

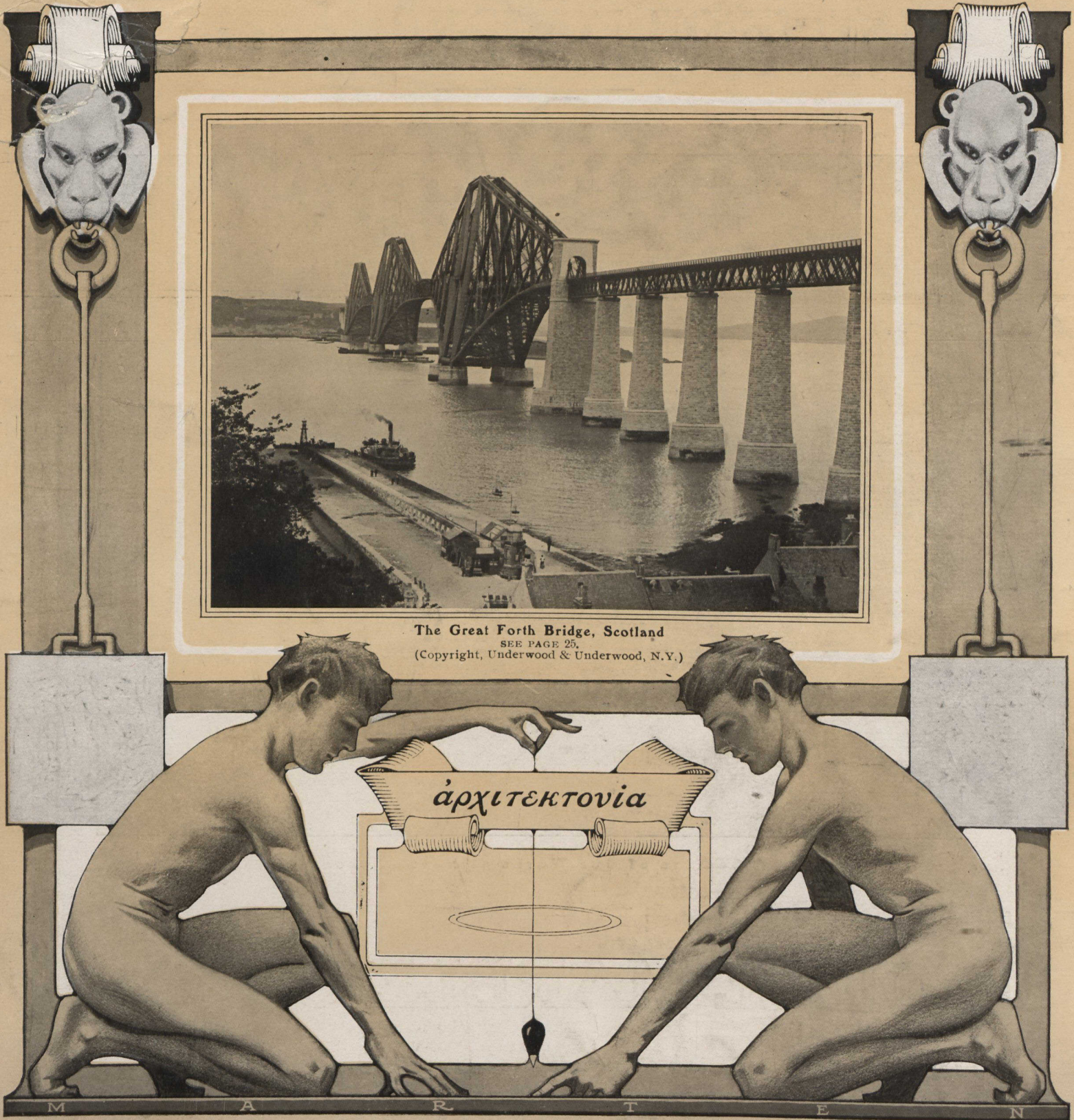
# CONSTRUCTION

A JOURNAL FOR THE BUILDING AND  
ENGINEERING INTERESTS OF CANADA

Vol. I, No. 6.

APRIL, 1908

\$2.00 PER YEAR  
25c. PER COPY



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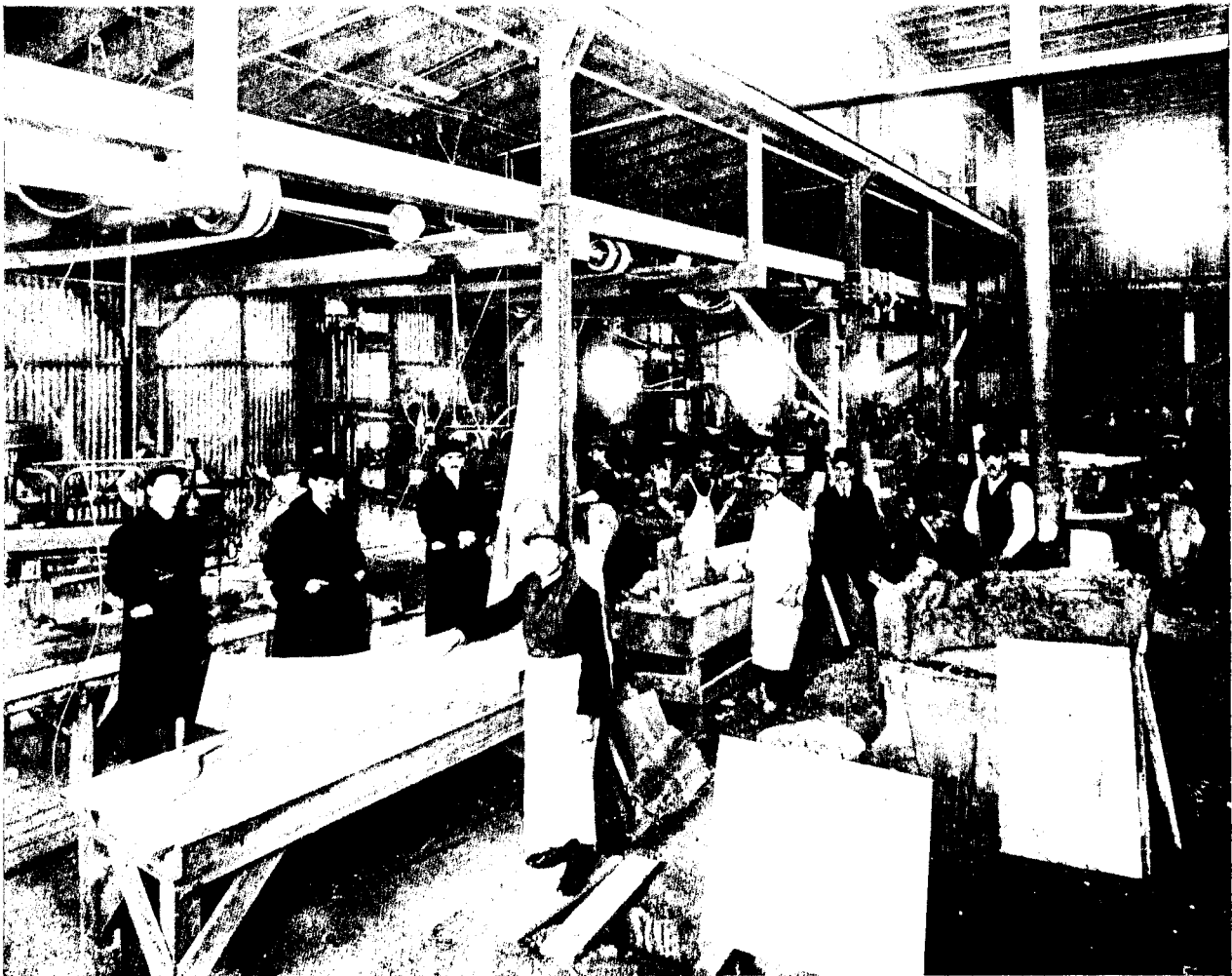
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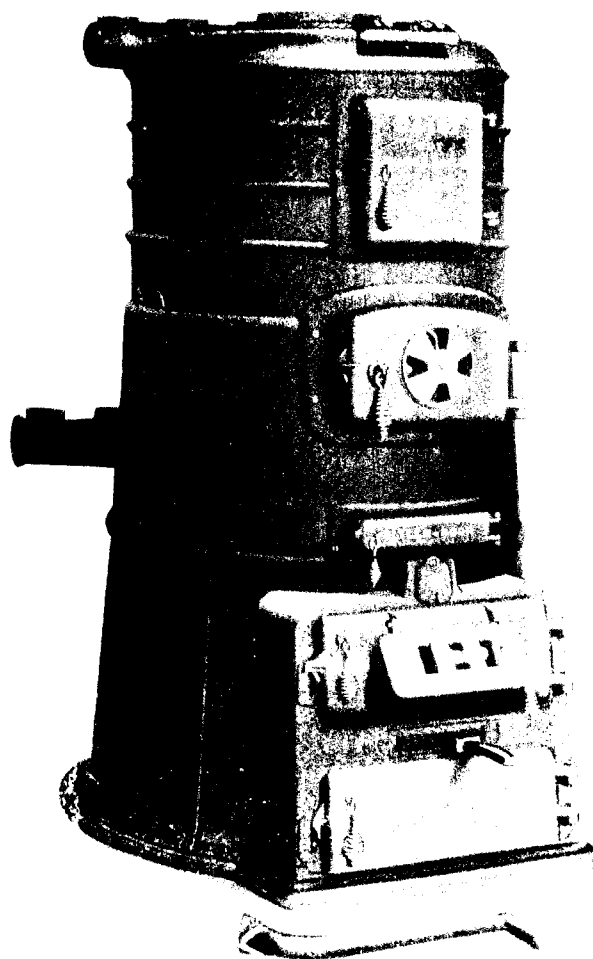
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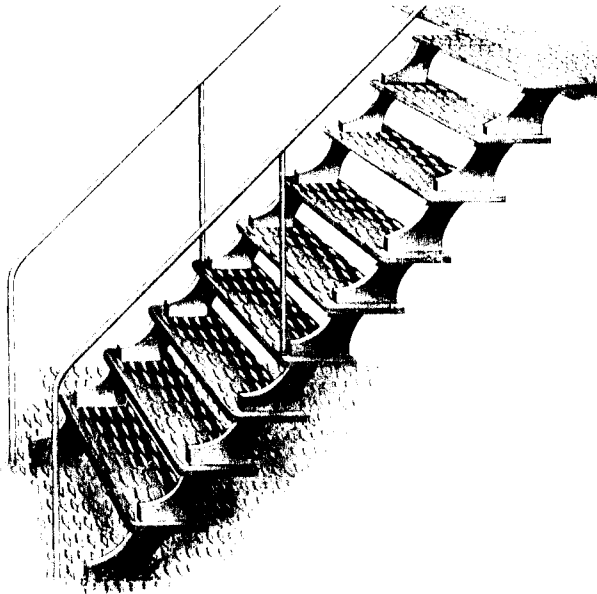
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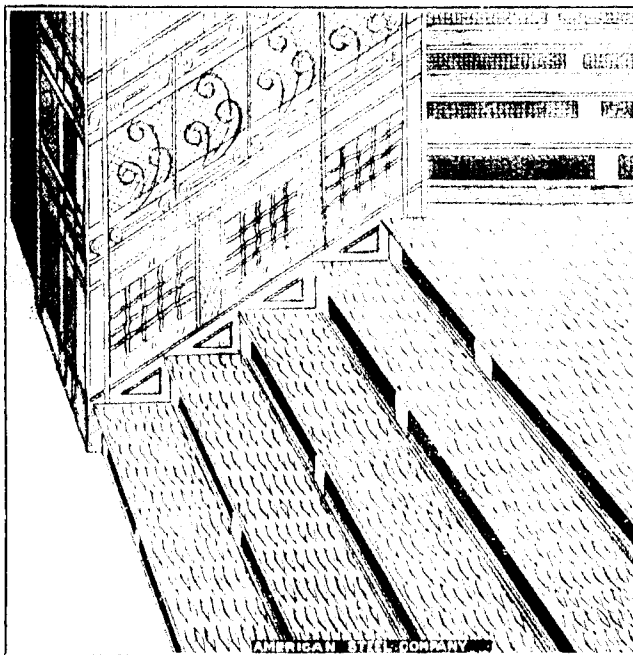
50 per cent.  
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Cellar Doors  
etc., etc.

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Company,  
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Entire plant  
constructed with  
**IDEAL**  
Concrete Machinery.



## An Important Hint to Builders

When the great cement works and offices of the Sandusky Portland Cement Company were erected at Dixon, Ill., IDEAL CONCRETE MACHINERY, after a careful investigation, was purchased to do the work. The result is a significant and everlasting testimonial to the superiority of the "IDEAL" line.

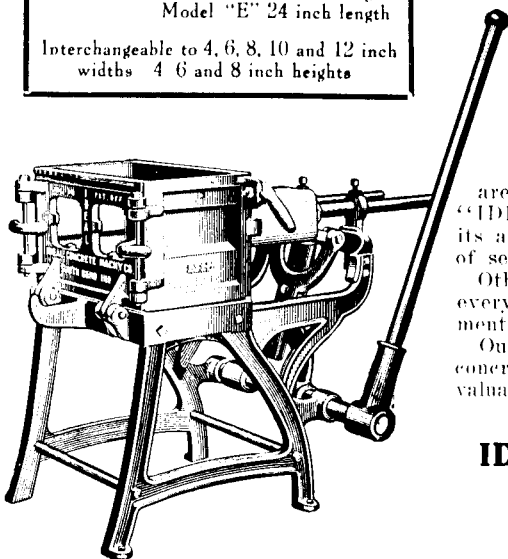
The peculiar advantages of the "IDEAL" that make it the favorite of all who study it closely are its simplicity in principle and construction; the ease, speed and little cost of operation; its unbreakable strength and freedom from repair bills; its almost endless adaptability to various shapes, sizes and designs of blocks.

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An important consideration to the buyer of the "IDEAL" is that it is the ONLY machine legally built on the perfected "face-down" principle, allowing a rich facing mixture, with cheaper material for back of block.

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**IDEAL CONCRETE MACHINERY CO., LTD.**

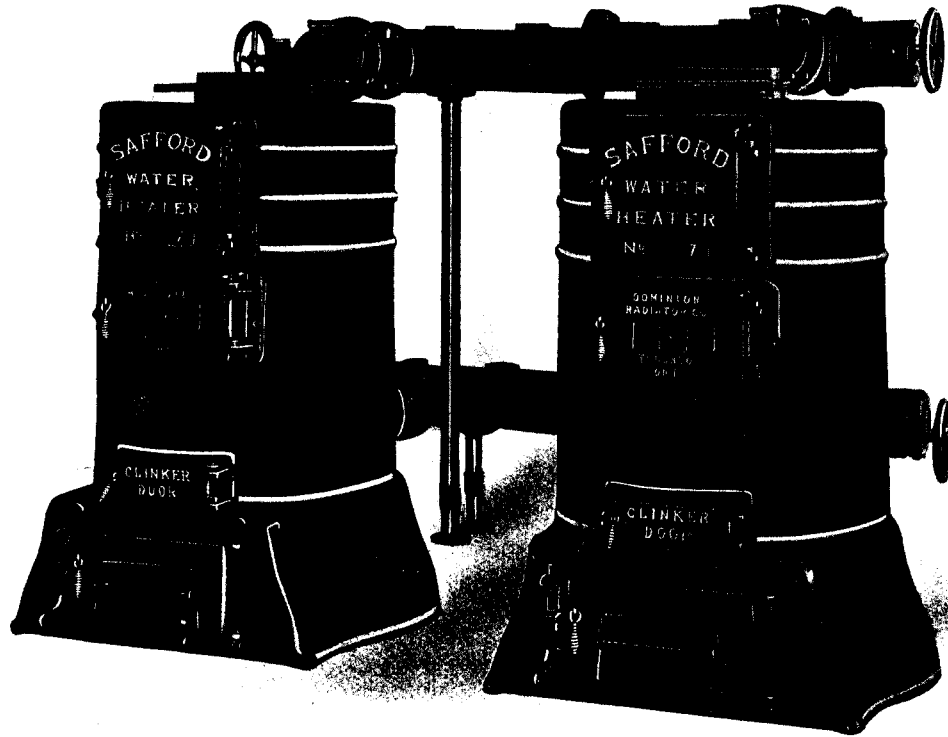
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## "The Proof of the Pudding"

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Plumbers and Tinsmiths  
Kingston, Ont., Feb. 22nd, 1908  
**The Dominion Radiator Co.**  
Toronto, Ont.

Gentlemen:—  
We desire to say, unsolicited, that the No. 6 "Safford" Boiler purchased from you in January last, has given such entire satisfaction to our customer and ourselves that we have no hesitation in saying that for economy of fuel, general construction, and the simple mode of operation, it is equal, if not superior, to any hot water boiler erected by us.  
Respectfully yours  
**ELLIOTT BROS.**

**Robertson Bros.**  
Wholesale Crockery  
Kingston, Feb. 22nd, 1908  
**Messrs. Elliott Bros.**  
City

Gentlemen:—  
I have no hesitation in saying that I am well pleased in every respect with the working of the No. 6 "Safford" Hot Water Boiler as manufactured by the Dominion Radiator Co. and erected by you in our building. It does all that was claimed for it, and that is saying a lot.  
Yours respectfully  
**THOS. McKEAN ROBERTSON**

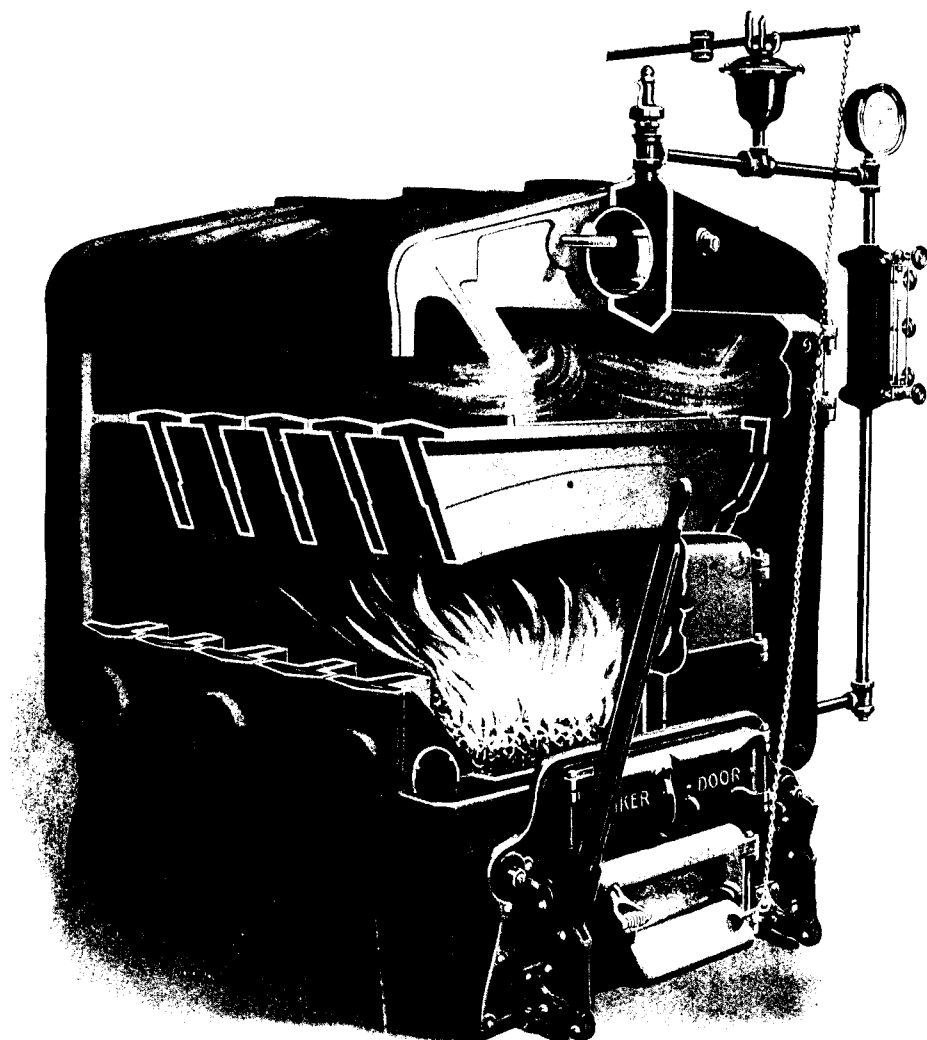
# DOMINION RADIATOR CO., Limited

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# Triumph Hot Water and Steam Boilers 1908 Type



36-Inch Triumph Sectional Steam Boiler

That is why it will pay you to specify Triumph Boilers, because it is just what your clients have been looking for.

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SMALL FUEL CONSUMPTION.

LITTLE ATTENTION.

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GENTLEMEN:—

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I should be very glad at all times to recommend this boiler to any person desiring a modern and satisfactory heating apparatus.

Yours very truly,

S. D. RAMEY

## Dominion Radiator Co., Limited

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# The Milton Pressed Brick Company, Limited

We have recently completed delivery of 4,000,000 high grade pressed brick for the Macdonald Colleges at St. Anne De Bellevue, P.Q., the largest order for pressed brick ever placed in Canada. The satisfactory manner in which this large order was handled is vouched for in the following letter :—

MACDONALD MANUAL TRAINING FUND  
MACDONALD RURAL SCHOOLS FUND

GENERAL MANAGER  
JAS. W. ROBERTSON

## THE MACDONALD COLLEGE

STE. ANNE DE BELLEVUE, P.Q., December 14, 1907.

Milton Pressed Brick Company,  
Milton, Ont.

Dear Sirs,—

I have pleasure in saying that I am entirely satisfied with the manner in which you have filled our large order for pressed brick for Macdonald College. The flash bricks for facing the outside walls are eminently satisfactory in every respect. Men who have travelled widely have frequently mentioned to me that for a climate like ours the walls are the finest brick walls they have seen. For myself I concur in that opinion.

I am glad to say also that your deliveries, according to our needs, have been satisfactory.

Faithfully yours,



Brick similar to the above are being used in the Samuel & Benjamin Co.'s building, now in the course of erection at the corner of King Street and Spadina Avenue, Toronto, Burke & Horwood, Architects.

# The Milton Pressed Brick Co.

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THESE illustrations represent two of several rooms in the National Club, furnished, carpeted and decorated by us. We undertake the interior decoration and furnishing of residences, hotels, clubs, etc., in any part of Canada.

When necessary a competent representative will be sent for consultation.

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**Enamelled Brick.** White and colored.

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**Iron Clad.** For strength and durability is unequalled.

**International.** The fact that we handle it is proof that we recommend it.

**Adirondack.** In a class by itself, being a special Cement for a special purpose ---*brickwork* and *masonry*. Does the work of one and a-quarter barrels of ordinary Portland Cement.

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**ADAMANT Wall Plaster.** Is the Twentieth Century plaster---convenient to handle, easily applied. Sets in four hours.

**White Enamel Finish.** Used with ADAMANT. Finishes the Walls in twenty-four hours.

**Calcined Plaster--Hammer Brand.** "F," "FF," "FFF," or Dental and Coarse always in stock.

**Drain Pipes and Connections, Chimney Linings** (vents). Round, square and oblong.

**Farm** (weeping) **Tiles** for surface drainage.

**"EVERYTHING FOR THE CONTRACTOR AND BUILDER"**

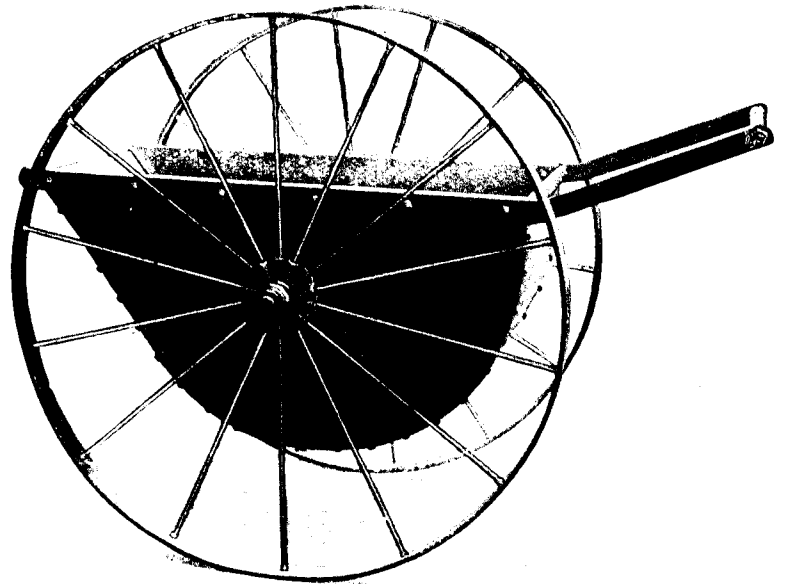
# HYDE & CO.

**MONTREAL, QUEBEC**

**T**HE BARROWS shown on this page have been designed to meet the rapidly growing demand of the Contractor who works in Brick, Stone, Mortar and Cement, for rigs suitable for different phases of this industry.

The enormous growth of the use of Cement has necessitated the building of barrows that would handle the product in its various stages the most economically.

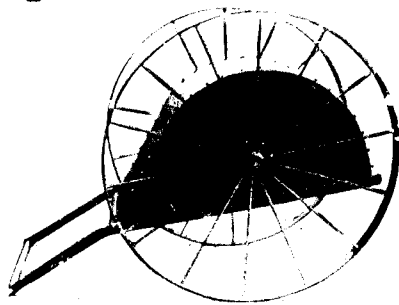
Our many years' experience in the selling of barrows enables us to put on the market a line that has strength, durability and quality, and is offered with a positive guarantee that it is the **BEST** of its kind manufactured.



**No. 1 CONCRETE CART**

The bowl is so hung that it can be turned bottom up, making it especially convenient for laying the concrete base for sidewalks, reservoir bottoms and floors for reinforced concrete buildings. A brief description of this rig is as follows:

LENGTH of Body . . . . .	39 1/2 inch	WIDTH over all . . . . .	32 inch
DEPTH of Body . . . . .	20 inch	WHEELS . . . . .	42 in. dia. 2 in. tread
Width of Body . . . . .	24 inch	AXLE . . . . .	1 1/4 in. cold rolled
GAUGE of Steel . . . . .	No. 12	WEIGHT . . . . .	225 pounds
LENGTH over all . . . . .	58 inch	CAPACITY . . . . .	6 cubic feet



**F-2 ECONOMY STEEL TRAY**

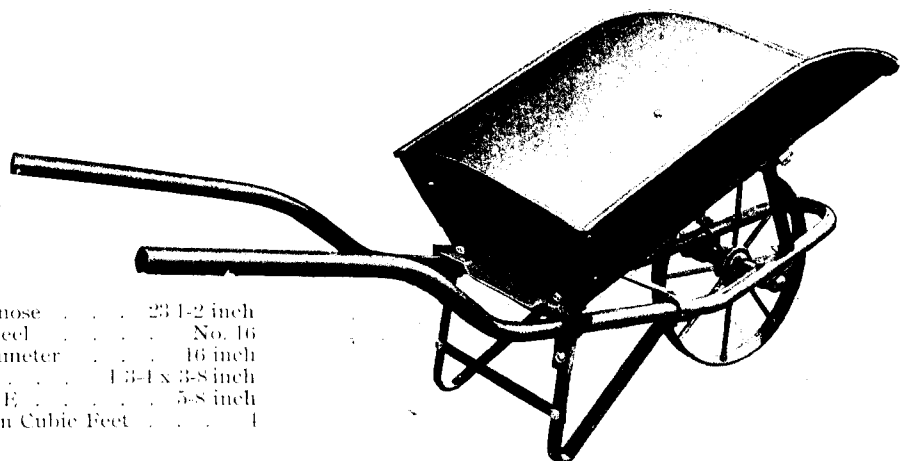
with angle steel legs and braces, is an excellent barrow for mortar and wet concrete.

Tray measures 34x26 in. and is made of No. 16 specially prepared steel, reinforced at corners and strengthened at top by a 5-16 in. steel rod. Heavy steel wheel, 16 in. in diameter, 1 3/4 x 5-16 in. tire, and runs on a steel axle firmly held to underside of handles by heavy lugs. Capacity 4 cubic feet. Weight, each, 76 lbs.

**H-21 BEAVER TUBULAR**

One of the best barrows made for handling Brick, Crushed Stone, Sand, Gravel, Mortar or Cement where quick action is desired. Hangs just right for handling easily. Dimensions in brief are as follows:

LENGTH over all . . . . .	65 1/2 inch	HEIGHT at nose . . . . .	23 1/2 inch
WIDTH over all . . . . .	23 1/2 inch	GAUGE of steel . . . . .	No. 16
HEIGHT over all . . . . .	27 inch	WHEEL Diameter . . . . .	16 inch
TRAY LENGTH . . . . .	38 1/2 inch	TIRE . . . . .	1 3/4 x 3-8 inch
TRAY WIDTH . . . . .	23 inch	STEEL AXLE . . . . .	5-8 inch
TRAY DEPTH . . . . .	13 inch	CAPACITY in Cubic Feet . . . . .	4
WEIGHT in lbs. . . . .	80		



**Write us for Booklet giving Description and Price of our complete line of Barrows**

# Terrano Flooring

TERRANO is a composition floor covering, laid when of the consistency of mortar, and forming a continuous sheet without joints or cracks over the entire area to be covered.

TERRANO can be laid on any foundation, wood or concrete. It is laid about half inch thick, and makes a fireproof, waterproof, non-slipping, foot-warm flooring.

TERRANO is cheaper than tile, mosaic, Terrazzo, and flooring of this character, and but little more expensive than hard wood.

TERRANO is the ideal flooring for Public Buildings, Churches, Private Houses, etc., etc.

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Metropolitan Bank, Toronto—Darling & Pearson, architects.  
McGill Union Building, Montreal—P. E. Nobbs, architect.  
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Ville Marie Convent, Montreal—Marchand & Haskell, architects.

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**ARMSTRONG CORK COMPANY**

INSULATION DEPARTMENT  
Coristine Building = = Montreal



**I**N our March advertisement in “Construction” we went into the question of low-cost construction in NIAGARA SYSTEM of Reinforced Concrete. In this number we wish to give particular attention to the SIMPLICITY, and what we call the “ELASTICITY OF APPLICATION” of the NIAGARA BAR to the problems of construction in concrete.

☐ Under the “Niagara System” the shear members may be attached to any form of plain or defamed tension bar now on the market—with only slight variation in the shape and size of the clip—such as “Runsome,” “Johnson,” “Thucher,” “Twisted Lug,” or “Kahn Cup,” bars, making the simplest method of attaching stirrups which it is possible to devise, and increasing the efficiency of any one of these bars.

☐ We have a preference for COMMERCIAL PLAIN BARS under ordinary condition, usually in squares and flats, and have found that the results are satisfactory in actual practice. Beyond this broad nature and simplicity of attachment of shear members to many types of tension bars is the important point of the varying length of the shear members, which at all times may be sufficiently long to enable homogeneous action in the stem and tee of a T beam.

☐ The T beam is the type most important and most used in concrete, and the reinforcement against shear should in all cases extend up into the floor slab. In our design of the Niagara Bar we use three quarters of an inch as the standard dimension in width, thereby making it possible, at all times to design in economical sizes of beams. Increase of steel area is made by increasing in depth of bar, in accordance with the logical development of a beam for heavy loading.

☐ We have the most ECONOMICAL reinforcing bar on the market. The NIAGARA BAR is of the HIGHEST EFFICIENCY. Our EXPERIENCE and SERVICE is at your command.

# PITTS & ROBINSON

Architects and Engineers

MANNING CHAMBERS

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CANADA

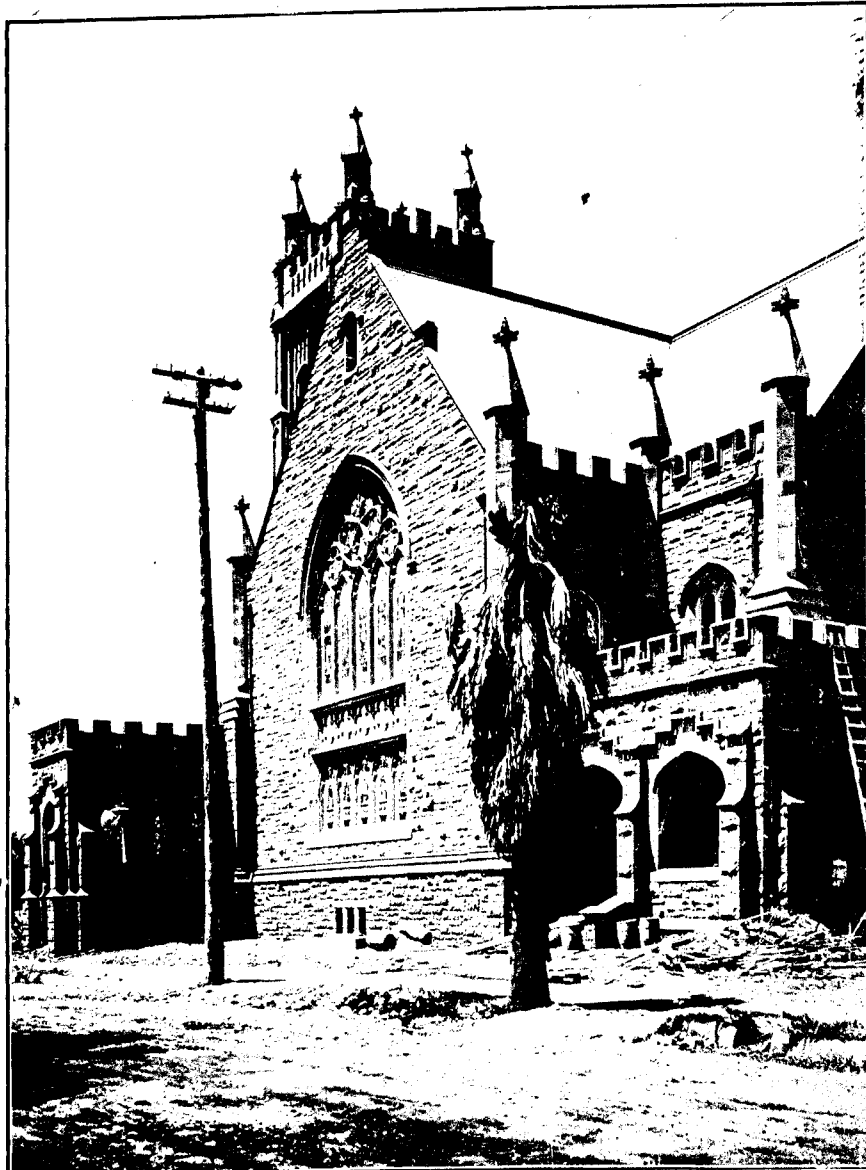
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REAL RANDOM  
ASHLAR

STONE ANY FRAC-  
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FOR, TO MEET  
ARCHITECTS' DE-  
SIGNS WITHOUT  
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ANY SPECIFIED DE-  
SIGN, REGARDLESS  
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OF UNDERCUTS



PRESBYTERIAN CHURCH, PASADENA, CALIFORNIA. (Partial view.)

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WORK  
OF ALL KINDS  
FRIESE, OR BELT  
COURSES  
BALUSTERS  
COLUMNS  
CAPITALS  
BRACKETS  
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LANDSCAPE DECOR-  
ATION FOR PARKS  
AND ESTATES

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**We install the California System anywhere under the positive guarantee that it will give all the results that we claim for it.**

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**OUR MOTTO**—Each and every piece of work **different**, made practical by the low cost of operating by the California System.

**WRITE US FOR PARTICULARS**

**CANADIAN CONCRETE MACHINERY COMPANY, Limited**

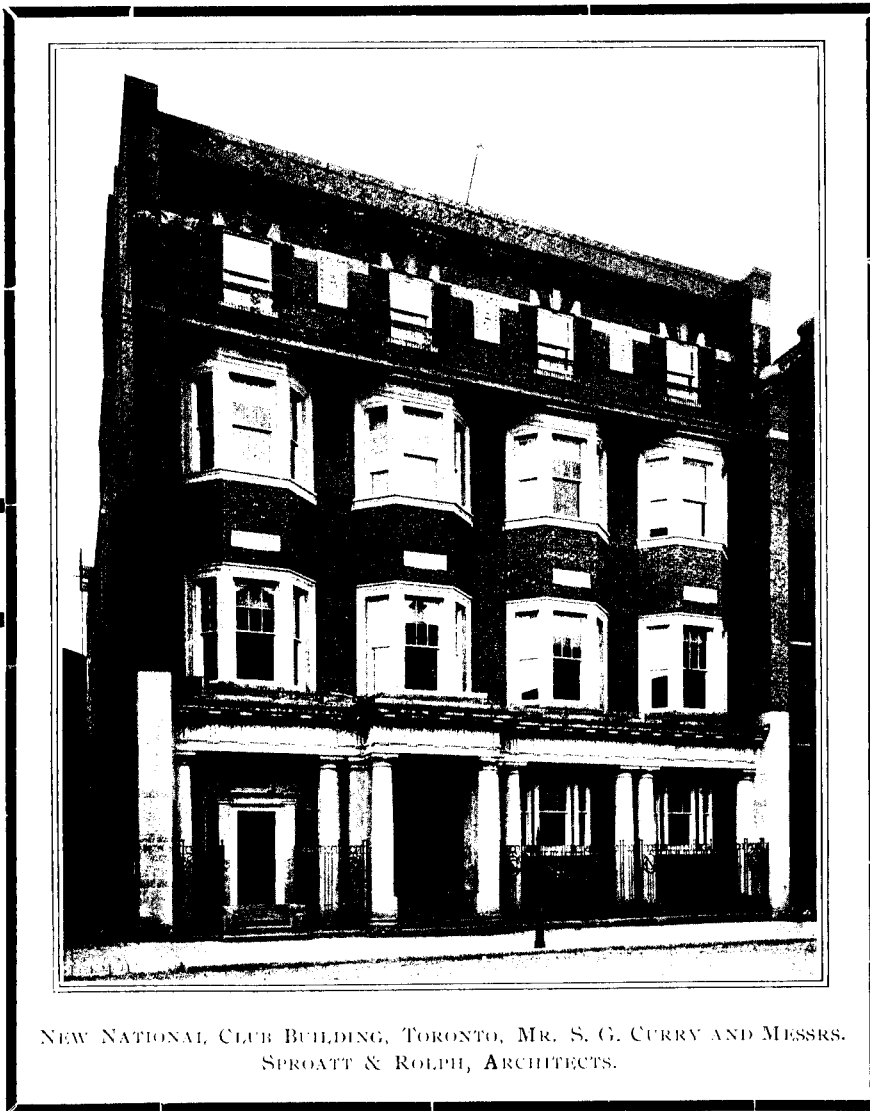
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*An Established Factor of*

## **Concrete Construction**

Expanded Metal assures an elasticity and tensile strength in concrete construction which admits of graceful lines without weakening arches, enabling it to conform to the requirements of the most elaborate architectural design and exacting engineering practice. It has been the standard—universally acknowledged—superior reinforcement for 15 years.



NEW NATIONAL CLUB BUILDING, TORONTO, MR. S. G. CURRY AND MESSRS. SPROATT & ROLPH, ARCHITECTS.

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### **EXPANDED METAL**

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**Expanded Metal and Fireproofing Company**  
100 KING STREET WEST, TORONTO



# 'CONSTRUCTION'

A JOURNAL FOR THE BUILDING AND  
ENGINEERING INTERESTS OF CANADA

Vol. 1

April, 1908

No. 6

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**H. GAGNIER, Ltd., Publishers**

Saturday Night Building

TORONTO

CANADA

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**The Experience of Others  
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faction with the Don Valley  
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"We beg to express to you our satisfaction with the excellent quality of your product, as supplied to us for the Royal Bank Building, and it is with pleasure we state that the materials supplied by you are equal if not superior to any we ever used. The 300,000 bricks that we have used have proved highly satisfactory." C. E. PALMER, NORCROSS BROS., New York.

#### **Highest Quality and Best Obtainable**

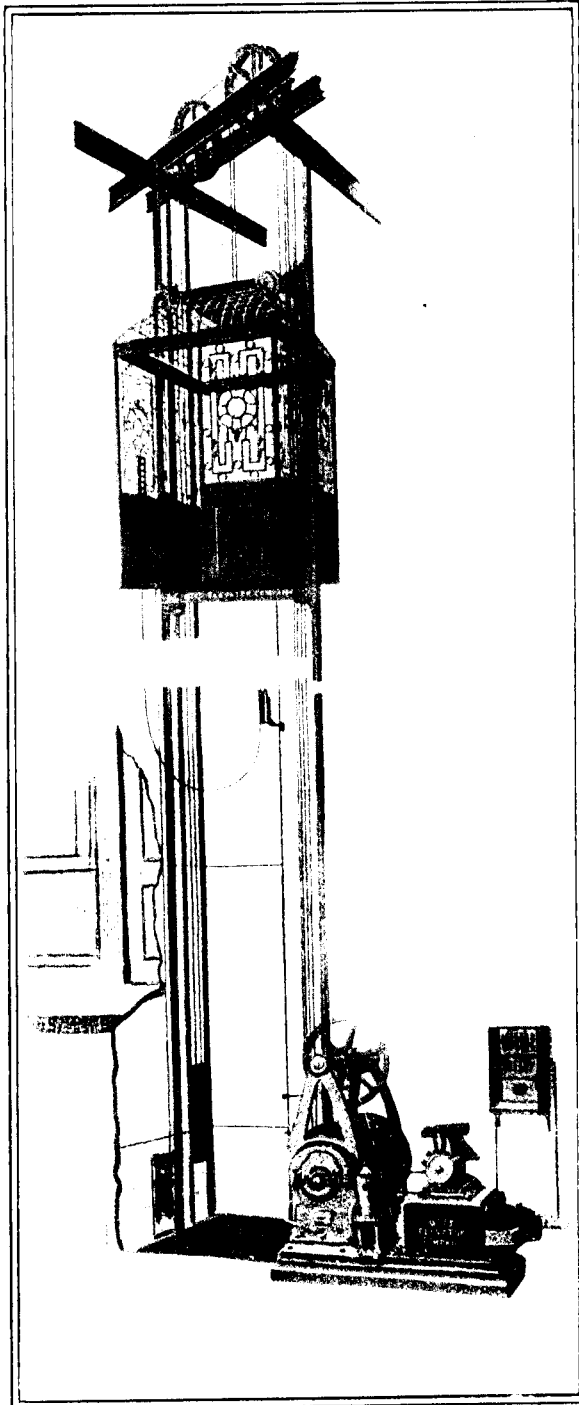
"We also take advantage of this opportunity to express to you our satisfaction with our dealings with you during the past season, not only the efficient service rendered us in delivery, but we must state that the materials supplied us were of the highest quality and by all means the best obtainable." FRED HOLMES & SONS, Building Contractors, Toronto.

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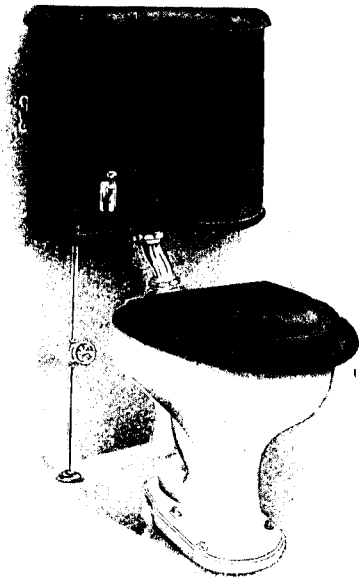
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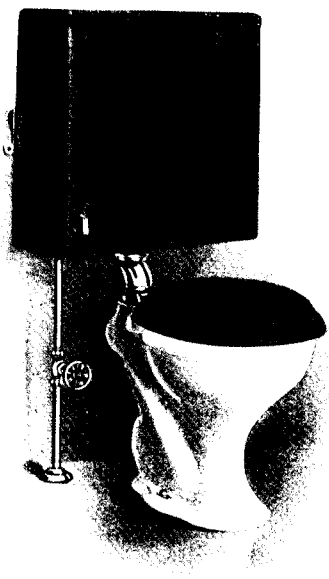
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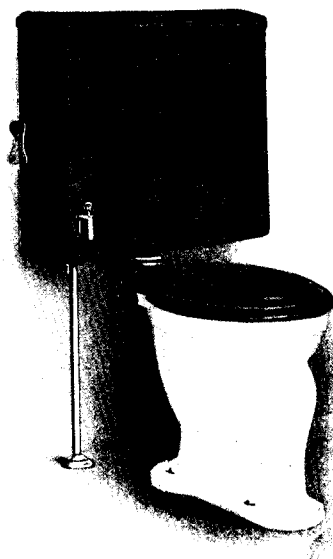
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WHEN the members of the Opposition in the Dominion House attempted to open up a discussion on the floor as to the extent of the responsibility of the Government for the collapse of the Quebec bridge, the Hon. Mr. Fielding took it upon himself to assure them that when the report of His Majesty's Royal Commission, appointed to investigate the disaster, was placed on the table of the House, it would be found that the "skirts" of the Government were clear, and that neither **PROPHESY THAT WORKED OUT.** the Government or any of its officials, according to the report, would be found in any way, shape or form, responsible for this *g-r-e-a-t* national calamity.

Mr. Fielding told the truth, and we are inclined to believe him to be either a far-sighted prophet, or a shrewd politician, whose thorough confidence in the strength and influence of his Government gave him reason to foretell, without a tremor, to what extent "the party in power" would be spared in the finding of the Quebec Bridge Commission.

It is noteworthy in the long, exhaustive report prepared by the Commission, that, while almost every prominent engineer, connected with the designing and erecting of the bridge, as well as the Phoenix Bridge Co., and the Quebec Bridge & Railway Co., is found guilty of negligence or lack of judgment, no effort apparently has been made to place the responsibility for the disaster on the shoulders of the Government, or any of its officials, that the evidence given before them makes quite plain.

The whole report has been very tactfully presented and in such a manner as will make it quite difficult to even indirectly determine the exact connection with or responsibility of the Government, for the whole transaction. In fact this voluminous report, that took months to prepare, and cost thousands of dollars, places us practically no nearer to the determining of the responsibility for the loss of some seventy lives, and several millions of dollars, than we were the day after the bridge fell. This is most unfortunate, and it seems farcical that this Commission, empowered to investigate one of the greatest catastrophes of modern times, and invested with the authority to take evidence under oath, should in its lengthy report give a technical history of the designing, erection, and fall of the bridge, rather than a fearless, concise, and direct statement of the exact extent of the responsibility that rests upon the shoulders of those connected with the financing, designing or erection of the bridge. If the Royal Commission, with its powers, the vast amount of

evidence before it, and the practical knowledge of its members, combined with the expert advice at its command, could not determine this all-important point, we ask who can determine it, or will it ever be directly established?

It is announced that the report is only partially finished, and it is to be hoped that the remaining appendices will give conclusions of a more definite nature. We would dislike to think that the remainder is being held back until it is edited by the Government, nor would we like to believe that the first section has been given to the public, and the manner in which it is received is, being carefully watched, before the last installment is finally handed to us.

It is a well known fact that the Government was responsible for the method of financing the project, and the general design of the bridge.

#### THE QUESTION OF DESIGN.

In this connection the Commission, in the second paragraph of the general summary of its findings, the portion that would be mostly quoted and read, says: "We do not think that either the general design of the Quebec Bridge, the methods of financing the enterprise, the payments of money that have been made to or by the company or in its interest, or the obligations that the company has undertaken under various contracts and agreements, have direct connection with the fall of the bridge." They, however, make a statement a little further on, that implies that the difficulty was with the design. In finding (N) it says: "The professional knowledge of the present day concerning the action of steel columns under load, is not sufficient to enable engineers to economically design such structures as the Quebec Bridge. A bridge of the adopted span that will unquestionably be safe, can be built, but in the present state of professional knowledge, a considerably larger amount of metal would have to be used than might be required if our knowledge were more exact."

The Forth bridge with two spans, almost as long as that of the Quebec Bridge, was successfully constructed, and is now standing and giving the service it was built for, which shows that such a bridge can be successfully designed if sufficient steel is used. But the Quebec Bridge fell. Why? Because it was too light, it required more steel than was provided for in the design. The Forth bridge was designed and built according to certain calculations of "present day professional knowledge." What have we right to infer from this? Nothing more than that the general design was wrong. Yet the report says that the

general design had no direct connection with the fall of the bridge.

Again, throughout the Commission's review of the evidence of Mr. Cooper, and the officials of the Phoenix Bridge Company, it is shown conclusively that the financial limitations of the Quebec Bridge and Railway Co. had a most important bearing upon the cause of the collapse of the bridge.

