart, president Albert Biscuit Co. of Calgary, and the manager, E. B. Johnson, are considering the establishment of a branch factory here, at an estimated cost of \$150,000.

Calgary, Alta.—Architects Dowler & Mclchie, Calgary, have prepared plans for a \$6,000 machine shop for Mathew McNaughton, here. Specifications call for concrete foundations, brick and veneer superstructure, rubberoid roofing, hot air heating, electric lighting, modern plumbing, wood finish, cement work, ornamental iron, freight elevator, art glass, machinery, lathes, forges and planes.

Victoria, B. C.—The Southern Cross Mining & Smelting Co., of this city, propose to have erected before next spring a smelter to cost at least \$500,000. H. Cecil, of this city, has the matter in hand.

Prince Rupert, B. C.—Mr. George Brown, of San Francisco, Cal., states that he will at once commence the erection of a large lumber mill here.

Vancouver, B. C.—Mr. B. F. Graham, of the B. F. Graham Lumber Co., states that his company will shortly erect a large lumber mill on Vancouver Island. The total cost of the proposed mill and the timber limits they have acquired is \$100,000.

Vancouver, B. C.—Two contracts have been awarded for the construction of pulp works for the Canadian Pacific Sulphite Paper Co., Swanton, Bay, B. C., one for the excavation and the concrete work on the pulp mill buildings, and the other for the construction of a power dam, pipe line and electric lighting plant, awarded to the B. C. General Contract Co., of Vancouver, and Messrs. Elliott & McCallum, of Vancouver, respectively. Work will commence at once.

Vancouver, B. C.—Mr. J. T. Shadforth, of Newcastle-on-Tyne, England, at present in Vancouver, states that the North Pacific Iron & Steel Corporation, whose interests he represents, are about to expend the sum of \$2,000,000 on a large blast furnace here.

Vancouver, B. C.—There is a possibility that R. E. Masten, president of the Toronto Sand Lime Brick Mfg. Co., may shortly establish a plant in this city.

Vancouver, B. C.—J. C. Coughlin & Sons, will erect a structural iron plant here.

Boundary Falls, B. C.—The Dominion Copper Co., of Boundary Falls, West Kootenay, B. C., announce that they will enlarge their smelter to a capacity of 3,000 tons of ore daily.

Kootenay, B. C.—C. P. Hill, general manager of the Hillcrest Coal Mines, Hillcrest, Alta., states that he, in company with Mr. Charles Hosmer and Mr. Shaughnessy, of the C. P. R. will erect a blast furnace here in the course of the next year.

Sechelt, B. C.—The Canadian Financiers Co., of this city, have organized the above company for the purpose of erecting a plant for the manufacture of brick. This company have already sent a force of men from Vancouver to Sechelt to commence the erection of same.

Emily Lagoon, B. C.—Coleman Spencer & Co., known as the Milwaukee Lumber Co., will very shortly erect a \$500,000 lumber mill on Emily Inlet, Mackenzie Sound, near Vancouver.

New Westminster, B. C.—Mr. A. P. Gillies, of the Tacoma Construction Co., has submitted a proposal to the council of this town for the erection of a cement brick plant here.

Dalhousie, N. B.—The ratepayers of Dalhousie have accepted a proposal made to the town by the Cascadia Trading Co., to establish a plant for the manufacture of lumber, to cost about \$100,000.

St. John, N. B.—J. H. Hague, of this place, has been awarded the contract for the erection of a reinforced concrete construction grist mill here, for C. D. Ford of Nauwigewank, and W. E. Darling, of this city. The dimensions of the proposed building are 35x40 ft.

St. John, N. B.—F. Neill Brodie, of this place, has prepared plans for an addition to the brewery of Simeon Jones, Limited, here. Specifications include steam heating, electric lighting, cement work, cut stone, reinforced concrete, sheet metal work, freight elevator. The proposed structure will have concrete foundations, composition roof, and of mill construction throughout.

Maisonneuve, P. Q.—Architect Chas. A. Reeves, Montreal, has prepared plans for an \$10,000 factory, stone foundations, solid brick and stone superstructure, composition roof, for the National Licorice Co., 115 John street, Brooklyn, N. Y. Specifications include steam heating, electric lighting, structural iron, freight elevator and plate glass.

South Bay, N. B.—The Canada Wood-encore Co., whose factory was burned at Hampton, N. B., propose to erect a large mill at South Bay, N. S.

Louisburg, C. B.—The Eastern Fishing Co., here, Capt. F. Forward, promoter, has made a proposition to the town council here to the effect that if the town will grant them a bonus they will invest from \$30,000 to \$50,000 in a fishing plant here. The town council favors the idea and will submit a by-law to the ratepayers at an early date.

Gas Plants, Elevators and Warehouses

Milverton, Ont.—The J. C. Grosch Felt Shoe Co., are having plans prepared for an addition to their present factory building. It will be three storeys in height, 35x65 ft. dimensions. It is estimated that the work will cost in the neighborhood of \$15,000.

Brantford, Ont.—The Provincial Gazette announces that a charter has been granted the Oxford Linen Mills, Limited, Tillsonburg, Ont., capital \$200,000, to acquire the Brantford Linen Mfg. Co. Provisional directors are: Wm. Berry, manufacturer; Robinson Berry, retired farmer, and John Berry, mechanic; Samuel Percy Davis, accountant; John Thomas Atkinson, osteopath, of Brantford.

Cayuga, Ont.—Messrs. J. J. Murray & Co., of this place, have been awarded the contract for the erection of a pumping station and gas reservoir on Robert McEldred's farm near Cayuga, for the Dominion Gas Co. Contract price \$35,000.

Tillsonburg, Ont.—Mr. Berry has submitted plans and specifications of a textile factory which he proposes to erect here. The proposed structure will be 120x60 feet with full basement, of red brick two storeys high. Mr. Berry, the owner, has submitted plans to the president of the Board of Trade here and they accepted them. It is expected tenders will be called for shortly.

Halleybury, Ont.—T. H. Hoard, of Messrs. Dreany Bros., Sault Ste. Marie, Mich., has purchased five acres of land here and will at once commence the erection of a large foundry and machine shop for the repair of heavy machinery.

Cobalt, Ont.—Samuel Newhouse, president of the Nipissing Mine here, intends, with his colleagues, to build a smelter at this place to cost \$15,000,000.

Norwich, Ont.—Mr. West, presenting the Norwich Brook Co., here, which was recently burned out, states that his company intend rebuilding at once.

Owen Sound, Ont.—The British Canadian Distillery Co., with a capital of \$250,000, intend erecting a large distillery here.

Port Arthur, Ont.—W. F. Gandy, of Berlin, was at Port Arthur recently with a view to establishing a candy factory. He has not yet arrived at any definite decision.

Sault Ste. Marie, Ont.—The Canadian Smelting & Refining Co. propose to build the largest smelter in Canada here. Mr. Frank Arnold, K. C. of Toronto, is the president. Mr. Otto Grahm, Salt Lake City, Utah, is the managing director. The estimated cost is \$500,000.

Owen Sound, Ont.—The Benallen Cement Mills for the Benallen Portland Cement Co., of this place, are to be erected here very shortly.

Fort William, Ont.—The Imperial Steel & Wire Co., of this city, have commenced the erection of an addition to their present works to occupy ten acres of land. Mr. Currie is the manager of the company.

Montreal, P. Q.—David R. Brown and Hugh Vallance, architects, of this city, have prepared plans for a \$250,000 building for the Canadian Spool Co. The proposed factory is to be of mill construction with concrete foundations. The specifications include: cement work, cut stone, brick, tile, fireproofing, reinforced concrete, structural iron, ornamental iron, freight elevator, fireproof windows, ornamental columns and machinery suitable to their business. The building will be steam heated and will be electrically lighted from the company's own plant.

St. Therese, P. Q.—The Dominion Furniture Co.'s factory was burned down recently entailing a loss of about \$90,000, with an insurance of \$40,000. It is the intention of the company to rebuild at once.

Paris, Ont.—Plans have been completed by Architects Ellis & Connery, Toronto, for a three storey frame and corrugated iron warehouse for the Paris Plow Co., to cost about \$3,000. Specifications include cement piers, sheet metal work and freight elevator.

Toronto, Ont.—Architect Henry Simpson, of this place, announces the following awards in connection with tenders for the Aluminium Crown Stopper Co.'s carpentering, R. G. Kirby; sheet metal work, Douglas Bros.; two 50 h.p. boilers, Babcock & Wilcox, Limited; painting, John Brennan; freight elevator, Otis-Fensom Elevator Co. The building will cost \$50,000.

Regina, Sask.—Architect J. H. G. Russell, Silvester-Wilson building, here, has prepared plans for a brick and stone warehouse for Messrs. Campbell Bros. & Wilson, at this place.

Edmonton, Alta.—The Edmonton Produce Co. here, proposes to erect a cold storage building and install therein a refrigerator plant, the whole to cost not less than \$50,000, if the by-law voted on by the taxpayers of this place passes. If arrangements are satisfactory building operations will be commenced not later than January, 1908.

Edmonton, Alta.—Plans for a new storage building in connection with the Government Creameries here, are being prepared under the direction of Dairy Commissioner Miller. The proposed structure will be of brick, two storeys in height, to cost at least \$5,000.

Strathcona, Alta.—Mr. Cyrus S. Eaton, who secured the contract for making and installing an artificial gas plant to supply both Strathcona and Edmonton will let the contracts for the mains for Strathcona at once and tenders for the mains in Edmonton will also be called for shortly. The erection of a plant for making gas from straw, and the laying of mains will cost about \$100,000.

Union Point, N. B.—F. Nell Brodie, architect, St. John, N. B., has prepared plans for a brick warehouse, with concrete foundations for the Edward Partridge Pulp & Paper Co., here. Specifications include cement work, cut stone, and electric lighting.

Electrical Construction

Ottawa, Ont.—The council of this city propose to call for tenders very shortly for the installation of suitable machinery for the utilization of water power for the driving of the electric generators supplying the electric light and power systems here.

Hamilton, Ont.—It is estimated by the Hydro-Electric Power Commission that the cost of a lighting installation for Hamilton would cost \$121,000. The council has the matter under consideration.

Plattsville, Ont., intends to raise money for the purpose of installing a street lighting system for the town.

Point du Bois, Que.—This town will have a power development station to cost in the neighborhood of \$70,000.

Sherbrooke, P. Q.—As the Sherbrooke Power, Light & Heat Co. have turned down that city's offer of \$200,000 for their plant, the special light committee will now proceed with the erection of a municipal electric generating plant \$200,000 for this purpose, has already been voted by the ratepayers. Messrs. Ross & Holgate, of Montreal, have been engaged as engineers for the work.

Moose Jaw, Sask.—A by-law for the authorization of an issue of debentures for \$90,000 for the purpose of extending the electric light system of Moose Jaw, Sask., will be voted on by the ratepayers of that place. John D. Simpson is secretary-treasurer of the council.

Revelstoke, B. C.—The city clerk of Revelstoke, B. C., has had plans prepared for improvements to the hydro-electric plant here, including 500 B.H.P. motor generators, 1000 volt motor generators and all accessories necessary to a complete plant. H. Floyd, City Clerk, Cecil Godard, C. E., Chief Engineer, Winnipeg, Man.

Grand Falls, N. B.—R. H. Conger, of New York, engineer for the Grand Falls Power Co., stated at a meeting of the Government of New Brunswick, which approved the plans of the company, that the company would spend \$3,000,000 within the next year in the development of power at Grand Falls.

Bridges and Wharves

Toronto—Hon. A. B. Aylesworth, acting Minister of Public Works, has assured Mayor Coatsworth and Controller Ward that the island breakwater will be commenced in the near future.

Toronto—The Hon. Sydney Fisher, acting Minister of Public Works, has notified the City Solicitor here that the Government has passed an Order-in-Council giving the city permission to proceed with the work of building a seawall in front of the exhibition grounds here.

Georgian Bay Canal—A 21 foot canal will be dug from the great lakes to the St. Lawrence through the French river, Lake Nipissing, and the Mattawa, Ottawa and St. Lawrence rivers into the Atlantic. Plans have been completed and the Georgian Bay Canal Commission appointed by the Dominion Government, and it is expected operations will commence in the near future. The estimated cost is \$105,000,000.

