

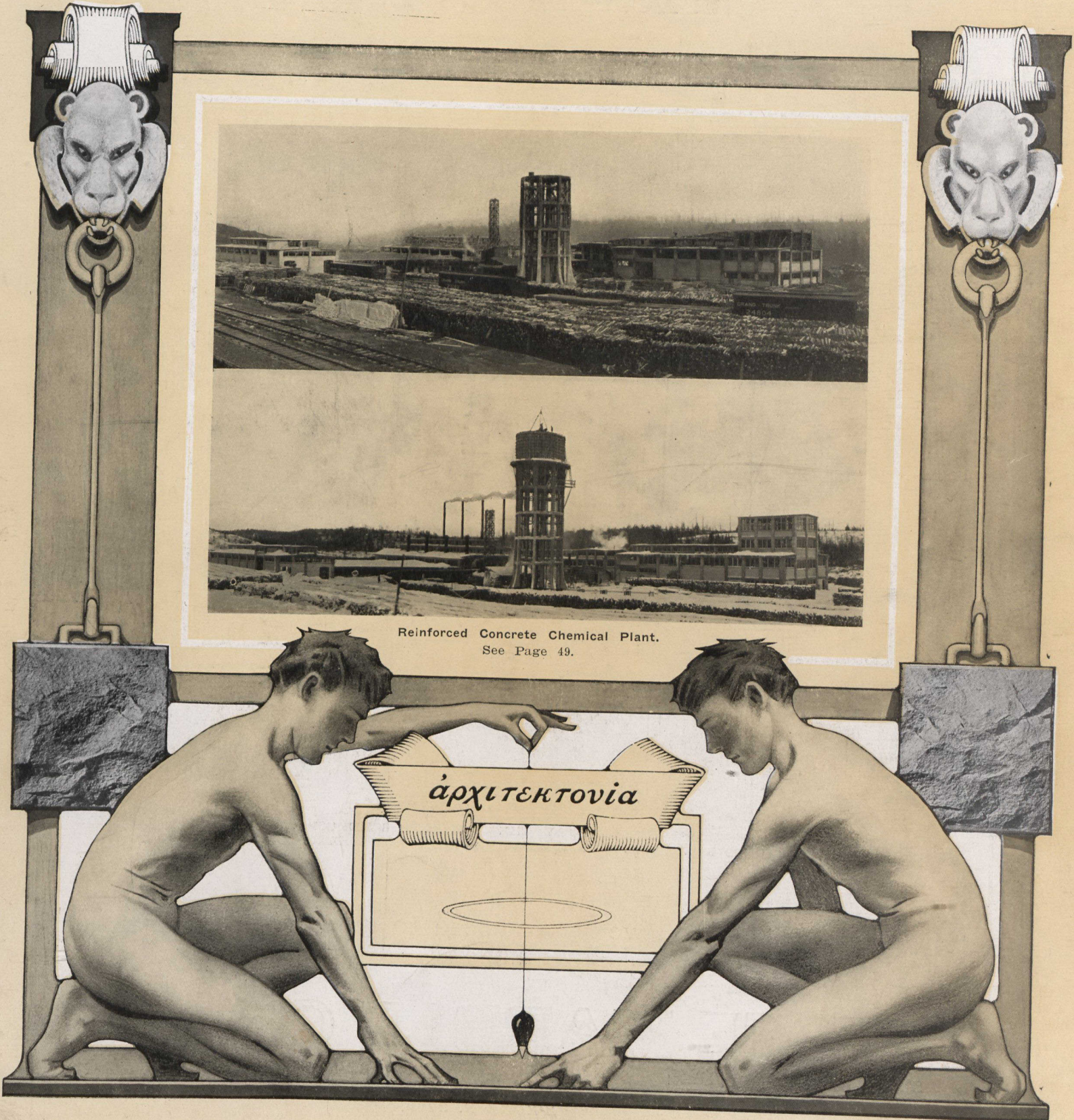
CONSTRUCTION

" A JOURNAL FOR THE ARCHITECTURAL ENGINEERING AND CONTRACTING INTERESTS OF CANADA "

Vol. 2, No. 3.

JANUARY, 1909

\$2.00 PER YEAR
25c. PER COPY



Reinforced Concrete Chemical Plant.
See Page 49.