In fact, the method of financing the project constituted such an important factor in the evidence of the higher officials, connected with the construction of the bridge, that the commission saw fit to devote one of the most valuable appendices in its report to

**LACK OF FUNDS A SERIOUS HANDICAP.**

"The effect of the Financial Limitations upon the Design of the Bridge and a Discussion of the Evidence Relating to same." In introducing this part of its report, the Commission said "The fact that

the carrying out of the bridge project was for years delayed by lack of funds being a matter of common knowledge, it was found desirable to investigate the effect of this condition upon the design and execution of the work"

In the review of the evidence that followed it is shown that the lack of funds on the part of the Quebec Bridge Company made it necessary to adopt a procedure in calling for tenders, that was almost unheard of in work of such magnitude and as the report says "not calculated to produce the most efficient results."

It states further that errors crept into the design which the report ascribes "to the failure of the Quebec Bridge Co. to provide for sufficient preliminary studies of the project by its own engineers." Lack of funds undoubtedly was the cause of this evident inefficiency. Then we find when the government came to the rescue after considerable delay caused by financial difficulties, the rush that followed hurried the work of designing and manufacture of the bridge to such an extent as to bring about many errors which would have been fatal in themselves.

Again, Mr. Cooper in certain portions of his evidence, not touched upon in this appendix, states explicitly that he was influenced in his work by the limited funds available for the erection of the bridge, and that he did not attempt to design the best bridge, but the best bridge for the money. Mr. Cooper also testified that the lack of funds became such a serious matter that he was obliged to cut his fee almost in half and accept the munificent sum of \$4,000 per year as a retainer for an engineer who had complete and absolute supervision and control of the greatest piece of bridge engineering of modern times, that involved the expenditure of some seven or eight million dollars. Because of this inadequate fee, he was unable to employ ample assistance both in his office and on the field, to exercise the absolute authority given him by the Canadian Government. While Mr. Cooper should not have accepted a responsibility that for any reason he was unable to do justice to, the Government invited disaster in limiting the service to be rendered by an engineer in such an important capacity, by such a totally inadequate fee.

Still further, we find that both Mr Reeves, President of the Phoenix Bridge Co., and Mr. Deans, the Chief Engineer, stated in their evidence that Mr. Cooper in his attempt to economize, provided in his

specifications for unit stresses, unprecedented in the history of bridge engineering, and that by these changes in the unit stresses lowered the efficiency of the bridge, and placed "the whole design in a field outside the benefit of experience."

Thus do we find that the method of financing the project resulted first in improper methods being adopted, in calling for tenders which did not produce

**ECONOMY THAT PROVED COSTLY.**

the most efficient results; secondly, in insufficient preliminary sketches for the design that produced errors; thirdly, in rush of work that produced more fatal errors; fourthly, in cutting the fee of the chief

consulting engineer that did not permit him to give the work the care and attention that might have prevented the disaster; fifthly, in forcing upon the consulting engineer, the designer and the contractors, an extravagant economy that produced unit stresses unprecedented in bridge construction, and finally resulted in the failure of chord 9 L. and the eventual fall of the bridge.

In the face of these facts, the Commissioners say in the main part of their report that the method of financing the project had no direct connection with the fall of the bridge, while in the winding up of appendix (5), they say; "The facts that have been discussed in this appendix show that, while there is no evidence of any cheap or insufficient work being *purposedly* done by either Mr. Cooper or the Phoenix Bridge Co., there is evidence to prove that the financial weakness of the Quebec Bridge Co. seriously interfered with the carrying out of the undertaking."

Why this roundabout method of dealing with concrete facts? Is it an effort to spare the guilty?

**REPORT DEVOID OF DIRECT CONCLUSIONS.**

If so, who? The Government we know was responsible for the general design and method of financing the undertaking. We do not wish to detract from the glory of the work of the Commission, we do not question

the integrity of the members of the Commission, who are men who stand high in their profession, nor can we believe that they have been influenced in their findings by any government patronage that might have been held out as a kindly consideration for their services. The problem before them was of a difficult nature, and the task imposed upon them an arduous one that required much patient, careful study and research, and they are to be complimented upon the scholarly manner in which their report was rendered. It is, however, most unfortunate that they shrank from the most unpleasant duty imposed upon them by the powers they were invested with, of giving a plain, direct, unbiased, and fearless statement as to whom the responsibility rested with for the fall of the Quebec Bridge. The Government is undoubtedly pleased with the report, but what does the engineering profession and the lay public think of it?

**EDITOR'S NOTE**

[Since the above has been put in type, we learn that four additional appendices to the Quebec Bridge Report have been presented to Parliament, covering an examination of the various full size column tests, and a comparison of the stresses computed from the bridge as finally designed with the stresses authorized by the specifications.]

**G**RUESOME and horrible as it may seem, it is nevertheless a fact that the close-fisted, narrow-minded, criminal incompetency and negligence on the part of municipal building departments and school boards renders inevitable, and it seems necessary, such a horrifying catastrophe as that of the Collingwood School fire.

**FALSE ECONOMY AND THE RESULT.**

It was necessary that more than one hundred and fifty little innocents should have their lives stamped out before the public came to the full realization of the miserable condition of its school buildings and the miserly policy that has been carried out in the plan, construction and equipment of the structures in which its children spend a very large percentage of their daily life.

The thousands of investigations that have been conducted with regard to the safety of public schools since this horrible disaster has brought to light the fact that there is no class of building that offers such a comparatively small protection to the many lives it daily contains than our modern public school.

Our commercial buildings are made fireproof, equipped with sprinkler systems, outside iron stairways and fire escapes, but these precautions apparently have not been necessary in our schools. It is important that we protect our merchandise against fire and save insurance, but why our children?

Our government buildings must be colossal, constructed of marble and granite and must be modern in equipment and appointments for the comfort of our politicians and the security of our important documents, but school buildings must be constructed as cheaply as possible.

We are told by some officials "long in the service" that even the small expense of fire escapes is unnecessary, and every precaution that involves the expenditure of money is rendered useless, we are told, by the much-talked-of "fire drill," a scheme whereby the little tots are expected to save their own lives in lieu of unnecessary equipment that costs money.

Children are sometimes wonders, and it seems that school inspectors and superintendents should be given credit for knowing them better than editors, and therefore we have a right to believe that there is no reason, why the little folk cannot "hold their heads," remember the "Loss of the Birkenhead," stand in line, shout the first verse of the "Charge of the Light Brigade" and forward march through the smoke and crackling embers to the music of "Soldiers of the King."

This, however, is a most serious question and one which should not be made light of; but the childish stand taken by some school officials who are vainly trying to cover up their incompetency and past negligence by stating that fire drills render fire escapes unnecessary, are sufficient to throw one into alternate fits of laughter and rage.

Fire drills are excellent and if in case of emergency, children can be filed out of a building in marching order, they have rendered a service. But suppose a boiler explodes, or a nervous teacher faints or shows signs of fright, or a pupil becomes hysterical, or a boy or girl comes in contact with flames; or smoke becomes so dense that the children are blinded or choked, suppose the passage to, down or from the main staircase is blocked by fire or smoke. Suppose any one of these, not only possible but highly prob-

able, conditions occur. A panic ensues and the only hope for the safe exit of the children from the structure is plenty of means of egress, or, in other words, plenty of adequate fire escapes. When we say fire escapes we do not mean iron ladders but wide iron balconies and stairs that lead down to terra firma.

In the face of these facts a school official who states that the expense involved in equipping schools with fire escapes is an unnecessary one, or that fire drills render fire escapes unnecessary, is either highly incompetent to fill his position or he is a dangerous bigot.

\*\*

**E**VERY building over two storeys in height erected for human habitation, with the exception of private dwellings, should be equipped with adequate fire escapes. This fact is recognized by every sane, unbiased architect or builder, and yet but a very small percentage of such buildings, either old or new, are provided with this most essential protection for human life in spite of the fact that the building laws of almost every municipality

**BUILDING INSPECTOR AND FIRE ESCAPES.**

of any size, distinctly states that the building department may demand the erection of same on such buildings. In view of the fact that every building inspector that deserves to hold his position, knows that every building over two storeys in height should have fire escapes, what can be his reason for not using his prerogative in this particular? In regard to old structures erected before the municipal building department was created in that especial town or city, the owners take the inexcusable position that fire escapes are unnecessary on their structures and that their enforced erection would only serve as a persecution to him, the "affable" landlord, because of his having to part with a few shekels in what he claims to be an unwarranted expenditure. If the building inspector directs his attention to some structure which he knows should be provided with fire-escapes, the landlord immediately runs to some friendly alderman with a most "pitiful" tale as to how he is being persecuted. He tells how other buildings, worse than his, are without fire-escapes, and very often, as a last resort, promises, if only left alone, to tear down his old structure and put up a fine new building in the near future. The alderman gets together some other friendly members of the council, and the building inspector is called upon by these gentlemen and told in a very diplomatic manner that "under the circumstances" it will be well for the present at least to forget his order. The building inspector is thus retarded in his every effort until he finally becomes "weary in well-doing" and decides "what's the use." Instances are not rare where owners have gone so far in attempting to defeat the efforts of a building inspector, as to charge him with receiving remuneration from manufacturers of fire escapes in return for his strict enforcement of these provisions of the building by-laws. It is not the policy of "Construction" to encourage graft but we believe, that if such a combination were formed between building inspectors and manufacturers of fire escapes, it would not be without some redeeming features. We only relate this as an instance to show to what extremes owners will resort, to evade the law and thus refuse to make their buildings fit for human occupancy. Aldermen

and councillors are not without blame for this unfortunate condition, which would be impossible if they honestly and conscientiously performed the sworn duties of their office.

However no little extent of the blame can justly be attributed to the architect, as it is he who fights the battles of the owner with the building department.

A great many members of the profession seem to believe that the small commission paid them by the owner has bought them body and soul and that it is their duty to do the owner's bidding, even though they have to resort to extreme measures to evade the people's building by-laws.

Some architects even go so far as to boast to their clients of their ability to have certain plans passed by the building department that their brother architect could never get through.

**ARCHITECTS** Every building inspector will tell  
**FIGHT** you that he is constantly fighting  
**OWNERS'** with architects in his endeavors to  
**BATTLES.** make them construct their buildings according to the requirements of the law. Fire-escapes, of course, are only one of the many points of contention between the architect and the building inspector, but are by no means the least important.

If the architect wishes the lay public to consider him as a professional man he should conduct himself accordingly and not assume the position of the purchased slave of the avaricious owner. When the architect undertakes to plan and superintend the construction of a building he owes a duty to his profession and the public, as well as to the owner, and if he betrays the confidence of the public in the unprofessional performance of his work he cannot be considered other than an enemy of the people and his profession.

If every architect were to join hands with municipal building departments in the enactment and enforcement of adequate building laws we would not only have the required fire-escapes on our buildings but we would have a much higher standard of buildings generally.

Some recent events have brought to the public notice, quite forcibly the grave danger of the lack of fire-escapes, especially on buildings of a semi-public nature. It is not long ago that the Protestant School Board of the City of Montreal was found liable for damages in the case of J. F. Anderson, who lost his child of six years of age in the burning of the Hochelaga school. The jury found that the death of this child was due directly and entirely to the negligence of the School Board in failing to provide the school with fire-escapes. This should prove a lesson to school boards in every city and town in the Dominion who have declared themselves as failing to see the necessity of fire-escapes. The question came up before the School Board in Toronto last winter and the arguments put forth by some of the members in their contentions that fire-escapes were an unnecessary expense, were, to say the least, foolish and childlike and far from being worthy of men in whose hands is placed the responsibility of providing means for the education of the coming generation. Will Toronto have to be visited with an awful fire like that of the Hochelaga school, or the Collingwood disaster before her citizens will awake to the realization of the incom-

petency of the men who have refused to protect the lives of her school children because, forsooth, "they thought" fire-escapes were unnecessary?

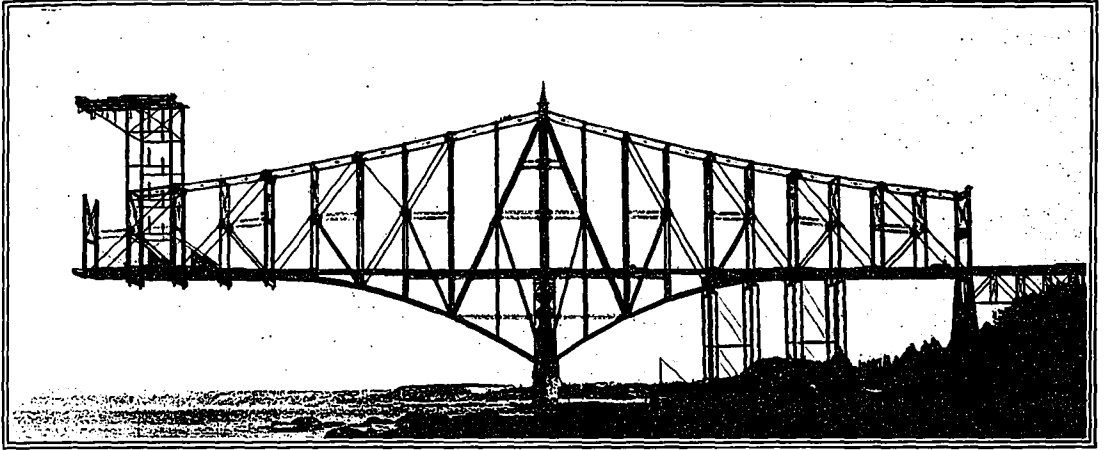
A fire occurred last October in a tenement house on York Street, Toronto, in which ten persons were injured and a mother and child lost their lives. The structure, which was three storeys high with a tailor shop on the ground floor, not only  
**LACK OF** was without fire-escapes but it did  
**FIRE** not even have an entrance leading  
**ESCAPES** directly to the street or alley  
**A CRIME.** at the rear. (See November "Construction"). Had this building

been provided with a fire-escape, either at front or rear, there is no question that every inmate could have been rescued and the lives of the young mother and child, who perished in the flames on the top floor, would have been saved. There are hundreds of just such buildings in Toronto and yet there is no apparent effort to have them equipped with fire-escapes. We ask how many more lives will have to be sacrificed on the altar of greed, incompetency and negligence before it will be deemed necessary to provide such buildings with this evident and important protection for human life.

After the recent Boyertown holocaust, City Architect McCallum, of Toronto, stated in an interview published in the daily press, that he had found many buildings containing public halls without fire-escapes, and that he was ordering to be equipped with them, and that all new apartment buildings had to be equipped with regulation fire-escapes. It is a gratifying indication that public officials are realizing the necessity for this reform but why should it take such a horrible disaster like that at Boyertown, to bring it to light, and also, why should not the already constructed tenement houses be provided for as well as the new apartment buildings?

The only satisfactory solution to be found that will relieve the building department of the necessity of constantly fighting with owners and architects to force them to properly equip their structures with fire-escapes, is the passage of a law, such as is in force in mostly all the larger cities in the United States, which makes it a misdemeanor, punishable by a fine or imprisonment, for an owner or a lessee of a structure to fail to provide it with the required regulation fire-escapes. Under such a law it is not necessary that a building inspector only, shall institute an action against the offender but any citizen may lay information against any owner who may fail to comply with the law. As it is, with most of the by-laws in Canadian cities, the fact of a building being without fire-escapes does not constitute an actionable offence. An owner does not become an offender in the eyes of the law until he has failed, after sufficient notice from the building department, to comply with the order of that department. Under the former law, city officials cannot shield an offender, while under the latter one, as long as a structure does not come under the notice of the building department or as long as the owner is successful in evading an order from the city building inspector, he is enabled to avoid the equipment of his building with fire-escapes. It is a law of this nature that we require, one that will make it unlawful to own a building other than a private dwelling, of over three-stories or over, that is not equipped with fire-escape.





SOUTH CANTILEVER ARM OF THE ILL-FATED QUEBEC BRIDGE THAT FELL INTO ST. LAWRENCE RIVER ON AUGUST 29TH, 1907, TAKING WITH IT THE LIVES OF 74 MEN, AND RECORDING THE GREATEST ENGINEERING CATASTROPHE IN THE HISTORY OF MODERN BRIDGE BUILDING.

# Report of Quebec Bridge Commission

**A Review of the Voluminous Report on the Fall of the Quebec Bridge as Presented Before the Canadian Government. Responsibility is Not Fixed and Report While a Technical Masterpiece is Misleading in its General Conclusions**

**H**IS Majesty's Royal Commission has laid its report on the failure of the Quebec Bridge before the House of Commons. Beyond giving a rather conflicting history of the financing, designing, erection and fall of the bridge it does little more in the matter of making a direct statement as to the real cause of this great disaster than declare that the failure of the structure was the result of the faulty design of the compression chords of the bridge. True it criticizes the action of certain engineers in authority in connection with the manner in which they exercised their judgment and performed their duties, and while it is to be inferred from their reviews of certain evidence given before them that in the opinion of the Commission certain irregularities and faults in connection with the design and erection of the bridge that contributed to its final collapse were directly due to the negligence or incompetency of this or that official, it still remains an almost inconceivable fact that for some reason, that may or may not be explained, the Commission laid no direct specific charge against anyone and failed to place the responsibility for the loss of life and money involved in this, the greatest engineering disaster of modern times. Mr. Henry Holgate, chairman of the Commission, in answer to a query, is credited with having made the following statement, which appeared in the daily press on December 3: "*I think I can safely say that in the report we will not hesitate to place the responsibility definitely. Of course it will need some very careful thinking over.*" After having examined the report carefully we are inclined to think that the Commission did a great amount of "careful thinking."

The report, as it has been handed to the government, is comprised of the main summary and eleven appendices, which covers several hundred pages of type written matter. A very remarkable feature of the report is that a statement made in one portion is almost flatly contradicted in what appears to be an equally important statement in another appendix, thus rendering the whole report decidedly colorless and in fact almost valueless as evidence that might be used in court in a legal attempt

to place the responsibility for either the loss of life or money involved.

As a piece of engineering literature, dealing with this class of bridge design and erection, however, the report contains a vast amount of valuable data and the Commissioners are to be complimented upon the thoroughness of the technical information gleaned from the best works and authorities on the matters directly bearing upon the subject before them.

## GENERAL SUMMARY OF FINDINGS.

We understand that the Commission instructs us to determine to the best of our ability the cause of the collapse of the Quebec bridge and to thoroughly investigate any matters appertaining thereto which might enable us to explain that cause. We do not think that either the general design of the Quebec bridge, the methods of financing the enterprise, the payments of money that have been made to or by the company or in its interest, or the obligations that the company has undertaken under various contracts and agreements have direct connection with the fall of the bridge. In the course of our investigations we have secured a large amount of general information on these and other matters not directly pertinent to the object of the inquiry, some of which has been introduced into this report so that the history of the undertaking might be more readily followed. We have not considered the scope of our inquiry limited concerning any matters which, in our judgment, related to the collapse of the bridge.

Some of our various inquiries have yielded negative results, but these are dealt with at some length in the report to make it clear that the subjects of these inquiries have not been overlooked.

Your Commissioners find:

(a) The collapse of the Quebec bridge resulted from the failure of the lower chords in the anchor-arm near the main pier. The failure of these chords was due to their defective design.

(b) The stresses that caused the failure were not due to abnormal weather conditions or accident, but were such as might be expected in the regular course of erection.

(c) The design of the chords that failed was made by Mr. P. J. Szlapka, the designing engineer of the Phoenix Bridge Co.

(d) This design was examined and officially approved by Mr. Theodore Cooper, consulting engineer of the Quebec Bridge & Ry. Co.

(e) The failure cannot be attributed directly to any cause other than errors in judgment on the part of these two engineers.

(f) These errors of judgment cannot be attributed either to lack of common professional knowledge, to neglect of duty or to a desire to economize. The ability of the two engineers was tried in one of the most difficult professional problems of the day and proved to be insufficient for the task.

(g) We do not consider that the specifications for the work were satisfactory or sufficient, the unit-stresses in particular being

higher than any established by past practice. The specifications were accepted without protest by all interested.

(h) A grave error was made in assuming the dead load for the calculations at too low a value and not afterward revising this assumption. This error was of sufficient magnitude to have required the condemnation of the bridge even if the details of the lower chords had been of sufficient strength because, if the bridge had been completed as designed, the actual stresses would have been considerably greater than those permitted by the specifications. The erroneous assumption was made by Mr. Szlapka and accepted by Mr. Cooper and tended to hasten the disaster.

(i) We do not believe that the fall of the bridge could have been prevented by any action that might have been taken after Aug. 27, 1907. Any effort to brace or take down the structure would have been impracticable owing to the manifest risk of human life involved.

(j) The loss of life on Aug. 29, 1907, might have been prevented by the exercise of better judgment on the part of those in responsible charge of the work for the Quebec Bridge & Ry. Co. and for the Phoenix Bridge Co.

(k) The failure on the part of the Quebec Bridge & Ry. Co. to appoint an experienced bridge engineer to the position of chief engineer was a mistake. This resulted in a loose and inefficient supervision of all parts of the work on the part of the Quebec Bridge & Ry. Co.

(l) The work done by the Phoenix Bridge Co. in making the detailed drawings and in planing and carrying out the erection and by the Phoenix Iron Co. in fabricating the material was good and the steel used was of good quality. The serious defects were fundamental errors in design.

(m) No one connected with the general designing fully appreciated the magnitude of the work nor the insufficiency of the data upon which they were depending. The special experimental studies and investigations that were required to confirm the judgment of the designers were not made.

(n) The professional knowledge of the present day concerning the action of steel columns under load is not sufficient to enable engineers to economically design such structures as the Quebec bridge. A bridge of the adopted span that will unquestionably be safe can be built, but in the present state of professional knowledge a considerably larger amount of metal would have to be used than might be required if our knowledge were more exact.

(o) The professional record of Mr. Cooper was such that his selection for the authoritative position that he occupied was warranted and the complete confidence that was placed in his judgment by the officials of the Dominion Government, the Quebec Bridge & Ry. Co. and the Phoenix Bridge Co. was deserved.

Owing to the necessity of having the evidence taken in the United States sworn to before a British Consul, written questions were submitted to each witness examined in the United States and written answers were returned after an interval of some days.

The Commission is greatly indebted to the following gentlemen, who have most courteously furnished information: Mr. Charles Macdonald, formerly chief engineer of the Union Bridge Co., contractors for the superstructure of the Memphis cantilever bridge; Mr. H. W. Hodge, of Messrs. Boller & Hodge, engineers of the Monongahela cantilever bridge; Mr. Ralph Modjeski, of Messrs. Noble & Modjeski, engineers of the Thebes cantilever bridge; Messrs. Ingersoll and Seaman, of the Department of Bridges of the City of New York and Messrs. Reynolds and Kunz, of the Pennsylvania Steel Co., respectively engineers and contractors for the superstructures of the Blackwell's Island cantilever bridge.

We are also indebted for professional advice and assistance to Professor Mansfield Merriman, Professor W. C. Kernot, Professor W. H. Burr, Professor Edgar Marburg, Professor H. M. MacKay, Professor G. F. Swain and Messrs. W. R. Webster, T. K. Thomson and E. W. Stern, consulting engineers.

The technical investigations have been by far the most arduous and difficult part of our inquiry and it is questionable whether they could have been brought to any conclusion without the assistance that these men of expert training and experience have so freely given.

We have set forth the facts which have convinced us of the soundness of our findings in the accompanying appendices, each of which is an independent discussion dealing at length with some one phase of our inquiry. The subjects of these appendices are as follows:

1. The evidence given before the Commission of Inquiry.
2. The exhibits filed with the Commission of Inquiry.
3. The history of the Quebec Bridge & Ry. Co. up to the end of the month of August, 1903.
4. The Phoenix Bridge Co.
5. The effect of financial limitations upon the design of the bridge and a discussion of the evidence relating to this.
6. The history of the development of the specifications and a discussion of the evidence relating to it.
7. A description of the organization and staffs maintained by the different corporations interested in the erection of the bridge.
8. A history of the development of the plans and of the methods followed in the designing offices.
9. Material shop work and inspection.
10. Transportation and erection.
11. A discussion of the difficulties that arose during erection and of the events at the time of the collapse of the structure.
12. A description of the fallen structure.
13. An enumeration of the various full-sized column tests that have been made in America accompanied by diagrams showing the results of these tests.

14. A comparison of the stresses in the several members of the main trusses computed from the bridge as finally designed, with the stresses authorized by the specifications. This comparison was made by Mr. C. O. Schneider, consulting engineer, and is embodied in his report to the Department of Railways and Canals.

15. A description of the various experimental researches that have been made in connection with the building of the Quebec bridge and during this inquiry.

16. A discussion of the theory of built-up compression members.

17. A comparison of the design for certain chords of the Quebec bridge with those for similar members of other great cantilever bridges illustrated with outline drawings of the bridges and copies of the shop drawings of the chords.

18. A critical discussion of certain parts of the specifications.

19. Miscellaneous information.

All of which is respectfully submitted.

**THE EFFECT OF THE FINANCIAL LIMITATION  
UPON THE DESIGN OF THE BRIDGE AND A  
DISCUSSION OF THE EVIDENCE RELAT-  
ING TO SAME.**

Despite the fact that the Commission states in its report that the design and the method of financing the project had no direct connection with the fall of the bridge, appendix 5, dealing with "The Effect of the Financial Limitations upon the Design of the Bridge and a Discussion of the Evidence Relating to Same" is the most important portion of the report and throws more light on the "slip shod" methods employed from the very inception of the work that finally resulted in the fall of the bridge, than any other part of the report. For this reason we give appendix 5 in full.

**APPENDIX V.**

The fact that the carrying out of the bridge project was for years delayed by lack of funds being a matter of common knowledge, it was desirable to investigate the effect of this condition upon the design and execution of the work.

Mr. Cooper has stated that "during the early progress of the work it was an open secret that the Quebec Bridge Co. had but a small amount of money in sight."

In proof of this statement reference may be made to the following facts:

Between 1887 and 1898 the Quebec Bridge Co. accomplished practically nothing.

In 1900 it let the contract for the substructure, payment to be made partly out of subsidies and partly in bonds of the company, to be accepted at 60 per cent. of the face value, and offered its superstructure contract on similar terms.

In 1900 its securities were thoroughly investigated by the leading firms of American bankers, who declined to invest in them.

The Phoenix Bridge Co. was paid for the construction of the approach spans, not by the Quebec Bridge Co., which ordered them, but by Mr. M. P. Davis.

It must have been clear to the engineers from the first that the financial conditions were such that nothing but absolutely necessary work could be undertaken.

The effect of the lack of funds is noticeable in the methods of calling for tenders, and of letting contracts, and in the delays that occurred in the execution of the work.

In September, 1898, the bridge contracting firms were asked to submit tenders upon their own designs, to be drawn in accordance with certain specifications. Practically this meant that each bridge company was asked to spend several thousand dollars on the preparation of plans, and that in return it was given an opportunity to bid for a contract to be let by a company of weak financial standing. The result was, that although the magnitude of the work placed it outside the limits of established practice, most of the tenders submitted were made from immature studios based upon insufficient data. The evidence shows that the Phoenix Bridge Co. gave more time and attention to the competition than any other tenderer, but the error afterwards made by it in assuming the weight of the structure for final designs shows how faulty the estimate accompanying its original tender was. We consider that the procedure adopted in calling for tenders was not satisfactory, in view of the magnitude of the work, and was not calculated to produce the most efficient results.

In his evidence Mr. Hoare ascribes the failure of the Quebec Bridge Co. to take advantage of the lump sum tender of the Phoenix Bridge Co. to lack of funds. We are satisfied from the knowledge gained during the designing of the 1,800-ft. span, that the 1,600-ft. span could not have been built with the weight of metal stated in the tender of March 1, 1899. Mr. Deans' letter to Mr. Hoare shows that the Phoenix Bridge Co. expected that its tender would be modified before the work was built. The letter is as follows:

(Personal and Private.) April 14, 1899.

Mr. E. A. Hoare,  
Chief Engineer, Quebec Bridge Co.,  
Quebec, Quebec.

Dear Mr. Hoare:

Mr. Szlapka and I were with Mr. Cooper the greater part of yesterday and you will be glad to learn there was not a single vital

or important criticism or mistake to be found in our plans. All the slight differences, such as dead load, anchor arms, reverse strasses, in one or two members, thickness of some detail plates, etc., were all thoroughly discussed and satisfactorily settled, and not a single one would affect in any way our price or our proposition. It was especially gratifying for us to learn this.

Mr. Cooper, however, somewhat upset me, by making the following remark, which, of course, I understood was entirely personal and without any full knowledge of the situation. He said: "Well, Deans, I believe that all of the bids will probably overrun the amount which the Quebec Bridge Co. can raise and that the result will be, as is usually the case, that all of the bids will be thrown out and a new tender asked on revised specifications and plans."

I told Mr. Cooper that, while this might be the usual procedure, that in the present case it was distinctly understood that whoever was the lowest bidder under the present specifications and plans will be awarded the work, and if any modification were made their bid would be altered accordingly, as this could readily be done through a conference with the bridge company's engineers and ourselves; as we could undoubtedly build as cheap a structure as any other company and that unless this plan was carried out as understood and agreed upon, the present bidders would be placed in a very unfair position after the expenditure of great time and expense.

I finally succeeded in convincing Mr. Cooper that this was the only fair method, but I think it will take the greatest care on your part to see that his report is not worded in such a way as to give the directors an opportunity of following this suggestion. Mr. Cooper undoubtedly desires to be perfectly fair, but not having been through this whole matter like ourselves, does not fully understand the situation. I trust, therefore, that you will give his report the most careful scrutiny and get it in the right shape before it is submitted, as far as this suggestion is concerned. It would simply be just what our competitors, and particularly the Dominion Bridge Co., would like, or the Union Bridge Co., in fact, and I shall be much interested to hear from you on this point.

You have not advised me to whom I shall send the revised price, including delivery of the material from Quebec and Levis to site.

Mr. Lindenthal and I have an appointment with Mr. Cooper next Tuesday to discuss the suspension plan.

Kindly advise me when you will desire the revised propositions of the suspension design.

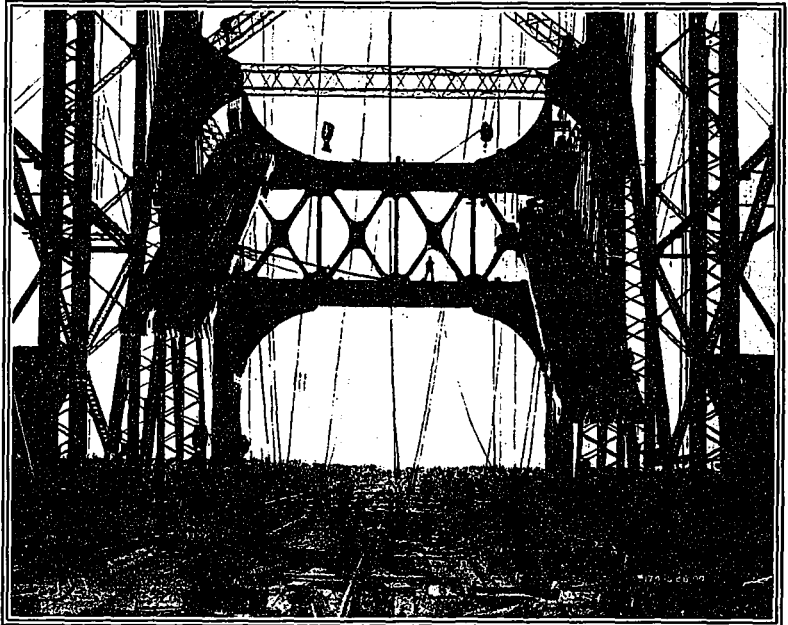
I remain,  
Yours truly,

Jno. Sterling Deans.

We desire to draw attention to this letter, because it indicates that the contract was subsequently awarded on the result of this competition, the basis of the award being a lump sum tender, which could not have been accepted without modifications.

These errors we ascribe to failure on the part of the Quebec

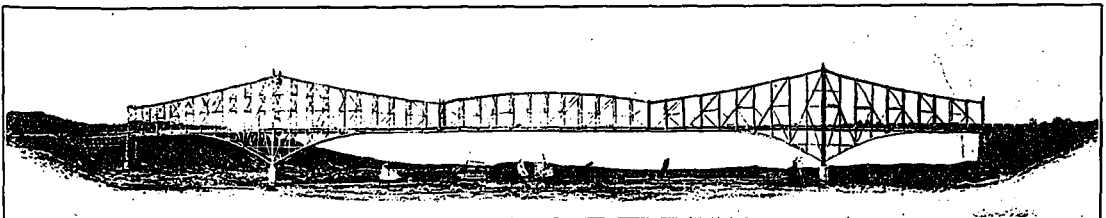
In April, 1900, the Phoenix Bridge Co. undertook to complete the plans for the bridge with all possible speed. In May, 1900, the Quebec Bridge Co., on the advice of its consulting engineer, determined to adopt a main span of 1,800 ft. and tacitly approved alterations of the specifications. The contractors were ordered to proceed with the designing for the 1,800-ft. span, under the supervision of



VIEW TAKEN FROM THE FLOOR OF QUEBEC BRIDGE, SHOWING THE LIGHT INTERLACING OF THE VERTICALS AND DIAGONALS WHICH WAS STRONGLY CRITICIZED BY THE ROYAL COMMISSION. THE LOWER MAIN STRUT BETWEEN MAIN POSTS IS ALSO SHOWN. TWO COMPLETE UPPER CHORD PANELS ARE BEING HOISTED INTO POSITION.

Messrs. Hoare and Cooper, but the new specifications which had to be accepted and officially approved by the Canadian Government, were not issued until the summer of 1903. This delay of three years seems to have occurred with the mutual consent of the Quebec Bridge Co. and the Phoenix Bridge Co. The Quebec Bridge Co. was not in a position to pay for the work and did not demand that the designing be proceeded with, nor did it furnish the necessary data for the designing. The Phoenix Bridge Co. was occupied with other contracts and did not make any further expenditures on behalf of the Quebec Bridge Co. until the financial position was assured.

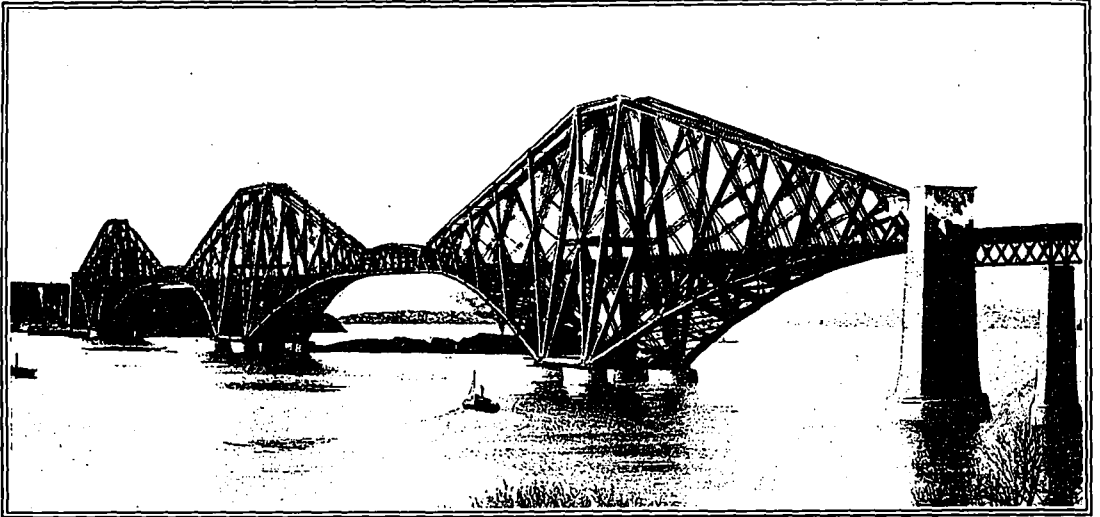
When the Dominion Government finally came to be more closely identified with the Quebec Bridge Co., in 1903, it intimated unofficially to the Phoenix Bridge Co., its desire that the bridge should be ready for the Quebec Tercentenary in 1908. For this and for ordinary business reasons the Phoenix Bridge Co. hurried the work of designing and manufacture as much as possible, this hurry resulting in errors, but not in those errors which were the immediate cause of



THE QUEBEC BRIDGE AS IT WOULD HAVE APPEARED WHEN COMPLETED. IT WOULD HAVE BEEN 400 FEET HIGH, WITH A SINGLE CANTILEVER SPAN OF 1,800 FEET. CAN A BRIDGE WITH A SPAN OF SUCH LENGTH BE SUCCESSFULLY AND ECONOMICALLY CONSTRUCTED? THE QUEBEC BRIDGE COMMISSIONERS SAY NO.

Bridge Co. to provide for sufficient preliminary studies of the project by its own engineers. It should also be noted that in the opinion of Mr. Cooper the preliminary surveys from which the main spans and the position of foundation piers, etc., were first determined, were entirely insufficient; further examinations and borings were made on his advice and resulted in radical alterations in the design.

the accident, these having been previously made. It is necessary in designing a bridge to commence by assuming what its weight will be, and as the design progresses to alter this assumption by calculation from the drawings. In the rush following the final financial arrangements of 1903, the necessity of revising the assumed weights was overlooked both by the engineers of the Phoenix Bridge



THE GREAT FORTH BRIDGE OVER THE FIRTH OF FORTH IN SCOTLAND, THE LONGEST CANTILEVER BRIDGE IN THE WORLD, WHICH WAS SUCCESSFULLY DESIGNED AND ERECTED ACCORDING TO CERTAIN CALCULATIONS OF "PRESENT DAY KNOWLEDGE." IT HAS A TOTAL LENGTH OF 8,296 FT., COMPRISING TWO CANTILEVER SHORE ARMS OF 680 FT. EACH AND TWO MAIN CANTILEVER SPANS OF 1,710 FT. EACH. IT WAS THIS BRIDGE THAT MR. THEODORE COOPER IS SAID TO HAVE STATED COULD HAVE BEEN ERECTED IN AMERICA IN HALF THE TIME AND AT A SUBSTANTIAL SAVING IN COST.

Co. and by those of the Quebec Bridge Co., with the result that the bridge members would have been considerably overstressed after completion. This error was sufficient to have condemned the bridge had it not fallen owing to other causes.

During the period occupied in the development of the details of the design, the designing engineer and his staff were absorbed in the

preparation of detail plans, and this resulted in the slighting of matters of primary importance.

Under the circumstances this condition was unavoidable, but could have been improved had the time between April, 1900, and August, 1903, been used in consideration and preparation of designs; however, business matters were in such shape that the Phoenix Bridge Co. were not warranted in expending time and money in this direction.

It is also proper to inquire whether the engineers modified their designs to the injury of the bridge, on account of the financial conditions.

The importance of economy in the preparation of the first tenders is shown by the letter already quoted.

The tenders, however, had to conform to the original specifications, and there is no evidence of unwise economy in the provisions of these.

Mr. Cooper's attitude with regard to cost, while he was examining the plans and tenders, is shown by the following letter:

(Personal)

April 19, 1909.

E. A. Hoare, Esq.,  
Chief Engr., Quebec Bridge Co.,  
Quebec, Quebec.

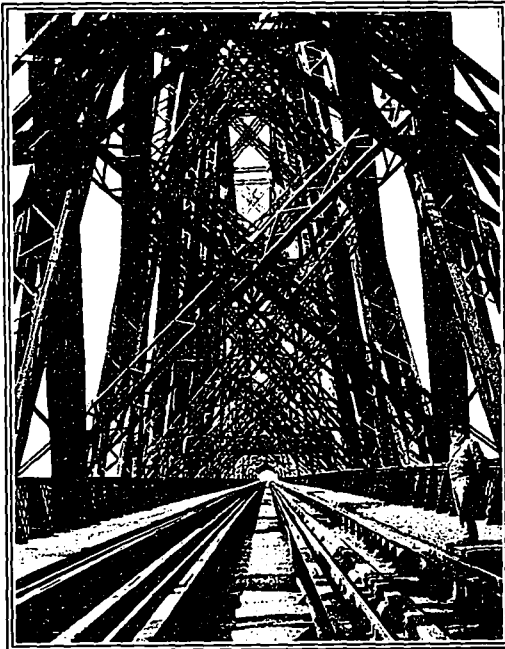
Dear Mr. Hoare:

I spent most of yesterday in New York in consultation with Mr. Cooper and Mr. Lindenthal, and found that Mr. Cooper had no serious complaints to make in connection with Mr. Lindenthal's plan; in fact, he expressed himself as much interested in the ingenious design.

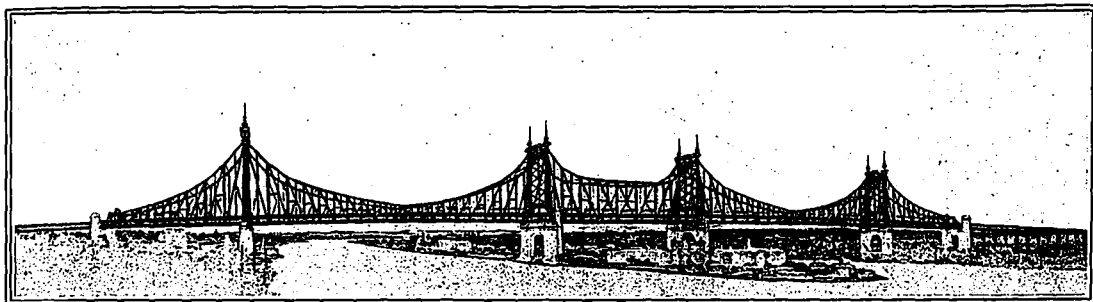
It developed, however, in conversation, and Mr. Cooper so expressed himself to Mr. Lindenthal, that, in view of the amount of the bid under his design, he would not give Mr. Lindenthal's plan careful and detailed consideration and would so report. This rather exasperated Mr. Lindenthal, and for a time I feared he might withdraw his bid, but it was smoothed over, and I think will be permitted to stand. Mr. Lindenthal thought that Mr. Cooper should report solely and wholly on the merits of the several designs, without any regard to cost, and each design should have the same careful consideration, and that you and your company alone should consider the question of price. I know this is entirely different from Mr. Cooper's instructions, and that it would be useless to spend detailed investigations upon plans which are very expensive in price, but Mr. Lindenthal viewed the matter from an engineer's standpoint, and, having taken such unusual pains with the design and estimate, felt that he was in a measure being slighted.

Mr. Cooper advises that he will finish about May 1.

I think it of the utmost importance to see you some time before that date, and write to ask if you will not come to New York. Cooper also advised me that he had no authority to receive any revised bids for possible reduction in suspension bridge wire, and I think this entirely proper. It seems to me, however, that you should have all of these bids in your hands at once, and I will be prepared to submit ours when you come to New York.



From Stereograph Copyright by Underwood & Underwood VIEW LOOKING THROUGH THE GREAT FORTH BRIDGE, SHOWING THE HEAVY BRACING EMPLOYED. THE INTERLACED STRUTS AND THE TUBULAR DIAGONALS FORM A MASSIVE NETWORK OF STEEL. COMPARE THE MASSIVE MEMBERS OF THIS BRIDGE WITH THE LIGHT FRAIL WEB TRUSSES OF THE QUEBEC BRIDGE.



PERSPECTIVE VIEW OF BLACKWELL'S ISLAND BRIDGE JUST COMPLETED ACROSS THE TWO CHANNELS OF THE EAST RIVER AND OVER BLACKWELL'S ISLAND, NEW YORK. IT COMPRISES FIVE MAIN SPANS OF 469½, 1,182, 630, 984 AND 459 FT., RESPECTIVELY; IT WEIGHS 50,000 TONS AND COST ABOUT \$25,000,000. THIS BRIDGE HAS THE LONGEST CANTILEVER SPAN IN THE UNITED STATES, AND WAS DESIGNED UNDER THE DIRECTION OF THE DEPARTMENT OF BRIDGES OF NEW YORK.

Please let me know at once and by wire when you will be in New York.

Yours truly,  
Jno. Sterling Deans,  
Chief Engineer.

In his report upon the competitive tenders submitted on June 23, 1899, Mr. Cooper says:

"The tender accompanying this plan (from the Phoenix Bridge Co.) is the lowest in price and is the most favorable as to prospective duties upon the materials to be used in its construction. I therefore hereby conclude and report that the cantilever superstructure plan of the Phoenix Bridge Co. is the 'best and cheapest' plan and proposal of those submitted to me for examination and report."

There is no evidence whatever to indicate that economy at the expense of efficiency was ever considered by Mr. Cooper. His award was made distinctly to the lowest tenderer and he so states, but in the preceding paragraphs the accepted design is stated to be "an exceedingly creditable plan" and "in accordance with your specifications."

The full text of the report and Mr. Cooper's evidence show that his award was made for technical reasons, although he did not overlook costs; and he states that he was left absolutely unhampered in any manner in his report as to which he should consider the best plan and the best bridge.

In a memorandum accompanying his original report Mr. Cooper indicated his desire to alter the specifications and to reconsider the length of the main span as soon as proper foundation surveys could be made.

These changes were subsequently made, but it does not appear that economy was the ruling factor in his selections. He unquestionably increased the unit stresses, but not to a point beyond those already adopted by the Bridge Department of the City of New York for its great bridges, and the increase can be stated to be in harmony with the most advanced practice of that time and due more to an instinct of wise investment than to any endeavor to simply cheapen the structure. The wisdom of his modifications is discussed in Appendix 18.

In his evidence Mr. Cooper has outlined his intentions in making his alterations and a desire not to involve the Quebec Bridge Co. in a greater expenditure than was at first anticipated is given among them; but on the same page it is sharply stated that he would not recommend any plans that did not promise to give a safe and satisfactory structure.

The facts that have been discussed in this appendix show that, while there is no evidence of any cheap and insufficient work being purposely done by either Mr. Cooper or the Phoenix Bridge Co., there is evidence to prove that the financial weakness of the Quebec Bridge Co. seriously interfered with the carrying out of the undertaking.

The Phoenix Bridge Co. were limited only by the specifications as amended by Mr. Cooper, endorsed by the Government and concurred in by themselves, and no sum of money or total weight was set as a limit in the designing or building of the superstructure, the sole aim of all being to produce a safe and economical bridge.

The Phoenix Bridge Company

were paid for the work at so much per pound, so there was no incentive to the Phoenix Bridge Co. to make the bridge lighter than they deemed it should be.

(Signed) Henry Holgate, Chairman;  
J. G. G. Kerry,  
J. Galbraith.

*EVIDENCE NOT DIRECTLY TOUCHED UPON IN THE FOREGOING APPENDIX.*

In this connection it is well to note some important evidence given before the commission covering this important point that does not seem to have been touched upon in this report.

Mr. Cooper, in his evidence, is quoted as declaring under oath that the Quebec bridge was not the best bridge, but the best bridge that could be built with the money provided. The amount being limited, the structure had to be planned to meet this amount. He further stated that Mr. Parent left him with the impression that the work was to be constructed by a private corporation, whose money was limited, and the question first to be decided was the possibility of building a bridge within the financial strength of the company. He also made the statement that the Quebec Bridge and Railway Co. became so embarrassed for funds that he was obliged to have his salary cut in two.



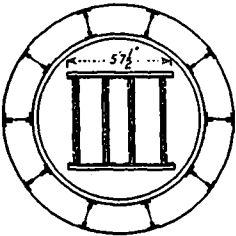
VIEW LOOKING THROUGH BLACKWELL'S ISLAND BRIDGE, NEW YORK, FROM THE LOWER DECK, SHOWING THE MASSIVE STRUTS AND BEAMS, ALSO THE HEAVILY INTER-LACED VERTICALS AND DIAGONALS.

**UNPRECEDENTED EXTREMES IN ECONOMY.**

The evidence of John Sterling Deans also tends to show that it was Mr. Cooper's unprecedented economy that caused the failure of the bridge. This evidence reads as follows:—

"Did the consulting engineer at any time urge upon you the necessity of economy beyond the point where you considered the best efficiency could be obtained?"

"He effected economy in cost by changing the specifications, and these changes lowered the efficiency of the bridge. In details not expressly covered by the specifications he also exercised economy. He endeavored to reach an economical design and we do not think he carried this so far as to question the safety of the structure."



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

"Did any one else?"

"No."  
"Did the changes in the unit stresses meet with your approval?"

"The changes in unit stresses were made by Mr. Cooper and were not submitted to us for approval."

"Did these changes follow previous experience?"

"The changes in unit stresses for compression members carried them out of the field of past experience in bridge construction and detailing and did not follow usual practice."

**AN IMPOSSIBLE BRIDGE.**

As a result of this enforced economy Mr. Reeves in his testimony says Mr. Cooper made specifications for a bridge that could not be built. Mr. Reeves, in his evidence before the Commission, said:

"He made modifications in the unit stresses to be employed upon the various members, which very much increased them beyond any precedent, and by so doing placed the whole design in a field outside the benefit of experience.

"Such high stresses had never before been used, and in using them he acted with the authority of the Quebec Bridge Company, and the Dominion of Canada vested in him.

"The fall of the bridge is to be laid directly to the change in the unit stresses as made by Mr. Cooper."

These little bits of evidence in addition to the Commission's findings on this point surely show that the bridge failed because of the high unit stresses used by Mr. Cooper. Mr. Cooper stated that he was forced to make these changes because of the financial limitations of the Quebec Bridge and Railway Co. Hence we believe that the Commission is quite in error in stating that the general design or method of financing the project had no direct bearing on the fall of the bridge.