St. Catharines, Ont.—F. J. Yelman, of Toledo, representing American capitalists, is looking for a suitable site to erect a dry-dock here. The deal for the land has been almost completed and it is expected that a dry-dock capable of accommodating the largest steamers on the lakes will be shortly be erected here.

Poucher's Mills, Hastings County—The Corporation of the County of Hastings will submit a by-law to the ratepayers on the 16th of October, voting to take place at Shire Hall, Belleville, Ont., for the purpose of raising \$20,000 for the erection of a bridge at Poucher's Mills, in Hastings County.

Welland, Ont.—Mr. Butler, Deputy Minister of Railways and Canals, was in Welland recently, looking over the situation and the Government will shortly call for tenders for the erection of a suitable dock for the Ontario Iron & Steel Co., at this place.

County of Bruce, Ont.—The council of the County of Bruce, will at Paisley, Ont. on the 23rd day of October, consider a by-law for the purpose of raising \$20,000 for the purpose of building a new bridge in the place of the old Denby bridge.

Hanover, Ont.—The C. P. R. will at once commence the construction of a wooden bridge across the G. T. R. tracks here to cost about \$15,000. The proposed structure will be 65 ft. high by 600 ft. long.

Welland, Ont.—The Dominion Government shortly propose to call for tenders for the erection of a new armory here for the accommodation of the 8th, 9th and the 44th Regiment. W. M. Gorman, member for Welland, is advocating the proposal.

Hamilton, Ont.—Mr. Van Allen, of this city, who has charge of the plans for the new park to be laid out on Burlington Beach, states that they have been almost completed. It is the intention of the Government to build a sea-wall, or revetment wall in the bay 2,000 ft. long at an average distance of 200 ft. from the roadway along the shore, along each side of the piers. It is expected to cost \$20,000.

Dunnville, Ont.—Dunnville will erect a concrete arch bridge 18 ft. long, 10 ft. wide, or a wooden structure of the same size to be built near Moulton Station, Ont.

Bobcaygeon, Ont.—The Department Railways and Canals, Ottawa, will build a concrete dam at Bobcaygeon, Ont.

Southampton, Ont.—Sealed tenders marked "tender for Southampton Wharf Extension" will be received by Fred Gellinas, secretary, Department Public Works, Ottawa, until October 25th, for the construction of an extension to the wharf at Southampton Harbor of Itasca, county of Brant, Ont. Forms of tender and specifications at the Department.

Fort William, Ont.—The Grand Trunk Pacific will immediately construct a \$250,000 draw bridge across the Kaministiquia river here for the accommodation of railway and pedestrians, to be completed some time in the summer of 1908.

Fort William, Ont.—The C. P. R. are preparing plans for a \$1,000,000 dock to be erected here in a short time. They also contemplate the erection of a large grain-cleaning elevator at some point on the river near here, in addition to several freight sheds.

Parry Sound, Ont.—The Department of Marine and Fisheries, Ottawa, will erect a wharf for the berthing of steamers at Parry Sound, Ont.

Quebec, P. Q.—The Department of Public Works of Quebec, has prepared plans for the construction of four piers and two abutments of concrete for a fixed bridge to be built at the site of the Richelieu, on the site of the old Yule bridge.

Winnipeg, Man.—Winnipeg, Man., will erect a bridge over the Winnipeg river at Point du Boisé, to be of wood or steel of ten spans of 50 ft. each and one draw-span of 160 ft.

Winnipeg, Man.—Winnipeg will erect a bridge to cost over \$125,000, over the Red river here between Winnipeg and St. Boniface, to be completed in the next three months. Particulars at the Department of Public Works, Ottawa.

Winnipeg, Man.—The chairman of the Board of Control of this city has had plans prepared for the erection of piers and superstructure of the Redwood street bridge here.

Winnipeg, Man.—At a meeting of the Power Committee it was decided to erect a wooden trestle bridge to cost about \$10,000 between Mud Lake and Lac Du Bonnet. Tenders will be invited shortly.

Brandon, Man.—The Board of Works here, upon report of their engineer, W. H. Shillinglaw, have decided to recommend a reinforced concrete bridge on the proposed bridge across the Assiniboine river here, at a cost of \$40,000.

Dunrea, Man.—The municipality of Riverdale, Man., will erect a steel bridge of 100 ft. span, (two) over the Souris river at Dunrea, Man.

Shell River, Roblin, Man.—The municipality of Shell River, Man., will erect a bridge across the Shell river.

Fork River, Man.—Mossy River municipality, Man., will erect a Howe truss bridge, 30 ft. spans (two) near Winnipeg, also two concrete abutments and the Fork river, Howe truss, each span of 60 ft.

Lethbridge, Alta.—The following contracts for the new steel bridge to be built here for the C. P. R. have been let: John Gunn & Sons, of Winnipeg, will build all concrete abutments and the concrete substructure of the bridge at a cost in the neighborhood of \$200,000. The Canada Bridge Co., Walkerville, Ont. have secured the contract for the steel superstructure. The total cost of the bridge, it is estimated, will be nearly \$1,500,000.

Vancouver, B. C.—The city council here has passed a motion to submit a by-law to the ratepayers of this city next municipal election, to authorize the expenditure of \$1,000,000 for the purpose of building three bridges over False creek and one over Coal Harbor. J. H. L. Waddell, of this city, is to be the designer of the proposed bridges.

Vancouver, B. C.—The Macdonell-Gzowski Co., of this city, have been awarded the contract for the alterations to a large grade on main line of the C. P. R., the driving of about three-quarters of a mile of tunnel and the construction of two bridges over the Kicking Horse river.

Vancouver, B. C.—The Johnson Wharf Co. have decided to construct a large wharf that was first intended, and they have increased their capital stock from \$60,000 to \$100,000 for that purpose. It is expected that the wharf will be completed by the end of the year.

New Westminster, B. C.—The Board of Park Commissioners of the City of Vancouver has deposited in the Land Registry office, and in the office of the Minister of Public Works, Ottawa, plans of a proposed wharf to be constructed in New Westminster. Applications for the same has been made to the Commissioner of Public Works for the erection of such wharf.

St. Peter's Bay, P. E. I.—The Department of Public Works, Ottawa, will extend the breakwater at St. Peter's Bay, King's County, P. E. I.

Salmon River, N. B.—Tenders marked "Tender for Great Salmon River Breakwater Extension" will be received by Fred Gellinas, secretary, Department of Public Works, Ottawa, until October 26th for the construction of an extension to the breakwater at Great Salmon River, St. John County, N. B. Tenders must be accompanied by an accepted cheque for \$300. Plans and specifications with E. A. P. Shewan, St. John, N. B., and with the Department, Ottawa.

St. John, N. B.—The Board of Works, of this city, propose to construct a 450 ft. wharf in the harbor here, to have a depth of 30 ft. on one side and 16 ft. on the other side.

St. Alphonse, P. Q.—Sealed tenders addressed to Fred Gellinas, secretary, Department of Public Works, Ottawa, Ont., will be received by him until October 26th for the erection of an extension to the wharf at St. Alphonse, P. Q. Tenders must be accompanied by an accepted cheque for \$4,000. Plans and specifications with the above; also J. L. Michaud, Merchants Bank Building, Montreal.

Portuguese Cove, N. S.—Sealed tenders addressed to the Department of Public Works, will be received until October 25th, 1907, at the Department, Ottawa, for the construction of a breakwater at Portuguese Cove, Halifax County, N. S. Tenders must be accompanied by a marked cheque for \$900. Plans and specifications with the Department, Ottawa, and with E. W. Dodwell, resident engineer, Halifax, N. S.

Water Works and Sewers

London, Ont.—The council has under consideration the installation of a filtration plant for the filtration of water from the North Branch river for the supply of the city. The plant used, it is expected, will be similar to that now in operation in the town of Harrisburg, Pa.

Ottawa East, Ont.—The Ottawa East Water Co., Ottawa East, Ont., will construct a new pumping station in addition to extending the present plant.

Clinton, Ont.—A by-law to raise \$53,000 to establish a system of waterworks for fire protection and domestic use has been carried by a large majority.

Aylmer, Ont.—The ratepayers of the town of Aylmer have passed a by-law authorizing the expenditure of \$101,000 for the purchase of the present water works system owned by private capital at \$50,000 and an additional \$5,000 to be expended in the laying of water mains, the balance of the amount to be applied on the installation of a sewerage system.

Niagara Falls, Ont.—The council has passed a by-law authorizing the expenditure of \$11,940 for waterworks extension and improvements.

Carman, Man.—The council of Carman, Man., will submit a by-law to the ratepayers of that place to raise \$10,000 for the purpose of installing a waterworks and sewerage system. A. Malcolmson, secretary-treasurer.

Winnipeg, Man.—Sealed tenders addressed to the chairman of the Board of Control, Winnipeg, Man., will be received until November 15th for delivery May 15th, of about 15 miles of assorted water pipe. Specifications and forms of tender at the office of H. N. Rutten, City Engineer.

Regina, Sask.—The council here expect to spend \$200,000 next year on the water supply for the town, and they have secured Messrs. J. W. Smith, C. E., of Toronto, and F. Lou, C. E., of Montreal, to make a report on a waterworks storage system.

Humbolt, Sask.—The council of this place have decided to spend \$7,000 in providing adequate fire protection.

Regina, P.—Plans have been prepared for the laying of water mains in the city of Regina. P. Robinson, Deputy Commissioner of Public Works.

Vancouver, B. C.—A by-law has been carried for the purpose of raising \$300,000 for sewer extensions and improvements.

Vancouver, B. C.—The ratepayers of Vancouver have passed the following by-laws: to raise \$200,000 for sewer construction; to raise \$100,000 for a marine driveway, and to raise \$45,000 for additions to and extra school buildings.

Public Buildings

Toronto, Ont.—The Board of Control has approved the plans for the new bath-houses on St. Catharine place. The building will be 14x52 ft., two storeys in height and will cost \$40,000. There will be a 26x72 ft. plunge bath, fourteen shower baths for men and eight for women.

Toronto, Ont.—The Board of Directors of the Home for Incurables have approved of the city's plan to spend \$50,000 on an additional wing, which will accommodate 50 patients. Contracts will be called in the near future.

Toronto, Ont.—James Bain, chief librarian, Toronto, has been asked to report on suitable plans for a branch library at the corner of Queen and Lisgar streets. Changes and decorations will also be made in the near future to the branch library on College street.

Sudbury, Ont.—Public Works Department, Ontario Government, will erect a court house and registry office at Sudbury, Ont.

Dresden, Ont.—Architect A. M. Piper, of Chatham, has received tenders for an \$8,000 brick and stone library building to be erected at Dresden for the corporation. The building will have slate roof, steam heating, electric lighting, Georgia pine interior finish and the plumbing will include closets and basins. Specifications include mantels, artificial stone, sheet metal work and metallic ceiling.

Dresden, Ont.—Architect A. M. Piper, of Chatham, announced that he has prepared plans for an \$8,000 brick and stone library building to be erected here for the corporation of Dresden. The building will have slate roof, steam heating, electric lighting, Georgia pine interior finish, and the plumbing will include closets and basins. Specifications include mantels, artificial stone, sheet metal work and metallic ceilings.

Kingston, Ont.—The Department of Public Works will erect an officers' mess building at the barracks here. The proposed structure will be of stone, with interior finish of pine, oak and burlap. The specifications include cement work, cast stone and brick, tile mantels, structural iron, dumb waiter, sheet metal work, metal ceiling and roof, electric lighting, modern heating and plastic relief work decoration. H. P. Smith, supervising architect, Kingston, Ont.

Ottawa, Ont.—Secretary McMahon, of the Ottawa Exhibition Committee states that a new steel grand stand will be erected to accommodate the patrons of the fair.

Sault Ste. Marie, Ont.—Architect M. B. Aylesworth, Port Arthur, is preparing plans for a parish hall for the Anglican church here, to be constructed of stone at a cost of \$5,000.