- MONTREAL -
BOARD OF TRADE BUILDING

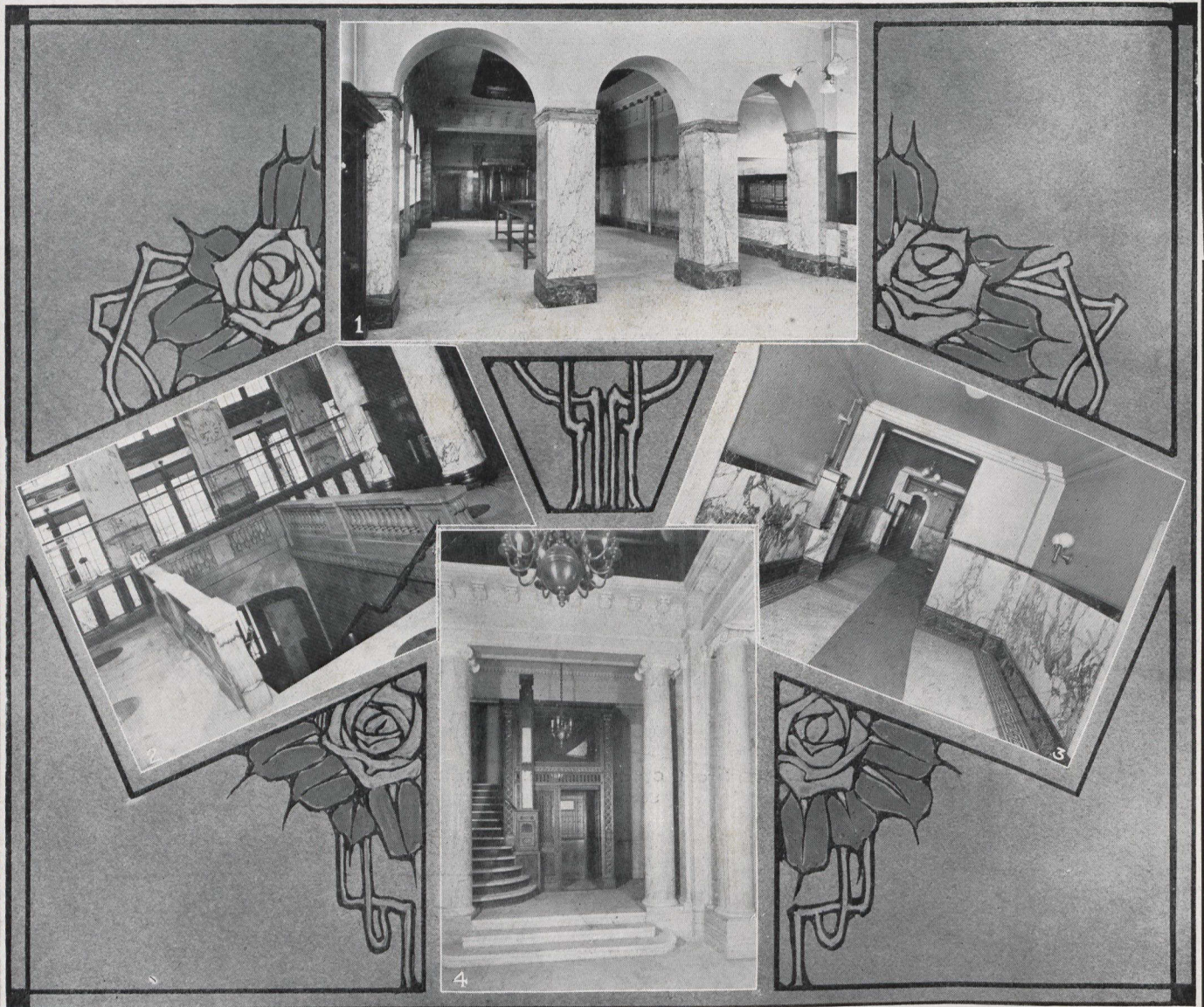
- HEAD OFFICE -
'SATURDAY NIGHT' BUILDING,
TORONTO

- LONDON, ENG. -
BYRON HOUSE, 85 FLEET STREET, E.C.