**CRITICISM OF MEN ON WORK.**

In that portion of the report dealing with the officials of the two companies the commissioners give a description of the organizations and staffs maintained and in a summing up of the Phoenix Co. staff, say: "In general it may be said that this staff was highly efficient. The men were well trained and had ample experience in the class of work that they were called upon to do and there is throughout evidence of great pride in their individual connection with the undertaking and of determination to do their utmost to make it a success in every way."

The only fault found with their organization is that they did not provide an engineer to take charge of the erection who "by virtue of technical training and long experience on large bridge work, was fitted to take complete local control of the erection."

In this the commissioners think that the Phoenix Bridge Co. erred in judgment and failed to appreciate the magnitude and difficulties of the work. In doing this, however, they followed the usual practice which, however, should not apply in this instance.

A brief summary of the qualifications of the different officials of the work entrusted to them is given:

**QUEBEC BRIDGE CO.'S STAFF INEFFICIENT.**

Of the Quebec Bridge Company staff the report does not speak so highly, and it is summed up in this manner:

"As a whole the staff was inefficient and not well organized; the excellence of the work done was largely attributed to the ambition of the constructors to do the will to the very best of their ability; the organization was weak in the absence of a fully competent engineer of erection, and of a forceful chief of staff for the inspection of shop work."

"The commissioners do not consider that Mr. A. Hoare, the chief engineer, had the necessary experience to qualify him for such a position. There is, however, nothing in Mr. Hoare's record that would indicate that he had the technical knowledge to direct the work in all its branches.

The company directors do not seem to have realized the importance of the duties pertaining to Mr. Hoare's position and while believing that he was not competent to control the work, they still gave him the position."

Continuing, the commissioners say that the evidence shows that Mr. Hoare lacked a comprehensive grasp of the work that was being done by the inspectors and that although his subordinates entertained the highest personal regard for him they did not look to him for advice when technical difficulties arose.

**MR. COOPER CRITICIZED AND EXCUSED.**

Mr. Cooper, the consulting engineer, is very highly spoken of. One of the faults found however, is in the fact that his professional standing was so high that his connection with the work produced a false feeling of security. His approval of any plan was considered by every one to be final, and he has accepted absolute responsibility for the two great engineering changes that were made during the progress of the work; that is, the lengthening of the main span and the changes in the specifications and the adopted unit stresses. The commissioners considered Mr. Cooper the only one in the employ of the Quebec Bridge Company who was capable of assuming the duties of a chief engineer and he was not authorized to act in this capacity, nor was he able, owing to ill health to visit the bridge site during the erection work.

The inspection staff at the works in Phoenixville was also too small, although the men employed there did the work to the best of their ability.

**MATERIAL AND WORKMANSHIP GOOD.**

With the material and workmanship of the Phoenix Bridge Company the commissioners find but little fault. They say that the evidence shows that the Phoenix Company fully appreciated the difficulties of manufacturing the large and complicated pieces of the bridge and that more than usual attention was given to the execution of the work.

The report quotes fully the discussion, letters and telegrams that followed the discovery of the deflections in the lower chords a few days before the collapse occurred. As will be remembered the work was proceeded with after these discoveries were made as it was decided that the faults in the members existed before they left the works at Phoenixville and were not the result of excessive strain after erection. In this connection the commissioners say:

**MR. DEANS SHOULD HAVE STOPPED WORK.**

"We consider that Mr. Deans was lacking in judgment and in sense of responsibility when he approved the action of Mr. Yenser in continuing the erection and when he told Mr. Birks and Mr. Hoare that the condition of the chords had not changed since they left Phoenixville." They also state that the whole incident points out the need of a competent engineer in responsible charge at the site. Continuing the report says: "Mr. Hoare was the only senior engineer who was able to reach the structure between August 27 and August 29. He was fully advised of the facts but yet did not order Mr. Yenser to discontinue erection which he had power to do. We consider that he was in a much better position than that any other responsible official to fully realize the events that had occurred and his failure to take action must be attributed to indecision and to a habit of relying upon Mr. Cooper for instructions. We are satisfied that no one connected with the work was expecting immediate disaster and we believe that in the case of Mr. Cooper his opinion was justified. He understood that erection was not proceeding and without additional load the bridge might have held out for days."

**STRUCTURE COULD NOT HAVE BEEN SAVED.**

One of the most sensational statements made in the course of the whole investigation was that of Mr. Cooper when he stated that "a few hours work and one hundred dollars worth of timber and bolts would have saved the bridge and prevented the loss of seventy-three lives if this action had been taken in time." Regarding this the commissioners say: "Our tests have satisfied us that no temporary bracing such as that proposed by Mr. Cooper could have long arrested disaster; struts might have kept the chords from bending but failure from buckling and rivet shear would soon have occurred."

**THE SUMMING UP.**

In summing up, the commissioners say: "As a conclusion reached from the evidence, and from our own studies and tests, we are satisfied that the bridge fell because the latticing of the lower floors near the main pier was too weak to carry the stresses to

(Concluded on page 55.)

# Personnel of Quebec Bridge Commission

Brief Biographical Sketches of the Men Who Were Appointed by the Government to Investigate the Fall of the Quebec Bridge, Together With a Concise History of Mr. Charles Conrad Schneider, Who Acted in an Advisory Capacity to the Department of Railways and Canals

**A**s the Commission appointed by the Dominion Government to investigate the fall of the Quebec Bridge has rendered its report, it may not be amiss at this time to give a brief biographical sketch of the members who composed it, together with that of one of the most eminent consultants and authorities of bridge construction on the American continent, who was employed in an advisory capacity by the Department of Railways and Canals.



HENRY HOLGATE.

Other has spent 30 years propounding the principles of engineering in academic work; while the third has devoted his time about equally as a consultant and practical engineer and as a lecturer and professor in the school from which he graduated.

During the many months in which it was engaged in carrying out the investigation, the Commission applied itself in an assiduous and diligent manner, and the voluminous report, with its mass of evidence, contains, to say the least, a vast amount of data and information which should be of inestimable value to the engineering profession.

**H**ENRY HOLGATE, chairman of the Commission, is a member of the firm of Ross & Holgate, and one of the best known practical engineers in Canada. He was born at Milton, Ont., on September 14, 1863, and at the age of 15 was apprenticed to the engineering department of the Northern Railway of Canada, under the late Col. F. W. Cumberland. Mr. Holgate rose rapidly in the ranks of his chosen profession, and six years later was placed in charge of the engineering department of the amalgamated Northern and Hamilton and Northwestern Railways.

Upon the absorption of these interests by the Grand Trunk System in 1888 he was continued in that capacity until 1892, when he severed his connections to become Engineer for the Central Bridge Company of Peterboro', Ont. During the years 1894 and 1895 Mr. Holgate was engaged as Engineer of Construction for the Royal Electric Company, of Montreal, and in the two succeeding years was the company's engineer and manager, and also acted during this time in the former capacity for the Montreal Park and Island Railways.

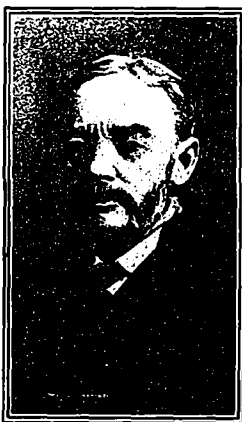
In 1898, accepting the position as engineer and manager of the West India Electric Company, he left for Jamaica, where he remained for a period of two years. Returning to Canada Mr. Holgate decided to take up pri-

vate practice, and in the following year entered into a partnership with Mr. Robert Ross, a practitioner with a broad engineering experience and an intimate knowledge of electrical construction, under the name of Ross & Holgate, as consulting and supervising engineers. In the seven years of its existence this concern has been instrumental in the development of a large number of engineering projects, extending from coast to coast, and to-day occupies a prominent position among the engineering firms of Canada.

In the 28 years of his experience in the field of engineering Mr. Holgate has acquired a theoretical and practical knowledge which has placed his service as a consultant and arbitrator in no little demand, and which eminently qualified him for the exacting duties of chairman of the Commission, with which the Government honored him. Throughout the investigation his every effort has been characterized by an indefatigable zeal to obtain all available evidence bearing on the cause of the disaster, in order to enable the Commission to arrive at a proper and definite conclusion. The voluminous report attests to the diligent manner in which the Commission applied itself in its exhaustive labor, and the result of the enquiry is due in no small measure, to the efficient chairmanship of Mr. Holgate.

**T**HE other members associated with Mr. Holgate in making the investigation were John Galbraith, LL.D., Dean of the Faculty of Applied Science, of Toronto University, and J. G. Kerry, of the firm of Smith, Kerry & Chase, Toronto.

Mr. Galbraith's broad experience in practical work, together with his academic attainments, have placed him in the highest repute with the engineering profession of Canada. He was born and educated in Canada, completing his University course in 1868, when he graduated as Gold Medallist in Honor Mathematics and Prince's prizeman at the University of Toronto.



JOHN GALBRAITH, LL.D.

Deciding to enter the field of railroad engineering, Dr. Galbraith was articulated from 1863 to 1871 to George A. Stewart, O.L.S., and Chief Engineer of the Midland Railway.

After serving a short time as contractor's engineer on the Intercolonial, he re-entered the employ of the Midland Railway as Resident Engineer, being shortly afterward advanced to Division Engineer.

He was next engaged in engineering work on the Georgian Bay branch of the Canadian Pacific, in whose employ he remained until 1878, when he accepted the appointment as Principal of the School of Practical Science and Professor of Engineering at the Toronto University.

During the thirty years that the school has been under Dr. Galbraith's guidance its growth has been remarkable.

In that time the faculty has increased from a staff of two to a staff of fifty, and the handful of scholars in daily attendance has grown to a student body of over seven hundred. New departments have been added, the curriculum has been extended and every advantage of modern methods has been placed at the disposal of the student who is equipping himself for engineering work.

The endeavors of Dr. Galbraith to bring this school up to the highest scholastic standard have been crowned with success. A tribute to his sterling character is the high esteem in which he is held by the graduates, who have not only enjoyed his sound pedagogical methods but the benefits of his practical knowledge as well.



JOHN G. G. KERRY.

Mr. Galbraith has occupied many positions of honor and responsibility with various organizations. At present he is President of the Canadian Society of Civil Engineers, and during his career has been Vice-President of the engineering section of the British Association for the Advancement of Science, and Vice-President of the engineering section of the American Association for the Advancement of Science. He has also had conferred upon him the degree of L.L.D. by both the Toronto University and the Queen's University.

In appointing Mr. Galbraith as a member of the Quebec Bridge Commission the Government selected a man whose integrity is unquestioned, and whose knowledge of materials and the theoretical and practical applications of construction made his services invaluable.

**J**OHN G. G. Kerry, the other member of the Commission, is also possessed of high academic attainments, combined with a thorough practical knowledge. He is an Honor Graduate and Gold Medallist of McGill University of the civil engineering class of 1886.

From that time until 1893, with the exception of the year 1889, Mr. Kerry devoted his efforts to railroad engineering work, first operating from the Montreal office of the Canadian Pacific, and afterwards employed in location and construction work on the Algona branch.

He was engaged as Assistant Engineer to the engineering staff of the Montreal Harbor Board during a portion of the years of 1888 and 1889. In 1890 an offer from the Southern States took him to that section, where for three years he was employed as Resident Engineer on heavy construction work in Virginia and Carolina.

Returning to Canada, Mr. Kerry became a member of the faculty of McGill College, first as lecturer of surveying, and afterwards as Associate Professor in surveying and lecturer on railroad engineering.

As McGill College does not make it incumbent upon its professors to devote their time exclusively to academic work, during this period, Mr. Kerry enjoyed the privilege of acting as consulting engineer for several corporations, principally the East Liverpool Bridge Company and the Grand Trunk Railway, working for the latter company, generally, under directions from Mr. F. H. McGuigan, Fourth Vice-President of the road. In 1907 he engaged in private practice, entering into a partnership with Mr. Smith and Mr. Chase, under the name of Smith, Kerry & Chase.

While Mr. Kerry is possibly not as well known as the other members of the Commission, he is, nevertheless, an engineer whose theoretical knowledge, shown in his

high academic standing and ability as a practical bridge engineer, should have rendered his services in working out the many details of the investigation valuable as the junior member of the Commission.

**W**HAT should be one of the most interesting, as well as important, documents in connection with the investigation, is the report showing a comparison of the stresses in the several numbers of the main trusses computed from the bridge as finally designed, with the stresses authorized by the specifications. This comparison was made by Mr. C. C. Schneider, Consulting Engineer, of Philadelphia, and is embodied in his report to the Department of Railways and Canals, by whom Mr. Schneider was commissioned to conduct this most important part of the investigation. While his report has not as yet been given to the press, we are satisfied that his findings will throw much light upon the question as to whether the cause of the disaster was bad design, faulty specifications, or poor material and shop work. At any rate, Mr. Schneider's reputation as one of the greatest bridge consultants of the day, as well as the straightforward and fearless campaign he has carried on for many years in engineering circles, against "rattle-trap structures with gim-crack connections," gives us every reason to feel confident that he has rendered his report according to his actual findings, irrespective of where the blame may fall.

Mr. Charles Conrad Schneider was born at Apolda, Duchy of Saxony, Germany, on April 24, 1843. After having graduated from the schools of his native city, he served two years' apprenticeship in a machine shop. In 1861 he entered the Royal School of Technology at Chemnitz, from which he graduated three years later. After three years of practical work in Germany he went to the United States, and worked for the Rogers Locomotive Works, in Paterson, N. J., as designer of locomotives and other machinery, with which firm he remained for three years. He began his career as Structural Engineer with the Michigan Bridge and Construction Co., as assistant engineer. In 1873 he accepted the position of engineer in charge of the Erie Railroad, in New York City. During 1876 he was engaged with the Board of Engineers, appointed by the Long Island Bridge Company to pass upon competitive plans for a bridge across the East River. After this work was finished he was engaged as Designing Engineer to the Delaware Bridge Company, of New York.



CHARLES C. SCHNEIDER.

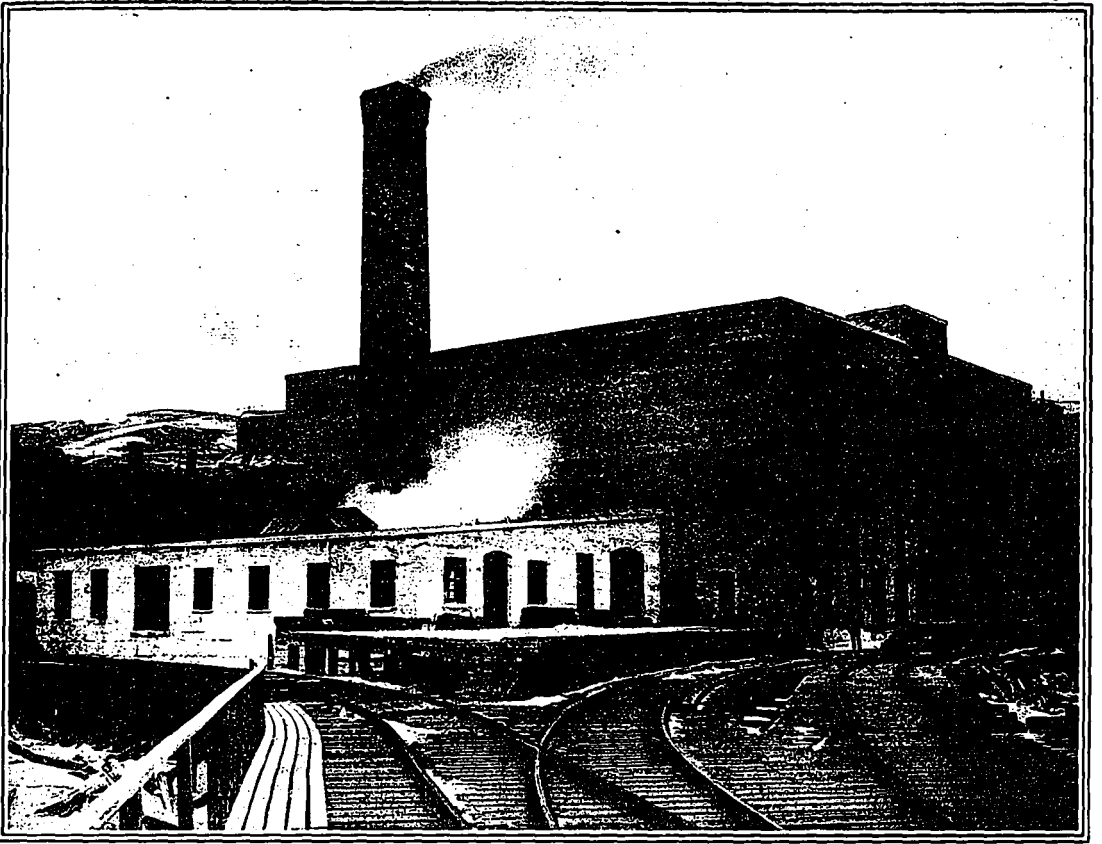
In 1877, shortly after the collapse of the Ashtabula bridge, Mr. Schneider began his independent career as Bridge Consultant. He was one of the first engineers to give considerable attention to the chief problems of bridge designing, and was one of the small group of specialists who inaugurated the movement which led to its present high development in the United States. Some of his important engagements during this period may be briefly mentioned as follows:

In 1879 and in 1882 he was associated with the late Geo. S. Morison, in the designing and construction of the Plattsmouth and Bismarck bridges across the Missouri River. In 1882 he designed the Cantilever bridge

(Concluded on page 55.)

[NOTE.—Since the above has been set in type Mr. Schneider's report has been placed before Parliament.—ED.]





REAR VIEW, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, RECENTLY ERECTED AT ST. JOHN, N.B., SHOWING POWER HOUSE, PLATFORM AND SIDETRACK FACILITIES. F. NEIL BRODIE, ARCHITECT.

## New Brunswick Cold Storage Warehouse

Illustrated Description of the First Cold Storage Warehouse to be Erected in Canada Under the New Dominion Law Subsidizing Such Plants. Plan, Arrangement, Apparatus and Insulation Thoroughly Gone Into

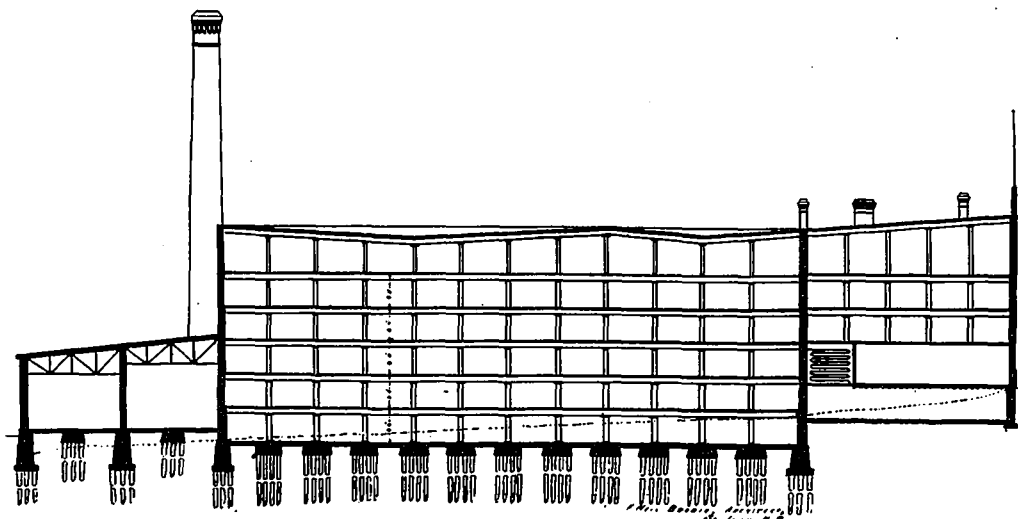
**N**O part of our industrial development has undergone a more complete evolution or has had a more direct bearing on our economic welfare than the refrigerating plant. As it is constructed to-day, the modern cold storage plant represents the culmination of the various methods that have been advanced, adopted and improved upon for many years back. In character of construction and in principle of operation, it marks a radical departure from the type of ice-house structure, with its slimy walls and tainted atmosphere, that was in general use a quarter of a century ago and may still be found in some sections where the modern method has not been introduced. While a large number of plants have sprung up within recent years, there is still a great need for storage facilities in various parts of Canada. Thousands of dollars have been lost by farmers and fruit growers annually simply because they had no storage warehouse at their disposal which would ensure the preservation of their crops and produce. Recognizing this fact, the Dominion Government, in order to encourage the establishment of cold storage plants throughout Canada, passed a bill, March 22, 1907, authorizing the granting of subsidies towards the erection of buildings of this character. It is known as the Cold Storage Act, and provides that:

"The Governor in Council may enter into contracts with

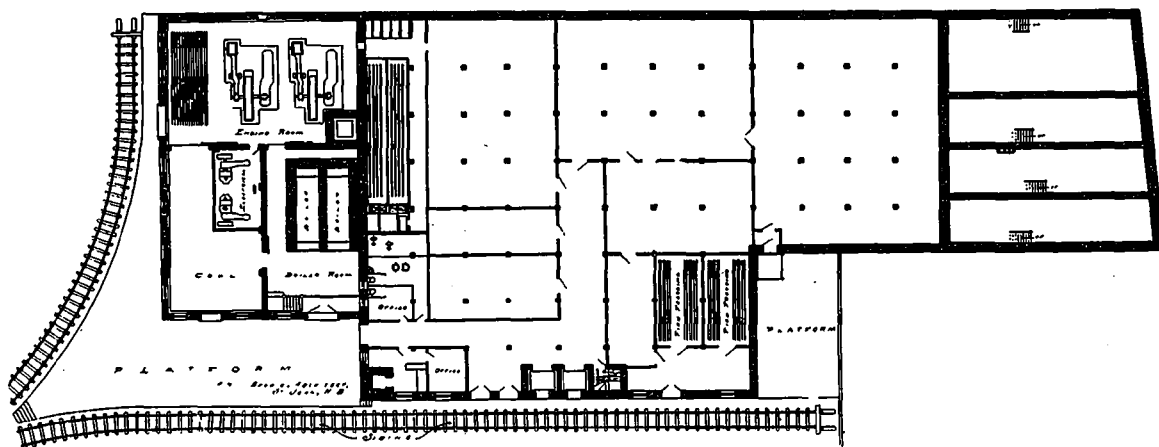
any person or persons for the construction and maintenance in good and efficient working order, of public cold storage warehouses equipped with mechanical refrigeration, in Canada, and suitable for the preservation of all food products. However, the location, plans and specifications of every such warehouse, its equipment, and the amount to be expended thereon, shall be subject to the approval of the Governor in Council.

"The Governor in Council may, out of any moneys appropriated by Parliament for the purpose, grant towards the construction and equipment of any such warehouse a subsidy not exceeding in the whole thirty per cent. of the amount expended or approved of in such construction and equipment, and payable in instalments as follows: upon the warehouse being completed and cold storage at suitable temperatures being provided therein, all to the satisfaction of the Minister of Agriculture, a sum not exceeding fifteen per cent. of the amount so expended; and at the end of the first year thereafter seven per cent. of the said amount, at the end of the second year thereafter four per cent. of the said amount, and at the end of each of the two next succeeding years two per cent. of the said amount: provided the warehouse is maintained and operated to the satisfaction of the Minister of Agriculture.

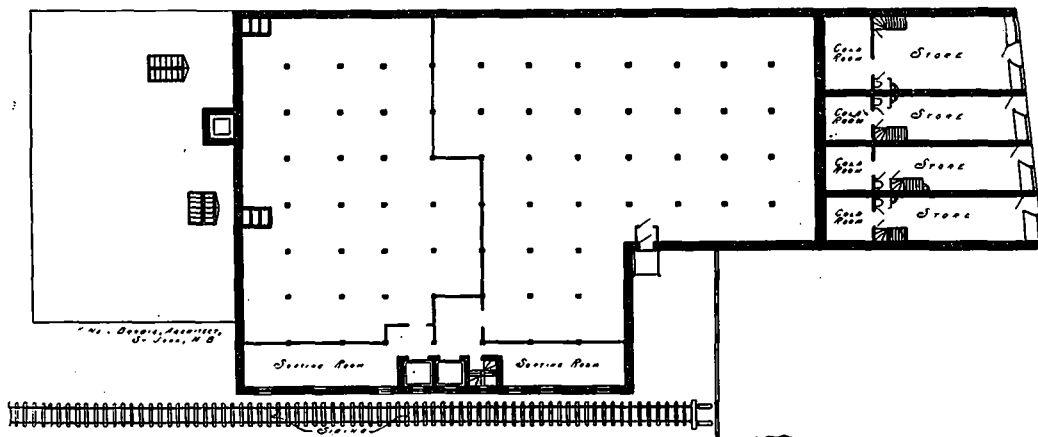
"It is within the authority of the Minister of Agricul-



LONGITUDINAL SECTION, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B., SHOWING PILE FOUNDATION TIPPED WITH CONCRETE SQUARES.



GROUND FLOOR PLAN, NEW BRUNSWICK—COLD STORAGE COMPANY'S PLANT, ST. JOHN, N.B., SHOWING THE LOCATION OF THE POWER PLANT, OFFICE AND VARIOUS STORAGE ROOMS. F. NEIL BRODIE, ARCHITECT.



FIRST FLOOR PLAN, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B., SHOWING THE FOUR STORES WITH COLD ROOMS IN THE REAR AT FRONT OF BUILDING. F. NEIL BRODIE, ARCHITECT.

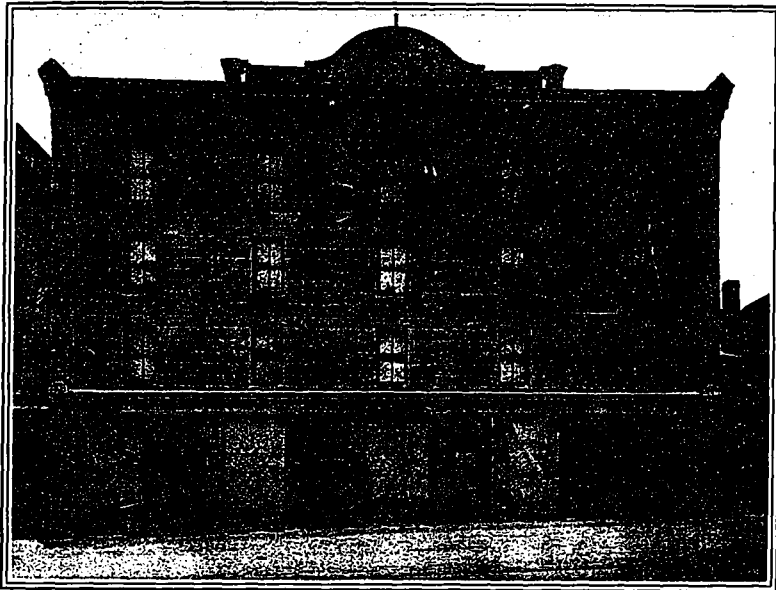
ture to refuse payment on any part of the said subsidy if, in his opinion, the operation of the warehouse has not been of such a character as to provide for the proper preservation of such products as may be stored therein.

Company is the first to take advantage of the subsidy offered by the Government. It was designed in accordance with the latest improved principles, and its general construction and equipment are such as to bring the efficiency

of the plant up to the highest standard. The building was recently completed and is now in operation. The designing and superintending of the construction of the foundation and concrete work was done by F. W. Holt, C.E., while the superstructure was designed and erected under the supervision of Mr. F. Neil Brodie, architect, St. John, N.B. Many difficulties were encountered as the work progressed owing to the fact that the level of the high tide is about three feet above the finished floor of the basement. The foundation walls of the basement, which are four feet thick at the bottom and gradually taper to 22 inches at the top, rest on four rows of piles driven to hard pan. For the support of the interior posts, nine piles were in each case driven to hard pan and topped by a six-foot square of concrete, five feet deep. The entire basement level is covered by a concrete floor of eight inch thickness, reinforced with  $\frac{3}{8}$  inch iron

rods set at 6 inches on centres. Between the piers are placed concrete girders, 12 by 14 inches, each reinforced with three  $1\frac{1}{2}$  inch mild steel rods.

All cement used in the basement is composed of one part of cement to every  $2\frac{1}{2}$  parts of sand and 5 of coarse gravel, some filler being used in the thickest part of the walls. The superstructure is of standard mill construction



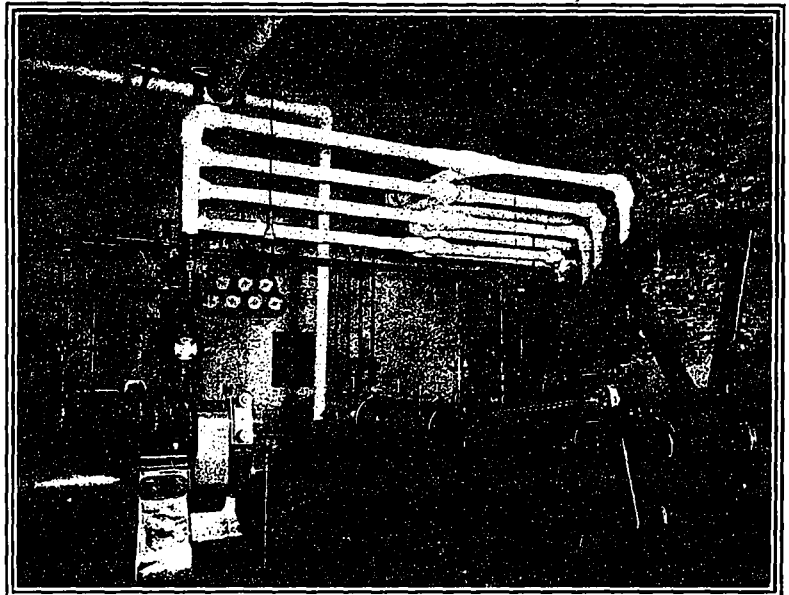
FRONT VIEW, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B.  
F. NEIL BRODIE, ARCHITECT.

He may at any time order, and cause to be maintained, an inspection and supervision of the sanitary conditions, maintenance and operation of such warehouses, and may regulate and control the temperatures to be maintained therein in accordance with the regulations to be made as hereinafter provided.

"The rates and tolls to be charged for storage in such warehouses shall also be subject to the approval of the Governor in Council, and for the effective carrying out of the provisions of the Act the Minister of Agriculture may appoint inspectors, who shall have access to all parts of such warehouses at all times."

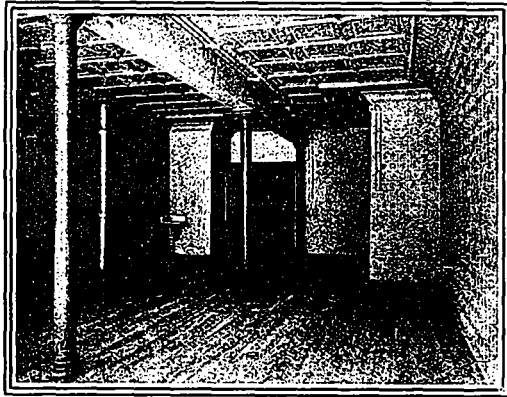
The bill further provides that the Governor in Council may make such regulations as he considers necessary in order to secure the efficient enforcement and operation of this Act: and he may by such regulations impose penalties not exceeding fifty dollars on any person offending against them: and the regulations so made shall be in force from the date of their publication in The Canada Gazette, or from such other date as is specified in the proclamation in that behalf.

The plant of the New Brunswick Cold Storage Company, St. John, N.B., with which this article is illustrated, give an excellent idea of the modern methods of refrigeration and is particularly interesting as the



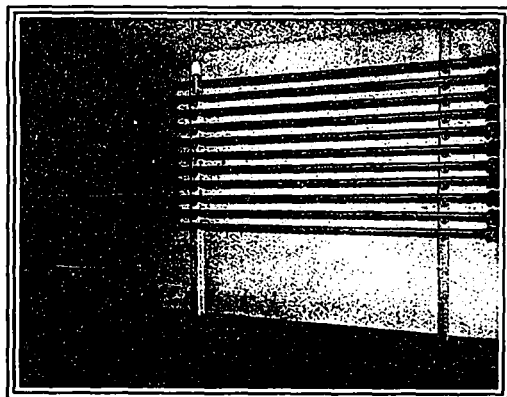
INTERIOR VIEW OF ENGINE ROOM, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B., SHOWING THE AMMONIA COMPRESSOR AND REFRIGERATING APPARATUS.

and is rendered almost fireproof by the insulation of its walls, floors and ceilings. All exterior walls are lined with three-inch corkboard, while the interior partitions, ceilings and floors of the cold rooms are covered with either two or four inches of this material. The building throughout is equipped with fireproof windows, consisting of metal sash glazed with wired glass. The power-house adjoining the plant is built of concrete, having 16-inch solid walls and a roof of steel and cinder concrete instead



INTERIOR VIEW OF ONE OF THE STORES WHICH OPEN ONTO THE STREET, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B. F. NEIL BRODIE, ARCHITECT.

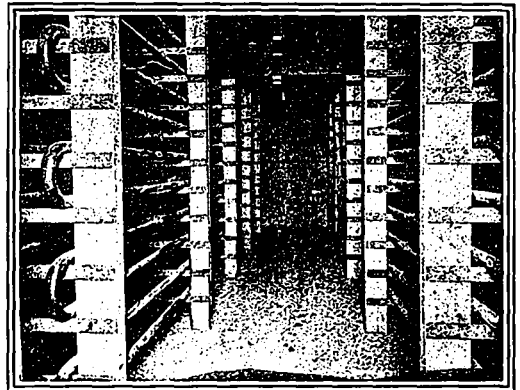
of a wood roof as shown in drawing. One of the most essential elements in the construction of a refrigerating plant, and one upon which its success depends to no little extent, is the insulation of which approximately 200,000 feet board measure is used in this building. On the brick walls of the freezing room four inches of Nonpareil sheet cork was applied in two layers, each two inches thick. The first layer was placed against the wall in a bed of Portland cement. This is covered by a second layer of corkboard, so laid that all joints of the first layer were broken, after which the interior of the walls was finished on the face of the corkboard with two courses of Portland cement. This plaster is composed of one part cement and two of sand.



INTERIOR VIEW OF COLD AIR COMPARTMENT AT REAR OF ONE OF THE STORES, NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B. F. NEIL BRODIE, ARCHITECT.

In the cooling rooms three inches of Nonpareil sheet cork was used on the walls, applied in one layer, and finished off in a similar manner to that of the freezing

rooms. The partitions in the freezing rooms are constructed of four inches of sheet cork put up in two layers, each two inches thick, the joints being broken both vertically and horizontally. The corkboard is held together by an asphalt cement. Three inches of impregnated corkboard is used in the partitions of the cooling rooms. It is applied in a like manner to that of the freezing rooms. All the partitions in these compartments are finished with Portland cement plaster, float surfaced. The roof insulation consists of two layers of "Kosat" insulating paper on which is laid one layer of Nonpareil sheet cork. This in turn has been surfaced and mopped with hot asphalt, and finished with felt and gravel roofing applied in the usual way. Corkboard has also been used in the basement floor. On top of the base of rough cinder concrete a layer of this material has been applied, after which the surface of the cork was mopped with hot asphalt and dressed with a concrete and cement finish. The different ceilings and floors of the structure are covered with corkboard provided with wood inserted nailing strips, through which it is securely nailed in place. The under side of this material on the ceilings has a float finish of Portland cement plaster. In order to secure the highest efficient service the refrigerating machinery in the plant is supplied in duplicate, consisting of two sixty-ton Linde compressors, each driven by its own steam engines. Under normal conditions one unit is sufficient to do the work, so that in case

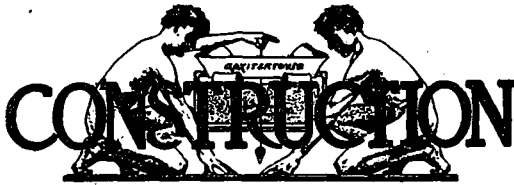


INTERIOR VIEW OF ROOM FOR THE FREEZING OF FISH, SHOWING THE SPECIAL DESIGNED EXPANSION PIPES. NEW BRUNSWICK COLD STORAGE COMPANY'S WAREHOUSE, ST. JOHN, N.B. F. NEIL BRODIE, ARCHITECT.

of a break-down or accident to one unit, the goods or produce in the cold store cannot suffer. The refrigeration proper, that is, the cooling of the different rooms, is done by two systems, namely, the Linde Patent Air Circulation System and the Expansion Pipe System.

For the storing of fruit and eggs, pure air is a necessity, therefore the different rooms in the store are cooled by the Linde Pure Air Circulation System, which circulates only purified cold air through the rooms. Special fans are provided which draw the warm or foul air out of each room, and pass it through the Linde patent air coolers, which are installed in separate insulated spaces, where the air gets cooled, and at the same time deprived of all impurities by being passed through a solution of salt brine. By this means the air gets thoroughly washed and all impurities absorbed by the salt brine and destroyed, as salt is known as the best destroyer of germs. After the air is passed through those coolers, it is delivered by the same fan back to the rooms in an absolute pure cold condition. By this system of refrigeration the rooms are kept perfectly dry and free of the foul air and gases which are given off by the goods stored therein, therefore the

(Concluded on page 39.)



A JOURNAL FOR THE BUILDING AND ENGINEERING INTERESTS OF CANADA

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ADVERTISEMENTS.—Changes of, or new, advertisements must reach the Head Office not later than the first of each month to ensure insertion. Advertising rates on application.

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

Vol. 1 April, 1908 No. 6

Current Topics

AT A RECENT meeting of the Freight Carriers' Association of Canada it was decided to advance the rate on stone five cents per ton. The price of stone, however, remains practically unchanged, save that the advance in transportation rates has been added to the cost.

\*\*\*

THAT THE LESSONS taught by the Hochelaga and Collingwood school disasters have been well learnt might be inferred from the statement given out by Building Inspector Chausse, of Montreal, to the effect that both the Catholic and Protestant Boards of School Commission of that city have decided that all school buildings erected by them hereafter shall be of absolute fireproof construction.

\*\*\*

A VIGILANCE that is advantageous to Canadian architects and engineers is being exercised by the Department of Customs relative to the importation of plans for improvements to be carried on in the Dominion. Within recent date the Collector of Customs, Vancouver, B.C. held up the plans for the proposed False Creek Bridge to be erected in that city, for the payment of \$2,000 duty, based on the percentage of the cost of the structure. The plans were prepared by Engineer Modell, Kansas City, Mo.

\*\*\*

PREPARATIONS have been practically completed for the Builders' and Contractors' Exhibition to be held in the new Coliseum at the corner of Dorchester and Guy streets, Montreal, during the week beginning April 20th. Up to the present time a great number of firms have applied for space and the display this year promises to surpass by far that of the initial exhibition which was held last fall in the Victoria rink. It is predicted that the many new features to be introduced at the exhibition will mark it as one of the finest industrial expositions held in Canada within recent years.

WINNIPEG'S new \$750,000 high pressure plant has been completed. Messrs. Crossley Bros., contractors for the gas producer plant, and Wm. Jacks & Co., contractors for the pumps, have finished their work, and the plant will shortly be taken over by the city, and used for the regular fire service. It is said that this is by far the most up-to-date plant of its kind on the American continent.

\*\*\*

ARCHITECT HERBERT H. NEW, who for the past eight years has been associated with several leading architects of Boston, has opened an office on the sixth floor of the Spectator Building, Hamilton. Mr. New has travelled extensively in Europe, at which place he spent considerable time in the study of his profession. With this advantage, in addition to his experience in Boston, Mr. New is well qualified to take a prominent place in his profession, in Canada.

\*\*\*

THAT THERE is a good opportunity for the development of certain industries in Canada is further accentuated by the fact that a large percentage of the hardware handled here is imported from the outside. From the United States are imported all kinds of self hardware, brass fittings, nickel-plated ware, and builders' hardware. The most active competitors are English and German manufacturers. The former have the advantage of a preferential tariff of from one-fourth to one-third (usually the latter) off the general tariff. American brass goods, better-class locks, and nickel-plated ware seem to be especially popular.

\*\*\*

APPLICATION has been made to the Provincial Government of Manitoba, for a charter for the Union Lumber Company, Limited, with a capital stock of \$10,000,000. The proposed company will take over seven of the largest lumber plants in the west, and more than three billion feet of standing timber, including Red Deer Lumber Co., Elk Lumber Co., Sunset Timber and Lumber Co., The Columbia Lumber Co., and the Bowman Lumber Co. Mr. Bowman, who will be president of the Union Lumber Co., is now president of the Bowman Lumber Co., and he announces that the new corporation will be by far the largest ever launched in Canada.

\*\*\*

OWING to several errors appearing in an item referring to the personnel of the officers of the Province of Quebec Architects' Association, for 1908, which was published under Current Topics, in the March number of CONSTRUCTION, we publish herewith a corrected list of the officers elected for the ensuing year: President, David R. Brown, Montreal; first vice-president, Louis A. Amos, Montreal; second vice-president, Thos. Raymond, Quebec; secretary, J. E. Vanier, Montreal; treasurer, J. R. Gardiner, Montreal; council, R. P. Lemay, Quebec; W. S. Maxwell, G. A. Ross, Joseph Venne, L. Lemieux, all of Montreal.

\*\*\*

PRINCE EDWARD ISLAND is again pressing its claim upon the Government for the long talked of tunnel connecting the island with Nova Scotia. It is said that this tunnel can be built for \$10,000,000. The province alleges that the Dominion Government has failed to carry out one of the terms of Confederation, and, on the strength of this, is making up a charge against the Dominion Government for damages, which will amount to about \$1,000,000. It is stated that until the tunnel is complete, these bills will be frequent, and will soon amount to the price of the tunnel. This particular bill is in connection with damages arising from the failure of means of communication for sixty-four days, two winters ago.

IT HAS BEEN proposed to use electro-magnets for lifting and handling large panes of glass, by placing a piece of sheet iron under the glass, and applying one or more electro-magnets on the upper face of the glass. The electro-magnets attract the sheet iron, and thereby hold the glass suspended while moving.

\* \* \*

THE BUILDERS' EXCHANGE. Ottawa, recently organized, has elected officers for the ensuing year as follows: President, G. A. Crain; first vice-president, Alex. Christie; second vice-president, Thorp Blythe; treasurer, Richard Hooper; directors, Alex. Garvock, James Ritchie, August Boehmer, J. A. Campbell, T. D. Macfarlane, W. J. Carson and P. Ackroyd.

\* \* \*

TWO HUNDRED tons of machinery is being installed in the new brickmaking plant at Sechelt Inlet, B.C. The plant will have a capacity of 150,000 bricks a day and will be the largest on the coast except one at San Francisco. The plant includes five huge buildings covering with yards 187 acres. The company will manufacture brick tile and terra-cotta products.

\* \* \*

WHAT is said to be the largest concrete building in the world is now being erected in Chicago for Montgomery, Ward & Co., on the east bank of the river at Chicago avenue. It is to be 750 feet in length, 270 feet in breadth and 135 feet high. The amount of cement to be used in the construction of the building is estimated at 100,000 barrels, the total weight of concrete being placed, 38,000,000 pounds.

\* \* \*

A GOOD IDEA of the extent to which the cement industry has developed in the United States, is gleaned from statistics compiled by the United States Geological Survey, which place the output for 1907 at approximately 48,000,000 barrels. This estimate, which shows about four and a fraction per cent. increase over the previous year, is based on returns received from 87 plants, representing 95 per cent. of the Portland cement production in the United States.

\* \* \*

A RESPONSIBLE Glasgow correspondent reports that a Glasgow engineer has astounded Clyde ship-builders by producing a small rotary turbine engine, little more than a foot in diameter, capable of developing forty horsepower. The new turbine will be known as the Corthesy, and its Swiss inventor claims that it will revolutionize turbine propulsion. Only two blades are used, as compared with many hundreds in each of the Cunard turbines. The new turbine is to be fitted on board an experimental torpedo boat, and the inventor asserts that it will produce a speed hitherto unknown. All the necessary capital to float a company has been eagerly subscribed.

\* \* \*

STRINGENT regulations providing for more efficient Government inspection of schools and other public buildings, and for better safeguards against fire and other accidents are embodied in a public bill introduced recently in the Quebec Legislature by Mr. Taschereau. The bill is for the purpose of forming a special act respecting public buildings in general, and provides for more vigorous application of the law than is made necessary by the act of 1902, at present in force. One section of it makes it necessary that all schools shall be furnished with outside fire escapes, and a specific article provides that if the order to furnish fire escapes is not complied with by the proprietor of any public building, the Government inspector can have such fire escapes immediately erected, the cost to be afterwards charged to the proprietor. This is thought to be the only way of avoiding delays that might be of fatal consequences.

PRELIMINARY contracts have been signed for official plans for a deep water canal from the North Sea to Veneren, Sweden's largest inland lake. If a canal is built millions of acres of land will become available for industries which are now prevented by lack of transportation. The proposed waterway is eighty miles in length and connects many small lakes.

\* \* \*

ONE OF THE most wonderful underground waterways in the world, which was constructed at the latter end of the eighteenth century by the dukes of Bridgewater, is now being used for the conveyance of waste water from the Earl of Ellesmere's collieries at Walkden, near Manchester. This canal, which is entirely underground, with its arms and junctions, covers over forty miles.

\* \* \*

A NEW TYPE of steam engine has been invented by Mr. George Cassady, manager of the British Columbia Packers, Vancouver, B.C., for which it is claimed that double the power can be produced for the same amount of steam required for the type of engines now in use.

Mr. Cassady now has a working model of the engine, which has aroused considerable interest among engineers at that place. He will commence the construction of a large model at once, and as soon as it is finished practical tests of its efficiency will be made.

\* \* \*

TESTIMONY to the durability of terra cotta, which enters so prominently into the construction of twentieth century skyscrapers, comes in an official report from W. H. Michael, U. S. Consul General at Calcutta. It shows that this material was known and used in ancient Burmah almost a thousand years ago. Mr. Michael quotes from a recent report of the archaeological survey of an interesting discovery of terra cotta reliefs with Pali inscriptions, dating back to the eleventh century, A. D., at Petleik Pagoda.

\* \* \*

A NEW use of tar is reported from East Palestine, Ohio, where a mason erecting a number of brick houses ran short of black mortar color, and was unable to get a new supply in the time at his disposal. Accordingly he tried a little partially refined tar, and had no difficulty in getting the right color for the mortar for pointing and heading between the bricks. Fearing defects from this material, the mason watched the houses very carefully, and recently reported that after a lapse of several years he found the color as strong as ever.

\* \* \*

MACHINERY aggregating 20,883 horse-power, and representing a value approximately £1,300,000, was purchased by the Transvaal gold mining industry during the year ending June 30, 1907.

Exporters may be interested in knowing the kinds of machinery purchased. Among the principal acquisitions were steam winding engines valued at £74,942; steam engines and compressors, £52,734; electric generators and engines, £48,890; belt conveyors and elevators, £26,334; reduction plant, £57,979; and treatment plant, £60,405. Other items were steel headgear of unusual dimensions, mechanical excavators to clear cyanide tanks, belt conveyors, monorail transport, suction gas engines, electric hoists, tube mills, etc. The total number of boilers in use in the gold mines was 2,156, and in chemical and metallurgical works, etc., 19, or a total of 2,175. Altogether the capacity of the machinery and plant erected in Transvaal gold mines and allied concerns at the end of the official year attained the respectable figure of 314,457 horse-power, of an aggregate value of £21,242,843.

ACCORDING to a recent news item the total monthly output of cement in Japan, which was not more than 600,000 barrels two or three years ago, is believed to have increased to about 1,300,000 barrels, the producing capacity of every cement company being increased by 50 per cent. The industry was encouraged by the recent activity of water-power electric works, water works, and other engineering works. Now the import of cement is materially checked.

\* \* \*

CORTLAND DE CREW, of Buffalo, N.Y., has invented a hollow steel tie that he believes will give efficient service under all conditions on a stone, gravel or cement bed.

It is of rolled metal, cut in lengths of 8 to 8½ feet, with a six-inch rail rest, and beveled sides and flanges extending six inches into the roadbed. The interior of the tie, if so desired, can be filled with broken stone or gravel, or be laid on a cement bed. Creeping or spreading of rails is declared to be impossible, owing to the fastenings used bearing entirely on the rail. Test tracks will be built at Buffalo and on the Pennsylvania near Philadelphia.

\* \* \*

ACCORDING to H. Nishahra, an arrival at the Empress Hotel, Victoria, B.C., and one of the best known scientific authorities in Japan, the buildings throughout that country in the future will be built of brick, stone or concrete, which will enable them to withstand the shocks of recurring earth disturbances. Japan has been subject to earthquakes of a minor character for a time immemorial but has had no seismic manifestation such as laid San Francisco in waste. Heretofore, with few exceptions, all houses in the country have been constructed of fragile materials, owing to the fact that when they were wrecked or destroyed they could be replaced at very little expense.