Peterboro, Ont.—The Nichols library will shortly be erected here at a cost of about \$10,000. Mr. Richard is looking after the interests of the council. The proposed structure will probably be three storeys high, although plans submitted by three different architects have not yet been decided on.

Brantford, Ont.—Messrs. Riddolls & Wright are the contractors for the new concrete and pressed brick fire hall for the city of Brantford, for which George W. Hall, architect, of this place, prepared plans. The contract includes ornamental iron, metal ceilings and electric work, slate roof, tile combination heating and modern plumbing.

Welland, Ont.—The site for the new post office to be erected here by the Dominion Government, has already been purchased and the Government will in the near future call for tenders for the construction of the same.

Guelph, Ont.—Messrs. H. A. Clemens & Co., of this city, have been awarded the contract for the erection of a 100x70 ft. building to be built of stone, at a contract price of \$10,000, for the Ontario Agricultural College. Work will be commenced at once.

Kincardine, Ont.—Fred Gellinas, secretary, Department Public Works, Ottawa, will receive tenders until October 22nd, marked "Tender for Public Building at Kincardine," for the construction of a public building at Kincardine. Plans and specifications, and forms of tender upon application to the Department, Ottawa.

Welland, Ont.—The site of the new armory for the accommodation of the 4th Regiment of Lincoln and Welland counties and the local troops of the 2nd Dragoons, has been secured and the work of erection will be let by tender very shortly. The proposed structure will cost about \$10,000 and will be built by the Department of Public Works.

Mildmay, Ont.—The contract for the erection of the new skating rink has been awarded to George Schwalm. The proposed building will be 160x50 feet.

Casacades Point, P. Q.—The Department of Railways and Canals, Ottawa, will erect a building at Casacades Point on the Soulanges Canal, P. Q.

Sherbrooke, P. Q.—The Public Works Department, Ottawa, will erect a new drill hall at Sherbrooke, P. Q.

Montreal, P. Q.—J. B. Fausse & Co., of this city, have been awarded the contract for the new jail, for the district of Montreal, at a price of \$790,000. The proposed structure will be completed in two years.

Montreal, P. Q.—Messrs. Peter Lyall & Sons, of this city, have been awarded the contract for the new post office building in this city at a price of \$500,000, to be constructed of stone and steel, five storeys high, to be completed May 1st next.

Montreal, P. Q.—Plans have been completed for the construction of a new engineering building in connection with McGill University to take the place of the one destroyed by fire in April. The new structure will be of fireproof construction at an estimated cost of \$275,000.

Montreal, P. Q.—Architects Saxe and Archibald, of this city, have prepared plans for the remodeling of the old Emmanuel Congregational church to be used as a concert hall. A new gallery will be put in and a stage built and stores will be built on either side of the entrance. Mr. Reid Wilson is the owner.

Hamlet, Man.—The council have passed a by-law to erect a fire hall and industrial structures in Hamlet.

Portage la Prairie, Man.—The Hon. Robert Horwood, Minister of Public Works, Manitoba, will shortly call for tenders for the erection of a boys' reformatory on a site which he is at present selecting.

Selkirk, Man.—The Department of Public Works, Ottawa, will erect a post office at Selkirk, Man.

Neepawa, Man.—The Public Works Department, Ottawa, will erect and complete a public building at Neepawa, Man.

Brandon, Man.—Messrs. Dumas & Lochrane, of Ottawa, Ont., are the successful contractors for the \$50,000 armory to be erected here. The proposed structure will be of brick and stone.

St. Charles, Man.—The Department of Public Works will erect brick and stone horticultural building at the Agricultural grounds, St. Charles, Man.

Winnipeg, Man.—Architect Samuel Hooper, for the Provincial Government, has prepared plans for a new telephone exchange, being erected by the Government Telephone and Telegraph Department, at a cost of \$100,000. The building will be of brick and stone, entirely fireproof, and will be situated at the corner of Dormont and Charlotte streets. It will be completed early next year.

Winnipeg, Man.—The Winnipeg Council has viewed favorably the establishing of public swimming baths. A by-law will be considered at a future date which if sanctioned by the people, will authorize the city council to issue debentures for \$30,000, for the purpose of providing public baths.

Carberry, Man.—A by-law has been submitted to the ratepayers of Carberry, Man., to raise the sum of \$2,000, by the issue of debentures for the erection of a municipal building.

High River, Alta.—The city council of High River will erect a town hall there, according to plans prepared by the city.

Winnipeg, Man.—The Salvation Army has purchased a site at a future date which Pritchard and Main streets upon which it is intended to erect a barracks in the near future.

Winnipeg, Man.—J. McDiarmid & Co., of this city, have been awarded the contract for the erection of a new Fort Osborne Barracks at a price of \$25,000. The proposed structure is to be two storeys in height, concrete foundations and brick superstructure.

Brandon, Man.—Messrs. Dumas & Lochrane, of Ottawa, were the successful contractors for the armory to be erected at Brandon. Thomas Sinclair, architect, Brandon, is superintending architect. Contract price \$50,000.

Portage la Prairie, Man.—Hon. Robert Rogers, Minister of Public Works, Manitoba Government, has completed arrangements for the erection of a reformatory to cost \$150,000, to be constructed of brick and stone. Plans will be prepared this fall and work will commence early next spring.

North Battleford, Sask.—Architects Storey & Von Pgmound have prepared plans for a court house here to cost \$46,000. Foundations to be of brick, brick and stone superstructure, and felt roof three storeys high. Specifications include steam heating, electric lighting, cement work, tile, reinforced concrete, metallic lath, structural iron, ornamental iron, fire escapes, vaults, metal ceiling.

Daysland, Alta.—Architect J. E. Wise, of this place, has prepared plans for a \$5,000 fire hall for this town. Ed. H. Dawson, here, is receiving tenders. The proposed structure will be two storeys high. Specifications include hot air heating, electric lighting, shingle roof, cedar interior finish, cement work, shingle stain.

Calgary, Alta.—Plans have been prepared for the erection of a city hall here. W. M. Dodd, Alexander Corner, Calgary, architect.

Edmonton, Alta.—Wm. Fingaid, architect, of Winnipeg, has been retained by the Alberta Government to superintend the formulation of plans for the new parliament buildings here. It is expected they will be completed in time to let contracts and have the foundations laid this fall.

Rosthern, Sask.—The Prince Construction Co., Minneapolis, Minn., have been awarded the contract for the proposed town hall here, at a cost of \$20,000. The proposed structure is to be built according to plans and specifications by Nobles & Anderson, architects, Prince Albert, Sask. Specifications include cement work, brick, reinforced concrete, metallic lath, fire escapes, vaults, sheet metal work, metal ceiling roof and walls, shingle stain, ornamental columns and art glass. Proposed structure is to be completed by November 1st, 1907.

Saskatoon, Sask.—J. McDiarmid & Co., of this city have been awarded the contract for the new post office building to be erected here for the Dominion Government. Although no official announcement has been made as to the successful contractor for the building of the court house, it is understood that Neil Stewart, of this place has been awarded the contract.

Medicine Hat.—W. E. Knowles, M. P., has sent word to have the armory site surveyed, preparatory to calling for tenders for the new armory building.

Saskatoon, Sask.—Plans have been prepared for the erection of a new court house at Saskatoon, Sask., by Messrs. Storey & Von Edmond, architects, Regina, Sask.

Moosomin, Sask.—Plans are being submitted to the government for a \$6,000 armory at Moosomin, and as soon as its approval is obtained, work will be promptly commenced.

Regina, Sask.—Comptroller White, of the Northwest Mounted Police, states that new barracks will shortly be built at Regina, as plans have now been completed.

Vancouver, B. C.—The firm of Macdonald, Snyder & Wilson, of Victoria, B. C., are the successful contractors for the proposed court house here. Contract price in the neighborhood of \$400,000.

Vancouver, B. C.—The Royal Institute for the Advancement of Learning, of British Columbia, has offered to architects the sum of \$50 in prizes for the proposed university building. First prize \$50, second prize \$25, third prize \$10. For particulars apply to D. Robertson, Board of School Trustees, Vancouver, B. C.

New Westminster, B. C.—Messrs. Dean & Barrett, Vancouver, own the property on the corner of Columbia and Church streets here, on which they propose erecting a four storey brick and stone hotel and theatre at a cost of \$100,000, and will be erected by the Dominion Construction Co. The plans are being prepared by Mr. Houghton, architect, Seattle, Washington Territory.

New Westminster, B. C.—The contract for the construction of the proposed eight storey and basement brick building for Messrs. David Spencer & Limited, awarded to Messrs. Smith & Sherbourne, of this place, at a price of \$102,000. Work will commence at once.

New Westminster, B. C.—Premier McBride, of the British Columbia Government, states that his government are about to erect a new stadium for the issue here, at a cost of \$200,000. The proposed structure is to be white brick, and, as plans have already been drawn up, it is expected that the work will be proceeded with at once.

Cumberland, B. C.—Edward Harris, Victoria, B. C., has been awarded the contract for the erection of the public building at Cumberland, B. C., for which tenders were recently called by the Dominion Government.

St. John, N. B.—The plans for the new Seaman's Institute, which it is proposed to erect on Prince William street here, have just been completed by the architect, Mr. G. Ernest Fairweather. Cost will be, it is stated, in the neighborhood of \$15,000.

Bridgewater, N. S.—The Department of Public Works, Ottawa, Ont., will construct a public building at Bridgewater, N. S.

Charlottetown, P. E. I.—The Public Works Department, Charlottetown, P. E. I., will erect a poor house here. C. B. Campbell, architect.

Queen's County, P. E. I.—The Department of Public Works, Charlottetown, P. E. I., will erect a new jail in Queen's County, according to plans and specifications at the office of C. B. Chappet, architect.

Charlottetown, P. E. I.—L. R. McMillan, secretary, Public Works Department, Charlottetown, P. E. I., has had plans prepared for a heating system and plumbing and electric wiring of the county court house and jail at Summerside, P. E. I.

Sydney, C. B.—It is reported that a Protestant Industrial Home will shortly be built here.

Business Buildings

London, Ont.—Architect E. Wright, 209 Queen's avenue, London (formerly of Chatham, Ont.), has prepared plans for a store building to cost \$18,000, to have stone foundation, brick superstructure, composition roof. Specifications include hot water heating, electric lighting, Georgia pine interior finish. The contractors are the Western Bridge Equipment Co., Chatham, Ont., who will build the structure for W. H. Reed & Co.

Windsor, Ont.—Architects Williams Bros., Windsor, have prepared plans for an office building for John Curry, of Windsor. Specifications include brick foundation, brick superstructure, hot water heating, electric lighting, oak interior finish, cement work, cut stone, tile, mantels, vaults, electrical work, ornamental columns, plate glass.

Brantford, Ont.—Architect George W. Hall, of this place, has prepared plans for the erection of brick business block for M. Mintern, Brantford, to cost \$1,000. The proposed structure will have cement foundations. Specifications include hot air heating, electric lighting, modern plumbing, composition roof, plain interior finish.

Brantford, Ont.—Architect Geo. W. Hall, of this place, has prepared plans for a \$10,000 business block for W. F. Cockshutt, M. P. Tenders closed Sept. 15th. The proposed structure is to have concrete foundation, sand lime brick superstructure, rubber roof, plain interior finish. Specifications include hot water heating, electric lighting, modern plumbing, cement work, artificial stone, vaults, art glass.

Winnipeg, Man.—Louis Pechal, Winnipeg, has been awarded the contract for erecting a \$10,000 stores and department building to be built with stone foundation, stone, brick and steel superstructure, felt roof. Specifications include steam heating, electric lighting, modern plumbing, oak and B. C. fir interior finish, cement work, fire escapes, structural and ornamental iron, fire proofing, sheet metal work.

Winnipeg, Man.—Architects Wardell & Nichols, Winnipeg, have prepared plans for a \$3,500 stable for the Hon. C. H. Campbell, to have cement foundations and half timbered superstructure, with shingle roof. Specifications include hot water heating, electric lighting, pine and ash interior finish. The General Construction Co., here, are the bulk contractors.

Vancouver, B. C.—The Leland Hotel site here with a frontage of 41 ft. on Hastings street, has been purchased by Senator Cox, who intends to erect an office building thereon next spring.