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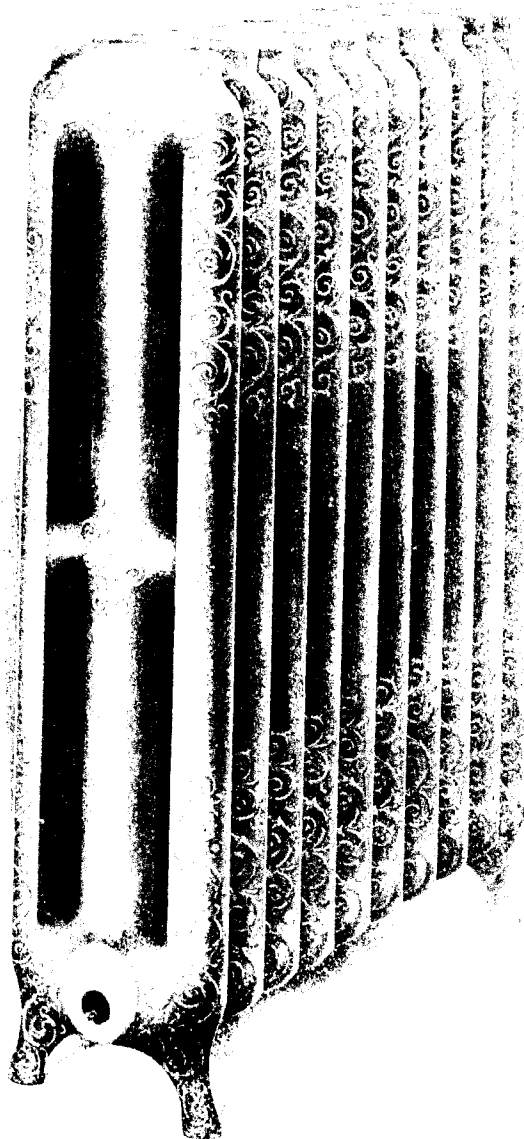
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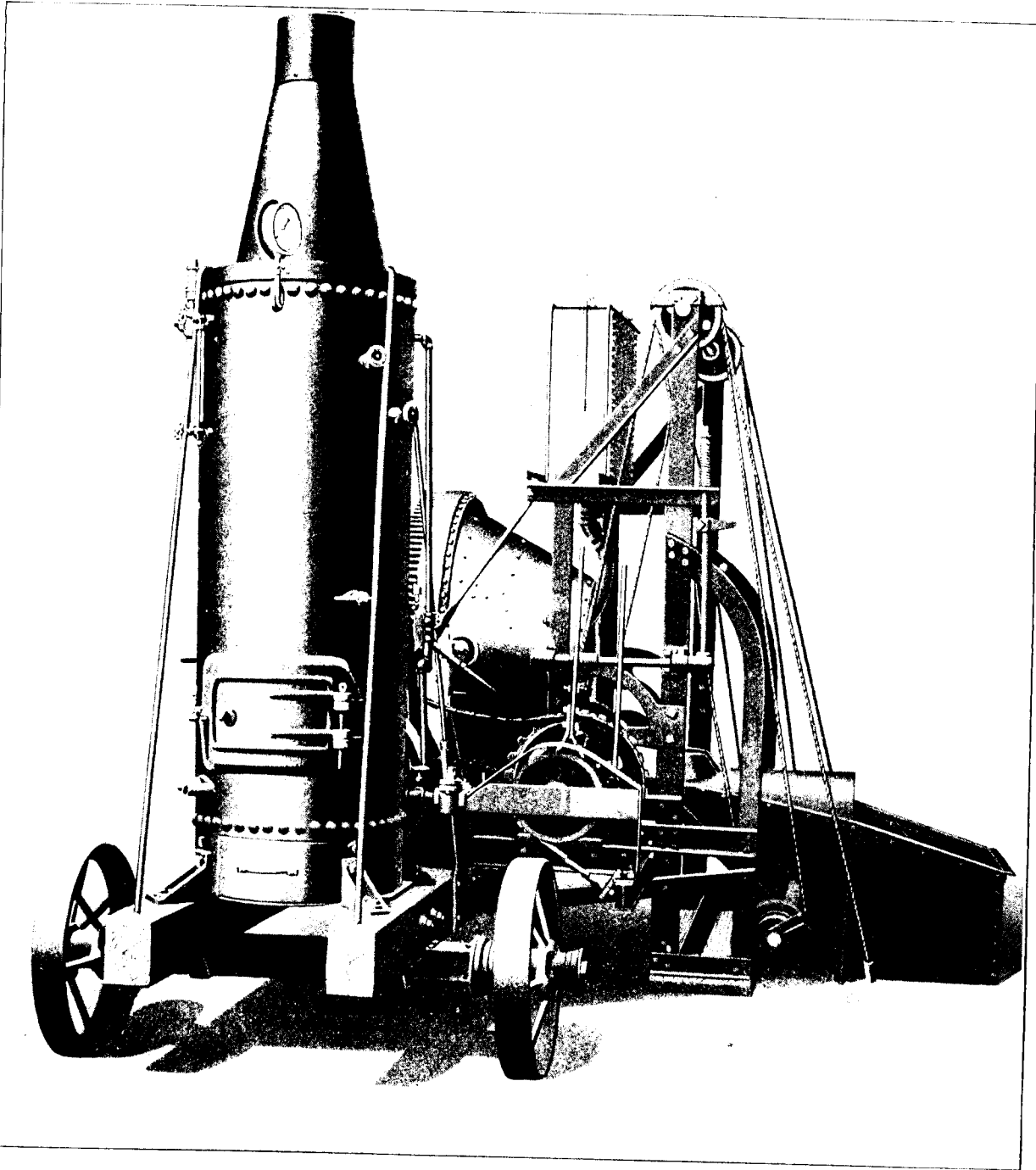
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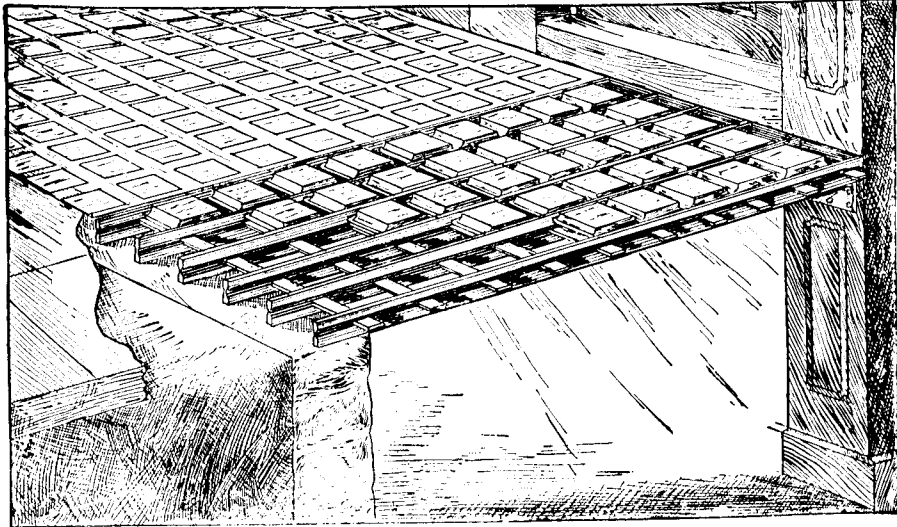