\* \* \*

IT has been for many years a hidden secret from builders how masons hundreds and thousands of years ago managed to make mortar which practically defied the ravages of time. In the ruins of our old castles, churches, etc., one will frequently see an overhanging arch, the other side of which has been battered down, perhaps, by cannon balls years ago. This fragment seems to defy the laws of gravitation owing to the excellent binding of the mortar. It is now stated that the Hungarian chemist, Brunn, has discovered the secret of this, having compounded a liquid chemical which renders certain kinds of matter proof against the effects of time. Professor Brunn asserts that it doubles the density of nearly every kind of stone and renders it waterproof. It imparts to all metals qualities which defy oxygen and rust.

\* \* \*

REINFORCED concrete instead of steel plates for the protection of large armour ships is an experiment which will be made shortly by the Italian Government. At a meeting of naval and mechanical engineers held in Genoa recently, Signor L. d'Adda, an Italian engineer, lectured on the feasibility of this scheme, stating that reinforced concrete had been used with excellent results for land fortifications. While following the operations of the Russo-Japanese war near Port Arthur he had been impressed by the resistance offered by Japanese casemates, which were thus protected, against heavy projectiles. He said the weight of such plates would be about the same, and the space required was not more than with metal armour, while the cost would be enormously less. The Ministry of Marine has directed that this method of protection be exhaustively tried at the Muggiano. The results are being awaited with interest in Italian naval circles.

THE imports of cement into Australia in 1907 amounted to 38,919,936 pounds, imported from the following countries: Germany, 50,441,990 pounds; United Kingdom, 34,648,653 pounds; United States, 257,152 pounds; other countries, 3,572,141 pounds. The wholesale price at Sydney varies, but is at present about \$2.50 per cask of 375 pounds. The cement works in New South Wales produce about 1,000 tons per week, but they will soon be enlarged.

\* \* \*

THE method employed in erecting Egyptian obelisks has long been a source of mystery to the student of Egyptian antiquities, and the numerous documents and hieroglyphics found have so far failed to elucidate it. In Das Haus, Kruseman suggests a possible method of handling the huge blocks of stone, weighing as much as 1,000 tons, and sometimes 131 feet high and ten feet square at the base, was by placing them on pedestals considerably raised above the actual level of the soil.

Kruseman finds that these obelisks were generally placed in front of pylons or temples, and it is his opinion that the Egyptians first built a slightly inclined causeway of sand or other material equal in height at one end to the obelisk to be erected, ending at the other extreme with a strong wooden crib, and the temple for the obelisk. The base was then built and the space between the temple and the crib was about half filled with sand, and on the face of the crib a strong inclined chute was constructed, leading to the base.

The obelisk was then rolled up the incline on hard wooden rollers, and, with tackle leading to the temple, it was then allowed to tilt over the front of the crib, falling into the sand and guided by the chute. By digging away the sand slowly and carefully and hauling on the top of the obelisk it would thus be gradually sunk, until it would finally rest on its base.

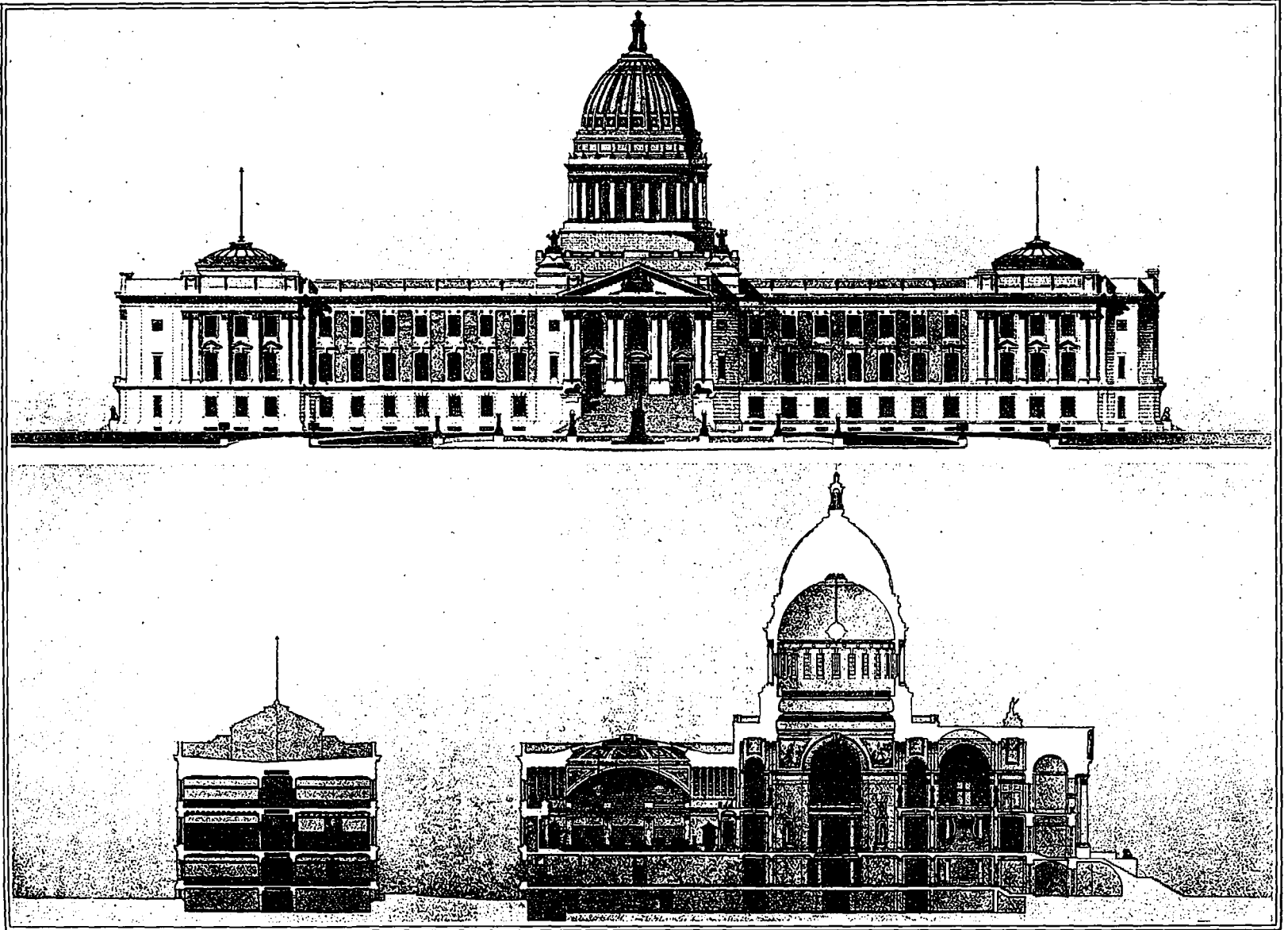
### New Brunswick Cold Storage Warehouse (Continued from page 36.)

goods are kept in a more healthy condition. This is of great advantage especially to fruit and eggs, for which the store will be principally used.

So as to provide cold storage for other kinds of goods which would have to be kept separate from the other rooms, several rooms are fitted up with expansion pipes, that is to say, pipes are placed in those rooms through which the cold ammonia vapors are passed, and by doing so, cools the air. Provisions, however, are made that the air out of these rooms can also be purified by being passed through the Linde air coolers, so that if found necessary, those rooms cooled by expansion pipes can at any time be purified, which is of great advantage.

St. John being a seaport, the plant is also equipped for the freezing and storage of fish. Special rooms have been provided for this purpose, which rooms have been entirely separated from the other rooms in the cold store so that no odor of any kind can pass through the general store. These rooms are cooled also by means of expansion pipes but of a special design, in such a way that the cooling pipes themselves form shelves on which the fish (previously packed on trays) are placed and frozen at very low temperatures. After they are frozen, the fish are taken out of these freezing rooms and glazed, that is, covered with a thin layer of ice, after which they are placed in a separate store where they are kept for shipment.

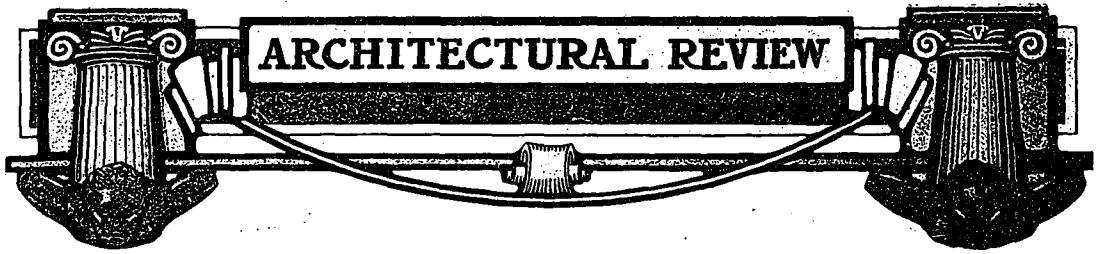
All the refrigerating machinery and equipment in the entire plant was supplied and installed by the Linde British Refrigeration Company, Limited, Montreal, and the insulation (which is of corkboard) throughout the building was furnished and applied by the Armstrong Cork Company, Coristine Building, Montreal.



01

**Front Elevation and Sectional Elevations, Competitive Design, Proposed Legislative and Executive Building, Regina, Sask. Storey and Von Edmond, Architects.**  
Construction, April, 1908





# Western Design in Regina Competition

Description and Illustrations of the English Classic Design Submitted by Messrs. Storey and Von Egmond of Regina, Which is Demonstrative of the Better Class of Work Now Being Executed by Western Designers

**T**HAT the competition for the proposed Saskatchewan Parliament Buildings exerted a strong influence in exhorting the invited architects to an especial effort is evinced in the highly creditable design submitted by Messrs. Storey & Von Egmond, of Regina, and while it was not awarded first place the designers have every reason to be proud of their admirable conception of a stately and dignified Legislative Building, in which every consideration has been given to the arrangement and convenience of the various departments of government.

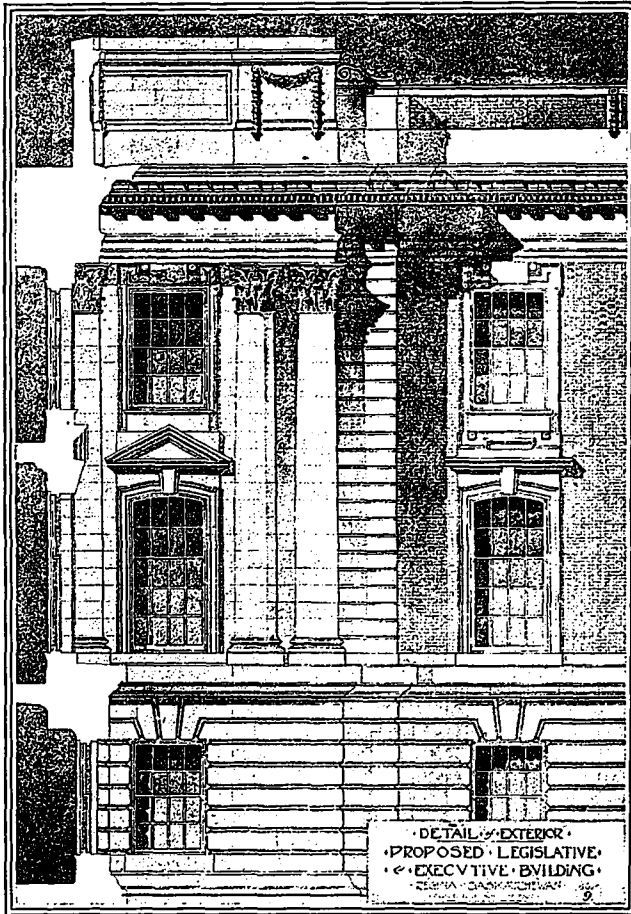
The design is particularly interesting as a purely Western production and is representative of the higher class of work now being ably executed by Western designers. The West has every reason to be proud of the work of Storey & Von Egmond, which demonstrates quite plainly that ere long the West will no more look to the East for designers of their masterpieces in architecture.

It was Messrs. Storey & Von Egmond's aim to select a style that would truthfully denote the purpose of the building and at the same time be in keeping with the broad and simple lines of its surroundings. While due consideration has been given to the precedents of Gothic at Ottawa and Westminster it was concluded that an adaptation of the Free English Classic, which is coming to be generally accepted by eminent English architects for municipal and public buildings, would better give that character of Imperialism and refinement necessary to a proper solution of the problem.

In designing the proposed building the architects have shown an endeavor to adhere strictly to the conditions of the programme and to create a design that would primarily be practical for the convenient and efficient working of all departments of government and also have distinctive and appropriate architectural beauty.

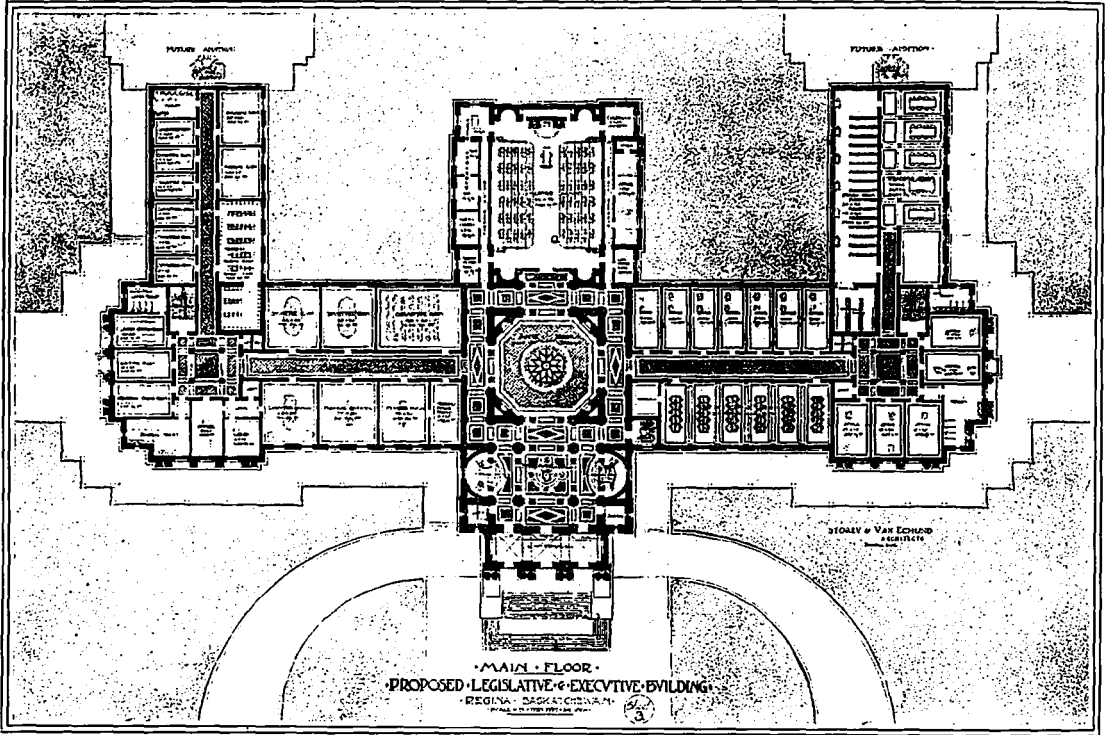
Economy in arrangement and construction has received careful consideration to ensure the building coming within the limited appropriation and in no case has good arrangement, construction, light or air been sacrificed to secure an artificial effect.

**ARRANGEMENT.**  
**ADMINISTRATION OFFICES:**—The Administration Offices have been confined to the ground and upper floors. Each department has been planned in a particular portion of the building and in every case on the same floor, while the various departments are conveniently arranged to facilitate the necessary intercourse between them. The suggested space allotment has been closely followed while economy has been carefully considered and no office has been made smaller except where considered advisable. The unit system has been adopted throughout.

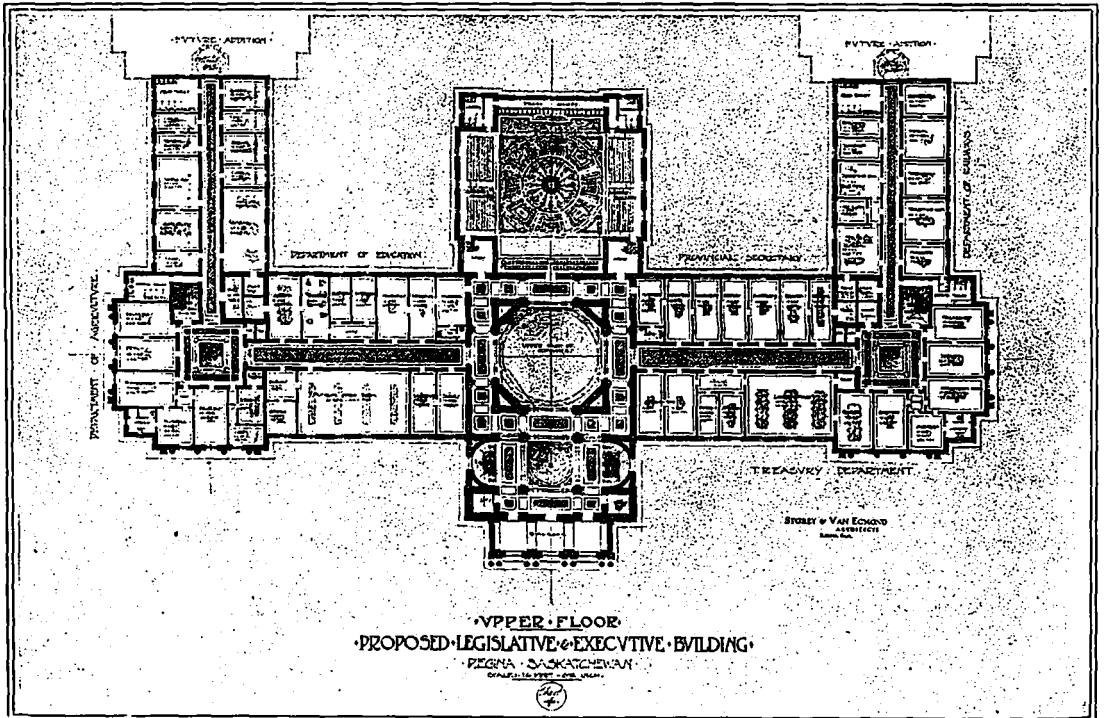


DETAIL OF EXTERIOR. COMPETITIVE DESIGN FOR THE PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING AT REGINA, SASK. STOREY & VON EGMOND, ARCHITECTS.

**MAIN FLOOR:**—In the central portion of main floor an im-



MAIN FLOOR PLAN, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK. STOREY & VAN EGMOND, ARCHITECTS.



UPPER FLOOR PLAN, COMPETITIVE DESIGN, PROPOSED LEGISLATIVE AND EXECUTIVE BUILDING, REGINA, SASK. STOREY & VAN EGMOND, ARCHITECTS.

pressive monumental effect has been sought by the simplicity of well proportioned, massive piers and arches. The Legislative Chamber has been centrally placed with the necessary offices in close proximity. The rotunda has been utilized for the ante-room, with corridors around same to give access to the other portions of building. One side of the building has been entirely devoted to the library and counterbalanced on the other side by the Governor's room, Premier's room, Executive Council, Committee rooms, etc. The arrangement has been carefully considered throughout, and all rooms are of sufficient size that no future extension will be necessary to admit of the entire future addition being utilized for administration offices. Stock room placed so that part of future addition may be used for its extension if necessary.

**BASEMENT:**—In the basement are placed restaurants, news fyles, patents, and the necessary storage rooms for all departments. Direct stairs from committee rooms to restaurant and from library to news fyles are provided. The printing department has been allocated in the basement to eliminate the objection to the noise and odor pertaining thereto.

**STAIRWAYS, ELEVATORS, ETC.:**—Three stairways and three elevators, centrally and conveniently situated have been provided, all enclosed in fire walls except main staircase which connects main and upper floor only. Ponderous grand staircases necessitating a great amount of space have been purposely avoided as the main entrance leads directly to main floor thus reducing the intercourse between this floor and the others to a minimum. Additional stairways have been suggested by dotted lines to make direct connection between the secondary floors with merely doors to main floor for emergency use only. The necessary communication between floors would largely govern the acceptance of these stairs and they have been left at the option of the promoters.

**LAVATORIES, ETC.:**—Each office floor has been provided with four lavatories conveniently arranged for access from all departments and privacy well considered. Public lavatories for both sexes have been provided on main floor and also sufficient lavatory accommodation adjoining library and committee rooms for members. Private lavatories are provided as specified.

Cloak rooms have been provided for both sexes adjoining public waiting room on main floor and also near entrances for administration offices. Members' cloak room with necessary lockers also provided.

Vaults have been placed in connection with all offices specified in programme for such accommodation, and also additional storage vaults in basement.

**CONSTRUCTION.**

The drawings denote brick and stone for walls as requested and steel concrete construction is proposed as especially adapted to the requirements and existing conditions. Economy and climatic conditions have been considered in the adoption of inverted roofs and economy also suggests the use of copper for the dome. Flues have been provided both horizontally and vertically for the distribution of ventilation ducts, pipes, wires, etc.

**GROUNDS.**

The present arrangement of grounds has been accepted while additional driveways and walks have been shown in close proximity to building to provide convenient access to all parts and allow of future extension without interfering with general scheme.

**EXTENSION.**

Future extension has been carefully considered as shown on plans. These extensions would be especially adapted to be entirely devoted to administration offices and as their rapid growth is anticipated it is so arranged that the side facades will only be complete when extensions are carried out. Subsequently, if necessary the scheme would lend itself admirably to further extension

by the joining of the two wings and the formation of closed courts.

**COST.**

Compactness, economy in construction and the absence of undue ornamentation would tend to insure the erection of the building within the appropriation. Appended is a guaranteed statement of cubic contents and estimated cost.

Central portion above ground floor, including assembly, ante-room, entrance hall and dome, 992,000 cubic feet at 42 cents	\$ 416,640.00
Balance of building, 2,673,000 cubic feet at 27 cents	721,710.00
Heating and ventilation, 3,665,000 cubic feet at 33 cents	109,950.00
Additional	1,700.00

Total ... .. \$1,250,000.00

Or an average cost of approximately 34 cents per cubic foot for the entire building inclusive of heating and ventilation.

In conclusion, it must be added that, in the limited time available, the architects have endeavored to secure a simple and practical solution of the problem, to produce a building that will be national in character and be refined and impressive without lavishness or excessive elaboration.

**The New Campanile**

THE new Campanile of St. Mark, Venice, now rises fifty-four feet above the piazza. As the work progresses a curious covered platform rises with it. Owing to the slowness of the work, it is impossible to estimate with any exactness the date of completion.

The old Campanile fell July 14, 1902. In the following spring, April 25, 1903, the cornerstone of the new structure was laid, and the regular work of laying the foundation was then begun.

In order to render the basic structure homogeneous, the engineers proceeded to enlarge the old foundations by the original method of piles, platform, clamped stones, and stones arranged stepwise up to the level of the piazza. A ditch about sixteen feet deep was dug all around the old foundations to the width of about twelve feet and carefully bratticed, and 3,076 piles of larchwood, fresh cut so as to insure the presence of abundant resin were driven.

The piles, eight and one-quarter inches in diameter, averaging thirteen feet long, were driven until they yielded only one millimeter to each blow from a weight of 570 pounds raised four feet six inches. They are calculated to have a carrying power of 90,000 tons. The weight of the tower they are to support is estimated at 20,000 tons, allowing for hollow space.

The pile driving was completed on October 8, 1904, the total enlargement of the foundation being 240 square meters. Then came an attack upon the old foundations, consisting of a cut made eight feet deep all around, so that the new platform could be knitted to the old. Then on the top of the new platform massive blocks of Istrian stone, cut in parallel-piped, were carefully cemented together. These Istrian stones, noted for their fine grain, are in eleven courses, and enter the old foundations to the depth of six feet six inches, the largest blocks being nine feet seven inches in length and four feet seven

MR. DEGUID, the British expert employed by the Dominion Government for the building of ice-breakers, has made a number of trips between Georgetown and Pictou on the winter steamers Minto and Stanley to observe the ice conditions. Mr. Deguid is completing his designs for a new ice-breaking steamer which will be used for keeping communication open between the island and the mainland.

# State Aid to Art Education in Canada

By PERCY E. NOBBS, M.A., A.R.I.B.A.

## The Necessity of Government Grants for the Institution of Travelling Scholarships and Museums With a View of Developing an Architecture Based on Distinctive National Traditions

THE relation of art to the modern state is a matter now claiming wide attention in Europe and the United States, but as far as this country is concerned it is still virgin ground, and what has been done elsewhere should be carefully studied, for public activities along these lines have not always been crowned with aesthetic or commercial success.

In any attempt to appraise what can and what cannot be regarded as legitimate enterprise on the part of a government for the advancement of art, it is necessary to begin by settling a definite position on the question of what is the function of art. Before going further, it must be understood that any general theories here propounded with regard to "art" are to be taken as broadly embracing literature, music, the plastic and the industrial arts. The recommendations herein contained are, however, restricted to the arts of architecture, sculpture and painting, and it is more particularly in the interests of architecture, in a broad sense, as including design for those industrial arts on which dignity in public and private life, and national prosperity, so greatly depend, that these remarks are made.

### THE FUNCTION OF ART IN GENERAL.

For present purposes, art as a human activity may be defined as *the use of beauty for purposes of expression and not the production of beauty.*

The intimate relation of beauty with pleasure is at the root of a widely spread misconception with regard to the function of art. While admitting that aesthetics and hedonics are closely allied, we hold mostly strongly that the function of art is expression, and not the production of pleasure, this being incidental to the fact that beauty is the instrument of art. Expression is, of course, a very personal thing in general, but the arts are not all equally personal in their subject matter.

### THE FUNCTION OF ARCHITECTURE AND DESIGN.

Architecture and design differ from the sister arts chiefly in this, that their province is less personal and more general. The phenomena of architectural evolution ("The styles," as the popular phrase expresses it), can best be explained by the ethnographic theory which regards architecture as history writ large: as "the expression of the age in which it was generated." If national expression, then, is the function of design, it is surely reasonable to take such precautions as are within our power to see to it that this expression shall ring true.

### ART EDUCATION A STATE QUESTION.

The question whether or no scholarships and museums (vital necessities as they certainly are for the improvement of the industrial arts and public taste), should be regarded as matters for Dominion or Provincial action, is susceptible of some argument on both sides.

For the view that the Central Government is concerned, it may be urged:

(1) That the Provincial Legislatures are not likely to be as farseeing as the Central Government in a matter of this kind, and that as architecture is always at its best when national in spirit, rather than personal, Canadian architecture as such requires a certain centralization of inspiration.

(2) That the fusion of our people's tastes and ideals in mere matters of form would be a potent factor for

national strength. This has a bearing on the question of U. S. influence in all the appurtenances of daily life in Canada, from tall buildings to personal attire. The education of our people towards a homogeneous and distinctive taste in national architecture and design, based on our distinctive national traditions and ameliorated to and rationalized by the conditions of our climate, our materials and our life, is surely a national, rather than a provincial matter.

(3) That the commercial prosperity of a country in such lean years as must come sooner or later, depends on skilled labor. An unskilled population must die off when war, famine, pestilence or financial distress supervene. Skilled labor and intelligent taste are national assets, quite comparable with the cruder elements of material wealth in cornlands and forests, with which Canada is naturally endowed.

(4) That, were museums established, civic and provincial grants, and private donations, should all be combined with state aid; but without an offer of state aid, it is difficult to see how these various interests are to be stimulated to common action along useful lines. The need of a museum, both in Montreal and in Toronto, is immediate and imperative. In other cities, museums will be necessary ten, twenty, or fifty years hence. Should the State offer sums, to be equalled by provincial and municipal grants, the burden will be fairly distributed in accordance with the benefits to be derived.

### DESIGN THE MOST DEMOCRATIC OF THE ARTS.

In architecture, the work of many hands is associated with the artist, and his media of expression are the building traditions of the people, not the touch of a brush or chisel. The existence of public taste and a general homogeneity of ideals are vital to the appreciation of architectural expression. There is this about architecture, that it is the most democratic of the arts. Especially is this so when viewed broadly, as embracing the arts of design, for the industrial arts, on which the amenity and the prosperity of the people depends, pervade the whole sentiment of modern life. The aesthetic goodness or badness of an object, moreover (cost of production apart), is a factor in the intrinsic value of everything the individual or the nation owns.

Pictorial art and sculpture, except for the decoration of public buildings and places are no very intimate affairs of the state. *The encouragement of the formation of collections and the foundation of travelling scholarships to enable young men of genius to study at home and abroad, are all that is necessary under this head.* The rare individual genius should have his chance, but the multiplication of canvasses and statues is of little moment to the nation at large. The matter is very different where architecture and industrial art are concerned.

### THE EFFECTIVE LINE OF STATE AID TO ART.

The question of what a state can do for art, without injury to the freshness and spontaneity of this most evanescent of human activities can be studied only in the light of the past.

### THE EXAMPLE OF FRANCE.

When Colbert organized the art instruction of France with ruthless skill, just as he organized the customs and the manufactures, he welded a double-edged weapon. When, however, as an adjunct to his schemes, he institu-

ted a system of travelling scholarships, and housed the royal collections in suitable museums and libraries, he endowed a public benefit for his country of incalculable moral, political and material value. His royal schools and shops for the industrial arts cannot be regarded as wholly for the good of art. The expenditure they involved, avowedly for the glorification of the head of the state, went far to bankrupt the country, but the ultimate improvement of French industry for which he is held responsible, is undoubted, and if to-day France still occupies a proud and prosperous place among the nations as being the chief manufacturer of all those things in which fine workmanship and good taste are essentials, it is thanks to the wise statesmanship of Colbert.

From the foregoing it would appear that state aid to art education should be restricted under the heads of scholarships and museums. Commissions on civic improvements schemes (which merge with social amelioration) and on public building schemes, may also do much good.

It is, we are firmly convinced, no part of a government's business to institute or countenance art teaching. Wherever this has been done, there has been a loss of spontaneity, of individualism, of life. And the resultant productions may be called by many names, but art is not among them.

The stimulation by direct teaching of art—that subtle activity which can make a dollar's worth of crude matter worth a king's ransom in the twinkling of an eye—is a matter far too delicate for a government to attempt with success. Schools of painting and design are best left to take care of themselves.

Indirect state aid to art education, through the institution of travelling scholarships and the endowment of museums is quite another matter. Here the state can intervene without any risk to the blossoms of art, and with calculated certainty of success.

#### *ARCHITECTURE OF THE U. S. A.*

It is remarkable to note the history of taste in the United States, as unfolded in architecture.

The Georgian or colonial tradition was broken at the rebellion; and between that upheaval and the Civil War, France was looked to as a model in all matters of art and taste. The extraordinary prosperity of the North after the Civil War was not characterized by any artistic achievement such as has marked the development period of other nations. In protest against British ideals, and partly on account of the influx of a cosmopolitan population, Paris has, during the last thirty years, become the Mecca of the vast majority of American students of art and design. The result is that to-day the academic spirit of the Ecole des Beaux Arts, which is now largely discounted throughout Europe, and even in France itself, reigns all but supreme in the United States. There is a rival school, small in numbers, but comprising some of the very ablest American architects, which is frankly opposed to the Beaux Arts ideals, and, one might say, militantly English in its tendencies. The U. S. Government has given some countenance to this school at West Point and elsewhere, but the architecture of the United States will be, for generations to come academic as an expression of cosmopolitanism and in repudiation of English ideals.

#### *THE BEAUX ARTS SOCIETY.*

For the furtherance of this academic teaching, an efficient organization exists in the Beaux Arts Society of New York. This association of architects, trained in Paris, was originally instituted for inculcating the principles of academic design to those students who could not afford college courses in architecture. Their success was phenomenal, and the university departments of architecture have with one or two exceptions, handed over the guidance of their designing classes to this organization.

Thus the Beaux Arts Society has practically become a national institution in the United States.

We have, while on the most friendly terms with the organizers of the movements, strenuously opposed the spread of their influence in Canada, on the ground that our history and tradition is different from that of the United States and should be expressed in our architecture, which has no logical relation with the academic school of Paris. For this school repudiates mediævalism, both French and English, as having no contribution of tradition to offer to our modern architecture, and particularly ignores the building achievement of England as a negligible quantity.

The weak point about the academic system of architecture is its inelastic quality. Within the Union there is every conceivable climate, and the profusely illustrated American building papers show us the identical architectural formulae applied throughout the States. This is carrying the principle of national homogeneity in architectural expression to a *reductio ad absurdum*, but the point of interest to us is not that academic bondage prevails among the architects of the United States, but that we are, of necessity, very liable to infection with those ideals and that a tremendous organization exists in the Beaux Arts Society, which is ready and willing to affiliate Canadian architectural societies and schools, and is likely to do so simply because there is no Canadian machinery of art education to take its place; and this is where the glorious traditions of English and French mediæval and renaissance architecture are our natural and rightful heritage, just as truly as our traditions in the matter of literature and language!

The political aspect of the "Americanization" of our arts, where they might just as well be based on National and Imperial tradition is, we venture to think, one which need only be pointed out to be appreciated by those at the helm of State.

There is much that we might copy from the organization and methods of the Beaux Arts Society of New York, in connection with a scheme of travelling scholarships. We would not recommend, however, that the scholarships should exist for the sole purpose of sending our students to Paris to go through the Ecole des Beaux Arts, nor that the competitive work for the awards should be guided on too strictly academic lines.

#### *NATIONALISM.*

The academic system of art education, initiated by Colbert for the glorification of Louis XIV., and incidentally for the lasting benefit of French industry, came in time to be accepted by all those European countries which adopted the French bureaucratic system as a model for their government as the outward symbol of this capitulation. This acceptance by Europe of French ideals was enforced all too completely by Napoleon, but since that day, modeling their governmental systems more and more upon the English parliamentary principles, nationalism has become again the mainspring of European progress. This is being expressed to-day in an artistic revolt against the academic in design. In 1800 all European architecture was achieved in imitation of the French style. To-day national traditions again have their share in the expression of public and private life in stone and brick.

Great architecture, among its many other functions has expressed national aspirations from time immemorial, and the national aspirations of Canada are surely not the imitation, root and branch, of the United States polity. If the national and democratic arts of architecture and design are to be allowed to degenerate into third-hand imitations of Parisian academic models, they will not ring true. If saved in time, they will help, as all true expressions tend to help our Imperial aspirations.

THE APPRECIATION OF ENGLISH ARCHITECTURE.

It is noteworthy that the appreciation of English architecture, both ancient and modern, as worthy a vil-  
limage, is growing, among German students at least, where an enlightened government has done more for the study of English architecture than our home government has ever attempted.

This lamentable apathy on the part of the English where their own art is concerned, is unfortunately characteristic also of the various Dominions of the Empire, where, cut off from the traditions of the past crystallized in the building remains of ten centuries, with inferior artizanship and crude popular taste, the arts that dignify public and private life get little encouragement.

The all-pervading cult of the modern Academic School of Design thus gains its opportunities for the fatuous expression of cosmopolitanism.

THE GREAT PERIODS OF ENGLISH ARCHITECTURE.

The student of English architecture from the tenth to the twentieth century, soon comes to realize that there were in that period two culminating points, the dates of which may be placed at 1370 and 1670 respectively. The former was the point in time corresponding to the summit of Gothic art, while the latter date may be taken as the climax of our renaissance tradition. During the nineteenth century, a century distinguished chiefly by a want of "aesthetic conviction," the gothic revival and the consequent battle of the styles which went through many phases, resulted ultimately in the belated appreciation of English architectural tradition as affording a sound basis for our modern aesthetic expression in design by a small but advanced school of designers.

The British Government has systematically, and we believe unwisely, scorned the political use of art, while France and the countries which have borrowed their bureaucratic systems from her, have ever been alive to the political and commercial advantages accruing from the encouragement of the arts, and conscious of the significance of their national monuments.

Thus the museums of France have grown rich chiefly with works of French origin, while in Italy, Germany and Russia, etc., national masterpieces have been collected and treasured with excellent results as far as the education of designers and craftsmen is concerned.

SOUTH KENSINGTON MUSEUM.

When at length the South Kensington Museum, together with the department of science and art, was instituted, two grave mistakes appear to have been made. Art education, instead of busying itself with design, was narrowed down to the perfunctory purposes of a drawing school system, (and a bad one at that), while the metropolitan and provincial museums were filled with Italian works, of no possible bearing on English design, or interest to any save the globe-trotting dilettanti.

MUSEUM POLICY.

If museums in Canada are to be really educational, they must necessarily contain the art of the Greek and the Roman, the Celtic and the Norman, of the French and the Italian periods, but let them also, to be truly representative, give a place to English art, and let that place be a place of at least equal honor with the rest.

The proposed collection here should, instead of taking on the somewhat narrow and nationalistic character of those in France and Italy, be planned to embrace the best that Europe has to give, and in so doing, the claims of English art should not be ignored, as has been usual in the past elsewhere, when collections have been got together. In the South Kensington Museum, and other official British collections, for instance, with characteristic British modesty and want of forethought, English art

is almost entirely ignored, while the early Italian renaissance has been lavishly over-represented. Thus the average English student of design, is apt to grow up in ignorance of the masterpieces of English design and to despise his national aesthetic traditions. He is thus encouraged to look to exotic styles and types for his inspiration, finding English art but little appreciated on the Continent, and less still by the officials of the science and art department at home.

Foreign governments are not slow to realize how potent are the visible symbols of an historic past to a se-  
cious present. The fine collection of casts of Germanic art, chiefly mediæval, recently presented to Harvard by the German Emperor, and the proposed Germanic monument at the forthcoming American exhibition, shows the intelligence of the Kaiser in these matters, whatever we may think of his taste as a Maecenas.

PROPOSALS WITH REGARD TO STATE AID FOR ART EDUCATION IN CANADA.

I. MUSEUMS.

Coming now to definite proposals with respect to government aid to architecture and industrial design, and the education of the public taste, we have urged the necessity for museums in such industrial centres as Montreal and Toronto, as of the very first moment.

Local schools of architecture, of industrial design, of painting and sculpture, should be associated where possible with museum schemes, and a museum of the arts, to be complete, should contain the following departments:

1. architecture; 2. handicraft; 3. sculpture; 4. painting; 5. exhibition gallery; 6. a library of art literature;

(1) A museum of architecture would necessarily consist chiefly of casts of detail and reproductions of features, together with small scale models of buildings.

Ancient, classic, mediæval, renaissance and modern architecture of all the European countries should be represented. Collections of photographs and measured drawings might well be included for purposes of reference. A survey of the fast disappearing older architecture of Quebec and the Maritime Provinces should be an integral part of the scheme.

(2) Under the heading of industrial art, the collection should contain textiles and fabrics, glass and pottery, metal work, wood carving, stained glass, and furniture of all periods. Such a collection could be made without very heavy expenditure.

(3) Sculpture galleries should contain examples of Chassic, Mediæval, Renaissance and Modern sculpture, and as casts are now obtainable of all celebrated works *except English*, at extremely moderate prices, the main consideration in this department is simply the question of floor space.

(4) With regard to paintings, prints and photographs of representative works are easily obtainable, and till such time as wealthy benefactors learn to leave their pictures to the proposed museums, would serve the purpose well enough.

(5) Exhibition galleries for current works of art should form an essential part of any museum building. It is very salutary to place the old and new in close relation.

(6) Libraries of the arts need not necessarily be very extensive, some 15,000 or 20,000 works being all that is required for practical study, although a central library of art for such a country as Canada should be upon a more generous scale.

As museums tend to become public treasure houses to contain gifts of works of art, it must not be supposed that the original outlay need be heavy. A sum of \$100,000, with an annual allowance for up-keep and improvement, of say \$10,000, would go a very long way, apart from actual building, to fill this great public want in such a city as Montreal, but the greatest care should be exercised in the expenditure not to fritter away public money

on mere inconsequential curios, as has often been the case.

## II. COLLEGE SCHOLARSHIPS.

Turning to the question of scholarships, there are two classes to be considered.

At the moment, there are two college departments of architecture, that at McGill University, some thirteen years in existence, and that at Laval, which was inaugurated last year; and till such time as others are endowed elsewhere, scholarships might well be instituted to assist needy students of promise to avail themselves of these. It is a well established fact that in the architectural profession, in which under modern conditions first-class draughtsmanship is a *sine qua non*, the spur of necessity is all but essential to success, the number of the well to do who embrace the profession and achieve success being very small. At the same time, the system of office training here in vogue is not calculated to form an education in design, for it is not usual here to draw up indentures with regard to service or instruction. The architect has therefore little to gain by teaching his assistant, while the assistant migrates from office to office in search of higher salary, just when it is most necessary that he should remain under one master for a period of years. The schools of architecture attached to most American universities, are an attempt to solve the difficulty, but the cost of a university education has precluded their being of use to the particular class of young designers to which they should be of most service.

Exhibitions to schools of architecture should of necessity be awarded on work in connection with school diplomas, and draughtsmanship.

## III. TRAVELLING SCHOLARSHIPS.

The travelling scholarship has been the high road to success in the architectural profession for nigh three centuries, and no amount of college work can possibly be so inspiring to young men of aptitude as the beholding with their own eyes the masterpieces of the past.

Scholarships over-restricted as to places of study, such as the famous French "Prix de Rome," and the American scholarships to the Ecole des Beaux Arts at Paris, are, to our way of thinking, somewhat narrowing and cramping. The student who has won a scholarship by competition in design or with sets of measured drawings of existing buildings, is competent to judge for himself what he should study, and only needs a free opportunity and time to con the architecture and collections of Europe. One year to be divided between France, Italy and England, would be a good basis for a general senior scholarship, while a special travelling scholarship for six months' study of English architecture would form a most attractive junior prize. The former should amount to at least \$1,200, and the latter to say \$600, half the money being paid before the student sets out and the balance on his return to Canada after exhibiting his work.

The award of such scholarships and the organization of the students' competitions for the same should be in the hands of a board of professional architects.

It would certainly pay the government to provide sufficient scholarships to fill its own offices of works with competent and educated draughtsmen and designers.

## IV. THE COMMISSIONS ON ART.

When it is borne in mind what the public commissions on art in European countries are doing for the dignity of life and the prosperity of industrial populations, it is a little disappointing to find that the recently appointed Commission on Art is simply an honorary committee of wealthy citizens for the purchase of pictures to be enshrined at Ottawa. The acquisition of good pictures, desirable as it is, is, after all, an insignificant matter in the aesthetic life of a people. Remembering that all art, and especially the arts of architecture and design must be essentially democratic when at their best, expressing the

civilization which gives such art its occasion, it is lamentable to find how inarticulate and dumb we have become as a people. Beauty of form, the instrument or artistic expression, has become a mere memory, half understood by the educated few, instead of the universal code of the race as it once was; the taste for good finish, clean execution, and rational or even substantial structure in the appurtenances of life, which was once a national characteristic, has been utterly lost.

The only distinctive note in our public taste as evinced in building, in furniture, in apparel, and in the apparatus of life generally, is a craving for the cheap simulation of United States styles, which are at best mere caricatures of the elegancies of French and English traditions.

A commission on art, but in a broader sense, is a national necessity rather than a luxury.

## CIVIC IMPROVEMENTS.

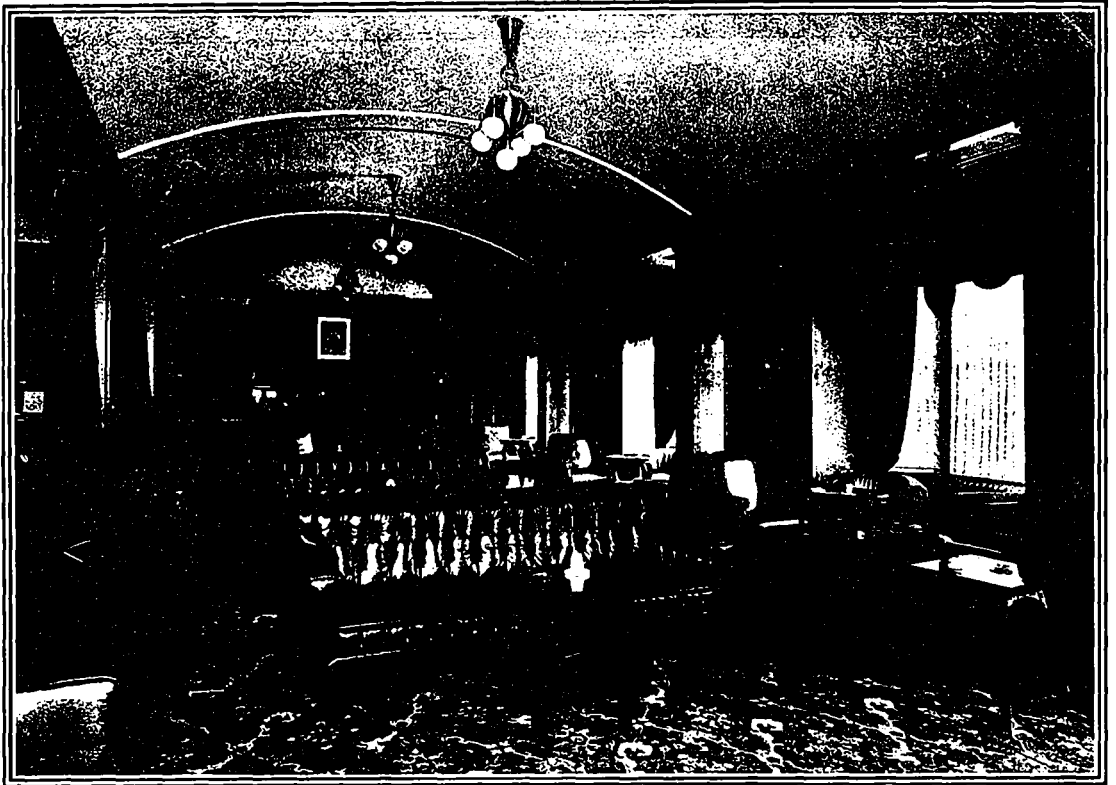
One matter apparently only of local interest, but in reality of national importance, is the question of civic improvement schemes for the older cities, and rational forethought in planning new ones.

A commission on art, which could assist local civic improvement committees with advice and information, and some small financial aid for the necessary work of giving publicity to their schemes, would be of incalculable service to millions yet unborn.

The dignity of our position strongly demands that the great cities which constitute the very gates of the country should not be left to the mercy of sordid and ignorant municipal bodies, to grow by a process of accidental agglomeration. This process, if left unguided, will cost future generations enormous sums to set right. Here we have a matter in which the example of the United States might well be followed, so far as the spirit and enterprise of their civic improvement work is concerned, though the interminable boulevards and driveways and monotonous grid-iron plans of the American cities should serve us in a measure as examples of misdirected zeal.

## Pompeian Temples

AN essential feature in the temples of Pompeii, as distinguished from those of Greece, is to be observed in the podium, or basement, on which they were elevated. In the religious edifices of an early age no such character appears. They were placed upon two or three steps only, if steps they should be termed, when evidently not proportioned for convenience of access to the interior, but calculated rather with a view to the general effect of the whole structure. By thus raising the floor to a level with or above the eye, the whole order, from the stylobate, or continuous platform on which the columns rest, to the roof was brought at once into view. The steps, Vitruvius says, should be of an odd number, that the right foot, being planted on the first step, may also first be placed on the pavement of the temple. To enter with the left foot foremost was considered unlucky. With regard to the proportions of the interior within the porticoes, the breadth is directed to be half the length, and the cell to be a fourth part more in length than in breadth, says a writer in an English exchange. The building is directed to stand east and west like our churches, and the statue of the presiding deity to be elevated above the altar, that the suppliants and priests might decently look up to the object of their worship. Thus an hypothetical temple would present a most splendid scene, the worshippers addressing their vows, the image apparently rising to behold them, and the building itself boldly projected on the eastern sky. It will be recollected that these are merely the rules laid down by Vitruvius. It does not follow that they were always observed.



SMOKING ROOM, NATIONAL CLUB BUILDING, TORONTO, A FEATURE OF WHICH IS THE BAY WINDOWS PROVIDING INVITING NOOKS WHICH OVERLOOK BAY STREET. MR. S. G. CURRY AND MESSRS. SPROATT AND ROLPH, ARCHITECTS.



MAIN DINING ROOM, NATIONAL CLUB, TORONTO, SHOWING THE TRIPPLICATE WINDOWS CONTAINING THE COAT OF ARMS OF THE NINE PROVINCES AND THE SPACE ABOVE THE WALL CORNICHE ADORNED BY THE PORTRAITS OF NOTABLE CANADIANS. MR. S. G. CURRY AND MESSRS. SPROATT AND ROLPH, ARCHITECTS.



# Toronto's Ideal Club Building

New Home of National Club, Toronto, a Good Characterization of Georgian Architecture.  
Interior Home-Like in its Appointment. Arrangement and Decorations of the  
Various Rooms Present an Interesting Study

HERE is perhaps no structure in modern day building that affords a more interesting study in design and general arrangement than the Club House of our metropolitan cities. In designing a building of this character, the architect is confronted with an interesting but difficult problem, the solution of which requires an intimate knowledge of club life. Many things have to be taken into consideration and each one has to be worked out in a careful and thorough manner. The facade alone is a most important feature, as in its broad outlines it should denote the character of the life within. The entrance must be inviting in aspect, reflecting the character of the interior, and yet be suggestive of privacy.