Vancouver, B. C.—R. Cassidy, K. C., of this city, has taken out a permit for the erection of a \$60,000 building here. **Calgary, Alta.**—The Dominion Stores Co., Ltd., is being promoted by A. W. Morris, second vice-president of the Louisville and Nashville Ry., for the purpose of erecting a five storey reinforced concrete departmental store. The capital of the proposed company is \$1,000,000, and it is expected that active building operations will be commenced in the near future.

Calgary, Alta.—Architects Dowler & Mehle, Calgary, have prepared plans for a laundry building for Christie Bros., of this place, at an estimated cost of \$22,500. The proposed structure will have concrete foundation, brick veneer superstructure, rubberoid roof. Specifications include steam heating, electric lighting, wood fibre plaster interior finish, modern plumbing, fire proofing, reinforced concrete, fire escapes, freight elevator, prismatic glass.

Regina, Sask.—The Saskatchewan Construction and Building Co., Regina, have been awarded the contract for a store and office building for J. W. Smith, of this place, for whom Architects Storey & Von Edmond prepared the plans at a proposed cost of \$10,000. The foundations are to be of brick, with brick and stone superstructure and felt roof. Specifications include steam heating, electric lighting, fir interior finish, three storeys high.

Stoney, Alberta, Sask.—Architects Nobles & Anderson, of this place, have prepared plans for a \$10,000 brick store for G. Eaton, and the work will be rushed to completion as soon as possible. The proposed structure is to be of a slow burning construction, concrete foundations, brick superstructure. The specifications include cement work, cut stone, brick, tile, reinforced concrete, artificial stone, metallic lath, structural iron, fire escapes, vaults, freight elevator, fire-proof windows, electrical work, plate glass, art glass and prismatic glass.

New Westminster, B. C.—Messrs. Cullie Brinton and Samuel Rogers, of Boise, Idaho, U. S. A., propose erecting a four storey building here for the accommodation of stores on the first floor and a skating rink on the second floor, with rooms above.

Vancouver, B. C.—D. Spencer, Limited, of this place have taken out a permit for the erection of a new store and arcade at a cost of \$240,000.

Quebec, P. Q.—Architects Talbot & Dionne, Quebec, P. Q., have prepared plans for a \$20,000 printing office for the Compagnie Action Societe Catholique. Specifications include steam heating, electric lighting, cement work, cut stone, bitum fire proofing, armored concrete, reinforced concrete, metallic lath, structural iron, fire escape, vault, freight elevator, fire proof windows, electric work.

Banks

Toronto, Ont.—The Canadian Bank of Commerce here has purchased the property at 449-451 Yonge street, opposite College, and will establish a branch there after the new structure they propose erecting is completed.

Brantford, Ont.—The successful contractors for the Bank of Commerce building here to cost \$25,000, are Messrs. Schultz Bros. Co., Limited. The proposed structure will have stone foundation, pressed brick superstructure, composition roof. Specifications include hot water heating, electric lighting, modern plumbing, hardwood interior finish, cement work, terra cotta, tile, mantels, fire proofing, armored concrete, metallic lath, structural iron, ornamental iron, vaults, art glass.

Brantford, Ont.—The Standard Bank intend enlarging their branch here by embracing the property immediately adjoining and putting in a new stone front and remodeling the whole at a cost of \$10,000.

Roland, Man.—The Bank of Hamilton has purchased the property on which Mr. Cowe's photograph gallery recently stood, and it is reported that they intend to erect a bank building on it in the near future.

Vancouver, B. C.—The contract for the new addition to the Bank of Montreal here was awarded to Messrs. McDonald & Wilson, here, at a cost of \$10,000.

Vancouver, B. C.—The plans for the extension of the Bank of Montreal building here, which were drawn up by Architects Hoenyman & Curtis, have been approved by the civic authorities. The proposed addition will cost \$50,000 and will be four storeys high. The successful contractors are McDonald & Wilson, of this place.

Vancouver, B. C.—Contractor A. E. Carter here has been granted a permit for the construction of the proposed building for the B. C. Permanent Loan and Savings Co., on Pender street. Cost about \$40,000.

Edmonton, Alta.—T. Page, of this city, has been awarded the contract for the addition to the Bank of Commerce building here, at a cost of \$12,000, for which Architect J. E. Wise prepared the plans. The proposed structure is to have concrete foundations, brick superstructure, composition roof. Specifications include steam heating, electric lighting, oak interior finish, artificial stone, metallic lath, structural iron.

St. Johns, Nfld.—E. D. Arnaud, Canadian Trade Agent in Newfoundland, states that a new bank to be called the National Bank of Newfoundland, with a capital of \$2,000,000, is to be established here.

Halifax, N. S.—The Eastern Trust Co. have recently acquired the premises adjoining and they propose to remodel the present building and build on the adjoining premises a building with a uniform front. Plans are now being prepared.

Railway Construction

Fort William, Ont.—The Canadian Pacific Railway Company's elevator here is to be remodelled and overhauled to increase its present capacity to 300 cars per day.

Hamilton, Ont.—The city council here has granted a franchise to John Patterson, of this city, for the construction of a railway from Hamilton to Guelph, at an estimated cost of \$3,000,000.

St. Thomas, Ont.—The G. T. R. will extend their round house and local shops here this fall.

London, Ont.—The car barns here which were destroyed by fire recently at a loss of \$150,000, will be rebuilt as soon as possible, according to the statement issued by Manager Mower, of the Northwestern Traction Co.

Elmvale, Ont.—Supt. Tiffin, of the Northern Division of the G. T. R., has taken measurements for the building of an elevator at the station yards here, to replace the grain sheds recently destroyed by fire.

Winnipeg.—The Canadian Northern Railway, in addition to other improvements to their main line, will erect a round-house to cost \$50,000.

Winnipeg.—Plans have been completed for a new Union Station here, and President Morse, of the G. T. P., stated that they will very shortly begin operations.

Brandon, Man.—The Sharpe Construction Co., of Winnipeg, are the successful contractors for the new round house for the Canadian Northern Railway, to replace the one burned down last winter. It will be erected at once.

Edmonton, Alta.—M. H. McLeod, General Manager Canadian Northern Ry., states that the company intend to make large additions to the freight sheds here very shortly.

Treherne, Man.—The C. P. R. will erect a new station at the foot of Smith street here in the near future.

New Westminster.—Lewis J. Hill, president Great Northern Railway, gives assurance that his company is prepared to erect a \$50,000 depot in New Westminster.

Fredericton, N. B.—At the Board of Trade meeting here the C. P. R. stated that they were willing to build a Union Station, provided some other party would join with them, with the proviso that the C. P. R. control said station.

Clubs and Societies

Quebec, P. Q.—Architects Talbot & Dionne, of this city, have prepared plans for a \$25,000 convent for the Societaires Nelson Ste. Marguerite. The proposed structure will feature stone foundation, brick superstructure, galvanized iron roof. Specifications include cement work, cut stone, structural iron, fire escapes, passenger elevator, dumb waiter, electric lighting, hot water heating.

Waltham, Ont.—A meeting was held here in the offices of McKinnon & Howitt. It was decided to vigorously push a movement looking to the erection of a Y. M. C. A. building here in the near future, to cost \$20,000.

Toronto.—The Parkdale Canoe Club propose to erect a new clubhouse somewhere on the lake front at Sunnyside. David Weismiller is the commodore of the club.

Sherbrooke, P. Q.—The Sherbrooke Construction Co. have been awarded the contract for the construction of the new Y. M. C. A. building here at a cost of \$15,000.

Kenora, Ont.—The C. P. R. has denoted a gift of \$30,000 to the Y. M. C. Association here, with which a large building will be erected for the purpose of the association. Travelling Secretary Sayer, of the C. P. R., will make the rough plans, which will be elaborated by the engineers of the company. The proposed building will be four stories high and will contain accommodation for a restaurant and a dormitory.

Rapid City, Man.—David E. A. Warnock, of this place, has been awarded the contract for the proposed Oddfellows building here at a contract price of \$10,000. The proposed structure will be of brick and contain approximately 50 beds. Plans by Architect Elliott, of Brandon.

Saskatoon.—Plans for the new Masonic Temple are being completed and tenders will soon be called for the work. The site is 100 feet square. The estimated cost will be \$30,000.

Asylums and Hospitals

Port Arthur, Ont.—Architect C. W. Wheeler, Port Arthur, has prepared plans for a \$5,000 hospital for the trustees board here. Foundation to be of concrete, superstructure brick and stone, metal shingle roof. Specifications include steam heating, electric lighting, oak interior finish, fire escapes, passenger elevator, dumb waiter, sheet metal work and art glass.

Toronto.—Architects Ellis & Convery, Toronto, have completed plans and specifications for alterations to the High Park Sanitarium, whereby twelve additional rooms and bath will be added to this institution. The cost is estimated to be \$25,000. Specifications include hot water heating, combination heating and plumbing and fixtures for one bath.

Hamilton, Ont.—William Southam, of this city, has offered the city the sum of \$10,000 for the purpose of erecting a Home for Incumbles here. A site for the proposed structure will be selected. Architects Stewart & Wilton, Hamilton, have prepared a preliminary sketch for the proposed building and it is expected work will commence in the near future.

Peterboro, Ont.—Plans have been prepared for the erection of a surgical ward to the St. Joseph's Hosptial on Rogers street, of this city. John E. Belcher, of this city, is diocesan architect.

Welland, Ont.—The Welland Hospital Trust, W. L. Philp, president, has been formed for the purpose of erecting a new hospital here.

Woodstock, Ont.—The council of the county of Oxford has appointed Councilors Buchanan, Chambers and McCarty to interview other municipalities with reference to the erection of a sanitarium for tuberculosis in this vicinity for the common benefit. If the project carries through it is expected that the Government will grant \$15,000 towards the work.

Prince Albert, Sask.—Messrs. Hotson & Leader, of this place, who secured the general contract for the \$1,000 enlargement to Victoria Hospital, have sublet the heating, plumbing and iron work contracts to O. B. Manville, a local man. The building will be 40 x 50 feet, three stories high of slow burning construction, and will be completed about November 20. Nobles & Anderson, of Prince Albert, Sask., are the architects.

Sydney Mines, C. B.—James Dorsay, John Walsh, Thomas O'Connell and Thomas J. Brown, of this place, have succeeded in raising \$7,000 for the erection of a city hospital, and it is expected a much larger sum will be raised, and the erection of same will likely be commenced in the near future.

Ottawa, Ont.—Architects Horwood & Taylor, of this place, announce that they have let the general contract for all the work on a proposed \$250,000 collegiate institute to be erected at this place. The building will be of reinforced concrete construction, blower system of heating, slate roof, Georgia pine interior finish, cut stone trimmings, marble work, tile roofing and the specifications include metallic lath, structural iron, ornamental iron fire escapes, electrical work, plaster relief work and plate glass. Taylor & Lackay have been awarded the contract at a price of \$225,000, they being the lowest tenderers. The contract specifies that building shall be completed by the end of December, 1905.

Ottawa.—Phoenix McCullough, of this place, was awarded the contract for an addition of four rooms to St. Anne's school, \$8,224 is the amount of his tender.

York, Ont.—The township of York is passing a by-law for the purpose of raising \$10,000 to be applied to the proposed additions to schools in the municipality.

Fort William.—A by-law has been passed by the city council of Fort William providing for the issue of \$24,500 of debentures for the building of a public school in ward 3. A. McNaughton, city clerk.

Osprey, Ont.—The town council will raise \$2,300 for the purpose of building a school here. Thos. Scott, secretary.

Paris, Ont.—The Board of Education has decided to have plans in detail and specifications drawn up for an eleven-roomed school building for this place.

Dundas, Ont.—The council of this town has passed a resolution to submit a by-law to the ratepayers at the next general election, for the raising of \$25,000 for the purpose of building a high school here.

Winnipeg, Man.—J. H. G. Russell, architect here, has prepared plans for the erection and completion of a kindergarten building on the corner of Sutherland avenue and Euclid street. Plans with the above.

Winnipeg, Man.—At a meeting of the school board here it was decided to borrow \$117,000 for the purpose of providing additional school accommodation.