As a Club building is the down-town abode of the member, it should consequently be similar in arrangement in most respects to their actual homes, and embody all the conveniences and comforts of domestic art. The majority of rooms should be home-like in appearance, but of necessity in this class of buildings a number of rooms must be more or less public in character to meet the demands of social intercourse. Large dining and billiard rooms are essential where the membership is comparatively large, and the whole plan should be laid out so as to render easy access to all parts of the building.

An appropriate exemplification of the typical club building of to-day is the new home of the National Club, Toronto, of which a number of half-tones and floor-plans are herewith reproduced. Toronto is to be congratulated on the possession of this admirable structure, which can be regarded as a good characterization of the Georgian style of architecture.

In designing the National Club Building the architects have produced a structure that is symmetrical in outline, complete in arrangement and perfect in detail. The general simplicity of its lines is relieved by the stone columns supporting the heavy cornice over the first floor and the four bays which extend above it to the wrought iron balcony of the fourth floor. The side walls, up to the third floor, project to the lot line, giving the building a recessed effect which suggests privacy. A striking, yet pleasing contrast is afforded by the stone work of limestone and the background of red bricks laid in Flemish

bond with white mortar joints. The small panes of the upper sashes of the windows add attractively to the general scheme of the facade and produces an agreeable light and shade effect in the interior. An artistically wrought iron fence extends from the columns of the entrances to the side walls, enclosing the space from the sidewalk to the building itself.

The building may be considered as consisting of three sections. The front section, four storeys in height, fronting on Bay street, contains the rooms in general use by the members; the rear section, five storeys in height, contains the service department, and the central section, connecting the front and rear sections, contains the dining and billiard rooms, the large rooms of the building. It is difficult to combine in a building small and large rooms and keep the ceilings of proper heights. However, this has been accomplished by keeping the large rooms in the centre section, placing the floors on different levels and using the main staircase to connect the different floors and sections of the building.

The building has a frontage of 60 ft. on Bay street, and a total depth of 167 ft. All the space is built upon with the exception of a light well or area on the south side, 14 ft. wide by 72 ft. long, which gives ample light to that portion of the structure opening on it.

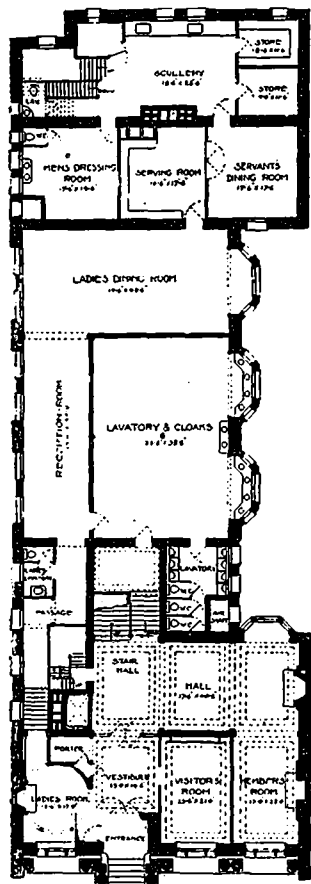
The ground floor of the front portion is seven steps above the street level, while the central portion, containing the hat and

coat room, is down eight steps below the level of the entrance floor, or one step below the sidewalk level. The dining room is thirteen steps above the entrance or ground floor level, and thirteen steps below the level of the members' club and smoking-room, on the second floor, which extends across the entire front, with four bay windows looking out on Bay street. This arrangement gives a number of very pleasing vistas of the different rooms, while at the same time connecting the floors, so that one does not notice the gradual ascent or descent from floor to floor.

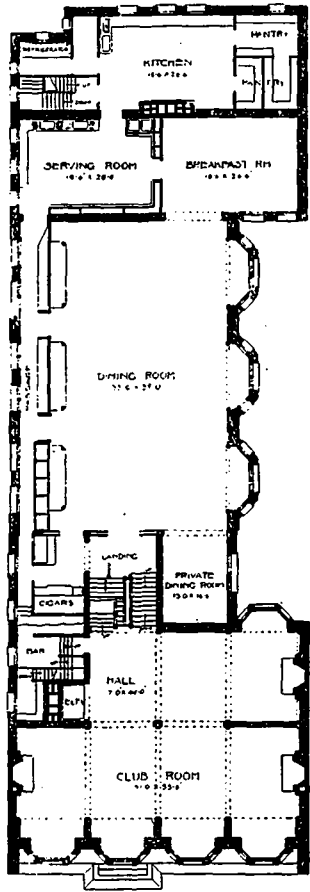
From the club or smoking-room floor there is an ascent of five steps to the level of the gallery floor, which gives access to the private dining rooms on the third floor of the service portion of the building in the rear. A rise of five steps from this level leads to the landing on



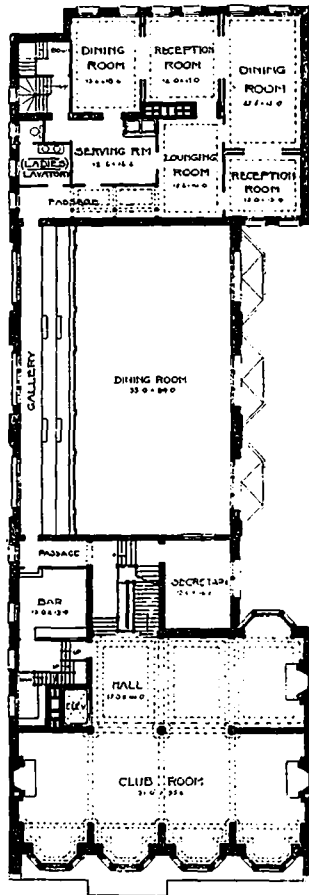
FACADE, NATIONAL CLUB BUILDING, TORONTO. MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH, ARCHITECTS.



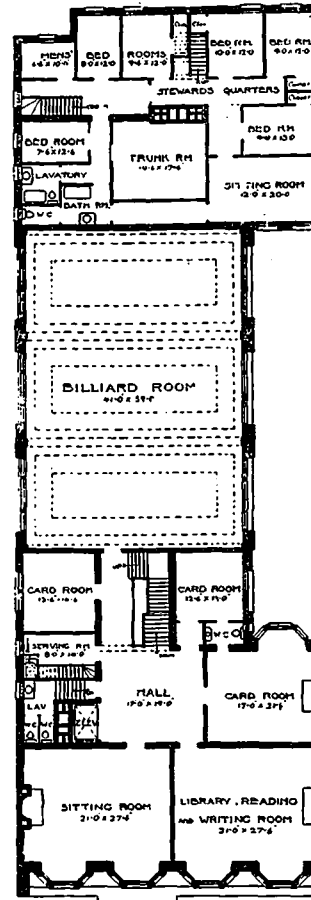
GROUND FLOOR



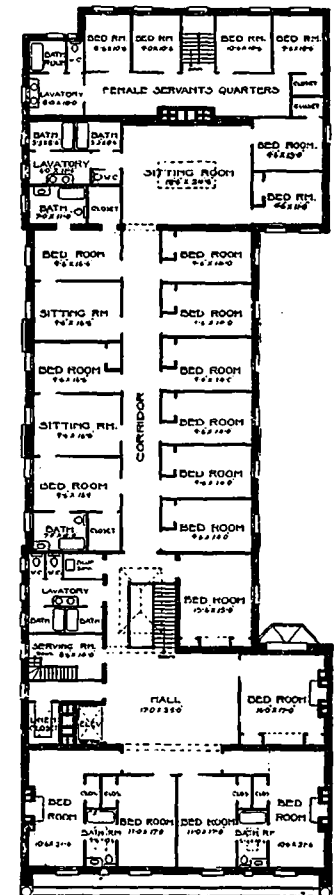
FIRST FLOOR



MEZZANINE FLOOR



SECOND FLOOR



THIRD FLOOR

Plans of the different floors showing the arrangement of the interior in which an interesting problem has been solved. National Club Building, Toronto. Mr. S. G. Curry and Messrs. Sproatt & Rolph, Architects

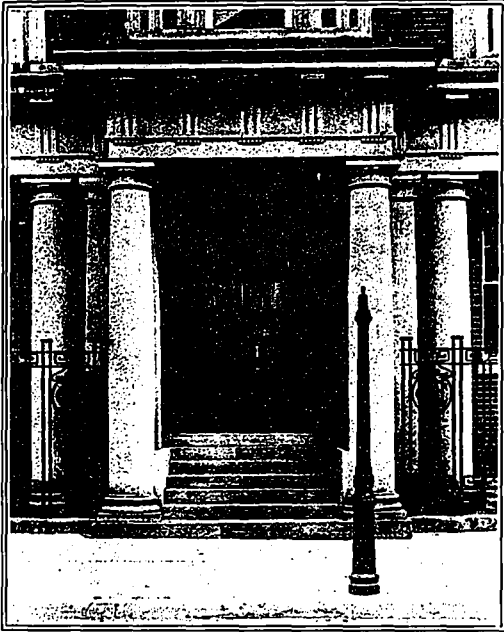
which the Secretary's room opens, and the third floor is reached by an additional seventeen steps, or a total of twenty-seven steps from floor to floor. On the second floor are the billiard, reading, silence and card rooms. A stairway of twenty-three steps connects the third floor with that of the fourth floor, which comprises twenty bed rooms for members, two large bath rooms for gen-

into the main dining room, is used as an auxiliary service pantry to the serving room. Situated on the north side, in the centre of the front section, is a service staircase connecting the service rooms, which gives access to all the floors in this part of the building. The buffet is placed on the level of the gallery floor, which is about half way between the ground and top floor. There are three small dumb waiters connecting the buffet with the service rooms on all the floors.

In order to assure ample protection, the building is equipped with outside fire escapes and balconies, and two stand pipes with hose racks have been installed on all the floors and the roof. The windows on the north or lane side are metal frames, glazed with wire glass. The windows overlooking the area are protected by water curtains. The ground or first floor throughout the building and the second floor of the kitchen wing are of reinforced concrete. No outside walls are strapped with the exception of the two top storeys, as it was thought advisable to do away with all spaces which might harbor insects or carry fire.

The building is heated by a single pipe low pressure gravity system, from one boiler placed in the front of the building, and ample storage space for coal is assigned in the basement abutting on Bay street. As it is the intention to install, at an early date, a forced system of ventilation, provisions have been made for a second boiler near the heating boiler, and a space has been arranged for fans, heating coils, etc., under the main hat and coat room. Flues have been built and registers placed in position for the conveying of fresh air to the members' portion of the building.

The plumbing, while not extravagant in the character of the fixtures, is of first class quality throughout, and all bath rooms and basins have hot and cold water connections. There is a direct connection at nine points in the building with the Bell Telephone system through a



MAIN ENTRANCE, NATIONAL CLUB BUILDING, TORONTO.  
MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH,  
ARCHITECTS.

eral use and two private bath rooms. It is not necessary, however, to use the stairways in order to get from one floor to another, as there is an automatic push button electric passenger elevator running from the ground to the top floor. The car is of metal, finished in light bronze, with a glass ventilated top and enclosed in a brick shaft. This car was installed by the Otis-Fensom Elevator Company.

The rear or service portion of the building consists of five floors or storeys, the ground or first floor being on the level of the main hat and coat room, and includes the service pantry for the ladies' dining room, the servants' dining room, the waiters' dressing room, scullery, room for stores, small laundry and cold storage. The second floor, which is on a level with the main dining room, embraces the kitchen, service pantry, steward's office, cook's pantry, storage for surplus delph, etc., and a room for refrigerators, and the next floor consists of the private dining rooms with service pantry and lavatory. The fourth floor comprises the steward's quarters, men's rooms and bathrooms for the steward and men servants. Located on the fifth or top floor are the female servants' rooms, with bathroom. Access to these rooms is gained by passing through the hall of the steward's quarters.

The service pantries on the different floors are connected by two hydraulic dumb waiters, one of which runs to the basement and the other to the steward's quarters. A hand power hoist is also provided for conveying trunks and furniture from the basement to the top floor. Running across the north side of the dining room is a service passage connecting the rear of the building with the front portion. This passage, which has two openings



LADIES' RECEPTION ROOM, NATIONAL CLUB BUILDING, TORONTO. MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH, ARCHITECTS.

switch-board and an internal or house telephone system reaching twenty points. All rooms can be lighted by either gas or electricity, as both systems have been

carried to all the pendants and brackets throughout.

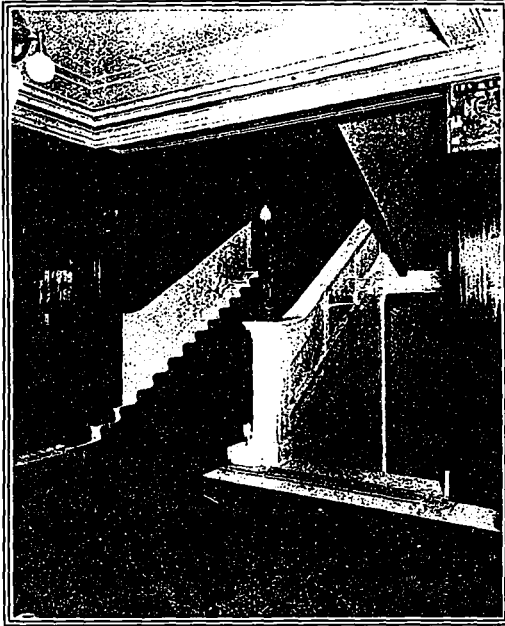
The building, while not fireproof in general character, has been thoroughly constructed with internal brick walls where possible. A large amount of steel was used in the construction, there being four large steel girders of 42 ft. span carrying the billiard room floor, and the bedroom floor above. With the exception of the

switchboard, letter racks, cupboards for parcels, etc. On passing out of the vestibule the members enter the lower club or smoking room, which has a Roman Mosaic floor and birch panelled wainscoting eight feet high. The panelling is finished in mahogany color, above which is a very rich (both in color and workmanship) hand painted frieze on a gold background. No less than forty-seven Coats of Arms of the British possessions, the British Coat of Arms, and the Canadian Coat of Arms are worked into this frieze. Two simple and dignified fireplaces lend an inviting aspect to the whole.

Across the end of this room the marble staircase leads down to the hat and coat room, which is about 40 ft. x 26 ft. and has two large bay windows. Hat and coat-rack accommodations have been fitted up for over 300 members, and ten marble and porcelain hand basins, together with ample mirrors and shelves for toilet accessories, have been provided. Off this room is a separate lavatory containing five syphon water-closets, seven urinals and a sink.

A spacious and handsome staircase of English veined marble connects the entrance floor with the main dining room, which has, on the right hand side, three large bay windows about ten feet high, with triple windows above containing the Coats of Arms of the nine provinces. The Coat of Arms of the Yukon Territory is in an opening into the Secretary's room on the end wall. On the left hand side is a panelled screen in quarter cut white oak, cutting off the service passage from the dining room.

Over the passage is a gallery which can be used on special occasions to give more seating accommodation. Off the main dining room are two smaller rooms to give additional accommodation, in event of the main dining room not being large enough. A wood band or cornice at the height of about 10 ft from the floor, runs around the room above the bay windows and across the front of the gallery. The space above this band has been specially arranged for the reception of the portraits of no-



MAIN STAIRCASE, NATIONAL CLUB BUILDING, TORONTO.  
MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH,  
ARCHITECTS.

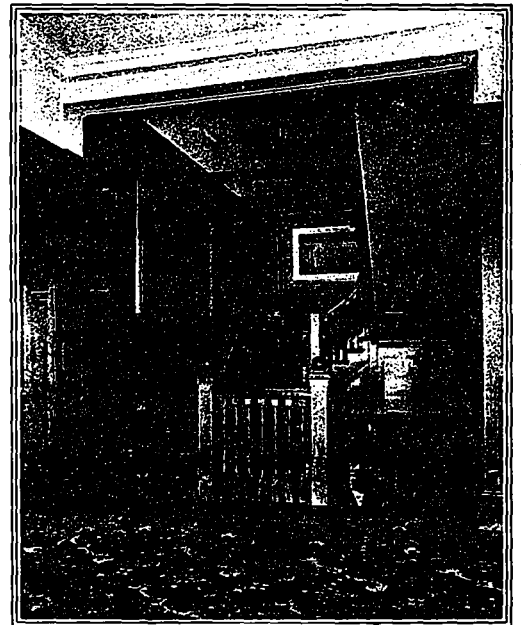
top floors, the outside walls are lined with porous brick. The ground floor of the front section is laid with Mosaic with a Terrazzo floor in the hat and coat room and lavatory.

The entrance to the building is by a large open lobby having stone steps and floor and enclosed by brick walls. The doors are double, glazed with bevelled plate glass, with bronze grills of simple design. The vestibule has a Mosaic floor with a monogram of the Club in the centre and the walls are lined with English veined marble to a height of eight feet. On the right of the vestibule is the visitors' room, which has a Roman Mosaic floor and panelled birch wainscoting to a height of five feet. The upper wall surface is finished in copper bronze tone which harmonizes with the ceiling of a light cream color.

On the left of the vestibule is the entrance to the ladies' section of the club and the hall porter's room. The ladies' rooms have an independent entrance from Bay street, through a small vestibule leading into a circular reception room, which also has a Roman Mosaic floor and is finished in white enamel and gold. The hall porter has command of this room and answers all enquiries of lady visitors.

From the reception room a corridor gives access to the rooms in the rear, which are reached by a descent of eight steps and are on the same level as the members' hat and coat room. This suite consists of a lounge or sitting room which leads into the dining room, and a cloak room located off the passage with a lavatory opening out of same. All of these rooms are very simply decorated in warm cream colors, with white enamelled woodwork and mahogany doors with hand finished brass hardware.

Returning to the entrance, the hall porter's room is off the main vestibule and contains the Bell Telephone



UPPER PORTION MAIN STAIRCASE, NATIONAL CLUB BUILDING, TORONTO. MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH, ARCHITECTS.

table Canadians, seven of which now adorn the walls. The main dining room is finished throughout with quarter cut white oak, stained a dark brown, and the walls

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

are decorated in brown and yellow, while the ceiling is finished in old ivory carefully wiped.

In leaving the dining room one passes out through the Cashier's office. The main staircase from this point

the north and south sides by three large triple windows on each side of the room. The bedroom floor contains twenty-two bedrooms, with clothes closets and ample bathroom accommodation.

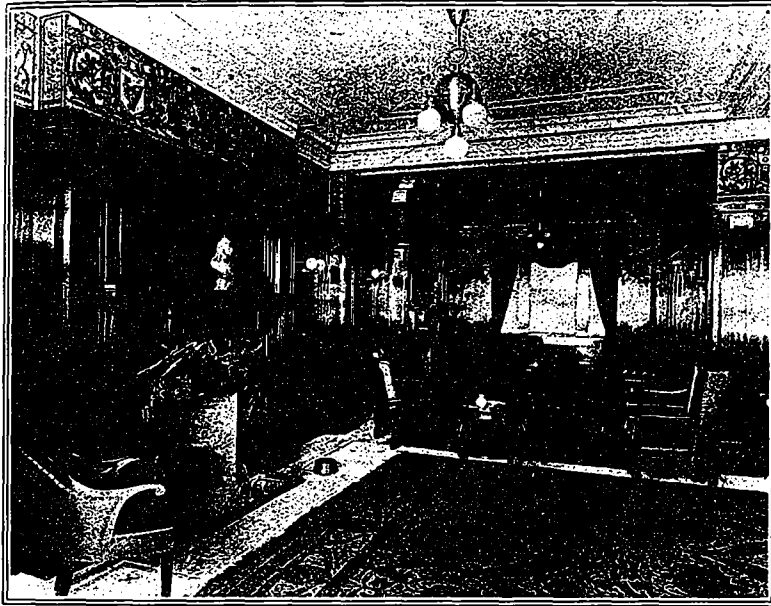
There have been a number of changes made in the plans from these as illustrated. They do not materially affect the general arrangement. An entirely separate and independent entrance to the ladies' rooms is one of the changes made.

The architects of the building were Mr. S. G. Curry and Messrs. Sproat and Rolph, Toronto.

## INTERIOR DECORATION.

The interior decorations in several of the rooms were carried out by the Thornton-Smith Company, of Toronto and London, England. To this firm is due the designing and executing of the decorations in the lounge room, private dining rooms, card rooms and library. In the lounge room, which is of generous dimensions, is to be found an interesting frieze painted on a gilded canvas ground over rich mahogany panels, the ornament taking the form of a free rendering of the oak and maple, surrounding and connecting

some twenty-five shields, bearing the arms of the principal possessions of the British Empire, in the soffit of the stairs being the complete arms in Canada. The places of honor over the two mantel-pieces are given to the quarterings of the Royal Standard. The object was to express in this room the idea embodied in the name of

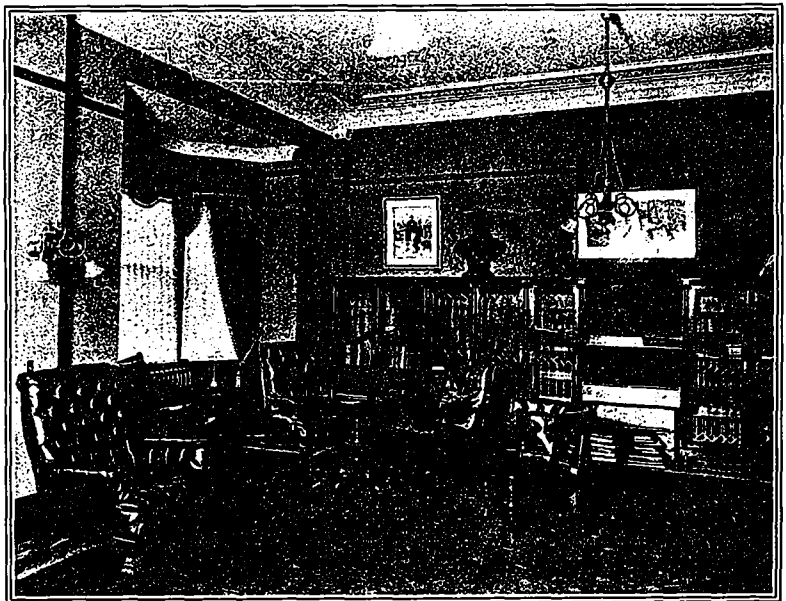


LOWER CLUB OR SMOKING ROOM, NATIONAL CLUB BUILDING, TORONTO. MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH, ARCHITECTS.

is of white oak stained, and leads up to the members' club or smoking room, which is 56 ft. long by 20 ft. wide. The street side of the room, including the four bay windows, is paneled in white oak to a height of ten feet, above which a wood cornice is carried around the room and hall off same. There are two large fireplaces in this room, one at each end, and the ceiling has a graceful curve, producing a very rich effect. Adjoining this room is the Board Room, which has a private stair to the Secretary's office.

A good view of the main dining room can be obtained from the gallery, which leads through to the private dining rooms. There is in all, in this section, four rooms finished in white oak and richly decorated. A service room and large lavatory are attached to these rooms. The private dining rooms were placed in this section of the building for convenient service and to insure that private dinner parties would not interfere with the regular routine life of the Club or of any of its members.

The stairway in the front section ascends to the third floor, where the library and the billiard and card rooms, with lavatory accommodation are located. The billiard room, containing seven tables, is also on this floor, being lighted on



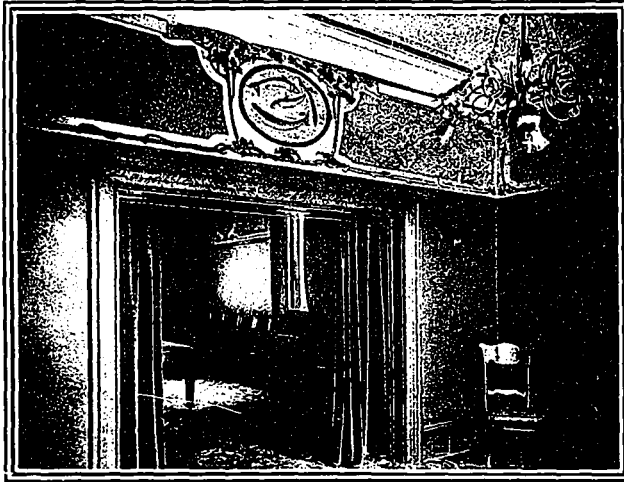
LIBRARY, NATIONAL CLUB BUILDING, TORONTO. MR. S. G. CURRY AND MESSRS. SPROAT AND ROLPH, ARCHITECTS.

the institution, "The National Club." This frieze, though sumptuously designed and scintillating with color, silver, and gold, takes its place so harmoniously in its rich surroundings as not to interfere with the feeling of ease and

panelling in harmonious colors. A very happy selection of color conception is to be found in the library.

The cost of the building was \$140,000.

The contracts for the various branches of the work were executed by the following firms: masonry, Holby Bros.; carpenter and joiner work, J. B. Scott & Co.; heating and plumbing, Bennett & Wright Co.; plastering, Hoidge & Son; marble work, Hoidge Marble Co.; electric light wiring and fixtures, W. J. McGuire & Co.; painting and glazing, Joseph McCausland & Son and Faircloth Bros.; steel work, McGregor & McIntyre; fire-proof windows, copper and galvanized iron work, A. B. Ormsby & Co.; Bell and house telephone system, Rogers Electric Co.; Mosaic floors and leaded glass, Luxfer Prism Co.; decorations, Thornton-Smith Co.



A CORNER IN ONE OF THE PRIVATE DINING ROOMS. THE WALLS ARE HUNG IN RICH LEATHER COVERINGS, ABOVE WHICH IS A FRIEZE IN OILS, A FEATURE OF WHICH IS THE MEDALLIONS SHOWING THE GAME BIRDS AND FISH OF NORTH AMERICA. NATIONAL CLUB BUILDING, TORONTO.

repose a room of this kind naturally calls for. So excellently has the conception of the artist been carried out that no one "possession" attracts undue prominence.

The private dining-rooms, four in number, are decorated in pairs. The decorative scheme in the first two of these rooms is most interesting. The walls are hung with rich green leather coverings surmounted by a frieze in oils, showing representations of fruits (blackberry and apple) surrounding medallions in which are painted, in a realistic manner the game birds and game fish of North America, the wild duck, black bass, wild turkey, partridge, prairie chicken. The red trout, with its high plumage, which is only to be found in the rutting season, is a particular feature to the followers of Sir Isaac Newton.

The other two private dining-rooms are hung with rich crimson leather above which is painted a conventional panel frieze in color gold. Around the base of this frieze is the well-known grace before meat by Burns "Some hae meat an' canna eat, an' some wad eat that want it, but we hae meat and we can eat and sae the Lord be thankit."

The private card-rooms, of which there are three have been most ingeniously treated. The small octagonal room is panelled out with a check ornament in two tones of brown on a buff wall. At the top of each panel are medallions representing morning, noon and night, by an owl, a cock, and a flight of sparrows.

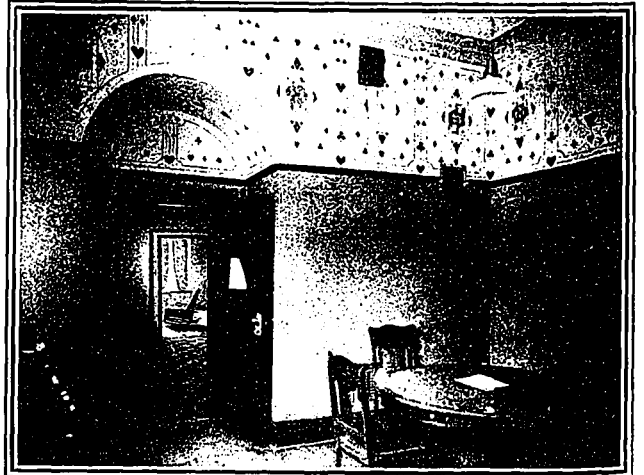
Another room has a canvassed wall painted in a soft green, the frieze having the court cards of the pack for its motif as shown in the accompanying illustration. The frequenters of this room will always be able to content themselves with the satisfaction that if their hands lack the all-important king or ace, they know where they can find it.

The third room which is of excellent proportions is canvassed and painted a soft Cerulian blue portioned off by a graceful treatment of

### Automatic Delivery of Mail in Apartment Houses

A FEATURE of some of the latest apartment houses in course of erection in the Borough of Manhattan, New York, is an electrical device for the automatic delivery of mail to occupants, which has recently been approved by the Postmaster-General. The device consists of a straight up and down well, about 18 in. square, running the height of the house and containing an elevating and lowering apparatus which takes up and down a steel tray with metal boxes. The apparatus works automatically and perpetually, making no mistakes and submitting tenants to no delays. Entering the vestibule, the postman leaves the mail in an automatic carrier, to which he carries the key. Having placed it in the proper box—there is one for each apartment—he simply closes the door, which starts into action the electric machinery. This carries the various boxes into which the mail matter has been placed up the well. The power required is slight, not greater than that necessary to operate an electric fan.

By a simple contrivance the boxes are dropped off from the carrier at the apartments where they belong, and at the same time overturned, so that the mail falls out in the locked receptacle inside the apartment. The automatic carrier keeps on going up until it reaches the top, when it descends again, picking up the boxes as it comes down.



A CORNER IN ONE OF THE THREE CARD ROOMS, WHICH HAS CANVASSED WALLS PAINTED A SOFT GREEN, THE FRIEZE HAVING THE COURT CARDS OF THE PACK FOR ITS MOTIF. NATIONAL CLUB BUILDING, TORONTO.

CORRESPONDENCE

**A**RCHITECT EDEN SMITH, of Toronto, answers letter from Mr. E. L. Horwood, of Ottawa, which appeared in the February number of CONSTRUCTION, in which he takes issue with Mr. Horwood on the question of Registration of Architects.

To the Editor of CONSTRUCTION:

That you so generously accord Mr. E. L. Horwood the Englishman's privilege of defending the society to which he belongs gives me hope that you will allow me also the Englishman's privilege of making myself heard in an attempt to prevent a few of my fellow citizens making unnecessary laws for all of us, even though the few are members of a society to which I have the honor to belong.

I do not think Mr. E. L. Horwood should be troubled about the mass of criticism. I have been reading it for twenty-five years, and I have not got enough yet. I should like to hear more from the heights where professors soar or from the depths where editors lie, why Mr. E. L. Horwood should say down to editors. I am curious to know. Is he very well acquainted with them?

Mr. Horwood asks why we fear close corporation. Because unlike the professions of medicine and law, which exist for the prevention of evils, architecture is a creative art, like literature, music and painting, and we must, to discuss it, separate it for a time from the science of building and all that relates to safe and sanitary construction, this part of it is best regulated by such by-laws as all the large towns have in their experience found necessary. That a man can pass an examination in building engineering does not make him an architect.

The art of architecture does not take a more prominent position in a nation's accomplishments than its literature. There is quite as much bad literature out forth as bad architecture, and the evil effect of bad literature is more insidious than that of inartistic building.

If it is found practical to compel all writers to pass an examination and become members of a literary society, although I think some bad writing is done by men with university degrees, then music, painting and architecture might be controlled in a like manner, but I fear such close corporations would affect badly the quality of their products, because I cannot conceive of a corporation which could frame laws that would regulate such different minds as Shakespeare's and Bernard Shaw's, Raffael's and Whistler's, Mozart's and Wagner's.

No doubt laws have helped the lawyers, they make most of them, and no doubt the profession of dentistry has, as Mr. E. L. Horwood points out, made gigantic strides since the days of the barber surgeons, but still I cannot help feeling there is something about architecture that makes it difficult to compare it with dentistry.

Perhaps I am still making unqualified or bald statements off my own bat, but Mr. Horwood should know how difficult it is to avoid doing so as even in his own letter he says one Horwood's opinion is as good as another's.

Mr. Horwood himself gives us very little help or information except when he asks in one part of his letter how are we to make the students study in the museums, and in another part of the same letter he says: "The architects of the present day have the closest kind of corporation so far as students are concerned, for they have absolute control over those whom they bring into their offices."

I quite agree with this; we have all the close corporation needed, let us get established better educational facilities.

One reason a certain elevated professor gave me for the compulsory education of architects was that the public did not know a good from a bad building. It seems a good reason, though a little hard, that because the public is sick we should be compelled to take the medicine.

Should I be relying too much on my own bat if I said that compulsion is not regarded as a factor in higher edu-

cation, or is it that architecture is not a matter of higher education?

I am, Sir,

Yours truly,

EDEN SMITH.

Toronto, March 9, 1908.

**Report of Quebec Bridge Commission**  
(Continued from page 30.)

which it was subjected. We also believe that the amount of these lattice stresses is determined by the deviation of the lines of centre of pressure from the axis of the chords and this deviation is largely affected by the conditions at the ends of the chords. We must therefore conclude that although the lower chords 9-L and 9-R anchor arm which in our judgment were the first to fail failed from weakness of laticing, the stresses that caused the failure were to some extent due to the weak end details of the chords, and to the looseness, or absence of the splice plates arising partly from the necessities of the method of erection adopted and partly from a failure to appreciate the delicacy of the joints and the care with which they should be handled and watched during erection. We conclude from the tests that owing to the weakness of the laticing the chords were dangerously weak in the body for the duty they would be called upon to do. We have no evidence to show that they would have actually failed under working conditions had they been axially loaded and not subject to transfer stresses arising from weak ends, details and loose connections. We recognize that axial loading is an ideal condition that cannot be practically attained but we do not consider that sufficient effort was in this case made to secure to a reasonable approach to this condition."

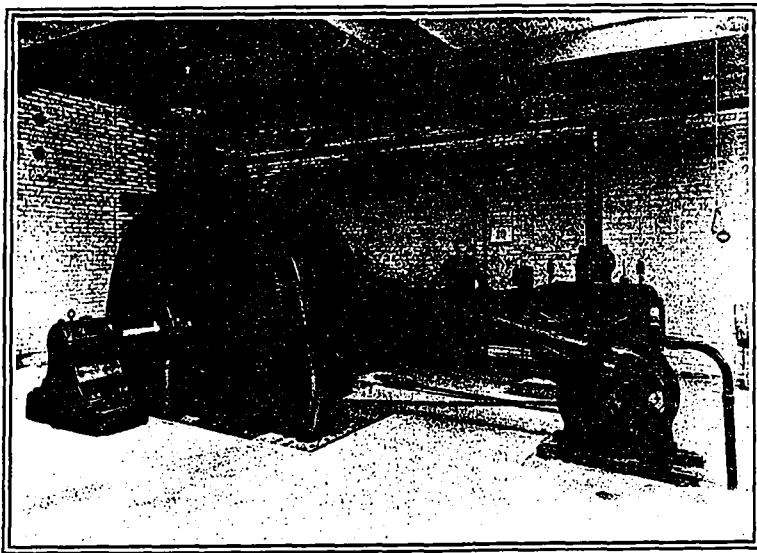
**Personnel of Quebec Bridge Commission**  
(Continued from page 32.)

over the Fraser River, for the Canadian Pacific Railway, and in 1831 the famous Niagara River Cantilever, of the Michigan Central Railroad. Other structures of this period which Mr. Schneider designed were the Marent Gully Viaduct, on the Northern Pacific Railroad, and the Stony Creek Viaduct, on the Canadian Pacific Railroad, the latter being, at the time of its construction, the highest viaduct in North America. He was also designer of the foundation of the Statue of Liberty, in New York Bay, railway bridges for Central and South America, shops for railways, and other work of a similar nature.

In 1886 he received the first prize in a competition for a bridge over the Harlem River, at New York, and in May, 1886, he entered into an agreement with the A. & P. Roberts Company of Philadelphia, owners of the Pencoyd Iron Works, to establish a bridge and construction department at their plant, which undertaking he carried out most successfully. While with this firm he had an opportunity to carry out on a large scale his ideas of scientific designing, embodied in his "General Specifications for Railroad Bridges," which was considered a highly valuable piece of technical literature.

During the existence of his agreement with this firm Mr. Schneider designed a large number of the biggest pieces of structural engineering work in the United States. In 1901, when the American Bridge Company was formed, the Pencoyd shops were its most important constituent, and Mr. Schneider was elected Vice-President in charge of engineering, a position he held until early in 1903.

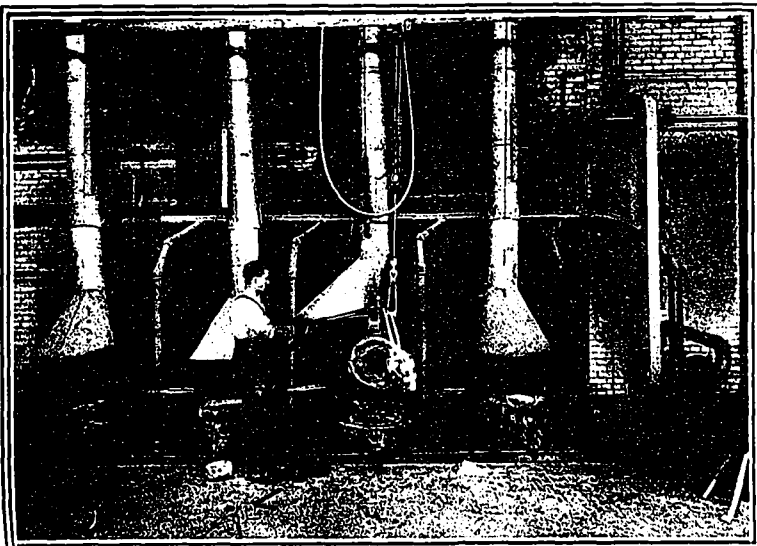
In 1882 he published in the "American Engineer" an article on the design of a 228-ft. centre bearing draw-span, with centre wedges on the pivot pier. This design, with a few modifications, has been employed ever since for many of the longer draw-bridges. In 1886 he received the Roland prize of the American Society of Civil Engineers for his paper on the Niagara Cantilever Bridge. His specifications for railway and highway bridges, and his volume of Standard Details, complete the list of his contributions to technical literature. During 1905 Mr. Schneider was President of the American Society of Civil Engineers, and is a member of the American Railway Engineering and Maintenance of Way Association, and Verein Deutscher Ingenieure in Germany, and the Engineers' Club in New York.



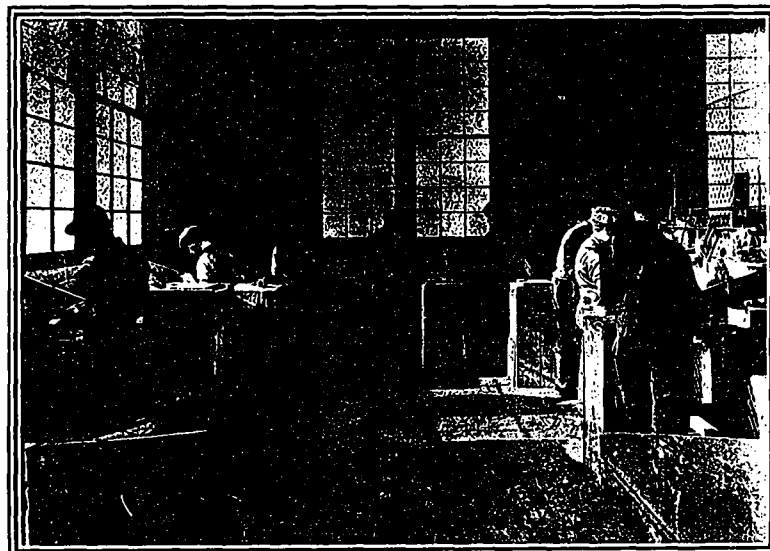
ENGINE ROOM, ABSOLUTELY FIREPROOF, EQUIPPED WITH 200 H.P. CORLISS LOW SPEED ENGINE DIRECT CONNECTED TO GENERATOR.



FOUNDRY 50 FT. X 100 FT. IT IS A BRICK AND STEEL STRUCTURE. THE FLOOR IS 4 IN. OF CONCRETE WITH 1 IN. OF SAND AND VITRIFIED BRICK ON EDGE.

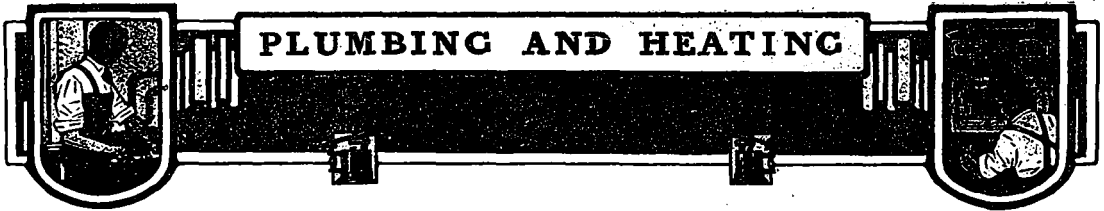


VIEW SHOWING OIL FURNACES, WHICH ARE OF THE MOST UP-TO-DATE PATTERN. THE CRUCIBLE IS BEING TAKEN FROM THE FURNACE BY AUTOMATIC COMPRESSED AIR CRANE.



SECTION OF THE CORE ROOM, WHICH IS SITUATED AT THE WEST END OF THE FOUNDRY AND IS SPLENDIDLY LIGHTED.





## PLUMBING AND HEATING

# Canada's Best Equipped Brass Plant

New Works of Somerville Limited, Toronto, One of the Finest Establishments of its Kind on American Continent.—Department Conveniently Arranged, Well Ventilated, and Provided With the Latest Sanitary Appliances

HERE is nothing that reflects the industrial expansion of Canada more fully than the numberless manufacturing plants which have sprung up in the past few years all over the Dominion. Structures of this class have not only multiplied at a very rapid rate, but the general character of their construction is far advanced over the factory buildings of a decade ago.

The most notable addition in this respect is the new brass plant of Somerville Limited, which was completed in January of this year. It is located on the west side of St. Helens ave, corner Bloor street west, Toronto, and covers a large tract of land. The land, buildings and equipment cost approximately \$200,000, and it is withal one of the finest appointed brass plants in Canada, if not on the American continent.

Owing to the splendid manner in which it is equipped, the convenient location of the various departments, the provisions that have been made for the welfare of its employees, as well as the many other important points it possesses, this factory should prove of general interest to the readers of CONSTRUCTION, and particularly so to the plumbers and steamfitters throughout the country, in view of the fact that it gives them an excellent idea of the construction and arrangement of a modern plant in which brass goods are turned out.

Through thorough business methods, aggressiveness, and the high quality of its products, Somerville Limited, has developed from a modest beginning into one of the leading manufacturing concerns in Canada. It was formerly the Ontario Lead and Wire Company, which was established in 1878. Since the addition of the plumbing supply department in 1896, it has grown to be one of the most important branches of the company's business. When the rapidly increasing patronage which the company enjoys made it imperative that a more commodious building should be erected, it was decided that neither expense or effort should be spared to make it one of the best equipped plants, both from a standpoint of convenience and utility, to be found anywhere. How well this determination has

been carried out is demonstrated by the accompanying half tones.

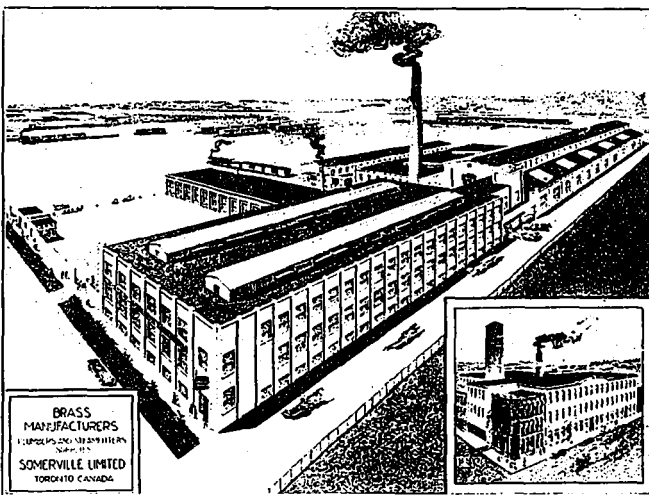
The new plant is built on the unit system, and consists of the main building, lead trap and pipe department, brass foundry, and boiler and engine house. The main building is a two-storey and basement structure, 60 x 175 feet, of standard mill construction, having brick curtain walls and provided with automatic sliding fire doors between every department.

The ground floor comprises the main office, plating and buffing room, stock rooms, receiving and shipping department together with a large pattern vault, 20 x 12 feet, while the entire first floor, with the exception of the superintendent's office and additional stock rooms, is occupied by the machine shop. In the basement is located a modern factory lavatory, probably the finest in Toronto, with shower baths and individual lockers for all employees. In addition, drinking fountains and urinals have been placed in every department, and every arrangement and provision has been made for proper sanitation.

A feature of this building is the superintendent's office, which is enclosed by glass on all sides, and is so located as to command a full view of the machine shop, tool and pattern rooms and foundry. All the partitions between the various departments are of wire, which has been used with the purpose of saving light.

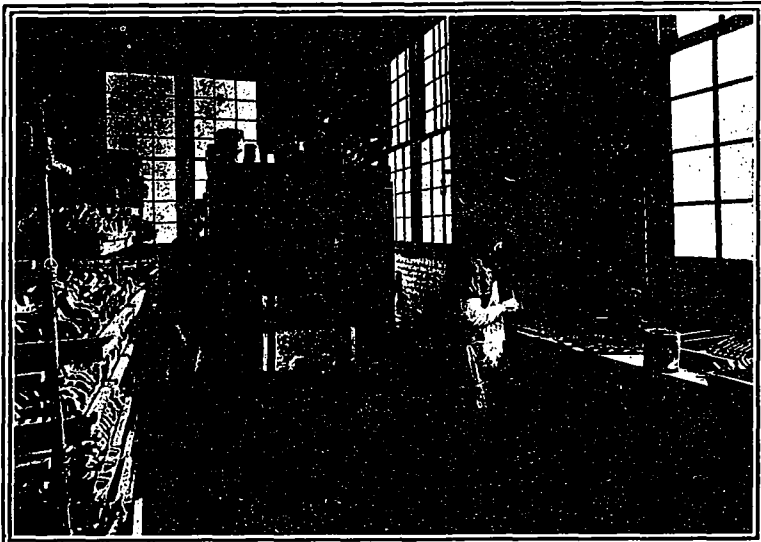
The windows of the ground floor are situated six feet above the street level so that no distracting influence from the outside will interfere with the men during the working hours. Adjoining the main building is the patent lead and trap department, 30 x 50 feet in dimension, where drawn lead traps are manufactured.

In the rear is the brass foundry, which connects directly with the main building. It is one storey high, 50 x 100 feet, and is built of steel and brick throughout. As no columns are used in this building, the roof is carried on a steel truss which spans the entire area from wall to wall.



PERSPECTIVE VIEW OF SOMERVILLE, LIMITED, NEW BRASS PLANT, TORONTO, CONSTRUCTED OF LIMESTONE BRICK. DIMENSIONS: 60 FT. X 175 FT., WITH A WING 30 FT. X 50 FT. AND A FOUNDRY 50 FT. X 100 FT. THE MAIN BUILDING IS OF SLOW BURNING MILL CONSTRUCTION. THE FOUNDRY IS BRICK AND STEEL.

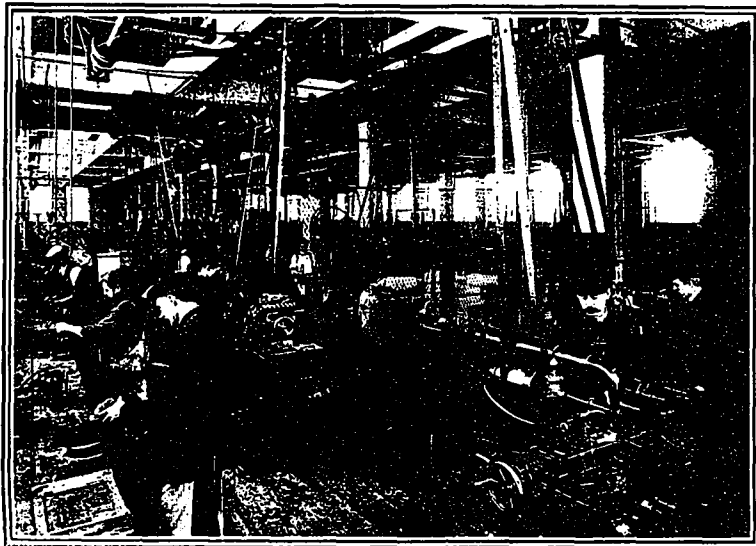
(Concluded on page 72)



VIEW SHOWING CORE OVENS IN OPERATION, WITH A CARLOAD OF CORES READY FOR THE FOUNDRY.



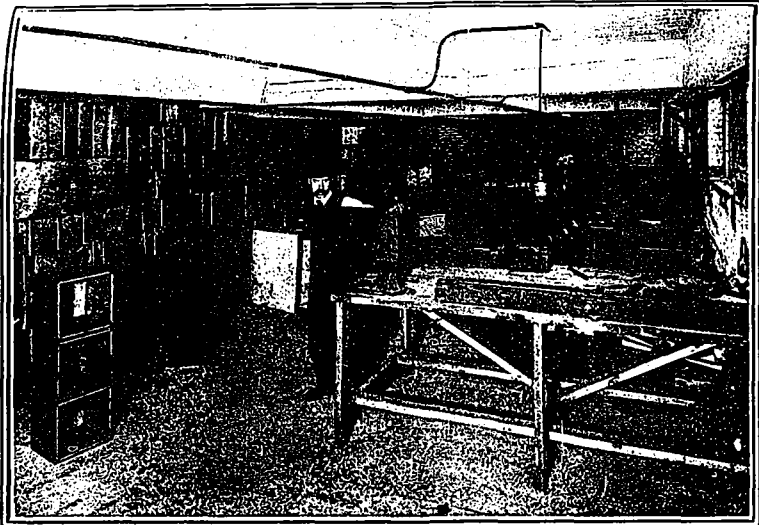
THE BRASS FINISHING ROOM, 60 FT. X 150 FT., CONTAINS THE MOST MODERN MACHINES FOR THE FINISHING OF PLUMBERS' AND STEAMFITTERS' BRASS GOODS. THE CHUCKS ARE OPERATED BY COMPRESSED AIR.



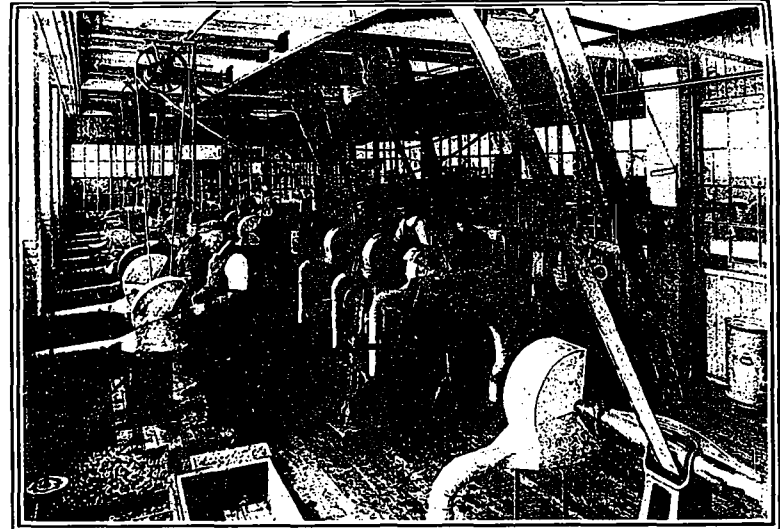
THE TOOL ROOM, WHERE ALL THE TOOLS USED ARE MANUFACTURED.  
Construction, April, 1908



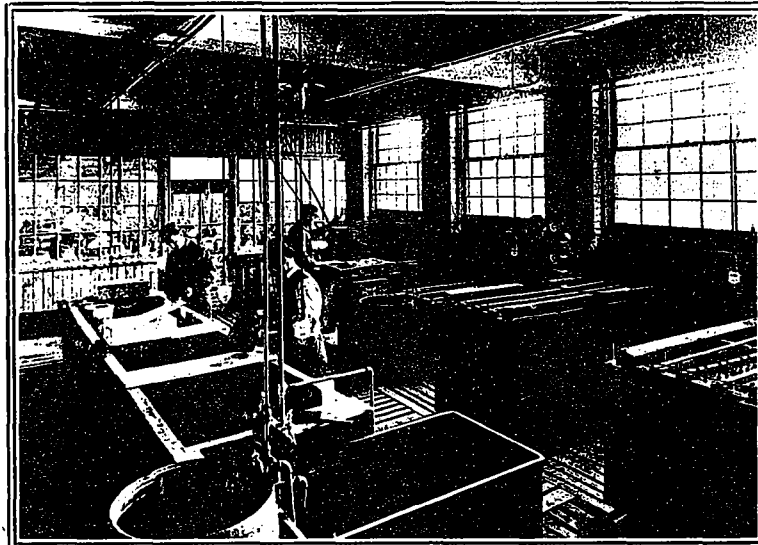
THE PATTERN ROOM ON THE SOUTH SIDE OF THE BUILDING, ADJOINING THE TOOL ROOM, IS ONE OF THE MOST IMPORTANT ADJUNCTS TO AN UP-TO-DATE BRASS PLANT.



THE CLOSET TANKS ARE MADE IN THIS ROOM. THEY ARE FITTED WITH A NEW PATENT BALL COCK WITH REVOLVING DISC, WHICH IS A NEW INVENTION MANUFACTURED SOLELY BY THIS FIRM.



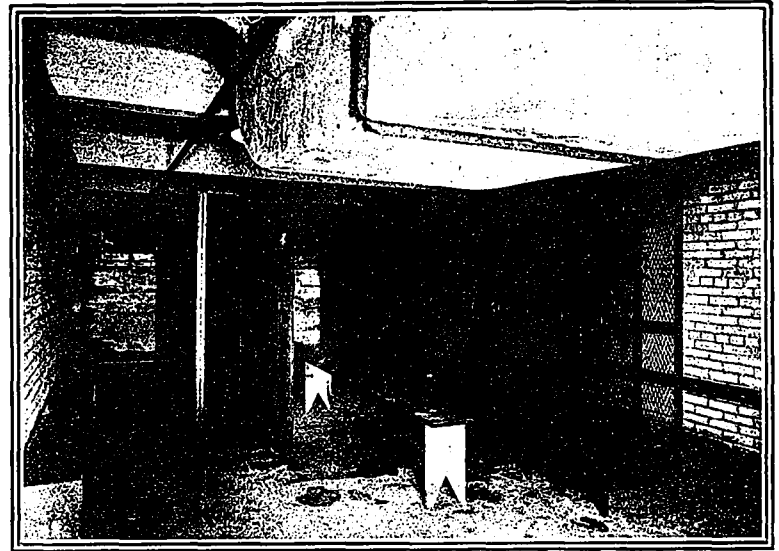
THE POLISHING ROOM IS MOST UP-TO-DATE AND EFFICIENT IN EVERY RESPECT, HAVING ALL PIPES UNDER THE FLOOR.



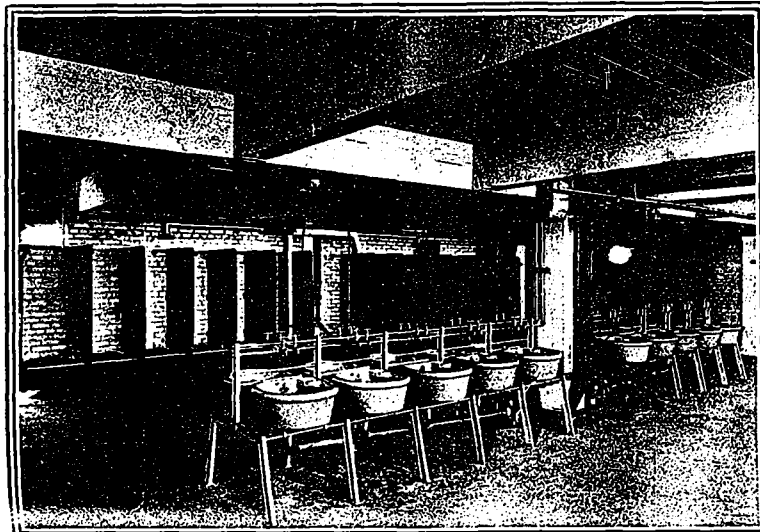
THE PLATING ROOM CONTAINS VATS CAPABLE OF TAKING WORK UP TO 14 FT. LONG, AND IS SO DRAINED THAT THE FLOOR IS ALWAYS PERFECTLY DRY.



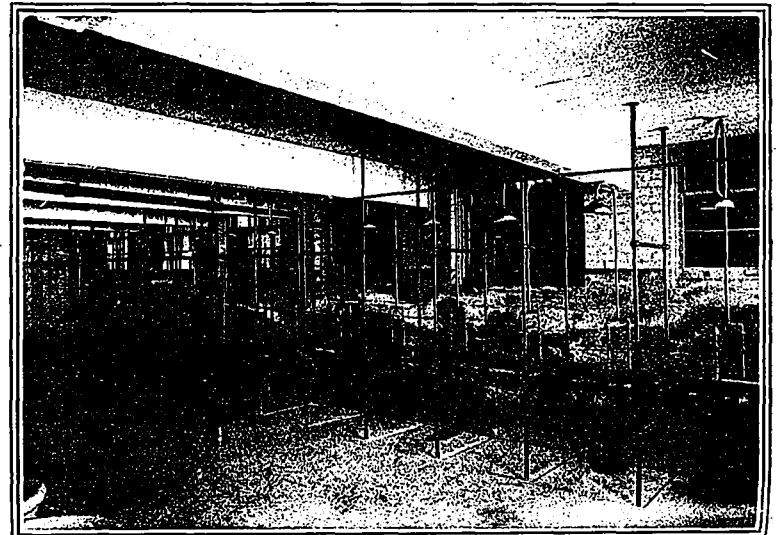
SUPERINTENDENT'S OFFICE, WHICH IS SITUATED IN THE CENTRE OF THE BUILDING. IT COMMANDS A FULL VIEW OF THE MACHINE SHOP, TOOL ROOM, PATTERN ROOM AND FOUNDRY.



THE LOCKER ROOM CONTAINS A WIRE LOCKER FOR EACH EMPLOYEE.



THIS SHOWS THE EMPLOYEES' WASH ROOM. EVERY CARE HAS BEEN TAKEN TO MAKE THIS AS SANITARY AS POSSIBLE. IT CONTAINS SOLID PORCELAIN WASH BASINS, WASH CLOSETS AND URINALS.



THIS SHOWS ANOTHER VIEW OF THE EMPLOYEES' LAVATORY. HOT AND COLD WATER ARE AVAILABLE AT ALL HOURS OF THE DAY FOR THE SHOWERS.



# 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 firm of Wm. Harland & Sons, varnish manufacturers, of London, Eng., have purchased the works of the Victor Varnish Co., in Toronto, and propose spending about \$5,000 in improving this property. Wm. Harland & Sons have a Toronto branch on East King street, near Church street.

**Toronto, Ont.**—J. J. Young has applied to Jos. E. Thompson, Commissioner of Licenses, for a site at Ashbridge's Bay, on which to erect a tallow rendering factory.

**Toronto, Ont.**—W. Lamenfeldt has purchased a site on the north side of Agnes street, near University avenue, upon which he will erect a metal factory to cost \$15,000.

**London, Ont.**—The factory of the Hobbs Glass Works, London, has been completely destroyed by fire. The Canada Furniture Company, whose buildings adjoin the glass works, was damaged to the extent of about \$125,000. Rebuilding will be commenced at once.

**London, Ont.**—M. J. Stevely, mayor of London, Ont., states that the Horlick Malted Milk Co., of Racine, Wis., is considering the erection of a branch of their factory in Canada, probably at London, Ont. This firm's Canadian office is in Montreal.

**London, Ont.**—The Steel Culvert Co., of Madison, Wis., propose erecting a Canadian branch of their business in London, Ont., to manufacture all their lines. The proposed plant will employ about 50 men.

**London, Ont.**—The Canada Organ Company, of Woodstock, has offered to locate in London, Ont., providing the City Council will grant them a free site, and a \$5,000 bonus.

**Campbellford, Ont.**—A by-law has been passed granting a site of five acres to the Canadian Steel Company. Buildings which will cost \$60,000 will be commenced at once.

**Chippewa, Ont.**—The British Canadian Smelters, Limited, of Toronto, Ont., have secured a site of twenty acres on which they propose erecting the smelter which they formerly proposed erecting on Ashbridge's Marsh, Toronto, but which was objected to by the City of Toronto.

**Shannonville, Ont.**—Messrs. Fred. R. Lingham and H. Corby, both of Belleville, have secured a tract of 800 acres near Shannonville, Ont., on which they will erect a large lime and cement works.

**Smith's Falls, Ont.**—Steel's Planing Mill, Smith's Falls, has been badly damaged by fire. The loss on the building is covered by insurance, but there is considerable loss on machinery.

**Ingersoll, Ont.**—The Manchester Cereal Company's factory, Ingersoll, has been destroyed by fire. The loss, fairly well covered by insurance, is about \$25,000, of which \$17,000 is on the building.

**Brockville, Ont.**—W. H. Wood has been awarded the contract for masonry work on two large additions to Jas. Smart & Co.'s plant. One is a separate building, 600 by 60 ft., three storeys high. The building will be entirely of brick, of mill construction. The other building will be a 40 ft. square addition to the hammer works.

**Brockville, Ont.**—Architect B. Dillon is preparing plans for the erection of an addition to the hat works, Brockville. Plans will call for a three-storey brick structure, 70 by 40 ft.

**Port Stanley, Ont.**—A company for the manufacture of disc ploughs, to be known as the Standard Implement Company, was organized at a recent meeting at this place. The company is capitalized at \$75,000. A site has been secured, upon which a plant 50 by 100 ft. will be erected. J. B. Donald is president of the company.

**Ottawa, Ont.**—Mr. S. May, Ottawa, Ont., headed a deputation which called on the Minister of Agriculture, which asked for a grant of \$6,000 from that department for the installation of a cold storage plant in the dairy building in the western fair grounds, at Ottawa, Ont.

**St. Mary's, Ont.**—Mr. McCrimmon, Toronto, representing The Canadian Smallware Co., has submitted a proposition to the City Council of St. Mary's, whereby the company he represents proposes erecting a plant at this place, to cost \$26,000, providing this town guarantees the company bonds to the extent of \$20,000.

**Kenora, Ont.**—The contract for the erection of the Maple Leaf Mill, Kenora, Ont., has been awarded to Messrs. G. R. Archibald & Co., Winnipeg, Man. The building will cost approximately \$25,000.

**Clinton, Ont.**—The ratepayers of Clinton, Ont., have passed by-law to amend their former agreement to the Doherty Organ Co.; and enable them to enlarge their business, and form a joint stock company with increased capital.

**Brampton, Ont.**—The Crossin Piano Co. will commence the erection of the factory building to employ 50 hands, in the near future.

**Brantford, Ont.**—Messrs. C. Schmidt & Co., Hamilton, manufacturers of bedding, mattresses, and general household goods, have leased the planing factory of Mr. S. F. Whitman, on Clarence street, Brantford, and propose establishing a branch factory here.

**Cornwall, Ont.**—The new factory erected here last summer by the modern Bedstead Company, has collapsed. The wrecked sections includes the tower, which contained the elevator, and which was surmounted by a 30,000 gal tank. The factory cost about \$25,000 and the company is composed mostly of Sherbrooke and Cornwall business men.

**Vienna, Ont.**—The Ingersoll Canning Co., head office Ingersoll, Ont., propose erecting their canning factory at Vienna, Ont.

**Welland, Ont.**—The Capitol Lock Nut Co., of Columbus, O., have acquired the plant of the Robertson Machinery Co., of Welland, Ont., and they propose spending \$100,000 in enlarging and improving it.

**Dunville, Ont.**—It is proposed that the town of Dunville buy a site of four acres, and erect a foundry and machine shop at this place, for the manufacture of gas and gasoline engines, gas producers, hoisting machinery, etc., for a company which guarantees to repay the cost in ten equal annual instalments. The company will guarantee to employ at least forty men during the coming year, and eighty men later on. Plans are now being made of the required buildings, in order to get an estimate of the cost before submitting by-law to the ratepayers.

**St. Thomas, Ont.**—The City Council of St. Thomas is contemplating the installation of an ammonia plant at a cost of approximately \$2,000.

**Hamilton, Ont.**—The Royal Distillery of this place will put up a building and plant at this place at a cost of, approximately, \$200,000.

**Montreal, P. Q.**—Offices of the American Canning Co. of New York City have decided to recommend their company to erect a factory in Montreal to cost between \$200,000 and \$250,000. The proposed plant will be equipped with modern machinery and appliances, for the manufacture of cans.

**Burlington, Ont.**—W. T. Glover's bucket factory at this place has been totally destroyed by fire. Loss estimated at \$5,000, covered by insurance \$2,900.

**Montreal, P. Q.**—Architect J. O. Turgeon, 55 St. Francois Xavier street, Montreal, has prepared plans for a \$50,000 factory building for M. J. Guelin and C. Tannour, Montreal, on St. Vincens st. Specifications include concrete foundation, concrete superstructure, six storeys high, steam heating, electric lighting.

**Sherbrooke, Que.**—C. E. Deakin, of Montreal, has been awarded the contract on the new Fairbanks Shops, to be established at Sherbrooke, Que.

**Sydney, C. B.**—Messrs. M. B. Dickenson and Jno. V. Calver, the latter formerly of the staff of the Dominion Iron & Steel Co., are organizing a company to be known as the Marine & General Engineering Co., Ltd., of Sydney. The new enterprise will capitalize at \$30,000, of which \$23,000 will be expended on a site and the erection of necessary buildings.

**Port Morien, C. B.**—The coal washing plant of the Dominion Coal Co., at Port Morien, C. B., was completely destroyed by fire recently, entailing a loss of about \$100,000. Loss covered by insurance. The plant will be rebuilt at once.

**Sydney, C. B.**—The city council will ask the Provincial Government to pass an act to enable the city to acquire the plant and property of the Illinois Solid Forge Car Co., from taxation for a period of ten years, and also for the power to borrow a sum of money, not to exceed \$1,000, for the purpose of presenting the company with a site.

**Sydney, C. B.**—A site is being prepared for the erection of a steel framed addition to the Sydney Foundry & Machine Works, Sydney. Buildings will be 100x50 ft., height to bottom of trusses 25 ft., and will be used as a structural shop.

**Bathurst, N. B.**—The large sawmill, owned by the Sumner Company, Bathurst, N. B., has been partially destroyed by fire. Loss \$25,000, partly covered by insurance.

**Port Wade, N. S.**—John Ervin, of Bridgetown, is promoting a company of English capitalists, with a view of establishing blast furnaces at Port Wade, N. S.

**New Westminster, B. C.**—E. E. and Louis Swift, of Swift & Co., of Chicago; Mr. Peter Jensen, lumberman, of Nebraska; Colonel A. A. Davidson, of Toronto, Ont.; and Mr. A. D. Melne, of Vancouver, B. C., have purchased the Fraser River sawmills at New Westminster, where they propose enlarging at a cost of \$3,000,000.

**Vancouver, B. C.**—Messrs. Evans, Coleman & Evans, have made arrangements with the Pacific Coast Gypsum Company, Tacoma, for the erection of a hard wall plaster factory in Vancouver.

**Vancouver, B. C.**—It is reported that C. P. Schindler is contemplating the construction of a large plant in this city for the manufacture of sand lime bricks.

**Vancouver, B. C.**—Arrangements have been completed for the purchase of the machine shop of S. Hallander at this place, by the British Columbia Marine Railway Co., and will improve the plant by the addition of improved machinery and equipment. The company will build a wharf and increase the dry dock facilities. Machine shop will be operated by electric motors.

**Chilliwack, B. C.**—A company has been formed for the purpose of erecting a fruit cannery at this place. Provisional Board of Directors: M. H. Meleme, A. R. McKenzie, F. N. Cranshaw, A. Unsworth, P. H. Wilson, W. Hodgins.

**Phoenix, B. C.**—The Granby Consolidated Co. will spend approximately \$200,000 in enlarging and improving their smelting works near Grand Forks, B. C. The improvements include new ore and coke bunkers, machinery and additional electrical and other equipment for enlarging of the smelter proper; remodeling of the converter plant, and the doubling of the capacity of the blower building.

**Baysland, Alta.**—Camille David, of St. John Baptist Parish, Baysland, Mont. has stated that he, in company with other capitalists propose erecting a large abattoir and pork packing plant, and cold storage warehouse in this place this coming summer.

**Borden, Sask.**—At a meeting of the Grain Growers' Association here at Borden, Sask., it was proposed to erect a large mill at this place, at an approximate cost of \$15,000.

**Winnipeg, Man.**—John Mattson, of this place, has purchased a site of 318 ft. on North side of Notre Dame ave., on which he will erect a sash and door factory at a cost of approximately \$13,000.

**Winnipeg, Man.**—Architect V. W. Horwood has prepared plans for a warehouse and tar paper manufactory, to be erected at Elmwood, on sidetracks of the Merrick Anderson Co. Plans show warehouse of mill construction, with three-story tar paper factory. Metal window frames, roof of reinforced concrete, and suspended ceilings of concrete will be installed. There will be a large concrete underground tar tank, which will require an extensive plant and pumping arrangements.

**Winnipeg, Man.**—Architect G. W. Northwood, will shortly call for tenders on the construction of the new Manitoba Linsed Oil Company's plant at St. Boniface. The warehouse will cost, approximately, \$20,000.

**Brookdale, Man.**—The brickyard business, formerly carried on by R. Hales & Son, of Rapid City, is being formed into a joint stock company, and application is being made for an authorized capital of \$40,000, for the installation of new machinery, etc., to the plant. \$25,000 has already been subscribed. The company will manufacture brick, hollow brick, tile and sewer pipe.

**Gas Plants, Elevators and Warehouses**

**Toronto, Ont.**—The warehouse at 35 Church street, Toronto, owned by Miss Eleanor Baird, 65 Peince Arthur ave., Toronto, was destroyed, the extent of about \$10,000. The damage will be repaired at once.

**Toronto, Ont.**—Plans have been prepared by Architect Leonard Foulds, and tenders will be called for in the near future, for the erection of a new brick and artificial storage warehouse, 125 ft. x 25 ft., three stories and basement in height, and located on the west side of Clinton street, near College. Building will be erected by the Imperial Storage Warehouse Co., and windows will be protected by automatic fire shutters.

**London, Ont.**—Architect Wm. G. Murray, London, has let the general contract for the McMaher Granger Warehouse, to be erected at this place, to Messrs. Hyatt Bros., London, at cost of about \$22,000.

**Fairville, N. B.**—Architect Nell F. Brodie, St. John, N. B., has prepared plans for a warehouse at Fairville, N. B., for the Edward Partington Pulp & Paper Co., Fairville. Building will be of fireproof construction, with concrete foundation, cinder concrete roof, electric lighting, fireproofing, etc., and cement work of reinforced concrete, structural iron, freight elevator, fireproof windows.

**Brandon, Man.**—Dr. C. W. Clark, Winnipeg, director of International Lighting & Heating Co., Cleveland O., and C. S. Eaton, western manager of the same company, have made arrangements for erection of gas plant at this place. Plant will comprise a retort house, a purifying house, and a condensing plant, large fuel sheds, and a gas cistern with capacity of 75,000 cubic feet. The cistern will hold concrete in place. Three large buildings will be erected.

**Rosenfeld, Man.**—The Imperial Elevator Co.'s plant, at this place, was destroyed by fire.

**Vancouver, B. C.**—G. C. Coulson, contractor, Vancouver, B. C., has been awarded the contract at a price of \$20,000, for the erection of a four story warehouse for R. Downman, of this city. The structure will have a frontage of 75 feet on Powell st., to be constructed entirely of concrete. An electric freight elevator will be installed.

**Medicine Hat, Alta.**—The ratepayers of Medicine Hat, have passed a by-law authorizing the issuing of debentures to the amount of \$25,000, for the extension of their gas system.

**Electrical Construction**

**Thorndale, Ont.**—A movement is under way to provide the village of Thorndale with a lighting plant, consisting of a generator engine, and storage battery, to be installed at a cost of about \$3,000.

**Stratford, Ont.**—Robt. Patterson, master mechanic, G. T. R., is inspecting power plants in different cities, with a view of having a new power house established at Stratford. The proposed building will cost \$12,000 to \$15,000.

**Goderich, Ont.**—Plans have been completed for the erection of an electric railway from Goderich to Kincardine. The work will cost \$15,000 per mile of the track, and it is expected that the improvement will be commenced before May 1st.

**Bridges, Wharves and Subways**

**Toronto, Ont.**—Plans for a new drydock, to be erected by the city of Toronto, over both of the central tracks at Spadina avenue, have been completed.

**Toronto, Ont.**—The Civic Board of Works, has decided to submit to the people a by-law authorizing the building of a viaduct across the Don Valley, connecting Wellesley street with Broadview avenue, at a cost of \$200,000. This will be submitted to the people at the same time as the proposition for the bridge at Wilton avenue, to cost \$2,000,000, is voted on.

**Toronto, Ont.**—The Provincial Government will instruct their engineer to prepare an estimate of the cost of the tunnel in the western channel, Toronto, to provide for the access of the street cars to the island. City Engineer Rust, Toronto, will also prepare an estimate.

**Toronto, Ont.**—Sealed tenders for the Toronto Island breakwater extension will be received at the office of the Department of Public Works, Ottawa, until April 21, for the construction of an extension to the breakwater on the south side of Toronto island, and specifications on file at the office of J. G. Sing, resident engineer, Confederation Life Building, Toronto, and Charles Desjardins, clerk of works, Ottawa.

**Brantford, Ont.**—The council of the city of Brantford, Ont., has applied to the legislature for permission to issue debentures for \$5,000 for the purpose of erecting two new bridges over the canal here.

**Copenhagen, Ont.**—The township council of Malahide, has decided to replace the steel bridge over Staller's gully on the first concession east of Grovesend, with a cement arch bridge.

**Peterboro, Ont.**—A deputation consisting of County Warden James Thompson, James Ingram, John Brown, Chas. Cohen, and others, has asked the Hon. G. T. Graham, Minister of Railways and Canals, Ottawa, that a bridge be built over the canal, to enable the Indians living on the reserve 15 miles north of Peterboro, to have easy access to the county town.

**Hamilton, Ont.**—At a recent meeting of the railway commissioners, at Toronto, it was ordered that the G. T. R. lay a new bridge at Watford, ten miles out of Hamilton, and that the company pay all costs of grading the approaches.

**Guelph, Ont.**—The city of Guelph will erect a new bridge at Brumosa road, and will ask the C. P. R. to pay half the cost of an overhead structure.

**Chatham, Ont.**—The town council of Chatham propose the erection of a new bridge across the Thames at the end of the town line, one mile and a half below Prairie siding.

**Ottawa, Ont.**—Tenders will be received by the undersigned, up to 4.30 p.m., April 27, for construction of an extension to the wharf at Campbellton, Restigouche County, N. B., according to plan and specification on file at offices of S. J. P. Shewen, resident engineer, St. John, N. B.; Geoffrey Stead, resident engineer, Chatham, N. B., postmaster at Campbellton, N. B., and at Department of Public Works, Ottawa.

**Point Edward, Ont.**—The Hamilton Steel & Iron Company will enlarge their docks at Point Edward, from present length of 325 ft., to 475 ft.

**Ottawa, Ont.**—The Public Works Department, Ottawa, has awarded contracts for the following bridges: Bridge over White River at Engelhart, to Pollock & Sons, Engelhart, at a contract price of \$2,400; bridge over White river at Hillardton, to Geo. Foster, Halleyburg, at a cost of \$1,500.

**London, Ont.**—The city council, London, has decided to instruct the city engineer to obtain estimates of the cost of an iron overhead bridge on Wellington street, from Piccadilly to Pall Mall, over the C. P. R. The C. P. R. has agreed to contribute \$15,500 towards the construction of a bridge or subway in this neighborhood.

**Hamilton, Ont.**—The government will spend \$25,000 in rebuilding cement piers on the lake side of the canal, that were washed away during the winter.

**London, Ont.**—A meeting of the Board of Road Directors will be held in the County Buildings, London, on April 25, to open tenders and award contracts for seven new steel and concrete bridges, which are to be erected on the river at Westminster, West Williams, West Nissouri, Biddulph, North Dorchester and McGillivray.

**London, Ont.**—County Commissioner Talbot, London, states that the Guest bridge, which was recently washed away by the flood, will be replaced as soon as possible, by a steel structure, costing about \$11,000.

**Montreal, Que.**—Contracts have been awarded by the Montreal and Southern Counties Electric Railway as follows: to the Dominion Bridge Co., a contract for the steel work on Black's Bridge, No. 1 and No. 2, to be erected on the United States Steel Corporation, contract for the marine cables crossing the canal.

**Wakefield, Que.**—A deputation consisting of Mayor Snyeck, of Gracefield, Mayor Moore, of Wright, and Mayor Lafontaine, of Northfield, has asked the Quebec Provincial Government for a grant of \$15,000, with which to construct a bridge across the Gatineau river from Wakefield to Northfield. The proposed bridge will cost \$25,000, and of this amount \$12,000 has already been subscribed by residents and clubs in the locality.

**Pier Les Becquets, Que.**—Tenders will be received by the Minister of Public Works, Ottawa, until April 25, inclusive, for the construction of a landing pier at St. Pierre Les Becquets, county of Nicolet, Que., according to plans and specifications on file at the office of J. J. Chatham, resident engineer, merchants bank buildings, 200 St. James street, Montreal, and P. Beland, clerk of works, Post office building, Quebec, postmaster at St. Pierre Les Becquets, and at the above department.

**Fredericton, N. B.**—The following contracts for the construction of bridges were awarded by Hon. C. H. LaBillois, Commissioner of Public Works, province of New Brunswick, Ottawa: Three span superstructure for the Bel river bar bridge, Restigouche County, to Duncan & McLellan, of Campbellton, N. B.; single span superstructure for the Black river bridge, Kent County, to C. J. Rudwick, Chatham; two span superstructure for the St. Jacques bridge, Andawaska, to the Canada Foundry Co., Toronto; one span superstructure for Broadway bridge, town of Grand Falls, to the Canada Foundry Co., Toronto; superstructure for the Bel river bar bridge in Restigouche, to John McLean and Jas. P. McPherson, River Carters, Restigouche; Ryan Brook bridge, York county, to Whitman Brower, St. Marys; Woodland bridge, Charlotte county, to McLaggan & Moore, St. Marys.

**Annapolis Royal, N. S.**—Tenders will be received by the department of Public Works, Ottawa, until April 21 for the construction of three ice piers, Annapolis River, at Annapolis Royal, N. S. Plans and specifications on file at the offices of D. E. W. Dodwell, resident engineer, Halifax, N. S.; E. G. Millidge, resident engineer, Antigonish; and postmaster Annapolis Royal, and at the above department.

**Halifax, N. S.**—Reid & Archibald have been awarded the contract for constructing a breakwater 400 ft. in length at Scotch Cove, Victoria County, C. B.

**Halifax, N. S.**—Reid & Archibald have been awarded the contract for the construction of a railroad bridge for the I. C. R., at Renous River, N. B. The bridge will be 350 feet in length, with concrete piers, and steel superstructure.

**Digby, N. S.**—Tenders will be received by the undersigned, until April 22, inclusive, for the construction of a spur pier at Digby, Digby County, N. S., according to plans and specifications on file at offices of C. E. W. Dodwell, resident engineer, Halifax; E. G. Millidge, resident engineer, Antigonish, N. S., on application to postmaster at Digby, and at Department of Public Works, Ottawa.

**Winnipeg, Man.**—The Grand Trunk Railway Co., propose erecting a bridge across the Red river at Winnipeg, at the foot of Lombard street.

**Winnipeg, Man.**—Plans are being prepared by the Northern Railway to be erected across the Assiniboine river, between the present Main street and C. N. R. bridges. The new structure will be two spans, built of steel, and sufficiently wide to permit of two tracks being laid. Tenders will be called for in the near future.

**Winnipeg, Man.**—The city council have decided to have the city solicitor take action to compel the C. N. R. to construct a proper subway under Water street.

**Winnipeg, Man.**—By-law will be submitted to the voters of Winnipeg, for the purpose of raising a sum of \$50,000 for improvements to Louise bridge.

**Brandon, Man.**—City Engineer Shilling-law, Brandon, has been awarded the contract for the erection of First street bridge, at this place, at a contract price of \$18,250. Work will at once be commenced.

**Ottawa, Ont.**—The Hon. W. S. Fielding, has laid on the table estimates for the following improvements in British Columbia: Campbell river wharf, \$3,000; improvements of navigable channel between Soda Creek and Fort George, on Upper Fraser river, \$15,000; divert stream into the old channel on Columbia river, \$10,000; harbors, bridges, repairs, etc., \$2,500; dredging Victoria harbor, \$3,000; Yukon telegraph system, \$17,000; lighthouse, \$40,000; improvements in St. Andrews rapids, \$52,000.

**Vancouver, B. C.**—The city council, Vancouver, have decided to extend the time for receiving tenders for the superstructure of the new bridges over False creek, until May 1.

**North Vancouver, B. C.**—The city council has awarded the contract for the construction of a steel bridge over Lynn creek, at this place, to Langley, Musgrove & Williams, at a contract price of \$43,000.

**Tabor, Alta.**—The Alberta Government has decided to extend \$25,000 for the construction of a bridge across the Belly river, north of Tabor.

**Waterworks, Sewers and Canals**

**Toronto, Ont.**—The Canadian Fairbank Co., Toronto, has received a contract from the City of Toronto, to supply 20 20-in. 12 1/2-in. Fairbanks bell end gate valves; 1 20-in. Fairbanks hub end gate valve, horizontally geared; 1 20 and 1 16-in hub end check valve all of which are to be used in connection with the waterworks extension.

**Toronto, Ont.**—The John Inglis Co., Toronto, has been awarded the contract for the construction and completion of 15,000 gal. pumping engine at \$17,000 and one six million gallon pumping engine at \$2,000 for the waterworks system of Toronto. The Poison Iron Works, of Toronto, were awarded the contract for the supplying of Heine boilers which will be used on the power equipment.

**Toronto, Ont.**—The Board of Control, Toronto, propose constructing a big sewer in Queen street, from Coatswood avenue to Woodbine avenue. It will be necessary to erect a pumping station opposite the Woodbine avenue, to pump the sewage into the septic tank and bacteria beds. Total cost of sewer and pumps, estimated at \$1,500.

**Aylmer, Ont.**—Engineer Jno. Rainboth, of Aylmer, has been awarded the contract for the installation of the Aylmer sewerage system, at a contract price of \$39,796.25. Work to be completed by July 1.

**Ottawa, Ont.**—There is a possibility of the city waterworks being extended this summer to the D. E. A. pavilion at Rockcliffe. Proposed improvement will cost \$3,110.

**Brantford, Ont.**—Tenders addressed to F. W. Frank, secretary of Board of Water Commissioners, Brantford, will be received up to noon, April 21, for: (a) construction of storage reservoir; (b) furnishing and laying of about 550 feet of 24 inch cast iron section pipe; (c) furnishing and laying of about 1,700 ft. of 18 inch, 20 inch and 24 inch sewer conduit pipe. Plans and specification and forms of tender may be seen at the office of T. Harry Jones, city engineer.

**Chesley, Ont.**—The town council of Chesley has awarded contracts for the installation of water tower, hydrants and valves, at that place, as follows: water tower consisting of a steel structure 60 feet high, and a water tower 31-1/2 ft. high and 19 ft. in diameter, capacity 60,000 gallons, the Hunter Bridge & Boiler Co., Kincardine, at a contract price of \$3,700; hydrants and valves to the Larr Engine & Foundry Co., of Walkerville, \$3,600; supply iron pipe and castings, to The Thomson Pipe & Foundry Co., of Hamilton, at \$34 per ton and 2 1/2 cts. respectively.

**Stratford, Ont.**—The Provincial Waterways and Municipal Board has approved the issuing of \$15,000 debentures for the installation of a chemical filtration plant in Stratford, Ont.

**Osnabruck Centre, Ont.**—Tenders will be received until noon, June 1, for construction of the Grantley Creek drainage ditch, north of town, in township of Osnabruck and Williamsburg, about six miles from Chesterville on C. P. R. Engineer's estimate of work, \$11,096.77. Tenders for culverts in township of Osnabruck may accompany tender for excavation. Plans and specifications may be seen at office of Magwood & Walker, Cornwall, or with H. E. Hodgins, clerk, Osnabruck Centre, Ont.

**Goderich, Ont.**—Tenders will be received at the office of the Water and Light Commissioners, Goderich, until noon, April 20, for following works: Contract A, covered reinforced concrete sedimentation basin, intermittent type, with screen and valve chambers and appurtenances; contract B, cast iron flanged pipe, 18 in. diameter, special castings, valves, etc. Plans and specifications and forms of tender can be obtained at the above office. W. T. Murney, chairman of commission. W. A. McKim, clerk.

**Montreal, Que.**—The Stanton Iron Works Co., Limited, of Nottingham, Eng., have secured the contract for supplying from 3,000 to 4,000 tons of cast iron water piping, to be delivered during the coming summer.

**Montreal, Que.**—An English syndicate, headed by Lord Templeton, has purchased the Montreal Bridge & Terminal Charter from the Prefontaine Estate, and will at once begin, the construction of a tunnel between this city and Longueuil, on the south shore of the St. Lawrence, in place of the proposed bridge.

**Montreal, Que.**—The Montreal Board of Trade has decided to petition the city council for the establishment of a high pressure system for water supply for fire protection, in the district bounded by the River, Lacrosse, Craig and McGill streets.

**Three Rivers, P. Q.**—The North Shore Power Co., Three Rivers, P. Q., who have the contract for the pumping of water for the town of Three Rivers, P. Q., propose installing an additional pumping engine having a capacity of 2,000,000 gallons per day.

**Medicine Hat, Alta.**—The ratepayers of Medicine Hat, have passed a by-law authorizing the issuing of debentures to the extent of \$40,000, for the extension of waterworks mains at this place.

**Regina, Sask.**—The Parsons Construction Co., of Regina, Sask., have been awarded the contract for the construction of a combined reinforced concrete bridge and dam at Regina, Sask. It will be 500 ft. long, 30 ft. wide, flanked by six foot sidewalks with iron railings.

**Railway Construction**

**Toronto, Ont.**—The Grand Trunk will spend about \$5,000 for improving their ticket offices at corner of Yonge and King streets, work will be started June 1.

**Ottawa, Ont.**—The following contracts have been awarded for the erection of the National Railway Extension to E. P. section 1, covering 39.7 miles westward from a point on National railway, 58 miles west of Moncton, to Grand Trunk Pacific; section 2, covering the next 67 miles westward to Tobique River, N. B.; to Grand Trunk Pacific; section 3, covering 31.5 miles from Tobique River to town of Grand Falls, N. B.; to Willard Kitchen Co.; section 4, distance 52.4 miles westward from interprovincial boundary between Quebec and New Brunswick, to M. P. & J. G. Davis; section 5, distance of 100 miles westward from a point 8 miles west of the Ashby river, Ontario, to E. P. & G. E. Foquier; section 6, distance of 75 miles westward from Lake Nipigon, to E. P. & G. E. Foquier.

**Smith's Falls, Ont.**—The Canadian Pacific Railway Company propose enlarging their yards, at Smith's Falls, at a cost of, approximately, \$60,000. The work includes the construction of several additional tracks, and erection of a car shop and large stores buildings. It is understood the work will be completed this summer.

**Cobalt, Ont.**—The T. & N. O. Railway Company propose to build a new station and freight shed, on the present site of the Y. M. C. A. building at this place.

**Hamilton, Ont.**—Col. Gibson, Hamilton, proposed to submit to the city council, at this place, a new proposition with reference to the new street railway system. It is understood that the company will agree to spend \$500,000 on the system, in return for certain concessions from the city.

**Montreal, Que.**—The C. P. R. has awarded to Janse & MacDonnell, of Maple Creek, contract for the construction of 30 miles of railway between Lethbridge and MacLeod. This extension will cost approximately \$10,000 per mile.

**Montreal, Que.**—Foley Bros., Larson & Stewart, have secured contract for constructing the first 100 miles of the C. P. R. in British Columbia, the terminal section from Prince Rupert eastward, which will cost between \$6,000,000 and \$7,000,000.

**Montreal, Que.**—The Grand Trunk Railway announce that they will shortly build a new direct line from Kingston to Ottawa.

**St. John, N. B.**—A joint committee of the town council and the Board of Trade, met to discuss the advisability of granting a free site, and tax exemption to R. D. Isaacs, who proposes establishing a car works in St. John. Chairman A. McGowan and Mr. Likely were appointed to confer with Mr. Isaacs relative to his securing a suitable site.

**St. John, N. B.**—In the Parliamentary estimate, the sum of \$240,000 appears for I. C. R. work at St. John. The improvements will include a coal shed and repair shops, which will be built near the new road, and the erection of a car cleaning shed, and improvement of the facilities in the new island yard.

**Winnipeg, Man.**—The Canadian Northern Railway will commence building operations on the new station, to be built on South Main street, as soon as weather will permit.

**Winnipeg, Man.**—Tenders will be received until April 15, for the erection of the Fort Gary station in Winnipeg, which will cost between one and two million dollars.

**Brandon, Man.**—Plans have been prepared, and a site procured, for the erection of a new C. N. R. depot at this place, at a cost of approximately, \$50,000. The building will be of brick and stone construction.

**British Columbia.**—It is reported that the Canadian Pacific is considering the construction of a second line across British Columbia, with a terminus at Hardy Bay.

**New Westminster, B. C.**—The B. C. E. R. Company has let the contract for a \$20,000 extension to their New Westminster car shops, to W. W. Forrester, of New Westminster, B. C. Work will commence at once.

**Lanigan, B. C.**—The C. P. R. has awarded to A. G. Creelman, Grand Forks, B. C., the contract for the erection of a new station at Lanigan, at a cost of approximately, \$6,000.

**Saskatoon, Sask.**—Plans are prepared for the erection of a new C. N. R. depot at Saskatoon, at a cost of \$40,000. The G. T. P. is also contemplating the erection of a depot at this place.

**Calgary, Alta.**—The Alberta South Western Railway has applied to the Dominion Government for a charter for the purpose of constructing and operating a line of railway between the international boundary in British Columbia, near Kootenay river to Elko and other points.

**Red Deer, Alta.**—The C. P. R. is contemplating the erection of a new station in Red Deer.

**Public Buildings**

**Toronto, Ont.**—The contract for the erection of the new wing of Osgoode Hall, has been awarded to Thomas V. Gearing. Contract price about \$35,000, not including heating.

**Toronto, Ont.**—The Dominion Government will erect an addition to the post office on Lombard street, at a cost of \$20,000. The general contract for the work has been let to Henry & Sons.

**Toronto Junction, Ont.**—The town council of Toronto Junction has decided to procure a site and give a grant of \$2,000 per year for a Carnegie library to be erected at this place, at a cost of \$20,000.

**Ottawa, Ont.**—The council of the city of Ottawa has applied to the legislature for permission to spend \$17,000 for the erection of a registry office according to plans prepared by Architect Weeks, of this city.

**Ottawa, Ont.**—The Hon. W. S. Fielding has laid on the table, estimates for the following public buildings, to be erected in Saskatchewan and Alberta: Immigration buildings at Prince Albert, \$100,000; North Battleford and Vermilion, to cost \$2,000 each; enlargement of public building, Calgary, \$21,000; public building, Edmonton, \$30,000, and public building, Fernie, \$10,500.

**Preston, Ont.**—The council of Preston, Ont., propose asking Andrew Carnegie

for \$12,000 for the erection of a public library at this place. J. J. Inniss is chairman of the committee having this matter in hand.

**London, Ont.**—The supplementary estimates in the Dominion House include \$6,600 for addition and improvements to the London post office. The proposed work will include installation of a new elevator, additional fittings to the vaults and furniture and fixtures.

**Pembroke, Ont.**—The city council, Pembroke, Ont., has accepted Andrew Carnegie's offer of \$12,000 for the erection of a public library in that place. Mr. Ralph Rose, B. A., of Pembroke, Ont., is chairman of the committee in charge of the project.

**Wetland, Ont.**—Plan for the ground floor of the new post office and customs building to be erected in Wetland by the Dominion Government, has been forwarded to Postmaster Burgar, Wetland. The structure will be of brick, three storeys in height and will cost approximately \$35,000.

**Kingston, Ont.**—Architect H. P. Smith, Kingston, has prepared plans for the erection of a gun shed and stores for the military department. The building will be of frame construction with metal shingles and wood interior finish.

**Niagara Falls, Ont.**—The Frontier Amusement Company, composed of St. Louis capitalists, will spend \$250,000 in the construction of an amusement resort at this place.

**Ridgton, Ont.**—The Howard Township Council is contemplating the erection of a new town hall this coming summer, to replace the present antiquated structure. The township has nearly \$12,000 on hand, which could be used for this purpose.

**Durham, Ont.**—The Government as a site has been chosen, the Department of Public Works, Ottawa, will call for tenders for the erection of an armory at Durham, Ont.

**Quebec, Que.**—A branch post office will be erected on St. Joseph street, Quebec East, at an estimated cost of \$20,000.

**Winnipeg, Man.**—Tenders have been recently received for the erection of an examining warehouse for the customs department at this place. The building will be four storeys in height and of fire proof construction and will cost \$15,000. A two storey one storey high, will also be erected. The entrances will be equipped with iron doors, and collapsible steel gates.

**Winnipeg, Man.**—A permit has been issued for the construction of an apartment building at Fort Osborne barracks. The structure will be two storeys, with brick and concrete foundation, and will cost approximately \$10,000.

**Winnipeg, Man.**—A by-law will be submitted to the voters of Winnipeg for the purpose of authorizing bonds to the extent of \$25,000 for library improvements.

**Manitou, Man.**—Messrs. Martin, McCoy & Clark, have secured the contract for the erection of a new town hall at this place, at a contract price of \$1,400, which includes furnace and lighting.

**Brandon, Man.**—Plans have been prepared for the new court house to be erected at the corner of Princess and Eleventh streets, Brandon, at a cost of \$100,000. It is expected that work will be commenced by June 1.

**Victoria, B. C.**—Tenders will be received until April 22, inclusively, for alterations in post office buildings, at Victoria, B. C. Plans and specifications can be seen at this department, or on application to C. H. Henderson, resident architect, Victoria, B. C.

**Kamloops, B. C.**—Messrs. Broley & Martin have been awarded the contract for the erection of a brick and stone courthouse building at Kamloops, B. C. Contract price, \$65,000. Architects, Moneyman & Child, Vancouver, B. C.

**Ladysmith, B. C.**—The contract for the new post office, to be erected at Ladysmith, has been awarded to a Victoria firm. The building will cost approximately \$30,000. Work will be commenced at once.

**Calgary, Alta.**—A \$50,000 Carnegie library will be erected at Calgary, as soon as a suitable site is selected.

**Humboldt, Sask.**—The Dominion Government has purchased a site at this place for the erection of new government buildings to be erected to begin the work of excavating at an early date.

**Moose Jaw, Sask.**—The Commissioner of Public Works, Regina, has awarded to Smith Bros. & Wilson, Regina, the contract for the new court house at Moose Jaw, at a contract price of \$21,000. The building will be three storeys high, 100x125 ft. in height, of brick and stone construction.

**Saskatoon, Sask.**—J. McDermid Company, Winnipeg, has been awarded the contract for the erection of the new post office building at Saskatoon. Contracts for the galvanized iron and copper cornice work has been sublet to M. Issisler & Son, of this place, at contract price of \$6,000.

**Business Buildings**

**Renfrew, Ont.**—G. A. Ellis has purchased the O'Connor property, at the head of Main street, on which he will erect a fine brick block this coming summer.

**Hanover, Ont.**—Messrs. Wepler & Helwig, Hanover, have purchased the Stone property, on Main street, and will erect a new 3,392 ft. two storey, business block having plate glass fronts on both sides.

**Chatham, Ont.**—Plans have been prepared for the erection of a three storey building adjoining the News office, on King street, Chatham, the upper storey to be used for lodges rooms, and the ground floor will contain stores. A similar building will also be erected by W. H. Westman, on the other half of the lot, adjoining the Central Drug Store. The structure will be 48x125 ft., three storeys high, with pressed brick front, cut stone and terra cotta trimmings.

**Sudbury, Ont.**—Architect Ed. T. Head, Sudbury, has prepared plans for a brick veneer store building, to be erected for Messrs. Moses & Magdez, Sudbury. The building will have concrete foundation, hot water heating, electric lighting, standard plumbing, flat roof, hardwood interior finish, fire escapes, metal ceilings, plate glass.

**Moncton, N. B.**—Architect W. C. Barnes, Moncton, B. C., has awarded the following contracts on a three storey 100 ft. brick building to be erected at this place for H. L. Hayne & Co. Mason, H. B. LaBlanc, carpenter, F. Brown, both of Moncton.

**Vancouver, B. C.**—Architects Parr & Fee, 507 Granville st., Vancouver, B. C., have prepared plans for a six storey store and office building for Martin & Robertson, of this place, to be located on Pender street. The contract has been let to Wm. Hepburn, Vancouver. The building will be of brick and mill superstructure with asphalt pitch roof, six storeys high, tile, structural iron, fire escapes, vaults, two passenger elevators, sidewalk lift, sheet metal work.

**Vancouver, B. C.**—Plans have been prepared for the erection of a six-storey steel building, to cost \$60,000, to be located on the site of the Lighthouse Hotel, corner of Homer and Cordova street east.

**Vancouver, B. C.**—Messrs. Atkinson & Dill, Vancouver, have been awarded the contract for the erection of a business block at the southeast corner of Homer and Pender streets, for the British Columbia Permanent Loan & Savings Company, at a contract price of \$20,000. Wm. F. Gardner, Vancouver, is the architect.

**Vancouver, B. C.**—Architects Parr & Fee, 507 Grenville street, have prepared plans and awarded the contract for the erection of a brick building for S. S. Reinhardt, Vancouver, to Miles & Williamson, general contractors, of this city. The building to be three storeys high, with concrete foundation, brick superstructure. Heating contract will be let separately.