Victoria West, B. C.—The plans for the Victoria West school here were passed at a meeting of the school board held recently. The plans by Architect W. Ridgway Wilson call for a modern school building, two storeys in height, of red brick with stone and cement dressings, with up to date heating and sanitary accessories, to cost in the neighborhood of \$30,000.

Calgary, Alta.—The school board of this place has had plans prepared for a proposed two storey brick school house, by architects Ellis & Convery, of Toronto. The cost of the proposed structure will be about \$50,000, and will be equipped with heating, Southern pine interior finish, shingle roof, extensive plumbing. The building will be of cut stone and brick, with cement basement.

Saskatchewan.—The following districts in Saskatchewan have been empowered to borrow money for the purpose of building rural schools: Altico, \$1,000; Turtle Lake, \$1,500; Melinda, \$1,600; McDonald Mills, \$1,000; Percielle, \$1,600; Mountain View, \$2,000; Lillie View, \$350; Lac Qui Parle, \$500; North Battleford, \$35,000; Pleasant View, \$1,800; Jambonow, \$300; Poun Lake, \$2,000; Thebes, \$1,000; Mission Lake, \$1,000; Oliver, \$1,400; Hill Hurst, \$1,100; Yellow, \$1,000; Little Butte, \$1,200; Green Mount, \$1,200; Louisa, \$1,100; Cloverfield, \$300; Stobart Catholic Public School, \$4,000; Battleford Protestant Public School, \$5,000; Buck

Lake, \$2,000; Nord, \$7,000; Barton, \$300; Broadway, \$1,500; Bellview, \$1,500; Wolkowitz, \$1,000; Mildon, \$1,700; Roseville, \$1,200; Chatsworth, \$500; Prairie Rose, \$1,500; Grange, \$1,500; Morven, \$300; Trombley, \$900; Saginaw, \$1,000.

Vancouver, B. C.—A by-law for the purpose of raising \$45,000 for school extensions has been voted on here and passed.

Regina.—The present building on the corner of Albert street and Twelfth avenue, Regina, will be moved back and will be replaced by a new Roman Catholic Convent. The structure will be brick veneered.

Rothsay, N. B.—Plans have been prepared for the secretary of the Rothsay school, district of Rothsay, N. B., for an extension to the present school building, by Architect Brodie, here.

Lewisville, N. S.—Morrice LeBlanc, of this place, has been awarded the contract for the erection of a schoolhouse for the town of Lewisville, for which architect W. C. Barnes prepared the plans. Specifications include stone foundations, frame superstructure, shingle roof, spruce interior finish.

Halifax, N. S.—Architect Herbert E. Gates, of this city, has prepared plans for a \$50,000 college to be erected by the Government of Nova Scotia, to be of brick and stone, stone foundation, brick and stone superstructure. Specifications include stone superstructure, metallic lath structural iron, ornamental iron, ornamental columns and caps, steam heating and electric lighting.

Churches

Galt, Ont.—Knox Church, Galt, Ont., will erect a Sunday school building to the cost of \$1,000. Specifications include masonry, carpentering, glazing, plastering, painting, tinsmithing, gravel roofing, plumbing and electric wiring. Smith & Gemmill, architects, 37 Bank of Commerce Building, Galt.

Ottawa, Ont.—The Church of the Sacred Heart, which was destroyed by fire, will be rebuilt at once. Insurance \$15,000. Father Jeanot will secure plans from Montreal for the new church.

Ottawa, Ont.—Mr. J. E. Vaughan, chairman, St. Bridget's church, Ottawa, states that the church will, in the course of the next few months, be re-decorated and renovated throughout.

Welland, Ont.—Architect Wilson, of this city, has just completed plans for the Methodist church, which it is proposed to erect to replace the edifice recently destroyed by fire. The proposed structure will be of stone and brick, slate roof, much larger than the old church, and will cost in the neighborhood of \$12,000.

Peterboro, Ont.—His Lordship, the Bishop of Peterboro, will receive tenders in the near future, marked "Tender for Church," separate, or in bulk, for the erection of a stone church and Sacristy. Plans and specifications at the office of John E. Belcher, C.E., Peterboro.

St. Prime, Lake St. John, P. Q.—Ed. Tremblay, George Bergeron and Er. Blouin, of Chicoutimi, have been awarded the contract for the erection of a church to cost \$60,000 for the Catholic Committee here, to have concrete foundations, granite superstructure, galvanized steel roof. Specifications include hot water heating, electric lighting, Scientific interior finish, terra cotta, vaults, plastic relief work. Architects Berlinguet Co., Quebec.

Lachine, P. Q.—The Methodists of this place, under the pastor, Rev. Mr. Pates, are proposing to erect a church to cost in the neighborhood of \$20,000.

Theford Mines, Megantic, P. Q.—Plans are being completed by Messrs. Ouellet & Levesque, Quebec, for interior finishing of church at this place. The estimated cost of the proposed work is \$25,000. The wood work will be grided and the wainscot will be hardwood. The specifications call for plastering and metallic lath. Rev. J. J. Gaudreau, c.o. Theford Mines Co., Megantic, P. Q., will supervise the work.

Winnipeg, Man.—O. Holm, of this city, has been awarded the contract for the erection of a \$25,000 residence for W. G. Leishkow. Work will commence at once.

Rothern, Sask.—The German Reformed Church here are having prepared plans for the erection of a church at this place. Rev. E. W. Grassie, of Zion Reformed Church has charge of negotiations.

North Sydney, C. B.—R. Gillis, architect, of this place, has prepared plans for a church for the parishioners of St. Joseph, to be 110 feet by 60 feet wide, 28 foot post, at a cost ranging from \$16,000 for a frame structure, to \$25,000 for a stone building. The work of construction will not begin before next summer.

Guelph, Ont.—The committee of the Paisley Street Church here have awarded the contract for the erection of a \$19,000 church to Inspector Oakes of this place. This edifice is to take the place of the one destroyed by fire last spring.

Edmonton, Alta.—The Baptist church board here has purchased land at the corner of Spadina street and Morris street, on which they intend, in the near future, to erect a church.

Halifax, N. S.—The contract for the erection of the proposed \$125,000 Church of England cathedral here has been awarded to S. M. Brookfield, Limited, of this place.

Residences and Flats

Toronto.—P. H. Phinney, architect, Toronto, has prepared plans for the erection of an \$8,000 brick and stone residence for J. Wilkins of this city. Specifications include cement work, cut stone trimmings, brick, tile, oak mantels, electrical work, modern plumbing, and refrigerator. Brick work will be done by the owner.

Toronto.—Architect P. H. Phinney, of this city, has prepared plans for an auto garage and stable 25 x 40 feet, for J. Wilkins, Wellesley street, here. Specifications include stone foundation, brick superstructure, concrete work, cut stone, and the proposed structure will be electrically lighted, and fitted with drainage and water taps. Brick work will be done by the owner.

York, Ont.—Architects G. Miller & Co., Toronto, have prepared plans for the construction of a Methodist parsonage at York, Ont., at a cost of between \$12,000 and \$15,000. The exterior will be of dark red brick with raked joints and stone trimmings, with a foundation of rubble stone brick lined. The roof will display asbestos, slate and stained shingles. The interior finish will be quartered oak, white wood and pine. Specifications call for hot water heating, electric lighting, modern plumbing, cement work, cut stone, brick, tile, mantels, metallic bath, two "T" beams, electrical work, shingle stain, plastic relief work, plate glass, art glass, and refrigerator. Contractor to include in tender birch or maple floors in vestibule, hall staircase, and reception room.

Stratford, Ont.—Architect W. J. Ireland, of this place, announces that he is preparing plans for a \$4,500 concrete residence to be erected at New Westminster, B. C., for E. B. Cate, of Stratford, Ont. The building will have hot air heating, electric lighting, complete plumbing, stained shingle roofing, and the specifications include mantels, dumb water, electrical work and art glass. Tenders will be shortly called for by the owner.

Stratford, Ont.—It has been announced by Architect W. J. Ireland, of this place, that he has awarded the following contracts on the proposed \$2,600 residence to be erected here for W. Benington: W. Wobbs, carpentering; H. Jacobs, plastering; W. Ireland, plumbing; McDonald & Henry, masonry. The building will be of brick veneer with concrete and stone foundations, cut stone trimmings, stained shingle roof, hot air heating, plumbing throughout, pine interior finish, electric light, art glass.

London, Ont.—Architect W. G. Murray, London, has prepared plans for a \$4,000 residence for George M. Anderson here. The specifications include cement work, cut stone, marble, brick, mantels, roof, electrical work and gas, and the interior finish will be pine grained.

Brantford, Ont.—Architect Geo. W. Hall, of this city, has prepared plans for a \$2,000 dwelling for J. Crookshank, M.P., to be built of stone and brick, with concrete foundations. R. Draper, here, has been awarded the contract for the building. The plumbing and heating contracts have not, as yet, been let.

Collingwood, Ont.—J. T. Pearson, of Collingwood, has been awarded the contract for erecting a \$3,000 brick residence on Hurontario street, here, for W. A. Tom. Specifications call for cement work, cut stone, brick and tile, mantels and electric work. The architect is John Wilson of this city.

Collingwood, Ont.—Architect John Wilson, of this place, announces that he has prepared plans for a \$3,500 residence for G. K. Mills, Collingwood. The building will be of brick construction with stone foundations, shingle roof, pine and hardwood interior finish, hot water heating, electric lighting. The specifications also include cut stone, brick, and tile mantels.

Brantford, Ont.—Architect George W. Hall, of this city, has prepared plans for a \$5,000 residence for Mrs. Andrew Cloghorn, Albion street, to be constructed of stone and brick with concrete foundations. B. Laundry, here, was awarded the contract for the building, the plumbing and heating to A. Taylor.

Fort William.—J. A. McLeod, of this place, will erect a \$3,500 residence on Herald street. It will have concrete foundations and outside walls of concrete blocks.

Fort William.—W. A. Stewart will erect a \$3,500 solid brick and stone residence on Catharine street.

Fort William.—F. & H. Stewardson will erect a \$4,000 double villa on Archibald street. The building will have concrete foundations.

Fort William.—R. Wilson, of this place, will erect a \$3,500 solid brick and stone residence on Catharine street.

Port Arthur, Ont.—Architect M. H. Aylesworth, of this place, has prepared plans for a \$3,000 residence for Arthur Munro here. The specifications call for brick construction with concrete foundations, said foundations to be built by the owner, Arthur Munro. Tenders to be called shortly.

Port Arthur, Ont.—Plans have been completed for three apartment houses here by Architects Ellis & Conroy, of Toronto, Mr. J. G. King, at a probable cost of \$5,000. The proposed building will be of brick construction with stone foundations, felt and gravel roof. It will contain hot-air heating, combination lighting and the very best plumbing. Specifications include cement work, cut stone, brick, tile, mantels, and plate interior finish. Tenders have been called for.

Wallaceburg, Ont.—Architect A. M. Piper, of Chatham, has prepared plans for George Lydall, of this place, for a \$3,500 residence here. Specifications at his office call for brick work, concrete foundation, hot-air heating, electric lighting, plumbing, shingle roof and Georgia pine interior finish, and art glass windows, cut stone trimmings.

St. Thomas, Ont.—Mr. George R. Crocker has torn down the old drill hall and he will erect a number of modern dwellings on its site.

Dresden, Ont.—Architect A. M. Piper, of this place, has completed plans for a proposed \$1,500 residence here for O. McVeau, of brick and stone, slate roof, oak and Georgia pine interior finish, hot water heating, electric lighting, complete plumbing. The specifications include cement work, cut stone, brick, tile, mantels, dumb water.

Barrie, Ont.—Architects Chadwick & Beckett, of Toronto, have prepared plans for a residence for Harold Dymont, of this place, which were forwarded to him recently. The specifications include cut stone trimmings, brick work, tile, mantels, dumb water, refrigerator. The foundations are to be of stone with superstructure of brick with cut stone trimmings, shingle roof, and the proposed structure will be hot water heated and electrically lighted, and have modern plumbing.