**Vancouver, B. C.**—The National Finance Company is contemplating the erection of a three storey building, at the corner of Homer and Pender streets.

**Fernie, B. C.**—The local branch of the United Mine Workers of America will erect a \$30,000 brick building, two storeys in height, and 60 by 100 ft. in ground dimensions. The ground floor will be occupied by a co-operative store in front and with billiard and reading rooms in the rear. The second floor will be used for billiard purposes.

**Fernie, B. C.**—Wm. J. Ingram, Fernie, proprietor of the Club Cigar Store, will shortly commence the erection of a brick building on the site of his present structure. It will be 30x94 ft., ground dimensions, and will cost \$12,000.

**Calgary, Alta.**—Messrs. Dowler & Michie, Calgary, will receive tenders until April 15th for the erection of a structure to contain stores and dwellings, to cost \$9,000, for Mr. W. P. Lathwell, Calgary. It will be of brick veneer construction, with stone foundation, steam heating, electric lighting, open plumbing, composition roof. Following work specified: Cut stone, reinforced concrete, metallic lath, sheet metal work, plate glass, prismatic glass.

**Banks**

**Toronto, Ont.**—The Home Bank has purchased a lot on the cor. of Queen and Ontario streets, on which a branch bank will be established.

**Toronto, Ont.**—The Metropolitan Bank, Toronto, has purchased the northeast corner of Queen street and Lee avenue, on which a branch bank building will be erected this spring.

**East Toronto, Ont.**—Plans have been prepared for the new Metropolitan Bank building which will be erected at the northeast corner of Lee avenue and Queen street.

**Toronto Junction, Ont.**—The Sterling Bank, with head offices in Toronto, propose enlarging their bank premises in Toronto Junction in the near future.

**Montreal, Que.**—Messrs. De Anglis, 18 St. Alexis street, Montreal, Que., have been awarded the contract for the interior alterations to be made to the Royal Trust Company's building, of this city, at an estimated cost of \$20,000. Architects, E. & S. Maxwell, Beaver Hall Hill, Montreal, Que.

**St. John, N. B.**—Architect F. Neil Brodie, St. John, N. B., will receive tenders after April 19th, for the erection of a new one storey building for the Bank of New Brunswick, St. John, N. B. It will be of stone and brick construction, piles and concrete foundation, pitch and gravel roof, oak interior finish, hot water heating, electric lighting, open plumbing, and will have fire-proof doors. Following work specified: Cement work, cut stone, reinforced concrete, metallic lath, structural iron.

**Saskatoon, Sask.**—The Imperial Bank will erect a branch bank in Saskatoon early in the spring.

**Clubs and Societies**

**Toronto, Ont.**—The directorate of the Victoria Club has laid aside an appropriation of \$50,000 for interior decoration and furnishing to their club house at this place. An addition to the building will also be erected.

**London, Ont.**—The Masons of London are contemplating the erection of a new Masonic Temple at this place. A site has not as yet been chosen.

**St. Thomas, Ont.**—The Oddfellows of St. Thomas are contemplating the erection of a hall, in a central locality. It is proposed to erect a two storey building, first floor to be used as stores, and the second storey to be used for lodge purposes.

**St. Thomas, Ont.**—The railroad men here will erect a \$20,000 club building on Main street, upon a site adjoining the City Hall.

**Hamilton, Ont.**—The I. O. O. F., Hamilton, Ont., propose to erect a new lodge building in Hamilton, to cost \$100,000.

**Montreal, Que.**—The National History Society will erect a new \$300,000 building on the site of the present structure, 152 Drummond street. Work will be commenced at once.

**Winnipeg, Man.**—A site on Logan avenue near Main street, has been donated to the Men's Club, Winnipeg. The sum of \$12,045 of \$30,000 needed for the new building which is to be erected, has been subscribed.

**Opera Houses and Rinks**

**Parry Sound, Ont.**—The members of the Loyal Orange Lodge, 1179, have decided to erect an opera house on the site of the present Union Hall, this coming summer. The building will be of brick construction and 100 by 17 feet in dimensions. The second floor of the structure will be used for lodge purposes.

**Cobalt, Ont.**—Running Ives, Cobalt, proprietors of the local skating rink, have had plans prepared for the erection of a large combination club house and skating rink.

**Brantford, Ont.**—The sum of \$20,000 has been subscribed for the erection of a new opera house in Brantford. The proposed structure will occupy the present site of the Johnson Skating Rink.

**Hamilton, Ont.**—The "Histic Rink Co., Hamilton, has had plans prepared by Stewart McPhee for the remodelling of its present structure. The improvements will include general alterations, the erection of a twenty foot addition to the rear, and an entirely new steel arch roof. The installation of an artificial ice plant is under consideration.

**Port Stanley, Ont.**—It is reported that a new theatre building will be erected at Port Stanley this coming summer.

**Durham, Ont.**—Joseph Brown, Durham, will erect a skating rink at this place during the coming summer. The proposed structure will be 74x196 ground dimensions.

**Montreal, P. Q.**—Architect J. O. Turgeon, 55 St. Francois Xavier street, Montreal, has prepared plans for a \$50,000 skating rink to be built on St. Catherine street, for J. O. Christlan, of this place. The carpenter contract has been awarded to F. Tremblay, Montreal.



**Tara, Ont.**—The citizens of Tara have agreed to erect a large skating rink at this place, providing the Council will grant a site for that purpose.

**Winnipeg, Man.**—The contract for the reconstruction of the Winnipeg theatre has been let to James Edkhardm Co. The work is to be completed August 24.

**Portage La Prairie, Man.**—W. J. Gillman, of New York, has purchased a site in Portage La Prairie on which a fire-proof theatre building, with a seating capacity of 750, will be erected. The proposed theatre will be located on Tupper street and will be known as "The Imperial."

**Asylums and Hospitals**

**Toronto, Ont.**—A committee of the House of Industry, consisting of J. O'Hara and Messrs. Macdougall, Bain and Hubbard, has asked the Board of Control, Toronto, for funds with which to erect a building for the accommodation of the casual poor.

**Toronto, Ont.**—Plans and sketches have been approved by the Building Committee, for the new general hospital to be erected in Toronto.

**Toronto, Ont.**—Fire escapes are to be placed on the Hospital for Sick Children, and on the nurses residence adjoining.

**Welland, Ont.**—Percy S. Peacock has been awarded the contract for the erection of the Welland County Hospital, at Welland, Ont. Contract price, \$31,000. Building will be commenced shortly. Langley and Howland, of Toronto, are the architects for this building, instead of Ellis & Conroy, of that city, as reported in last issue.

**Brantford, Ont.**—A tuberculosis hospital will be erected in Brantford this coming summer.

**Hamilton, Ont.**—The Board of Governors of the Isolation Hospital, Hamilton, will submit to the City Council a proposition for the raising of \$10,000 to \$12,000 with which to erect an additional story to the present hospital building.

**Dundas, Ont.**—Architect Jas. W. Keagley has prepared plans for the erection of an Aged People's Home, in Dundas.

**Montreal, N. S.**—The management of The Children's Hospital are seeking a site from the city, on which to erect a modern hospital building.

**Winnipeg, Man.**—The City Council have recommended that a by-law be submitted to the ratepayers authorizing the expenditure of \$225,000 for new buildings in connection with the general hospital plan. This will provide for a new isolation hospital, morgue, an ante-mortem and quarters, tubercular hospital and maternity and children's hospitals. It is proposed to erect this year the isolation hospital and the morgue at an approximate cost of \$100,000 and \$15,000 respectively.

**Winnipeg, Man.**—The Old Folks' Home Association have had plans prepared for the erection of a \$5,000 building, at Middlechurch.

**Moose Nose, Man.**—Plans have been prepared for the proposed Provincial Sanitarium for Consumptives, to be erected at Moose Nose, near Birds Hill, Man.

**Victoria, B. C.**—The Board of Management of the Aged Woman's Home, is considering plans for the new building which is to be a two story brick structure.

**Victoria, B. C.**—A number of buildings will be erected on the site of the Councilman farm, for the accommodation of the insane. The buildings will cost several hundreds of thousands of dollars. It is proposed to erect one of the structures shortly at a cost of approximately \$60,000.

**Vernon, B. C.**—Tenders will be received until noon, April 15, by the Jubilee Hospital directors, Vernon, B. C., for the erection and completion of new hospital buildings. E. S. Bate, secretary of board, Vernon, B. C.

**Calgary, Alta.**—Architect F. J. Lawson, Calgary, Alta., has prepared plans and will work on tenders, April 15th for a four story hospital building, to be erected for the Hospital Board of Calgary. Specifications include: Concrete foundation, brick superstructure, galvanized iron, sanitary interior finish, fire escapes, vaults, passenger elevator, plastic relief wall, automatic glass, refrigerator, pumps, laundry machinery, ventilating apparatus. The structure will cost \$140,000.

**London, Ont.**—The Ontario Government has awarded the contract for the erection of the new Hygienic Institute in this city, to Jones Bros., Hamilton road.

**Lambton, Ont.**—The Council of the County of Lambton, Ont., have decided to expend \$4,000 in the improvement of the House of Refuge at this place.

**Kingston, Ont.**—The military authorities have purchased two large storehouses on Queen street, near Clergy street, in Kingston, Ont., which they propose remodeling into an hospital for soldiers here. The Department of Public Works, Ottawa, Ont., will have charge of the work, and they will soon call for tenders for same.

**London, Ont.**—Architects Moore & Henry, London, Ont., have prepared plans for the erection of an addition to St. Joseph's Hospital here, to cost about \$10,000.

**Ninette, Man.**—The trustees of the Sanitarium for Consumptives, Winnipeg, Man., have, up to the present, raised \$10,000, which they propose to apply towards the erection of a sanitarium at Ninette, Man. J. A. M. Atkins, K.C., of Winnipeg, Man., can be addressed.

**Regina, Sask.**—A new Municipal Hospital will be erected at Regina this year at a cost of \$100,000. In all probability the present site of the hospital will be used.

**Schools and Colleges**

**Toronto, Ont.**—Plans prepared by Architects Sprout & Ralph, have been accepted for a new library to be erected by Victoria College at a cost of \$72,000. It will be 126 ft. long, by 110 ft. wide, of a perpendicular Gothic style of architecture, and will be built of grey stone. A new men's residence, and also a chapel, will be erected nearby.

**Toronto, Ont.**—The Board of Deacons, of the Methodist church, is negotiating for a site, upon which they propose to erect a \$125,000 training school. Officers of the board are Rev. Dr. Carman, president; J. M. Treble, treasurer; J. J. Reiditt, secretary.

**Toronto, Ont.**—A site has been purchased on the north east corner of College and Huron streets, for the erection of a new dental college. Plans for the building will be prepared at once.

**Portlaw, Ont.**—G. Proctor and T. Lewis, of Kimberly, Ont., have been awarded the general contract for the erection of a school building at Portlaw, to cost \$1,500.

**Smith's Falls, Ont.**—The Board of Education of Smith's Falls, has decided to ask the town council to submit a by-law to the ratepayers for sufficient funds to erect a new high school. It was estimated that \$25,500 would be required.

**Newmarket, Ont.**—Plans have been prepared for a new college building to be erected at Newmarket by the Friends' Society.

**Paris, Ont.**—It is proposed to erect a new central school in Paris, at a cost of \$55,000.

**Dundas, Ont.**—The following contracts have been awarded for the erection of the new Presbyterian Sunday school building at this place: Bowman & Gray, labourer work; E. C. C. Gray, mason work and plastering; Andrew McKinnon, of Guelph, painting; Jno. E. Riddell, Hamilton, roofing and galvanized iron and metal ceiling work.

**Chatham, Ont.**—At a meeting of the Board of Education, Chatham, it was decided to erect fire escapes on the McKeeough school, at an estimated cost of \$700.00. Upon the recommendation of Trustee McArthur, it was also decided to consider the matter of equipping the school with standpipes.

**Chatham, Ont.**—Plans are being prepared for the erection of a Sunday school building, in connection with St. Andrew's church, Chatham. It will cost \$10,000.

**Kemptville, Ont.**—It is estimated that repairs necessary to the public and high schools, Kemptville, will cost about \$3,000. The public school will need a new roof, new desks, and furnaces, and the high school, new laboratory and new furnaces.

**Woodstock, Ont.**—The Woodstock Board of Education will erect a public school building to cost \$20,000.

**Kingston, Ont.**—The Board of Education, Kingston, has decided to expend the sum of \$4,000 in erecting fire escapes on the local schools, and providing for new exits.

**McIntyre, Ont.**—The ratepayers of McIntyre have accepted a site from Geo. Arthur, at the intersection of Dawson street and Government road, on which a school building will be erected in the near future.

**Dundas, Ont.**—A special committee of the School Board has recommended that a new high school building be erected, and that the Town Council be asked for the sum of \$16,000 for this purpose.

**Orillia, Ont.**—The Town Council of Orillia have agreed to pass a by-law, authorizing the issue of debentures to the extent of \$8,000, for the erection of an addition to the Collegiate Institute at this place.

**Perth, Ont.**—The Board of Education, of Perth, Ont., has decided to equip the collegiate institute and public schools with fire escapes and ladders.

**Belleville, Ont.**—Quinlan & Robertson have been awarded the contract for the masonry, carpentry, iron and concrete work on the new Separate School building to be erected in Belleville. The building will cost \$45,000. Architect C. E. Meredith, Ottawa.

**Renfrew, Ont.**—The School Board, Renfrew, has decided to equip the collegiate institute with fire escapes, and the Ward School with an iron balcony at the upper flat.

**Welland, Ont.**—Plans have been prepared for a new \$20,000 structure to replace the old Delaware street school building at this place.

**Stratford, Ont.**—The Public School Board has decided to erect a new two story brick school building at this place. It will be equipped with steam heating, gravity ventilation with automatic registers, and fire-proof boiler rooms.

**Owen Sound, Ont.**—The Board of Education, of Owen Sound, has asked the City Council for a grant of \$12,000, to build an addition to the Boyd street school.

**Ottawa, Ont.**—Tenders will be received by Thos. Blrckett, Chairman of Building Committee, Room 11, Central Chambers, Ottawa, until noon, April 25th, for heating and ventilating system to be installed at the Collegiate Institute, Ottawa. Plans and specifications may be seen at office of Horwood and Taylor, architects, 102 Bank street, Ottawa. Cecil Bethune, secretary, Ottawa Collegiate Institute Board.

**Niagara Falls, Ont.**—Architect Wm. Nichols, of Niagara Falls, Ont., has prepared plans for the \$14,000 public school building to be erected at this place.

**London, Ont.**—The estimates of the Ontario Department of Education include an item of \$11,500 for improvements to the London Normal School as follows: General repairs, \$500; improving class rooms, lavatory, etc., \$6,500; ventilating, \$6,500; exterior painting, \$100; heating, \$500.

**London, Ont.**—Plans are being prepared for the new Lorne avenue school to be erected here.

**Hamilton, Ont.**—The Board of Education has awarded the contract for fire escapes on Queen, George and Bess street schools, Hamilton, to Kidger Smith Company, this city, at a contract price of \$2,700.

**Hamilton, Ont.**—A report providing for alterations and additions to school buildings, to be made within the next three years, at a cost of \$250,000, was adopted by the Board of Education. An eight room addition will be built to Sophia and Pictou street schools this year. Next year Victoria avenue school will be enlarged at an estimated cost of \$75,000, which improvements are to be followed by making Canon street school a 16 roomed building and enlarging the Murray street school into a ten room building, at a cost of \$62,000 and \$42,000 respectively. The latter projects will be carried out in the year 1910 and 1911.

**Hamilton, Ont.**—The Building Committee of the Board of Education, have decided to recommend to the Board that Architects Stewart & Witton be instructed to prepare plans for an eight room addition to the Pictou street school.

**Verdun, Que.**—The Catholic School Commissioners of this city have awarded to Jos. Piché, architect, Verdun, the erection of a school building to cost \$50,000. Mr. Piché of this place is the architect.

**Quebec, Que.**—The sum of \$4,650 has been subscribed towards the \$7,000 or \$8,000, which will be used for the erection of a Student's Lodge at Bishop's College, Quebec. Plans for the new lodge have been approved by the building committee, and work will be commenced in the near future.

**Westmont, near Montreal, P. Q.**—Architect G. A. Monod, 97 St. James street, Montreal, has prepared plans for a three story pressed brick school for girls, to be erected for the Sisters of the Congregation of Notre Dame, and have awarded the general contract to Isabelle & Lessard, of this city. Electric lighting has been submitted by Robert Mitchell; heating to T. Lessard & Fils; carpentry to Jos. Trudeau; steel framing, to Dominion Bridge Co. Fire escapes will also be installed.

**Quebec, Que.**—The convent of the Sisters of Charity, at Cap St. Ignace, P. Q., was recently destroyed by fire, entailing a loss of \$20,000. Insurance, \$6,000. It will be rebuilt at once.

**Moncton, N. B.**—A special committee of the School Board, Moncton, has been appointed to secure plans for the new school building to be erected in the west end. It is expected that the site will be on the land adjoining the present Victoria school, and that a two storey assembly hall will be erected between the two buildings, joined to each school by enclosed corridors. The building will be two storeys high, and fireproof throughout.

**Wolfeville, N. S.**—Laurie D. Cox, of Harvard University, has been chosen as landscape architect, to select a site for the proposed Carnegie Science Building, to be erected at Acadia College, at a cost of \$30,000.

**Halifax, N. S.**—At a meeting of the School Board, Halifax, it was decided to accept the plans submitted by J. Busch of Halifax for the erection of the new Chebucto school, at this place. The building will be equipped with fire escapes.

**Halifax, N. S.**—New competitive plans and specifications, for a school house on Oxford street, will be received at the office up to noon, April 20. Information and particulars may be had at the office of the supervisor, R. J. Wilson, secretary, School Commissioner's office.

**Winnipeg, Man.**—A by-law has been passed authorizing the construction of a new school in the rural district of Brooklands, adjoining the Weston suburb, at a cost of \$20,000.

**Minnedosa, Man.**—A new \$20,000 school building will be erected in Minnedosa as soon as a site is selected.

**Vancouver, B. C.**—The plans of Architect Pierce, Vancouver, have been accepted for the erection of a new \$80,000 Provincial Normal School, to be located in Fairview, a suburb of Vancouver.

**Victoria, B. C.**—A by-law will be submitted to the ratepayers of Victoria, in the near future, for the raising of a sum of \$70,000, with which to erect a school building, and purchase of school sites. It is estimated that the school building will cost \$50,000.

**Regina, Sask.**—The School Board, of Regina, is contemplating the erection of a \$120,000 collegiate building at this place.

**Craik, Sask.**—Architects Storey & Van Egmond, Regina, Sask., have prepared plans for a two storey brick school building in Craik school, district 891, at cost of \$12,000. The building will be equipped with a steam heating system.

**Asquith, Sask.**—Preliminary sketches of the proposed brick school building, to be erected at Asquith, have been prepared by W. W. Lawrence, Saskatoon.

**Prince Albert, Sask.**—A site has been secured for the proposed building to be erected for the St. Albans School for Girls, which was founded here a year ago. The structure will cost at least \$20,000, and work will be commenced as soon as the building permits are obtained.

**Prince Albert, Sask.**—Plans have been prepared, and a site procured for the erection of a new High School building, at Prince Albert, at a cost of \$100,000.

**Fumbolt, Sask.**—A new public school building will be erected at this place in the near future, at a cost of \$5,000.

**Moose Jaw, Sask.**—Trustees of Moose Jaw High School Board No. 1, have recently received competitive plans and specifications for a collegiate institute and building to contain twelve modern class rooms, a debating hall, a gymnasium. Cost of building and equipment is estimated at \$100,000. Further particulars may be had by addressing H. Jagger, secretary High School Board, Moose Jaw, Sask.

**Francis, Sask.**—Architects Storey & Van Egmond, Regina, have been commissioned to prepare plans for a four room school building at Francis, Sask.

**Kamsack, Sask.**—The Board of Education of Kamsack, Sask., has decided to erect a new school building at a cost of \$5,000.

**Nanton, Alta.**—Tenders will be received by Thos. Chesterfield, secretary of School Board, Nanton, until noon, April 15, for the erection of a school building in Auburn School District No. 1667.

**Strathcona, Alta.**—A site of 255 acres has been purchased in Strathcona for the erection of university buildings. Plans will be obtained in the near future, but the buildings will not be erected until next year.

**Edmonton, Alta.**—Phensey & Batson, Edmonton, have been awarded the contract for the erection of a \$60,000 brick and stone school building in Norwood, a suburb of Edmonton. Rowland W. Lines of Edmonton, is the architect.

**Edmonton, Alta.**—The School Board of Edmonton propose to erect a high school building to take the place of the present structure on College avenue.

**Churches**

**Toronto, Ont.**—St. Joseph's Catholic church on Leslie street, was recently destroyed by fire to the extent of \$25,000, covered by insurance to the amount of \$13,000.

**Toronto, Ont.**—The Roman Catholics of Toronto, under the direction of the Archbishop, have purchased the property at the corner of Degrassi and First ave., on which they propose erecting at once a church to cost at least \$30,000.

**Toronto, Ont.**—The congregation of the North Parkdale Methodist church, Toronto, will erect a new \$30,000 church building in the near future.

**Kew Beach, Toronto, Ont.**—Architect C. F. Wagner has prepared plans for a new Baptist church at Kew Beach, which will have a seating capacity of over 500 and contain a large school room in the basement.

**Toronto, Ont.**—The congregation of Westmoreland Methodist church, which was destroyed by fire several weeks ago has purchased another site at the north-west corner of Westmoreland avenue and Hallam street, on which a \$30,000 edifice will be erected, plans for which have been prepared by Geo. H. Miller & Co., architects.

**Hamilton, Ont.**—Goodale & Ludlaw, have been awarded the contract for decorating both the interior and exterior of the church and parsonage of the Emerald street Methodist church.

**Hamilton, Ont.**—A site has been purchased for the new Methodist church to be erected at the corner of Springer avenue and Main street. The construction of a parochial school building to accommodate 200 pupils, however, precede the erection of the church.

**Hamilton, Ont.**—Plans have been prepared for the erection of a new church for the St. James Presbyterian congregation, Hamilton. The structure will cost approximately \$10,000.

**Walkerville, Ont.**—The First Presbyterian congregation will erect a new church and Sunday school building here. A manse will also be built, in connection with the church in the near future.

**Clinton, Ont.**—Thos. McKenzie, Clinton, has been awarded the contract for the erection of the new Catholic church at Clinton. The building will be of St. Mary's stone and red pressed brick, with slate roof. Estimated cost \$13,000. Architect, W. J. Ireland, Stratford.

**City View, Ont.**—Architects Northwood & Noffke, 26 Central Chambers, Ottawa, Ont., have prepared plans for the erection of a brick church to cost \$5,000, in the village of City View, Ont.

**Ottawa, Ont.**—A new Methodist church will be erected this summer on the site of the one recently destroyed by fire. The structure will be of solid brick, W. E. Noffke, Central Chambers, is the architect.

**Gordonville, Ont.**—The Presbyterian congregation, Gordonville, has decided to erect a new \$7,000 church building this coming summer.

**London, Ont.**—Architects Moore & Henry, London, have prepared plans for a new chapel to be built at the Mount St. Joseph Institute, Richmond street N. The building, which will cost about \$25,000, will be 118 ft. long by 46 ft. wide.

**London, Ont.**—The Salvation Army, London, is contemplating the erection of a new building in East London, to accommodate 300 people. Approximate cost \$6,000.

**Teeswater, Ont.**—Architect Bonning, of Listowel, Ont., has been engaged by the trustees of Knox church, Teeswater, to prepare plans for alterations in this church at a cost of \$9,000.

**Pottersburg, Ont.**—The Presbyterian congregation of Pottersburg, propose to erect a new church building at this place.

**Chatham, Ont.**—The congregation of St. Joseph's church, Chatham, Ont., propose erecting two steeples on their church here, to cost about \$12,000.

**Berlin, Ont.**—The congregation of St. Matthew's Lutheran church, Berlin, Ont., Rev. E. Hoffman, pastor, propose erecting an addition to their church here in the near future.

**Montreal, P. Q.**—Architect J. C. Turgeon and D. Vinu, St. Francois Xavier street, Montreal, have awarded the contract for the erection of an \$80,000 church for the Roman Catholic congregation of Lachine, P. Q., to Frs. Dufresne, St. Laurent, P. Q.

**Montreal, Que.**—It is proposed to erect a new four storey building in connection with the Brewery Mission, at a cost of \$50,000. The new structure will occupy the site of the present mission. Plans prepared by Architects Finlay & Spence, have been accepted by the building committee, of which J. W. Palmer is chairman. The building will have a gospel hall with seating capacity of 500, restaurant, kindergarten, reading room seating 200, laundry, swimming pool in basement.

**Abbotsford, P. Q.**—Architect J. O. Turgeon, 55 St. Francois Xavier street, Montreal, has prepared plans for a \$20,000 church to be erected for the Roman Catholic congregation at Abbotsford, P. Q.

**L'Islet, Que.**—Architects Ouellet & Levesque, 117 St. John street, Quebec have awarded the contract for the erection of a Catholic church at L'Islet, Que., to Thomas Caron, St. Aubert, Que. Cost of building, \$10,400.

**Anclenne, P. Q.**—Architects Ouellet & Levesque, 117 St. John street, Quebec City, P. Q., have prepared plans for the interior finish of the Roman Catholic church at Anclenne, Lorette County, P. Q. Improvements will cost \$5,000.

**Adney, C. B.**—Plans prepared by R. Mills, architect, have been accepted for the erection of a Catholic church at Brook Village, Inverness county. The structure, which will cost \$5,000, will seat 400. The structure will be provided with art windows.

**Moncton, N. B.**—Architect W. C. Barnes Moncton, N. B., has prepared plans for changing choir and pulpit, and erecting a new organ in the First Baptist church, Moncton, N. B., at a cost of \$5,000.

**St. John, N. B.**—Rev. Mr. Nobles, pastor of the Victoria street Baptist church, St. John, N. B., states that the church will be enlarged at a cost of \$10,000.

**Moncton, P. Q.**—Plans for the proposed \$125,000 church and parish building, to be erected by the congregation of All Saints at Broadway and Osborne streets, have been completed. The structure will be of limestone construction, and of the Gothic style of architecture, and will seat 1,000 people.

**Winnipeg, Man.**—Architect J. H. G. Russell, Winnipeg, has prepared plans for a Mission building, to be erected at a cost of \$12,000, on Sutherland avenue, Winnipeg. The building will be two storeys in height, of brick construction, stone foundation, flat and gravel roof, steam heating, electric lighting, plumbing, British Columbia fir interior finish, cut stone, metallic lath, ornamental iron, fire escapes, sheet metal work, metal ceiling.

**Shelburne, Man.**—The congregation of the English church at this place, have decided to erect a new edifice this coming summer.

**Vancouver, B. C.**—The sum of \$15,000 has been raised for the purpose of enlarging Christ church, Vancouver. Work will be commenced about May 1.

**Vancouver, B. C.**—The congregation of the Wesley Methodist church, Vancouver, have purchased a site at the corner of Bute and Haro streets, on which they will erect a new \$100,000 church building. The auditorium of the church will seat 2,000 people. A separate building for Sunday school purposes having a seating capacity of 1,000 will be built first.

**Lanigan, Sask.**—The congregation of the Church of England have secured sites for both a church and parsonage, and will commence building operation at once.

**Yellow Grass, Sask.**—The congregation of the Church of Christ, Yellow Grass, will this coming summer erect a large church at this place.

**Red Deer, Alta.**—Both the Methodist and Roman Catholic congregations of Red Deer, Alta., will erect churches in the near future, at a cost of \$35,000 each.

**Residences and Flats**

**Toronto, Ont.**—E. D. Gooderham, 83 Prince Arthur avenue, has been granted a permit on the erection of a two storey and attic brick dwelling at 22 North Sherbourne street, near Elm avenue, at a cost of \$20,000. Architects Spratt & Rolph; builder, Wm. Hughes.

**Kingsville, Ont.**—Both the Methodist and Baptist congregations of Kingsville, Ont., will erect parsonages in the near future, adjoining their respective churches.

**London, Ont.**—Architect W. G. Murray, London, will receive tenders until April 15, for the erection of a two and a half storey, solid brick residence on Central avenue, for Ed. Shea, Wellington and Central streets, London, at a cost of

\$1,000. The building will have brick foundation, slate roof, hardwood interior finish, hot water heating, combination lighting, plumbing. Following work specified: Cement work, mantels, plate glass and art glass.

**London, Ont.**—Architect W. G. Murray, London, will receive tenders until April 15 for the erection of a \$3,000 two storey residence at the corner of Cheap-side and Richard streets, for Richard Hexter, of this place. It will be of solid brick construction with brick foundation, slate roof, hot air heating, gas lighting and plumbing.

**London, Ont.**—Architect W. G. Murray, London, has prepared plans for a \$3,600 two storey solid brick house on Central avenue, for Mr. Cartwright, of this place. It will have brick foundation, slate roof, hot air heating, combination lighting and plumbing and mantels.

**Hamilton, Ont.**—Architect E. D. Patterson, 167-1-2 East King street, Hamilton, Ont., has prepared plans for a residence to cost \$3,000, for Miss McGrath, Ferguson, south Hamilton, Ont. Specifications include stone foundation, brick superstructure, mantels, plate and art glass. The contract has been awarded to E. K. Thompson, contractor, of this city.

**Montreal, P. Q.**—Architect C. A. Pearce 7 St. George's Place, Westmount, near Montreal, P. Q., has prepared plans for a \$6,000 residence to be erected for C. J. Brown, Westmount, P. Q. Specifications include stone foundation, masonry superstructure, hot water heating, electric lighting, open plumbing, pine interior finish.

**Westmount, P. Q.**—Architect C. A. Pearce, 7 St. George's Place, Westmount, P. Q., has prepared plans for a double Residential building, to be erected for Chas. J. Brown, Westmount, P. Q., to cost \$6,000. Specifications include limestone foundation, brick superstructure, hot water heating, gas and electric lighting, modern plumbing, pine interior finish, tile mantels, plate and art glass.

**Westmount, P. Q.**—Architect C. A. Pearce, 7 St. George's Place, Westmount, P. Q., has prepared plans for a \$10,000 residence for C. J. Brown, Westmount, P. Q., to be built by day work. Specifications include stone foundation, brick superstructure, composition roof, pine interior finish, hot water heating, electric lighting, modern plumbing, tile mantels, ornamental columns and exps. plate and art glass.

**Westmount, Hochelaga County, Que.**—Architect C. A. Pearce has completed plans for a two storey brick dwelling to be erected in Westmount, at a cost of \$4,000, for C. J. Brown, of this place. It will have stone foundation, composition roof, hot water heating, electric lighting, and open plumbing.

**Ormslow, Que.**—Architect Kenneth G. Ren, New York Life Building, Ormslow, Que., will receive tenders to April 25, for the erection of a brick dwelling in Ormslow town, at estimated cost of \$10,000. Owner's name withheld. The structure will be two and a half storeys and basement in height, with stone foundation, shingle roof, electric lighting, hot water heating, mantels, artificial stone, shingle stain.

**Quebec, P. Q.**—Architects Quétel & Levesque, 117 St. John Street, Quebec City, have prepared plans for two residences for L. F. Burroughs, 60 Maple ave., Quebec City. Specifications include stone foundation, brick superstructure, galvanized iron roof, plaster interior finish, hot water heating, electric lighting, mantels, water heating.

**St. John, N. B.**—Architect F. Neil Brodie has awarded to J. M. Belyea, St. John, the contract for carpenter work, and to J. Burley, St. John, contract for masonry work, on a \$6,500 residence to be erected at St. John West, for Mr. B. Smith, of this place. The building is of frame construction, with concrete foundation, metal shingle roof, hardwood floors, and pine interior finish, hot water heating, electric lighting, open plumbing.

**Winnipeg, Man.**—Architect J. H. G. Russell has prepared plans for a \$12,000 two storey frame residence to be erected on Yale avenue, for H. P. Cox. The building will have stone foundation, shingle roof, oak and birch interior finish, combination heating, electric lighting and plumbing.

**Winnipeg, Man.**—Architect J. H. G. Russell, Winnipeg, is preparing plans for a \$10,000 bungalow, to be built on Roslyn road for Mr. Bull. It will be of frame construction, stone foundation, steam heating, electric lighting, plumbing, B. C. fir interior finish, mantels, plate and art glass.

**Winnipeg, Man.**—Architect Alf. Oldfield, Kennedy Building, Winnipeg, has completed plans for an \$18,000 residence to be located on Wellington Crescent, for Miss Taylor, of this city.

**Winnipeg, Man.**—Architect J. H. G. Russell, Winnipeg, has prepared plans for a twenty suite apartment building, at a cost of \$40,000, to be erected on Edmonton street, for Jno. Chrichton. It will be three storeys in height, of brick construction with stone foundation, steam heating, electric lighting, plumbing, hardwood interior finish, felt and gravel roof. Following work specified: cement work, cut stone, marble, tile, mantels, concrete blocks, metal ceiling, fire escape, capes, metal ceiling, plate glass, art glass.

**Vancouver, B. C.**—Architect Henry B. Watson has prepared plans for an apartment block for J. J. Dissette, to cost \$20,000. It will be three storeys in height and located at the corner of Georgia and Broughton streets.

**Victoria, B. C.**—Architect H. S. Griffith, Government street, Victoria, B. C., has completed plans for a \$3,500 frame residence on Pandora avenue, for Capt. Townsend, of this place.

**Victoria, B. C.**—Architect H. S. Griffith, Government street, Victoria, has prepared plans for a \$3,000 stone residence to be located on Wilmut Place, for T. C. Mackay.

**Vancouver, B. C.**—Architect W. F. Gardner, of Vancouver, has prepared plans for a three storey apartment house to be erected in this city. The structure will have a frontage of 100 ft., and will have one hundred suites of from two to six rooms. Cost of building \$100,000.

**Vancouver, B. C.**—J. A. Siebald, Vancouver, will shortly begin the erection of a fire proof dwelling, to cost \$5,000 on Howe street. The National Construction Company, of this city, has the general contract.

**Vancouver, B. C.**—Mr. W. L. Tait, of Vancouver, B. C., proposes erecting a five storey addition with 33 ft. frontage to his apartment house, corner of Robson and Thurlow streets, at a cost of \$25,000.

**Saskatoon, Sask.**—Messrs. Storey & VanEdmond, Regina, have prepared plans for a brick and frame dwelling to be erected here for Mr. J. A. Aiken, at a cost of \$4,000.

**Saskatoon, Sask.**—Messrs. Storey & VanEdmond, Regina, have prepared plans for a brick and frame dwelling to be erected here for Judge McLong, to cost \$4,000. It will be equipped with hot water heating.

**Regina, Sask.**—Architects Storey & VanEdmond, Regina, Sask., have completed plans for the Hasten Apartment building to be erected here. It will be of brick construction, and will be provided with steam heating. Following work specified: Cut stone, mantels, and metallic bath. Owner, J. H. Haslam, St. Paul, Minn.

**Regina, Sask.**—Architects Storey & VanEdmond have prepared plans for a brick house to be built for Geo. Forsythe, Regina.

**Regina, Sask.**—Architects Storey & VanEdmond have prepared plans for a brick house to be built for J. H. H. Young, Regina.

**Moose Jaw, Sask.**—Architects Coatsman & Cloakley, of Regina, Sask., have prepared plans for a 140 suite apartment building to be erected at Moose Jaw, Sask., at a cost of \$120,000.

## Hotels

**Niagara Falls, Ont.**—A new hotel building will be erected at Niagara Falls by Willis B. E. Smith. The structure will be of the Colonial style of architecture.

**Morristown, Ont.**—Mr. Burger, Canton, N. Y., will erect a four storey brick vancouver summer hotel at Morristown, Ont., to cost \$15,000.

**Quebec, Que.**—Permit has been issued to the Canadian Stewart Co., Limited, for the erection of an extension to Chateau Frontenac, at a cost of \$300,000.

**Halifax, N. S.**—The Sydney Hotel at Halifax, N. S., owned by Mr. Eroy, was damaged by fire recently to the extent of \$30,000. The loss is covered by insurance and the place will be rebuilt at once.

**Winnipeg, Man.**—Architects Hopper & White have prepared plans for a new three storey 1,158 ft. frame hotel to be erected by E. Windbank, at Winnipeg Beach.

**Vancouver, B. C.**—Architects Parr & Fee, 507 Grenville street, Vancouver, B. C., have prepared plans for a hotel building for A. Calvert, of this city, to cost \$100,000. The first three reinforced concrete, the other six storeys to be of milt construction. It will have asphalt pitch roof, marble and hardwood interior finish, the work, fire escapes, passenger elevators, dumb waiter, sheet metal work, plate glass, art glass, steam heating and electric lighting.

**Vancouver, B. C.**—H. D. Wright will erect a five storey hotel building on Hastings street, between Columbia and Cavell. The structure will be of brick with white glazed brick, and will cost \$50,000. Architect H. B. Watson, Pender st., Vancouver.

**Salmon, B. C.**—J. Richards, Salmon, is contemplating the erection of a large hotel building at this place.

**Moose Jaw, Sask.**—Mr. Ernest Von Ferber, proprietor of the Windsor Hotel, Moose Jaw, will make extensive alterations to this building. The present hot air plant will be replaced by a hot water plant and the hotel will be entirely refurbished, repainted and redecorated.

**Rosthern, Sask.**—A new \$20,000 cement block hotel building will be erected at Hague this summer, by H. W. Fisher.

## Fire Stations and Jails

**Toronto, Ont.**—Hon. Mr. Hanna, Provincial Secretary, will introduce a resolution in the Provincial Parliament, asking that a tract of land be purchased and a new Central Prison erected thereon.

**Regina, Sask.**—Carter, Halls, Aldinger Company, Limited, of Winnipeg, have been awarded the contract for the erection of a new jail at Moosomin. Contract price for building and fittings complete, \$60,945.

## Civic Improvements

**Toronto, Ont.**—The city engineer has recommended the following new pavements: asphalt, Wallace ave., from Lansdowne ave. to first trucks west, \$1,246; Golden ave., from Dundas st. to north end, \$4,073; Shaw st., from College st. to Bloor st., \$17,677; built by Edgar ave., from Schofield ave. to Glen road, \$11,310; Marjory ave., from Gerard street to a point 124 ft. south, \$3,161; Manchester ave., from Ossington; Shaw st., \$4,276; East Roxborough, from Schofield; Edgar ave., \$8,582; brick, Woodbine ave., from Queen street to a point 1,443 feet south, \$13,100; macadam, Cluny ave., from Crescent road to Roxborough st., \$1,654.

**Toronto, Ont.**—City Engineer Rust has proposed to the Board of Control, that \$5,000 be used for the construction of a stone wall along the front, and \$3,000 for resurfacing the road from a point west of Sunnyside to a point just east of the Humber. The Board of Control also had under consideration an application for \$10,000 for the construction of a new concrete sidewalk.

**Ottawa, Ont.**—The Board of Control, Ottawa, has awarded the following contracts for supplies: crushed stone, Dupuis Supply Co., and 100 point, just east of Fairbairn, Ottawa, at 98c per sack; yard; cast iron piping, T. S. Kirby & Co., Ottawa, \$14,544; hydrants and valves, T. Lawson & Sons, Ottawa, \$2,453; brass, Chadwick Bros., Hamilton, \$1,175.50; the piping, Kirby & Co., Ottawa, \$4,877.

**Ottawa, Ont.**—Contracts have been let for furnishing the city of Ottawa, with materials as follows: lead pipe and pig lumber, W. McLaughlin, \$8,411; cement, International Portland Cement Co., 52c per cwt.

**Port Arthur, Ont.**—Port Arthur has received assurances from the Ontario Government that the lease of Dog Lake power will be granted as soon as details can be arranged. The government will build a regulating dam at the outlet of the lake, at a cost of \$29,000.

**Hamilton, Ont.**—The city council, Hamilton, has declined to purchase a trenching machine for the construction of a sewer in the annex, at a cost of \$1,000.

**London, Ont.**—The Board of Health, London, is preparing data and estimates for a view of recommending to the city council, the establishment of an incinerator plant at this place. Manager Morse, of the Universal Destructor Co., of New York City, has submitted a proposition whereby his company offer to install a complete plant for the sum of \$60,000. Dr. Nixon, chairman of the Board of Health, or City Clerk Baker, can be addressed.

**Brantford, Ont.**—Tenders will be received up to April 23, for supplying sewer pipe, paving brick, and lumber required by the city of Brantford for 1908. T. Harry Jones, city engineer, City Hall, Brantford.

**St. Thomas, Ont.**—The city engineer of St. Thomas has been instructed to prepare plans and estimates for an incinerator plant to be installed here.

**Edmonton, Alta.**—The city engineer has prepared plans for three septic tanks to be installed by the city in connection with the sewer system.

**A Universal Flooring**

**N**OTHING has been adopted in improved methods of construction that has ingratiated itself so strongly with builders and owners as the modern jointless flooring. Owing to the very nature of its components, the manner in which it is applied, its durability, together with its economical and hygienic features, the jointless flooring of to-day is a necessity where a well surfaced, perfect and sanitary floor is required. A flooring of this character is not confined to any particular class of buildings, in fact, its field may be regarded as being universal, as there is no place in human habitations on which man sets his foot where it cannot be successfully applied.

Perhaps the best illustration as to the extent of its use and durability is the fact that Terrano, one of the best known and widely adopted products of this kind, is being employed as a flooring in steamships, and despite the constant jarring and pounding which a ship undergoes on an ocean trip, this material has not shown any indication of a split or fracture.

The admirable manner in which it has withstood the test in this respect has led the Montreal Street Car Company to have a floor of this product laid in one of its cars, with a view of adopting it throughout the service.

Terrano is applied in a plastic state about the consistency of mortar and in the same manner as a cement floor, thus forming a continuous sheet without joints or cracks over the entire area to be covered. It hardens in from ten to twelve hours' time and making a perfect bond with its foundation becomes a permanent floor. It can be laid on a foundation of concrete or brick, as well as old or new wooden surfaces. Under ordinary conditions it is applied about three-quarters of an inch thick and when finished makes a fireproof, waterproof, non-slippery, foot-warm flooring, easily cleaned and sanitary to the highest degree.

Another feature of Terrano is that it can be used also for wainscoting. This is done by continuing the floor surface in a cove base or by carrying it up on the walls to any height required. The particular advantage of this construction is that it forms a perfect, continuous, jointless surface which is especially adapted for hospitals, lavatories and bath-room, as it permits of the floor being flushed out without any possibility of injury resulting to the walls.

Owing to its deafening properties and sanitary character, Terrano makes an admirable flooring for churches, theatres, armories, hospitals, office buildings, halls, billiard rooms, cafes and similar places. It is also ideal for kitchen and laundry floors and is used extensively in factories, abattoirs, brewery and machine shop. In this class of building a special, coarse, non-slippery flooring is furnished, that will withstand the heavy trucking and rough usage to which it is subjected. A special Terrano flooring which, in addition to above qualities, is oil and water proof, is provided for power plant and engine rooms.

Another advantage which Terrano possesses is that it can be laid in various colors, in panels or squares of different tones, and permits of the execution of artistic designs and lettering. It can also be sawed like hardwood and gives a firm hold for screws, and in addition can be easily and cleanly cut or taken up and relaid when necessary to allow for pipe-holes, traps, partitions, etc.

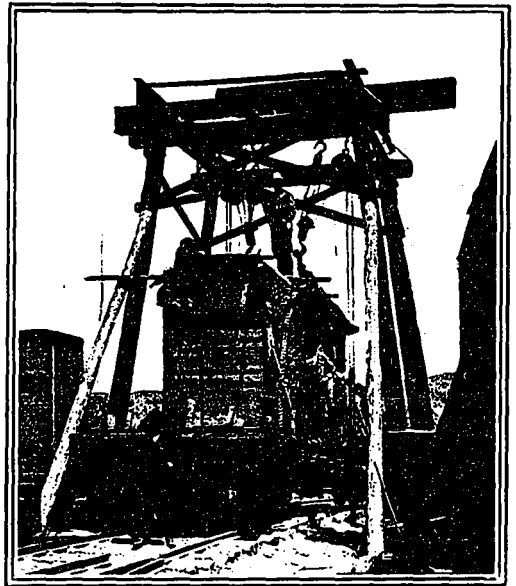
Terrano is equally well adapted as a covering for old worn-out floors as it is for flooring in a new building.

In repairing an old floor it is not necessary to remove any part of it, but simply cover it with this product, which makes the floor as good as new at a moderate cost and with little disturbance or dirt.

For more specific information, estimates, and a list of the many buildings in which this meritorious flooring is being used, write to Eadie-Douglas Company, 22 St. John street, Montreal, general sales agents for Terrano Flooring Company of Canada.

**Handling Heavy Machinery in Canadian Backwoods**

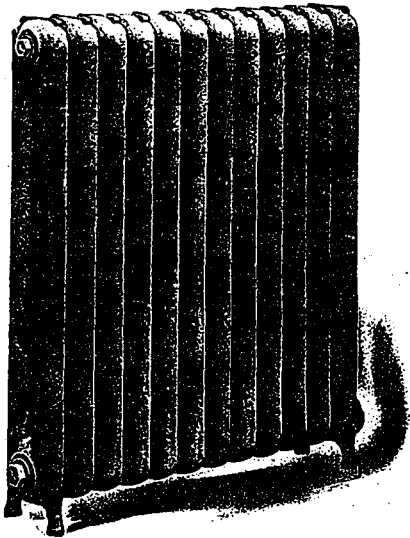
**W**HILE the recent additions that have been made in many persons have undoubtedly heard of the development of the natural hydraulic power at Shawinigan Falls, where electric power is generated and



SPECIAL DEVICE ERECTED FOR UNLOADING HEAVY PARTS FROM CARS PREPARATORY TO LOWERING THEM DOWN THE INCLINE TO POWER PLANT.

transmitted to Montreal, Three Rivers, Sorel and other contiguous points, there are few who have an idea of the enormous difficulties encountered and surmounted by the installing engineer in transporting the machinery to the base of operations.

The Shawinigan Falls are situated on the St. Lawrence river, 80 miles north of Montreal, and the principal industries located there are the Shawinigan Carbide Company, the Canadian Belgo Pulp and Paper Company and the Northern Aluminum Company. In the power house of the Shawinigan Water and Power Company have been installed two phase 30 cycle alternators aggregating 25,000 kilowatts, having direct connections with the water wheels operated under an average head of 130 ft. The fifth generator, which is of 6,600 kilowatts capacity, Canadian Westinghouse make, connects directly to a 10,500 h.p. turbine water wheel, manufactured by I. P. Morris, which was installed last year.



2 COLUMN PLAIN  
Heights 42, 38, 32, 26, 23 and 16 inches

# KING RADIATORS

ARE

## Honest Radiators

IN

### Build

### Rating

AND

### Design

The same style of ornamentation reigns supreme, so that in every installation, whether comprised of 2, 3, 4 Column, or Wall Radiators, the ornamentation will be found to be absolutely consistent throughout. This is a distinguishing feature of the KING.

THE  
**Ornamentation**

IS

**Raised** (not sunk)

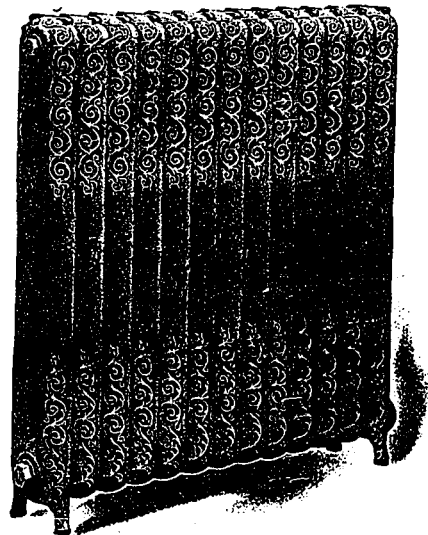
MATERIALLY REDUCING

**Cost of Decorating**

**CLUFF BROTHERS**

Lombard Street, TORONTO

Selling Agents  
for : : : **WARDEN-KING, Limited**



2 COLUMN ORNAMENTAL  
Heights 42, 38, 32, 26, 23 and 16 inches

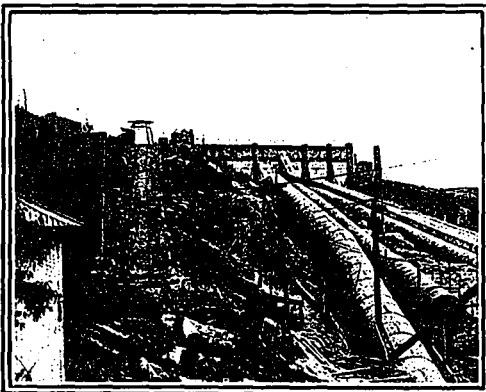
It was in the handling of these two gigantic machines that the engineers met with obstacles that are particularly interesting in the manner in which they were overcome. The power plant is located on the water edge, about 160 feet below the summit of the embankment, to where the machinery was delivered on cars. The chief difficulty with which the installing engineers had to con-



METHOD OF UNLOADING 55-TON TOP CASE OF THE WATER WHEEL.

tend was the lowering of the heavy parts to the objective point. In order to accomplish this huge task, it was necessary to erect a special device for unloading the big pieces from the cars, the lower half of the generator yoke alone weighing 44,940 lbs. With this device six cars of heavy apparatus varying in weight from 15 to 60 tons were unloaded in two days of 10 hours each. The next problem met with was transferring the parts to the power house.