Calgary.—A. L. Nunn has had plans prepared for the erection of a brick veneered residence here, by Hodgson & Bates, architects, Stephen avenue, Calgary.

Edmonton.—The Deputy Minister of Public Works, Edmonton, Alta., has had plans prepared for a terrace building, including steam heating, electric wiring and all necessary work in connection with same.

Edmonton, Alta.—Architect J. E. Wise, Edmonton, has prepared plans for a \$7,500 residence for Dr. J. Hislop here. Specifications include steam heating, electric lighting, shingle roof, modern plumbing, oak and interior finish. The proposed building will be three storeys high, cement work, brick work, tile, mantels, concrete blocks, shingle stain, ornamental columns and caps and art glass. T. Page, of this place, has been awarded the contract.

Winnipeg, Man.—Architects Wardell & Nichols have prepared plans for an \$18,000 residence for J. Ellis, of this place. The proposed building is to be steam heated, electric lighted, to have shingle roof, and interior finish of oak and mahogany. Specifications include stone foundation, brick and stone superstructure, shingle roof, cement work, marble tile, mantels, artificial stone, metallic bath. A. B. Anderson, of this place, has been awarded the contract.

Regina, Sask.—Architects Storey & Von Egmond, Regina, have prepared plans for eight houses for officers' quarters for Northwest Mounted Police, to have brick foundations, brick and stone superstructure, shingle roof, steam heating, electric lighting, fir interior finish. The proposed structures will be three storeys high.

Calgary, Alta.—Architects Dowler & Michie, of this place, have prepared plans for a \$2,500 residence for G. E. Crooks, of this place, to have concrete foundation, frame construction, shingle roof. Specifications include hot air heating, electric lighting, sanitary plumbing, mantels and art glass.

Quebec, P. Q.—Architects Tabot & Dionne, Quebec, have prepared plans for the erection of a \$6,000 cottage for Antonio Lacasse, of this place. The proposed structure will have stone foundation, pressed brick faced superstructure, metal roof. Specifications include hot water heating, electric lighting, interior finish, Selenith plaster.

Hotels

Ottawa, Ont.—The Dominion Government has approved of the plans of the Grand Trunk Railway for the proposed new hotel to be built by the railway on Major's Hill Park for the site of which they paid \$100,000. The proposed structure will have a frontage of 135x120 ft. The design will be gothic. The plans were prepared by Architect B. L. Gilbert, of New York City. The park entrance will have an arch of monumental design to cost at least \$20,000. The hotel will cost at least \$1,500,000, seven storeys in height, will have 340 bedrooms, 100 of which will be supplied with baths, a large and small banquet hall, a ballroom, a buffet, palm room and cafe, and will be fireproof throughout. Wm. Wainwright, of the Grand Trunk, states that the proposed structure will be called the Grand Trunk Hotel. Operations will be pushed as expeditiously as possible in order to have the hotel and depot completed by 1909.

Ottawa, Ont.—Ald. James Davidson has stated that he will build a six storey hotel here with a frontage of 279 feet. It is expected to be finished by May 1st next year.

Winnipeg, Man.—Architects Esde Bros. have prepared plans for a \$25,500 addition to H. Rosenblatt's hotel here. The proposed addition will be of brick and stone, with concrete foundations and will be steam heated, electric lighted, parol roof, and the interior finish will be birch wood and metal. The contract, which has been let to the Carter, Hall & Aldinger Co., Limited, includes fireproofing, metallic bath, dumb water, sheet metal work, metal ceiling, roof and siding, and refrigerator.

Saskatoon, Sask.—Architect W. W. LaChance, of this place, has prepared plans for Jas. Flaunigan, who proposes to erect a brick and stone hotel. The specifications call for cement work, cut stone, brick, tile, mantels, structural fire escapes, galvanized iron roof, electric lighting, ornamental columns and art glass.

Edmonton, Alta.—The Hotel Cecil here obtained a permit for the erection of a new wing to this hotel at a cost of \$15,000. W. Stewart Campbell, of this place is architect.

Waterloo, Ont.—Architect Charles Knechtel, Berlin, has prepared plans for the rebuilding and additions to hotel for Jas. Scott here. Tenders called for. The proposed structure will be three storeys high, concrete foundations, composition roof, black ash interior finish, cementine construction, ornamental iron, metal ceiling, electric work.

Opera Houses

Berlin, Ont.—Mr. Copen, manager of the theatre, here, has made a proposition to the town that if they will raise \$25,000 for a new theatre, he will add \$25,000.

The Dominion Builders' Exhibition

First Exhibition of Building Materials Supplies and Appliances a Great Success—Annual Repetition of This National Event Assured

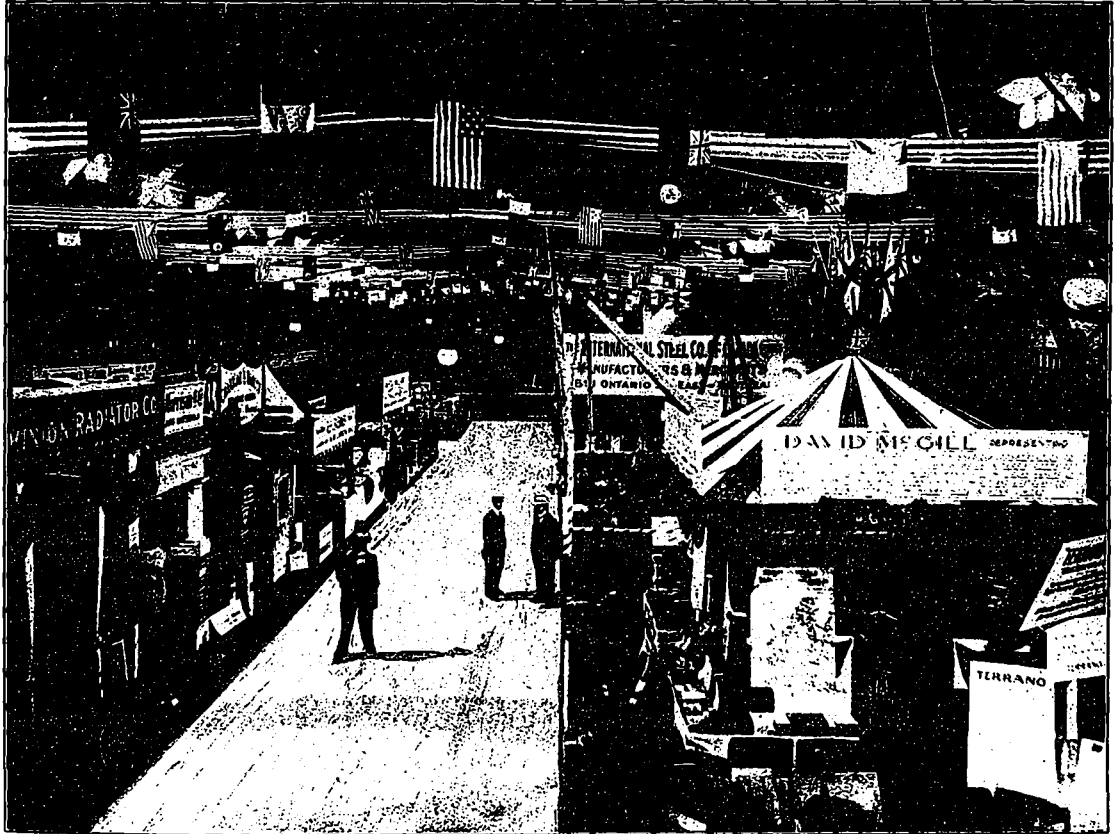
FROM the time the project of holding a Dominion Builders' Exhibition was first mooted by the Montreal Builders' Exchange interest became alive amongst the building fraternity and those trades which supply construction materials, and the success which attended the first exhibition of this ma-

paper, stained glass, cut stone and imitation stone, mosaic and other patent floorings, electrical supplies, heating appliances of many kinds, concrete mixers, novel derricks and all sorts of steel and other metallic work, paints and varnishes, etc.

In most cases the exhibits were ar-

minion by branches of American firms, but this merely went to prove the increasing value of the Canadian market, which had induced them to set up establishments in Canada.

Brief speeches were also made by Messrs. John Date, honorary president, and A. Turcotte, president of the Plum-



GENERAL VIEW OF DOMINION BUILDERS' EXHIBIT, WHERE EVERY CONCEIVABLE TYPE OF MATERIAL USED IN MODERN BUILDING METHODS WAS ON DISPLAY.

ture ever held in Canada presages well for the continuance of this national affair annually. Not only was the exhibition attended by architects, builders and contractors, but the general public and prospective builders also evinced much interest.

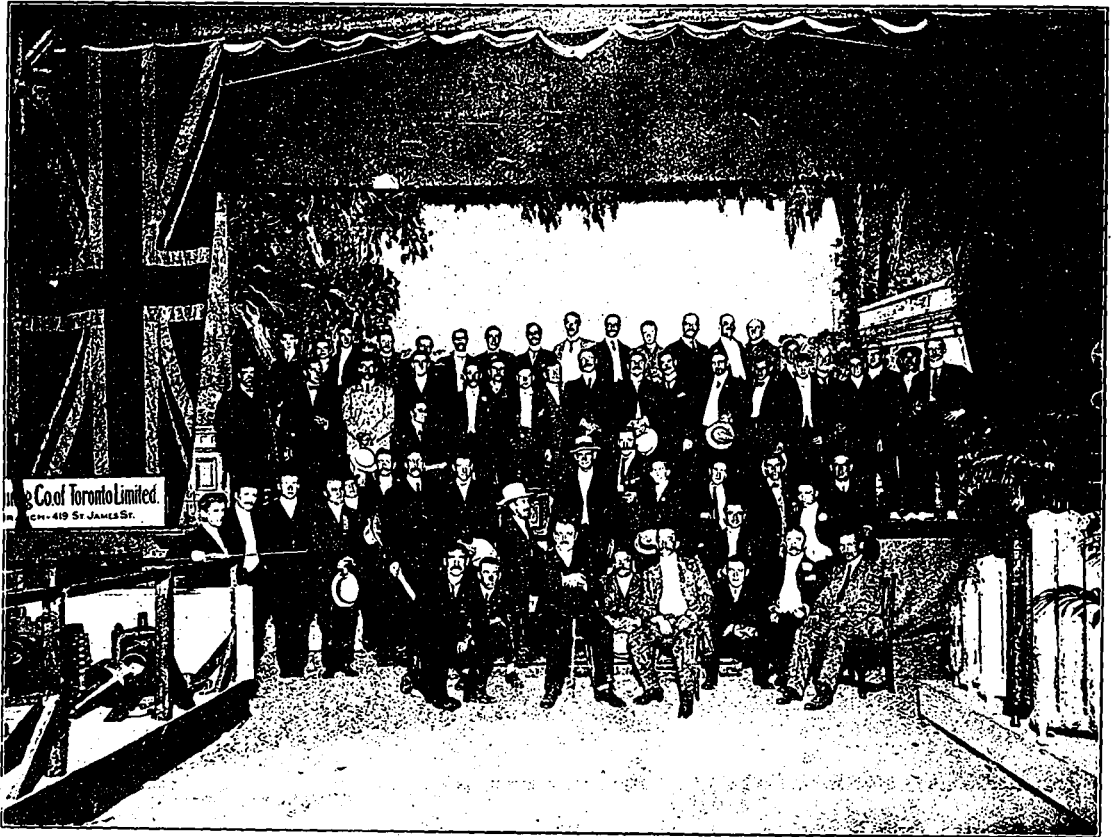
The members of the Montreal Builders' Exchange under whose auspices the fair was held is to be complimented upon the aggressiveness of its members in carrying the innovation to such a successful issue. Every one of the 110 booths was occupied, there being upwards of sixty-five exhibitors, many of whom required several booths to accommodate their elaborate displays.

The show was a useful one, not merely to those directly concerned in the building trade, but to the general public, as the variety and novelty of the articles shown furnished instructive proof of the rapid progress that is being made in the science of building. These included builders' and plumbers' supplies, wall

ranged with considerable skill. The interest manifested by manufacturers of building materials and supplies, as Mr. W. E. Doran remarked in his opening address, was most encouraging. The fair came at a time when every manufacturer represented was far behind with his orders, owing to the enormous amount of construction work of all branches being carried on all over the country. Mr. Doran considered it encouraging that so many leading firms had spared the time and energy to instal such extensive exhibits—not because they were just now looking for more business, but in order to acquaint the architects and the trade generally with the progress that was being made in the science of building. Mr. Doran further pointed out that the exhibition proved conclusively that Canadians did not need to go to the United States for their materials, as the very latest ideas in modern building on exhibition were "made in Canada." True, many of these were made in the Do-

minion by branches of American firms, but this merely went to prove the increasing value of the Canadian market, which had induced them to set up establishments in Canada.

Among the exhibitors were: The Canadian Fairbanks Co., concrete mixers and heavy hardware; Philip Carey Mfg. Co., magnesium roofing; Armstrong Cork Co., insulating devices; Colonial Doloments Co., patent flooring; W. G. Browne Co., wall papers and machinery; Mason Jean Paquette, builders' hardware and plumbers' supplies; A. P. Lemarquand, French decorative devices and tiling; D. McGill, Phillipsburg, marble and flooring materials; International Steel Co., steel derricks and stairways and ornamental metal work; Stinson-Reeb Co., builders' supplies and patent scaffolding; E. F. Dartnell Co., New York hydraulic pressed bricks; E. S. Dodds, paints and enamels; Dominion Radiator Co., heating appliances; T. A. Morrison & Co., builders' supplies and artificial stone; Alexander Bremner, builders' sup-



GROUP OF MEMBERS OF THE MONTREAL BUILDERS' EXCHANGE, INCLUDING MANY OF THE EXHIBITORS.—FROM A PHOTOGRAPH TAKEN AT VICTORIA RINK DURING THE BUILDERS' EXHIBITION.

plies and fireproof plaster: Laprairie Brick Co., pressed brick, etc.; Martin Senour Co., Chicago, paints and painters' supplies; Metal Shingle & Siding Co., metal roofing and lathing materials; Alex. McArthur & Co., builders' supplies; Standard Cement Co., cements; Dodge Manufacturing Co., split wood pulleys and machinery; Thos. Hodgson, revolving sashes; Francis Hyde Co., drain pipes and ornamental plaster work; Montreal Terra Cotta Co., perforated bricks and terra cotta flooring; Warden-King Co., furnaces and metal stable equipment; Hill Electric Switch Co., electric supplies; Wettlaufer Bros., Stratford, portable concrete mixers; Gurney-Massey Co., furnaces and radiators; Lockerby & Tacom, builders' materials.

durable and very rigid division between rooms.

The Armstrong Cork Co. are the largest manufacturers of cork in its various forms in America. A branch office has been lately opened in Montreal for the disposition of Corkboard insulation in Canada.

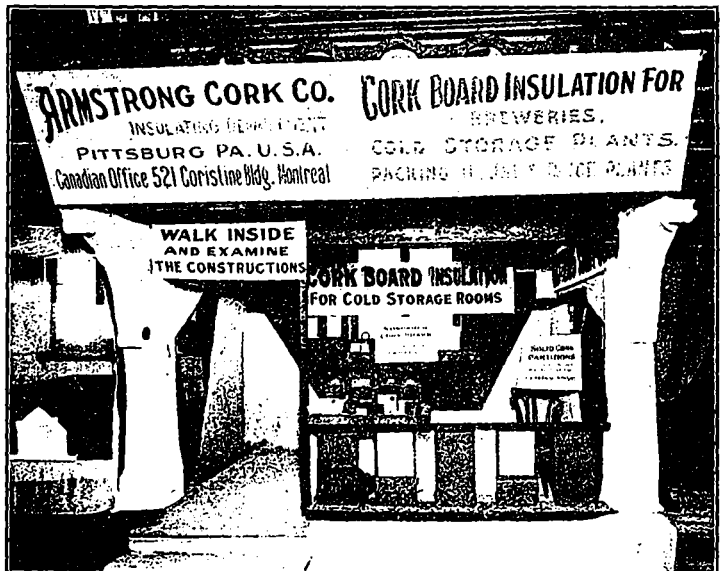
Of Interest to Cement Users

On page 5 of this issue appear views of the Quebec bridge disaster, advertising Star Portland Cement, manufactured at Marlbank, Ontario, by the Canadian Portland Cement Company.

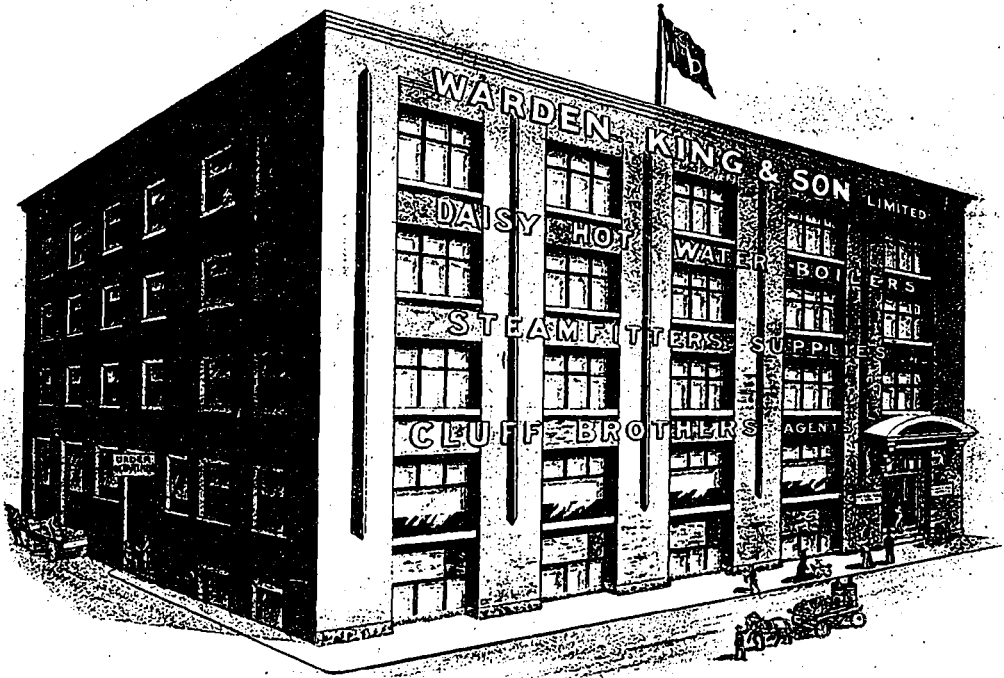
Cork Board Insulation

In this issue is produced a view of the Armstrong Cork Company's display at the Dominion Builders' and Contractors' Exhibition, recently held in Montreal. This exhibit clearly demonstrated the practicability of Corkboard insulation as applied to the interior walls of breweries, cold storage plants, packing houses and ice plants.

The booth was arranged to represent a section of an insulated compartment, the inner face of the Corkboard being finished with a smooth coating of cement-plaster. At the back of the booth is represented the outside brick wall of a building with Corkboard insulation applied to the inner surface. The partitions on either side are constructed of solid cork and, in this case, coated on both sides with cement plaster, making a



NOVEL BOOTH OF ARMSTRONG CORK CO.



The Toronto Warehouse of CLUFF BROS., Selling Agents for Warden King, Limited.

We carry in stock the most complete line in Canada
of the following goods :

Daisy Hot Water Boilers

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King Radiators

Cast Iron Steam Fittings

Soil Pipe and Soil Pipe Fittings

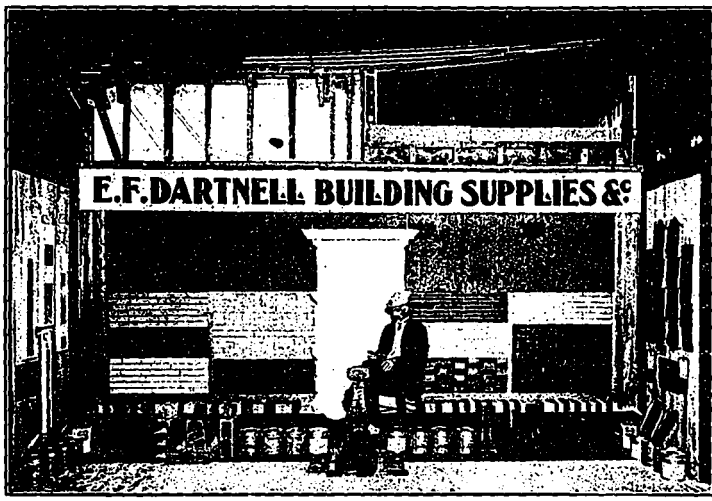
Stable Fittings

Steam Specialties

Brass and Iron Body Valves

Tools, Etc.

CLUFF BROTHERS
TORONTO



A PORTION OF E. F. DARTNELL'S EXHIBIT.

city and, with the aim of making the brief sojourn enjoyable, all the points of architectural interest were carefully mapped out in a complete and direct tour. An invitation was also extended to attend the F. H. Hyde & Co. exhibit in the rink, where a magnificent array of high class construction materials was displayed, including art stone, plaster board, cement, tiles, sewer and culvert pipes, enamelled brick, building brick, sewer brick, paving brick and stable pavers.

The booth of the Hyde people, as will be noticed by referring to the illustration, was finished in plaster board, especially manufactured for the exhibitors. The peculiar virtue of this composition is that it is made by such a process that should the board become cracked in handling, it will not break apart. This firm also handles the Locket Plaster Board. In their cement department they make a specialty of "Iron Clad," manufactured by the Glens Falls Portland Cement Co., the "International," manufactured by the International Portland Cement Co., of Hull, Ont.; "Keen's" and "Lafarge," non-staining.

with head offices at 502 Temple Building, Toronto. The manufacture of Star Portland Cement was begun about twenty years ago and this was the first artificial Portland cement made in Canada. Star cement has been used more extensively in the best classes of hydraulic and other structural work throughout the Dominion than any other individual brand of cement. In the year 1900 the output amounted to about 100,000 barrels, while for the present year it is estimated the output will be about four times that quantity. The erection at Port Colborne, Ont., of perhaps the most modern plant in America is being pushed rapidly to completion, in anticipation of a million barrel demand for the coming year.

Building Supplies

MR. E. F. DARTNELL, whose exhibit of builders' supplies at the Dominion Builders' Exhibition forms the subject of one of our illustrations, represents among other firms The New York Pressed Brick Co., of Rochester; the Kittanning Brick & Fire Clay Co., of Pittsburg, Pa.; the Toronto Pressed Brick and Terra Cotta Works, of Milton, Ont. He is also agent for A. Ramsay, manufacturer of enamelled brick, Mount Savage, Md.; handles common fire brick and numerous varieties of fine building stone, representing the Perry-Matthews-Buskirk Stone Co., for their (Indiana) limestones; the Columbia Stone Co., for Ohio Grey Canyon and Blue Sandstones; the Lochbarbriggs (Scotch) Red Sandstone; Canadian "Potsdam," Red Sandstone; also complete lines of Canadian, American, English and French marbles.

In addition, he handles Toch Bros.' (N. Y.) R. L. W. Damp Resisting Paints, Tockolith, Korkolit Coatings, cement filler and other specialties; besides representing the Parker Plasterers' Galvanized Steel Corner Bead, etc.

Owing to the congestion on the railways near one half of Mr. Dartnell's exhibit did not arrive in time (although almost two months on the road). Consequently the exhibit was not nearly complete, nor was the time sufficient to arrange what did arrive as well as Mr. Dartnell had wished.

Francis Hyde & Co.