The distance from the tracks to the power house is about 525 ft. over a rough stretch down the side of a hill. This, however, was overcome by gradually developing a first-class skidway, having a solid bottom and two rail tracks, on which the machinery was placed and lowered to the base. The grade of the incline being 1 in 3 with a sharp curve at the foot into the power house, it was necessary to exercise every precaution in controlling



SKIDWAY CONSTRUCTED ON THE GRADE OF 1 TO 3 UPON WHICH THE HEAVY MACHINERY WAS LOWERED TO THE POWER HOUSE.

the descent of the heavy pieces. For this purpose, at the top of the incline, two sets of anchor posts, each composed of three heavy pine snubs, were placed 8 ft. apart and

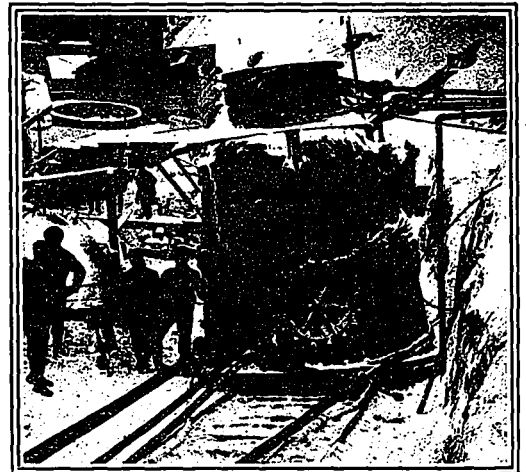
sunk in the ground to a depth of 6 ft., the snubs being embedded in a mass of concrete 5 ft. square.

After placing the piece to be lowered in position, a heavy 15-inch I beam was placed across the post and the upper blocks of the lowering apparatus was fastened to the centre of it.

The lower block was then attached to the machinery and the fall end of the rope was passed around three heavy snubbing posts of maple, set in the ground to a depth of 7 ft. in a concrete bed, and located to one side at the rear of the other sets of posts. With everything in readiness the parts were launched over the brow of the hill and a gradual descent made. The accompanying illustrations give a good idea as to how this feat was accomplished. The work was executed by R. C. Argall, 67 Notre Dame street, Maisonneuve, Montreal, who makes a specialty of submarine work, reinforced concrete work, and the handling and erection of heavy machinery.

## Water Curtains

IF the various devices and appliances adopted in the equipment of buildings, for protection against the ingress of fire, there are few, if any, which have the resistive force that is to be found in the water curtain. In this age, when adequate fire protection is recognized



THE 55-TON TOP CASE OF THE WATER WHEEL SAFELY LOWERED TO THE BASE OF THE HILL.

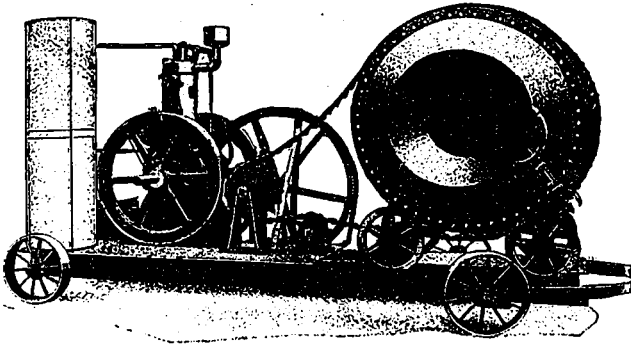
as a necessity in the economic construction of building, the water curtain is destined to play an important part. Not only does it prevent flames from entering the windows of a building, but by the veritable sheet of water it forms when in operation, isolates the entire side of the building on which it is located, from the attack of fire.

Nothing demonstrates the efficiency of this appliance better than Oneils Department Store, Baltimore, which, owing to the operation of its water curtain, was saved from destruction in the big fire which reduced the business section of that city to ruins a few years ago. This, and other tests to which the water curtain has been subjected, has recommended it so strongly to the Fire Underwriters, that wherever it is installed, the owner has benefited by a big saving in insurance rates.

The water curtain consists of a number of pipes extending over each window, with specially designed sprinklers to distribute the water, which, owing to its force, produces a curtain covering the side of the building. The size of the water mains vary according to the pressure required to reach the roof. Another important point in connection with water curtains is that in all cases where they are installed, the fire department can

# Contractors' Supplies

— of all kinds —



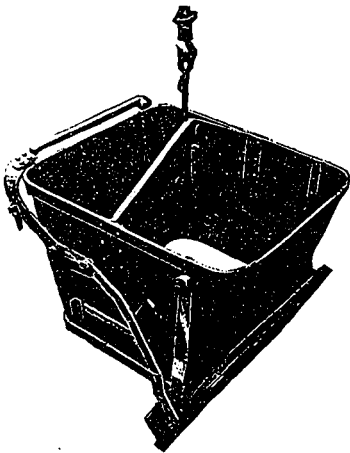
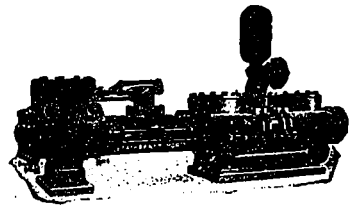
McKelvey Concrete Mixers,  
combined with Steam, Gas-  
oline, or Electrical Power.

**EMERSON STEAM PUMPS** (Pulsometer Type)

**DUPLEX POWER PUMPS**

**TRIPLEX POWER PUMPS**

**PUMPING MACHINERY** of all  
descriptions



**STUEBNER DROP BOTTOM DUMPING BUCKETS**

**WELL'S LIGHTS**

**BARRETT JACKS**

**DUNN'S TRENCH BRACES**

and a full line of

**RAILWAY and CONTRACTORS' SUPPLIES**

## THE CANADIAN FAIRBANKS COMPANY, LIMITED

MONTREAL

TORONTO

WINNIPEG

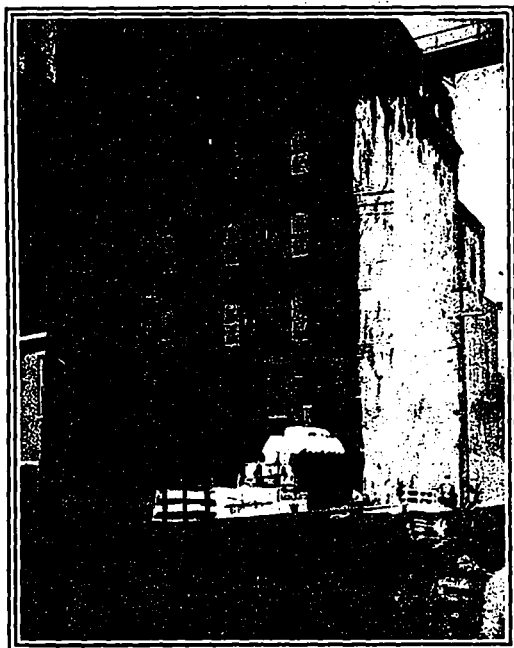
VANCOUVER

ST. JOHN

CALGARY

attach a hose to the Siamese twin coupling, which is placed on the exterior of the building, in case of the mains on the street breaking. By this means, water can be brought from another main and pumped through the sprinklers.

The accompanying illustration of the Royal Mills of the Ogilvie Flour Co., Montreal, shows one of these



WATER CURTAIN IN OPERATION AT THE ROYAL MILLS OF THE OGILVIE FLOUR COMPANY, MONTREAL.

water curtains in operation, giving an excellent idea of how the down-pour of water protects the building. This building is equipped with what is known as the Esty Sprinkler System, which was installed by the H. G. Vogel Company, 30 St. George St., Montreal. This firm also carries a complete line of pumps, hydrants, and underground piping of every description.

Among the principal buildings provided with water curtains by this firm are: Ogilvie Flour Mills, Winnipeg; Dowsville Mfg. Co., Hamilton, Ont.; Ontario Box Co.; E. & S. Currie Co., Toronto; W. R. Brock Co., Toronto; Hodgson, Son & Co.; Boulter Waugh & Co.; Montreal Woollen Mills Co.; Mark Fisher Sons & Co.; Notre Dame Church; Hudson Herbert & Co.; H. Wolff & Co.; L. Chaput et Fils; A. McDougall & Co.; Librairie Beauchemin; Brophy Caine; T. C. Wilson; Konig & Stuffman; Fitzgibbons & Schoffline; Finlay Smith & Co.; Bowin, Wilson & Co.; M. Vineberg & Co.; Lamontayne Ltd.; P. P. Martin; McClary Mfg. Co., all of Montreal; P. Garneau et Fils, and Holt, Renfrew, Quebec.

### A Loose Leaf Form of Catalogue

**A** NOVEL method of issuing a catalogue to the trade has been adopted by Frances Hyde & Company, dealers in contractors' and founders' supplies, 31 Wellington street, Montreal. The catalogue will consist of descriptive price lists in form of numbered bulletins which will be sent forth from time to time. Each bulletin in addition to dealing with some one line of the company's business will include technical tables and data of interest to the contractors and engineers.

The bulletins are to be in loose leaf form, each complete in itself and arranged to fasten in a suitable bind-

er which is furnished with the initial issue. In this manner the company will cover their entire line, thus forming a complete catalogue and reference book, which can be conveniently revised at intervals, as changes occur in the various lines.

Bulletin No. 1, devoted exclusively to fire brick, one of the most important departments of the company's business, gives an excellent idea of the thoroughness with which each section of the catalogue will be compiled. It is substantially bound in a press board cover with an extension back so-as to allow for each and every subsequent bulletin. Besides the descriptive matter, there are several pages of colored cuts showing the various shapes carried in stock, together with their dimensions.

The booklet also contains drawings showing typical cupola and typical lime kiln lining, general information about fire brick and various tables relating to wedge brick, arch brick, cupola blocks, method of estimating high temperature, temperatures of iron, steel and other metals under various conditions, and the weights of different materials. Subsequent bulletins will deal with foundry facings, iron and brass foundry supplies, wheelbarrows, scrapers, building brick, sewer brick, enameled brick, paving brick, sewer and culvert pipes and fire clay, all of which are included in the extensive stock carried by this concern.

### Canada's Best Equipped Brass Plant

(Continued from page 57.)

In this department oil furnaces instead of coke furnaces are used, and numerous pits for this purpose have been provided. The fact that oil is used permits of a larger number of heats per day. Every device of modern make has been installed, and the crucibles are lifted out by compressed air. The foundry is well ventilated throughout, and it contains stock rooms of ample size for brass and copper.

In connection with the foundry in a separate wing is the power house and boiler room, which occupies a ground area of 50 x 75 feet. It is absolutely fireproof throughout, the walls being of brick and the roof and floors of reinforced concrete construction. All current for operating the individual motors with which the factory is equipped is generated from two 100 horse-power return tubular boilers and one dynamo.

The electrical equipment throughout is the best, the conduit system of wiring having been adopted. Separate watchmen service is installed on all floors as well as in the main office, and also that of the superintendent. A telephone system extends to every part of the building and fire protection has been carefully considered as standpipes with hose attached have been placed on every floor.

The entire plant is heated by a modern hot blast heating system, which gives a complete change of air every three minutes. Sidetrack facilities are so arranged that cars can be brought to the centre of the buildings, thereby minimizing the handling of goods and avoiding delays in shipments.

The company make all its own patterns and tools, and the plant at the present time is employing 125 men. In addition to manufacturing a complete line of plumbers' and steamfitters' supplies, the company also makes lead pipe, lead traps and bends and solder.

Aside from this extensive brass plant, which is under the superintendency of Mr. F. L. Hazeldine, the company maintains a large warehouse at 54-56 Lombard street, and general offices and show rooms at 59 Richmond street east, which are in charge of Mr. Fred Somerville, general manager of the company.

The individual lockers for the employees with which Somerville, Limited, plant is provided were furnished and installed by Geo. B. Meadows, 479 Wellington street west, Toronto, who also makes a specialty of fire escape, bank and office fixtures and ornamental iron.



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Our 1908 Edition of the Ransome **HAND BOOK OF CONCRETE MACHINERY**---nearly 200 pages---is now about ready. Its numerous drawings showing concrete mixing plants will prove helpful to every designer of such plants and to anyone interested in concrete.

Its tables of weights, capacities and useful data and hints on concrete making will give many a valuable pointer. Not the least helpful feature is a set of specifications for reinforced concrete work.

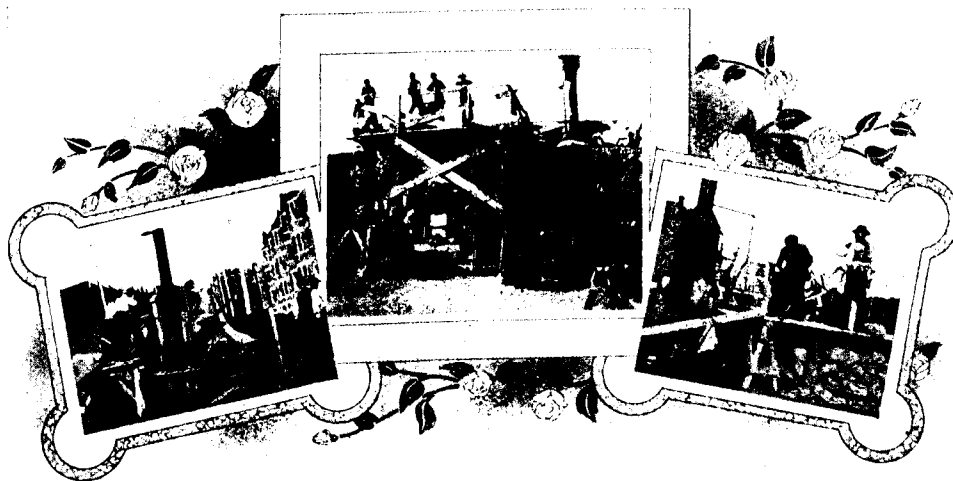
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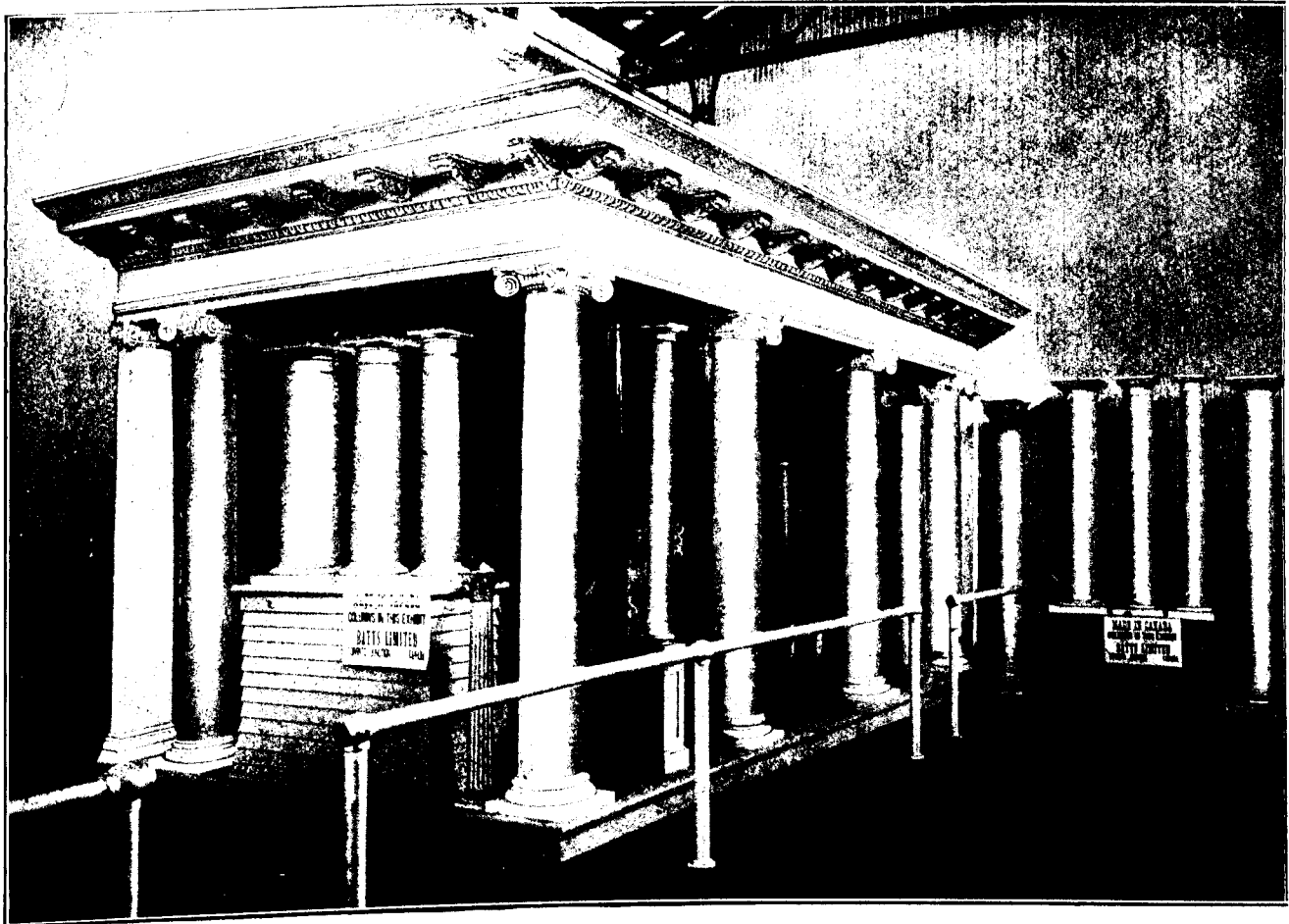
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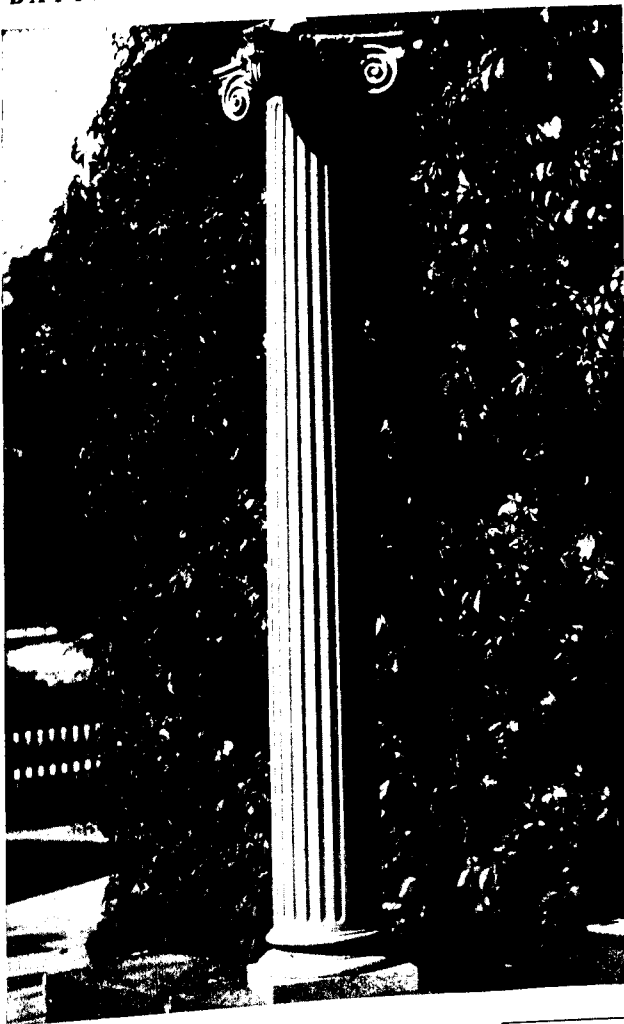
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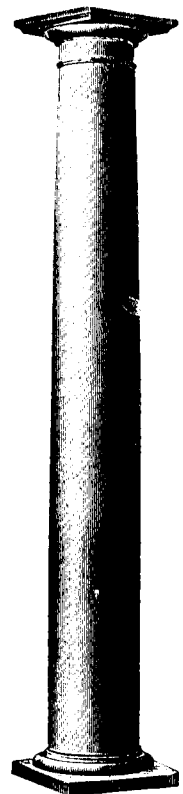
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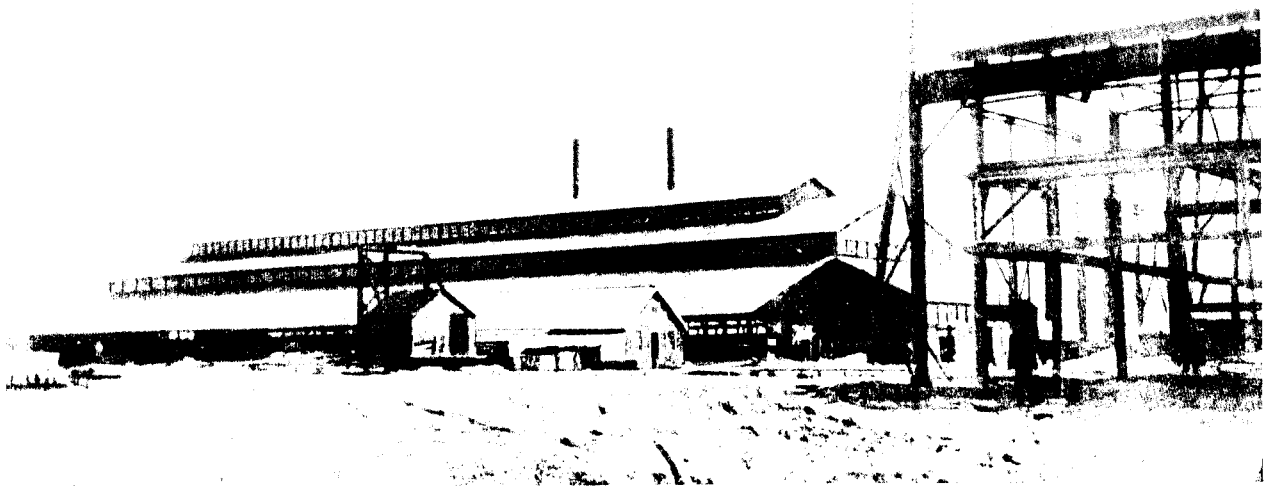
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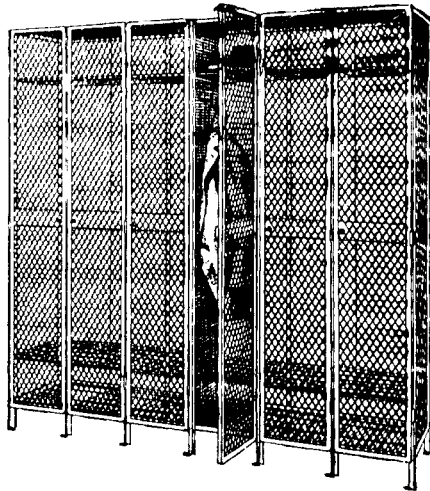
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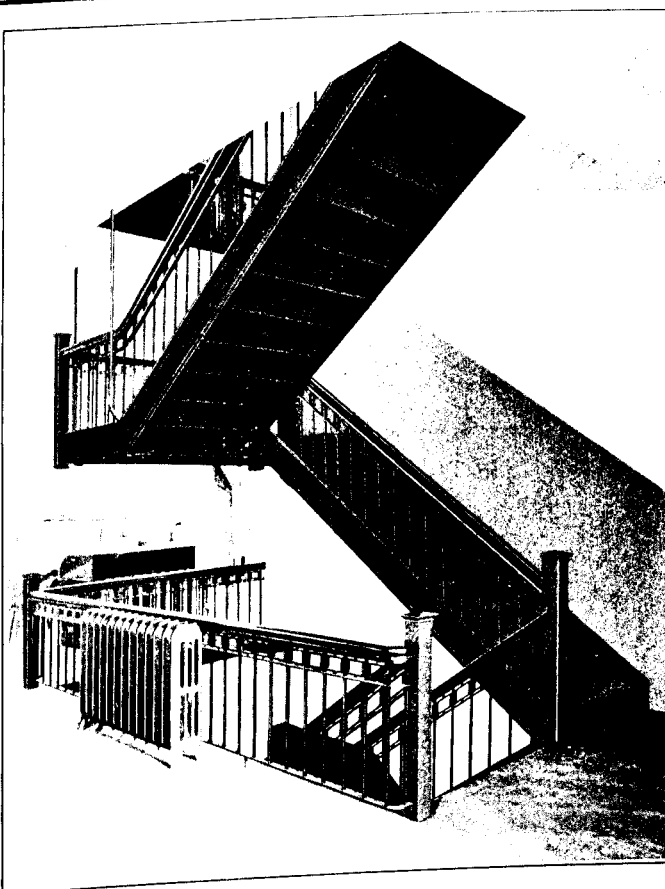
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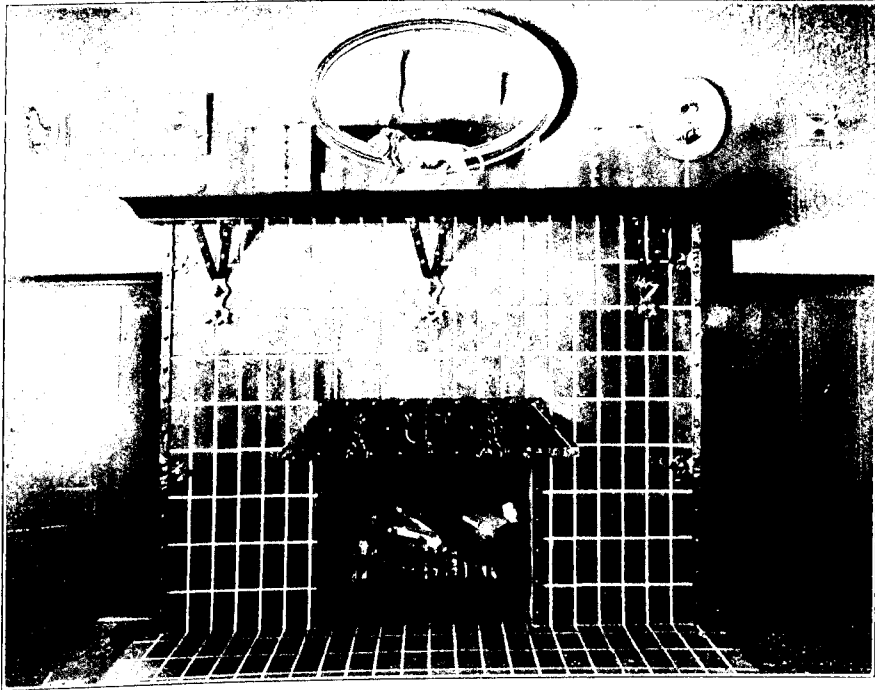
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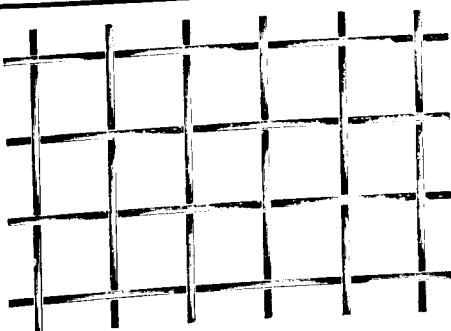
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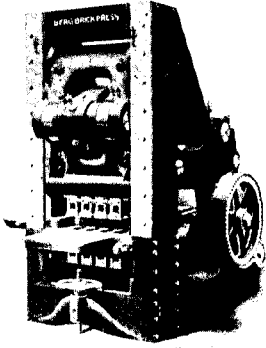
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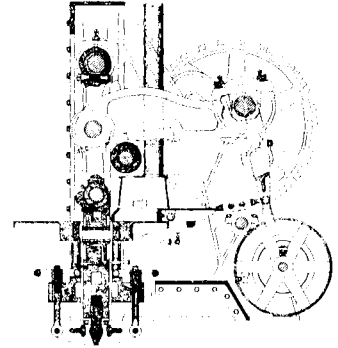
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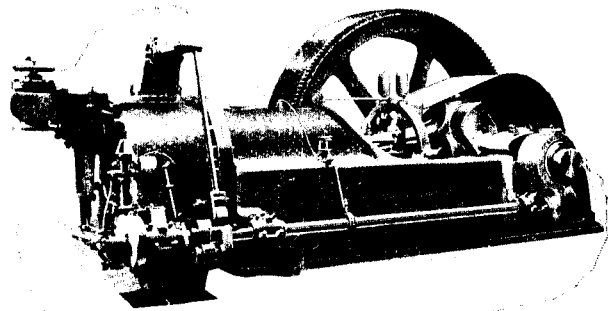
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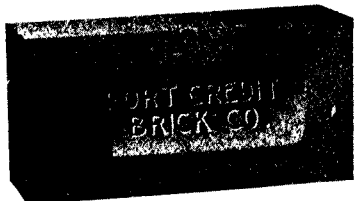
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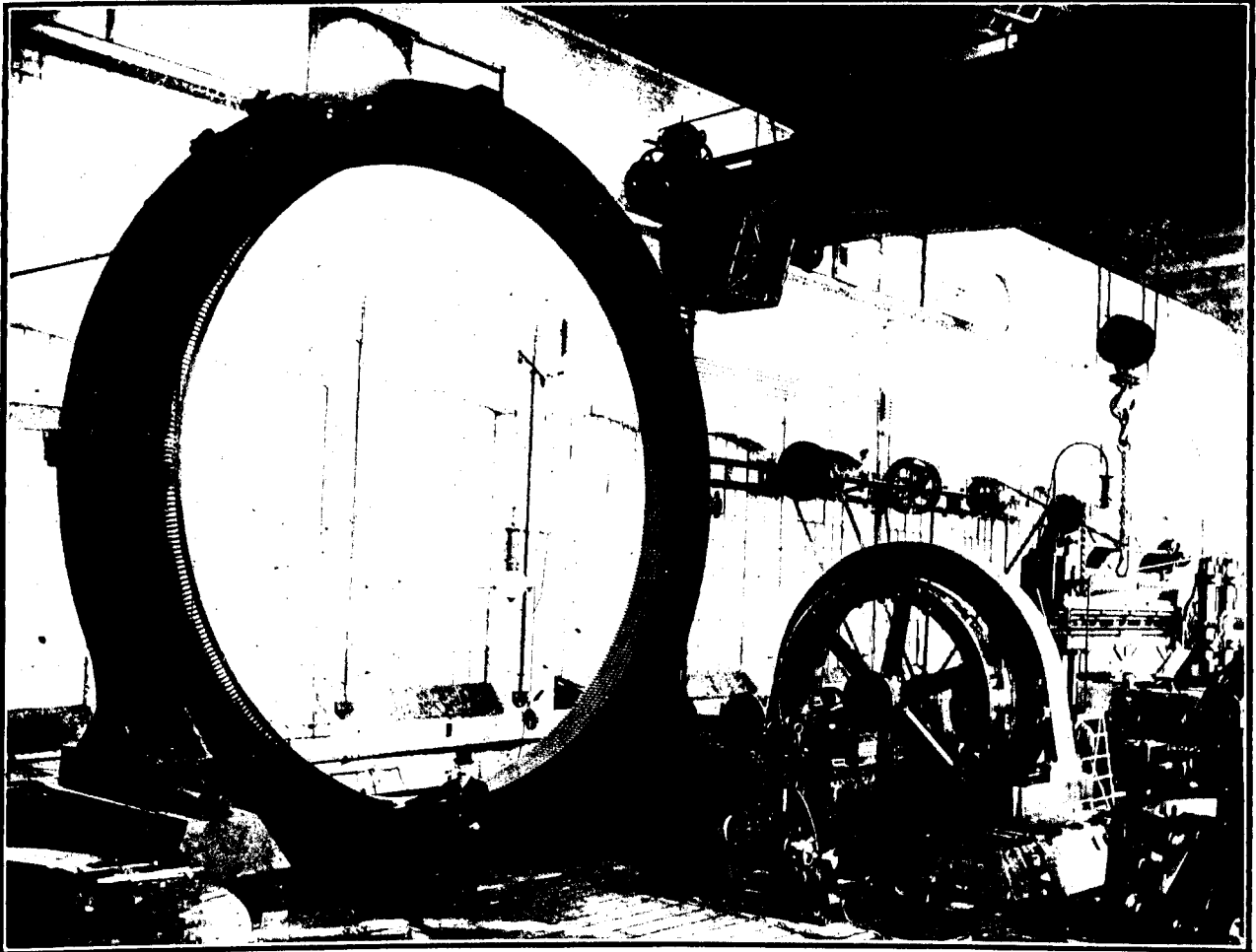
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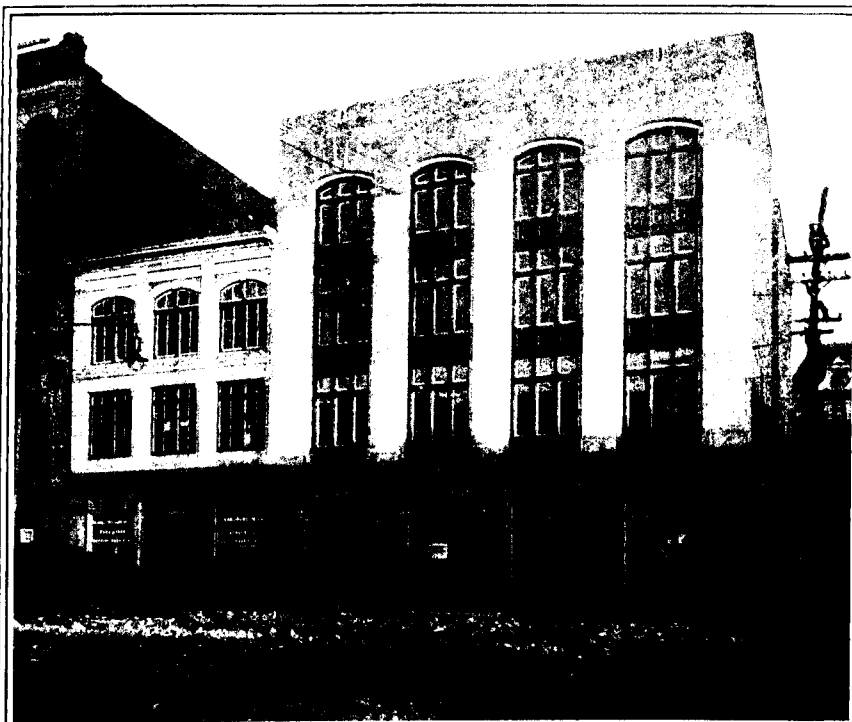
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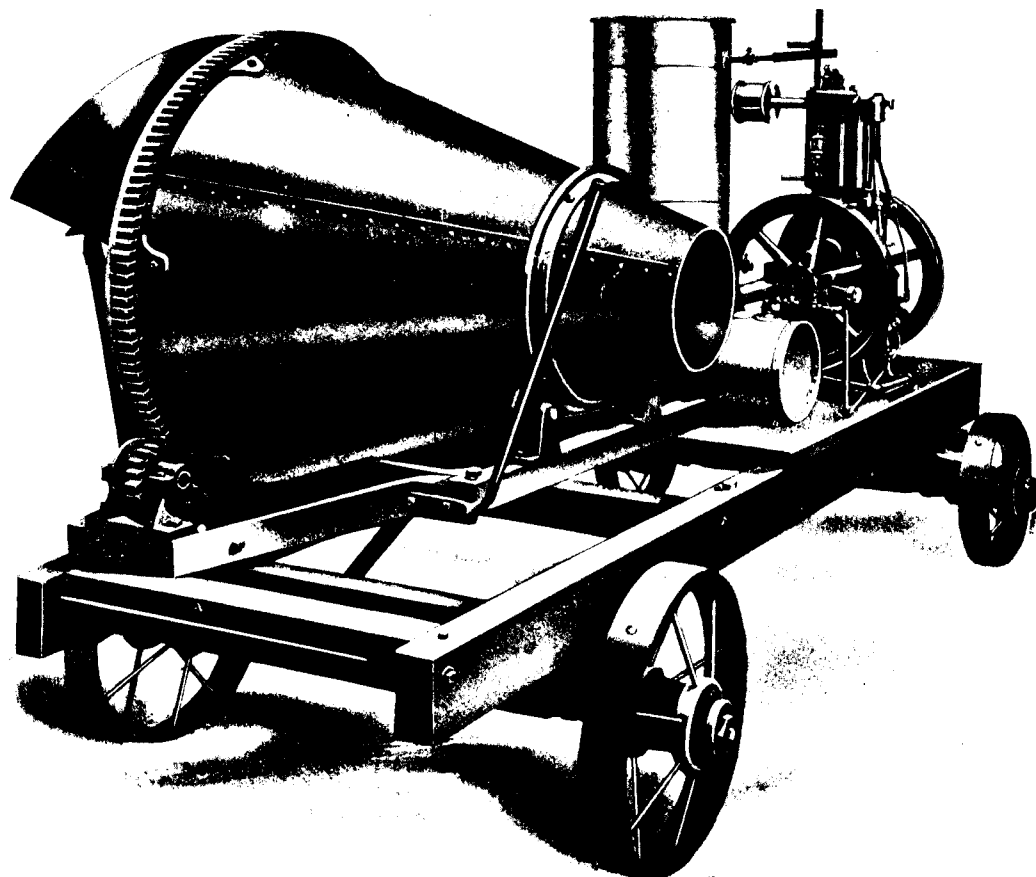
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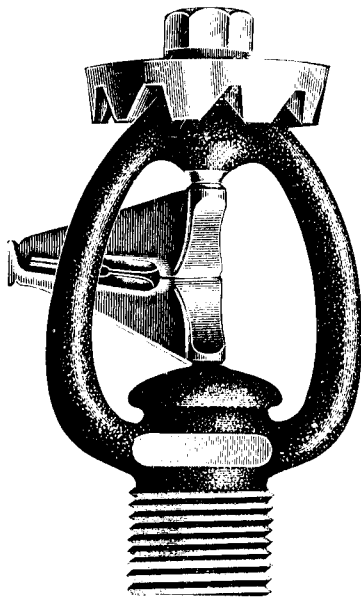
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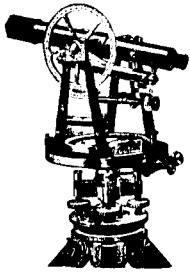
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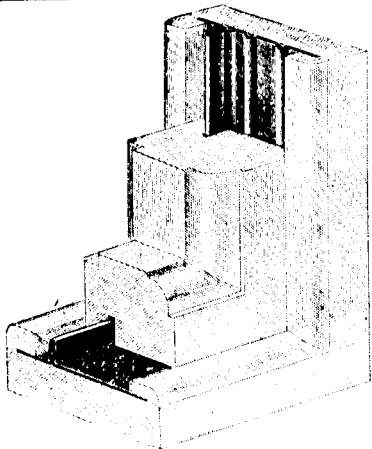
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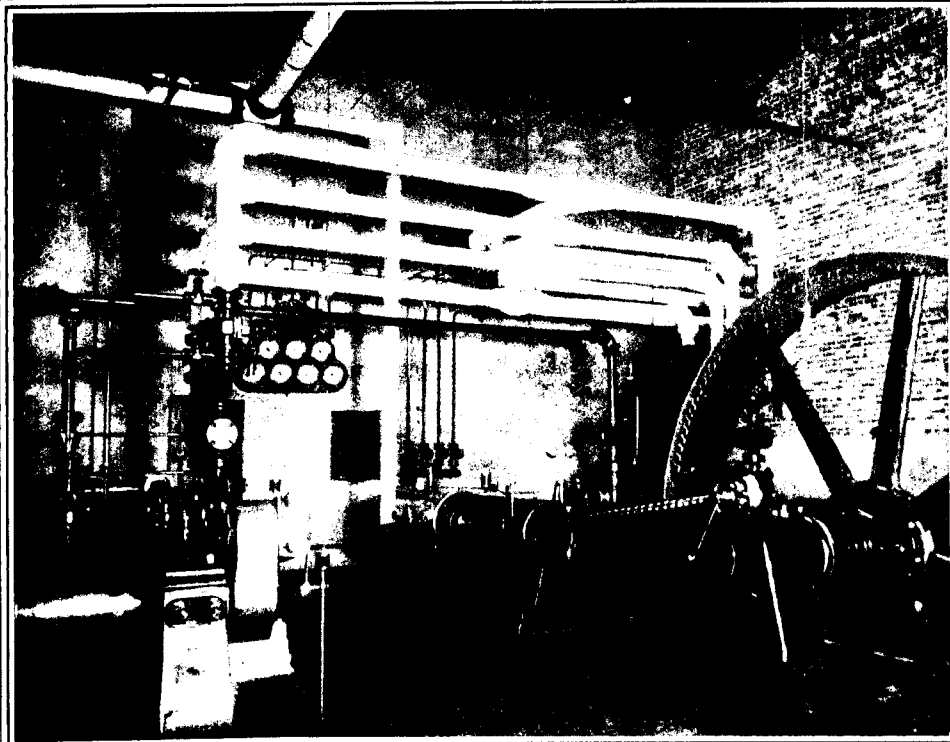
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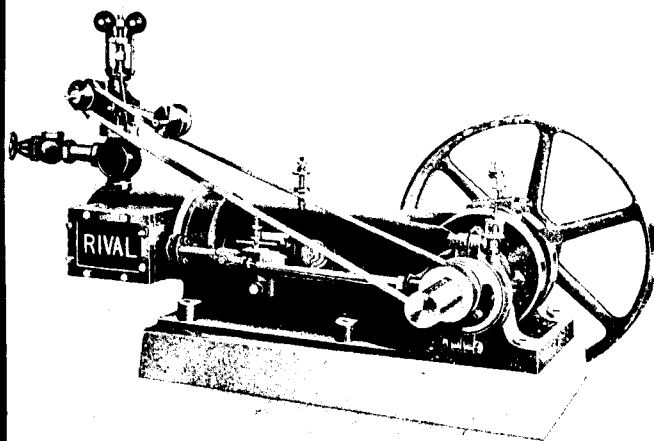
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Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.  
 Gas, Electric & Power Co., Stair Bldg., Toronto.  
 Jones & Glassco, Sovereign Bank Bldg., Montreal.

**RADIATORS.**

Cluff Bros., 21-27 Lombard St.  
 King Radiator Co., St. Helens Avenue, Toronto.  
 Dominion Radiator Co., Ltd., Toronto, Montreal, Winnipeg.  
 Warden King, Limited, Montreal.

**RAILWAY SUPPLIES.**

Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.  
 Drummond McCall & Co., Montreal.  
 F. H. Hopkins & Co., Montreal.

**REINFORCED CONCRETE.**

Concrete Engineering and Construction Co., 123 Bay St., Toronto  
 David McGill, Merchants Bank Chambers, Montreal.  
 Expanded Metal & Fireproofing Co., 100 King St. W., Toronto.  
 Pitt & Robinson, Manning Chambers, Toronto.  
 Trussed Concrete Steel Co., Limited, 23 Jordan St., Toronto.

**REFRIGERATING MACHINERY.**

Linde British Refrigeration Co., Limited, Coristine Building, Montreal.

**REFRIGERATOR INSULATION.**

Armstrong Cork Co., 521 Coristine Building, Montreal.

**RELIEF DECORATION.**

W. J. Hynes, 16 Gould St., Toronto.

**ROOFING PAPER.**

Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.  
 Lockerby & McComb, 65 Shannon St., Montreal.  
 The Paterson Manufacturing Co., Ltd., Toronto, Montreal and Winnipeg.

**ROOFING TILE.**

David McGill, Merchants Bank Chambers, Montreal.

**RUBBER TILING.**

Dunlop Tire & Rubber Co. Head Office, Booth Ave.; City Office, 13 Temperance St., Toronto.  
 Gutta Percha & Rubber Mfg. Co., Limited, 47 Yonge St., Toronto.

**SANITARY PLUMBING APPLIANCES.**

Somerville, Limited, 59 Richmond St. E., Toronto.  
 Standard Ideal Co., Limited, Port Hope, Ontario.

**SEWER PIPE.**

Francis Hyde & Co., 31 Wellington St., Montreal.

**SHEET METAL WORKERS.**

Galt Art Metal Co., Galt, Ont.  
 Metal Shingle & Siding Co., Preston, Ont.  
 A. B. Ormsby, Limited, Queen and George Sts., Toronto, and 677 Notre Dame Ave. West, Winnipeg.

**SIDEWALK LIFTS.**

Otis-Fenson Elevator Co., Ltd., Traders Bank Bldg., Toronto.

**SPRINKLER SYSTEMS.**

General Fire Equipment Co., 72 Queen St. East, Toronto.  
 H. G. Vogel Co., 30 St. George St., Montreal.

**STAFF AND STUCCO WORK.**

W. J. Hynes, 16 Gould St., Toronto.

**STEEL DOORS.**

A. B. Ormsby, Limited, Queen and George Sts., Toronto, and 677 Notre Dame Ave. West, Winnipeg.

**STEAM AND HOT WATER HEATING.**

Cluff Bros., 21-27 Lombard St., Toronto.  
 Warden King, Limited, Montreal.

**STEEL CONCRETE CONSTRUCTION.**

Concrete Engineering and Construction Co., 123 Bay St., Toronto  
 Expanded Metal & Fireproofing Co., 100 King St. W., Toronto.  
 Metcalf Engineering, Ltd., 80 St. Francis Xavier St., Montreal.  
 Pitt & Robinson, Manning Chambers, Toronto.  
 Trussed Concrete Steel Co., 23 Jordan St., Toronto.

**STEEL CASEMENTS.**

David McGill, Merchants Bank Chambers, Montreal.

**STRUCTURAL IRON CONTRACTORS.**

Feid & Brown, 63 Esplanade E., Toronto.

**STRUCTURAL STEEL.**

Gaudry & Co., L. H., Coristine Building, Montreal; 76 Peter Street, Quebec; Roy Building, Halifax.

**SWITCH GEAR (Electrical)**

Gas, Electric & Power Co., Stair Bldg., Toronto.

**TERRA COTTA FIREPROOFING.**

Eadie-Douglas Co., 22 St. John St., Montreal.  
 Don Valley Brick Works, 36 Toronto St., Toronto.

E. F. Dartnell, 157 St. James St., Montreal.  
 Francis Hyde & Co., 31 Wellington St., Montreal.  
 The Milton Pressed Brick Co., Milton, Ont. 75 Yonge St., Toronto. 204 St. James St., Montreal.

David McGill, Merchants Bank Chambers, Montreal.

**TILE (FLOOR AND WALL).**

Canada Plate & Window Glass Co., Limited, 49 Richmond St. East, Toronto.  
 David McGill, Merchants Bank Chambers, Montreal.

**WALL HANGINGS.**

Deecker & Carlyle, 26 Yonge St. Arcade, Toronto.  
 The Thornton-Smith Co., 11 King St. West, Toronto.

**WATER HEATERS.**

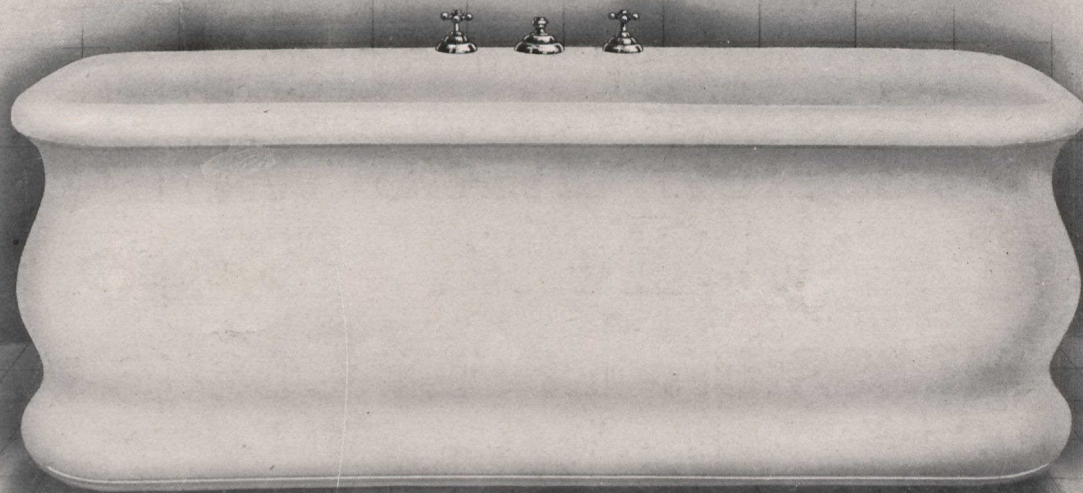
Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.  
 Somerville, Limited, 59 Richmond St. E., Toronto.  
 Drummond McCall & Co., Montreal, Toronto.

**WATER WORKS SUPPLIES.**

Somerville, Limited, 59 Richmond St. E., Toronto.  
 Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.

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**Fuller Bibbs.**

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**Fuller Bath Cocks.**

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