A VERY courteous and considerate attempt was made by the proprietors of one of the largest exhibits, to facilitate the sight-seeing tours of the visiting members of the Canadian Institute of Architects, who were meeting in the metropolises at the time of the Builders' Exhibition. This was the issue of a splendidly gotten-up booklet by F. H. Hyde & Co., in which the architects were welcomed to the



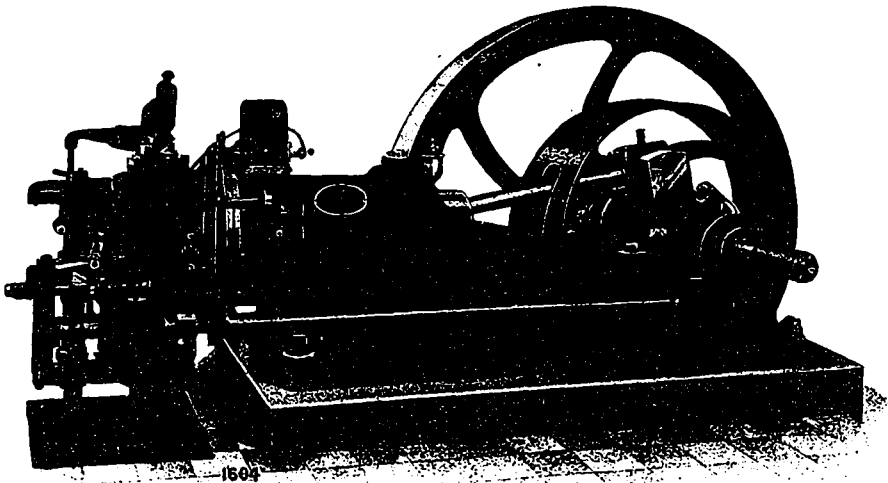
ATTRACTIVE BOOTH OF F. H. HYDE & CO.

\$12.00 Per Annum Per Brake Horse Power

**Efficiency
Simplicity**

Economy

**Reliability
Durability**



OVER 12,000 IN DAILY USE

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GAS ENGINE

Plants installed on absolute guarantees covering economy.

COLONIAL ENGINEERING CO., Limited

Consulting and Contracting Engineers

222-224 ST. JAMES STREET

MONTREAL

Doloment, the New Stone-Wood Flooring

The Establishing in Canada of this Concern and Its
First Year of Wonderful Progress

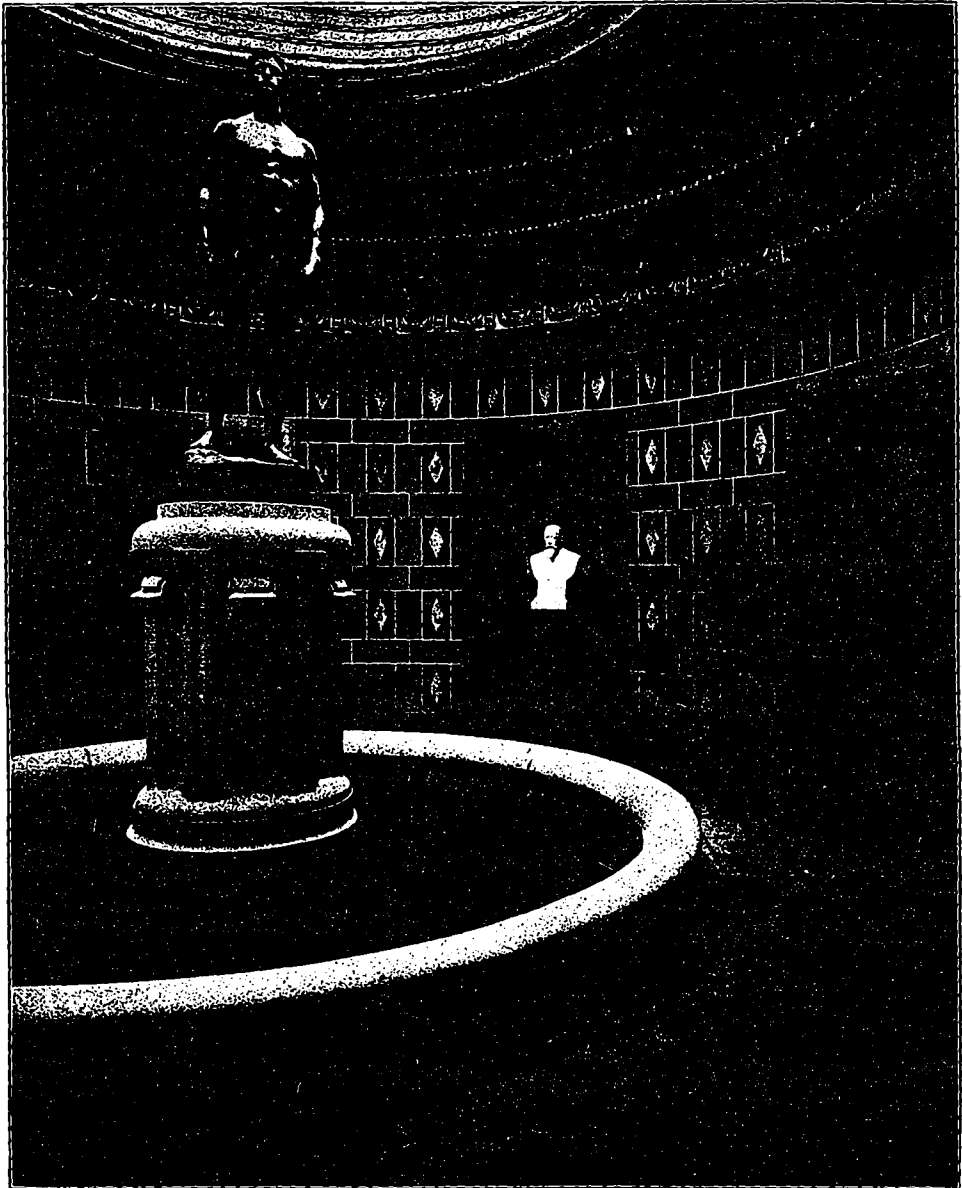
AN event which has proven of great importance to architects and builders was the establishing in Canada of a company for the manufacture of Doloment, the jointless stone-wood flooring. On January first of this year the Canadian Doloment Co., Limited, was formed with a capital of \$100,000; but its business developed so rapidly that six months later the Colonial Doloment Co., Limited, was formed with a capital of \$500,000 and the original company was merged with it.

The patent rights for Doloment, which is a German invention, are vested in this company, the capital for which

was subscribed by an English syndicate, of which Mr. E. Hatheway Turnbull is managing director. The head offices of the Canadian Doloment Co., Limited, are in the Mark Fisher Building, Montreal, but as its operations are spreading all over Canada they are opening agencies in all the larger cities.

The reason for the immediate success of Doloment in Canada is that it has proven to be the only jointless stone-wood flooring that has met the demands of architects and builders.

The great difference between Doloment and all other stone-wood floors is its semi-elastic lower layer. As this

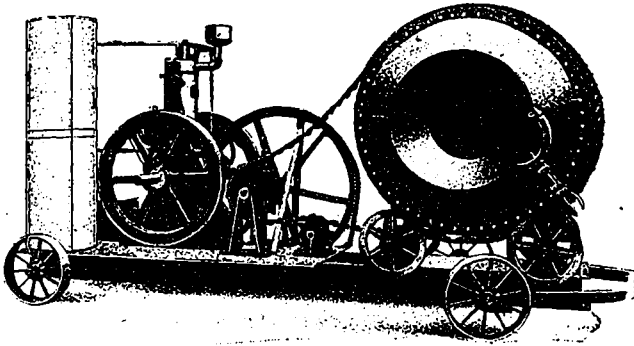


SHOWING DOLOMENT FLOORS AND WALLS IN DECORATIVE DESIGN.

McKELVEY MIXERS

From One-Sixth to One Yard Capacity

WITH GASOLINE, STEAM OR ELECTRIC POWER



They combine strength with many improvements for quickness of operation. All Mixers mounted on Steel Trucks

*ONLY STEEL AND MALLEABLE CASTINGS USED.
 ROLLER BEARING CAST STEEL ROLLERS UPON WHICH DRUM REVOLVES.
 LOWEST INTAKE AND HIGHEST DISCHARGE.
 NO WEAR AND TEAR OR MACHINE TO DISCHARGE.
 DISCHARGES BATCH EXACTLY AS MIXED.
 DISCHARGES IN LESS TIME THAN ANY OTHER MIXER.
 DURABILITY.
 EASE OF PORTABILITY.
 LARGEST CAPACITY TO POWER REQUIRED.
 EXCELLENCE OF PRODUCT.
 LABOR SAVING QUALITIES.
 SUPERIOR ADAPTABILITY TO ALL CLASSES OF CONCRETE CONSTRUCTION.
 ECONOMY IN OPERATION.
 LOWEST COST IN MAINTENANCE OR REPAIRS.
 NO CAST IRON, GEARS AND PINIONS.
 NO TILTING REQUIRED TO DISCHARGE THE BATCH.*

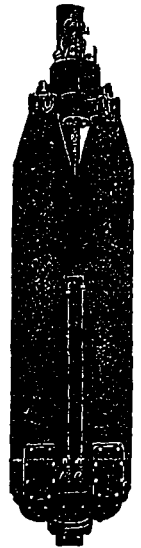
THE EMERSON STEAM PUMP

Pulsometer type, best in the world

to handle gritty water, for confined situations, and for the everyday pumping needs of a contractor. It has no packing glands, rubbing surfaces, exhaust pipe, rocker arms, pulleys, belts, fly wheels, priming pipes, make no noise. It has more points of merit and fewer of demerit than any other. It will handle gritty material without damage to itself. It is simple, reliable and will stand rough usage with the minimum expenditure for repairs.

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Vancouver

lower layer expands and contracts with every change of temperature, Doloment never cracks, bulges or pulls away from the base. It is also waterproof and fireproof.

Doloment is impervious to oils, grease or acids. Nor does it disintegrate, making it the finest possible floor for steam and electric engine rooms, machine shops, chemical laboratories, etc. For such uses the flooring is usually laid in one plain color, but it is capable of the most artistic treatment, thus fitting it for use in the most elaborate hotels and halls. Doloment can be laid on any surface—concrete, cement or wood—and can be ready for use quicker than any other flooring. The great number of orders which the Canadian company have already executed and the many more which are now being carried out speaks well for the company's future.

Problem of Heating the Home

(Continued from page 60.)

by every square inch of surface, and, second, that if

The fallacy of this idea will be apparent when one remembers that the heat will escape just as rapidly from window glass or exposed wall twenty-five feet above the ground, as at the ground level, and that while a considerable amount of heat will pass to the higher room through the ceiling of the room below, sight must not be lost of the fact that it will escape through the ceiling of the upper room and through the roof, very much more rapidly, and that for that reason the attitude of the apartment to be heated presents, to say the least, no advantages in that respect.

AN interesting as well as novel feature of the new Apollo Music Hall on the Rue de Clichy, Paris, is the reversible auditorium floor, which makes it possible to change the parquet into a dancing floor in the short space of seven minutes. On one side of the floor are fitted 500 chairs of the usual folding variety, and on the other side it is planked with hard wood, waxed and polished. During the performance each night it is pitched at an angle of about 15 degrees, like the floor of any



SHOWING DOLOMENT FLOORING AS USED IN BUSINESS OFFICE.

placed away from the exposed walls or windows, the cold air from the latter must inevitably pass across the floor to mingle with the ascending warm currents, as was described in connection with the reference to hot air heating in the beginning of this article.

In order to overcome this difficulty in very large rooms, or those having exposures at both ends, as for example the drawing room, dining room and kitchen shown, it is necessary to divide the required surface into two or more radiators, so that cold air travelling to them will necessarily stay close to the walls and will not be a source of discomfort to the occupants.

Before concluding this article, it may be well to refer to a mistake that is commonly made, that is, assuming that a room on the first floor does not require as much heating surface to maintain a given temperature, as would be required for a room on the ground floor used for similar purposes. As for example, a sitting room.

other theatre. When the show is over and the dancing begins it is absolutely level. When the curtain falls the seat holders are hustled back into the orchestra circle and the foyers, and then the mechanism is set in operation.

The floor, or rather the two floors are built on each side of a framework of steel girders. This is hung on pivots, and when the machinery is set in motion it simply turns the other side up. The huge seesaw—it measures about 45x50 feet—stops at the appropriate angle when it is to be an auditorium and is secured there by strong supports.

THE Bethlehem Steel Co. has decided to establish, in connection with its plant at South Bethlehem, Pa., a school for apprentices in which boys will be taught the rudiments of all trades entering into the making of iron and steel.