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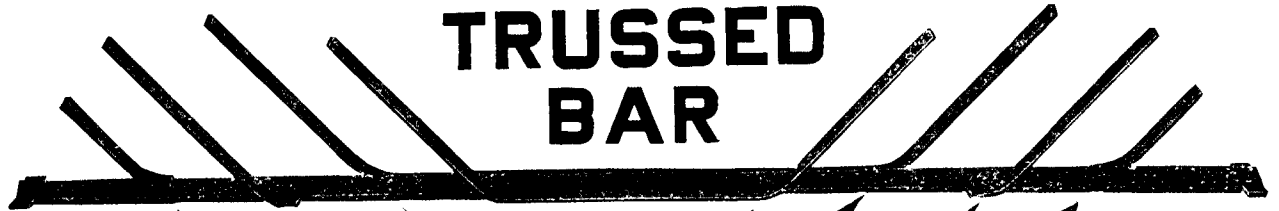
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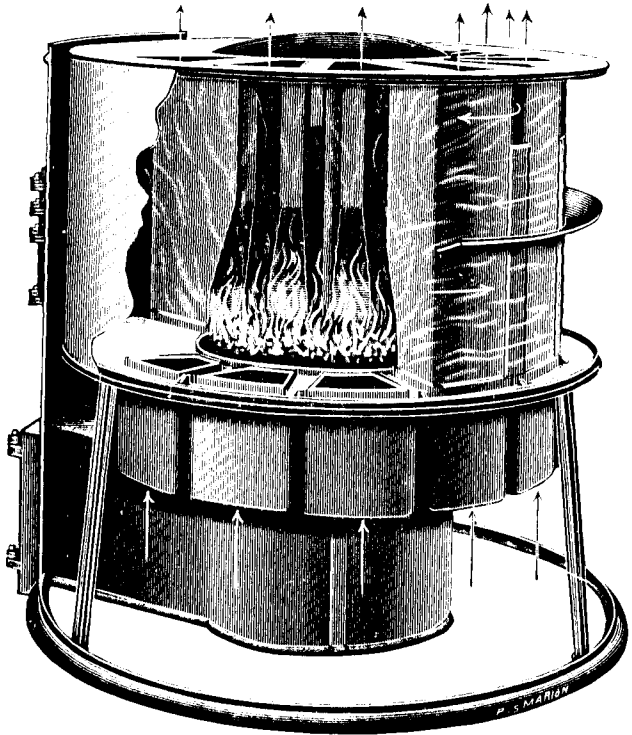
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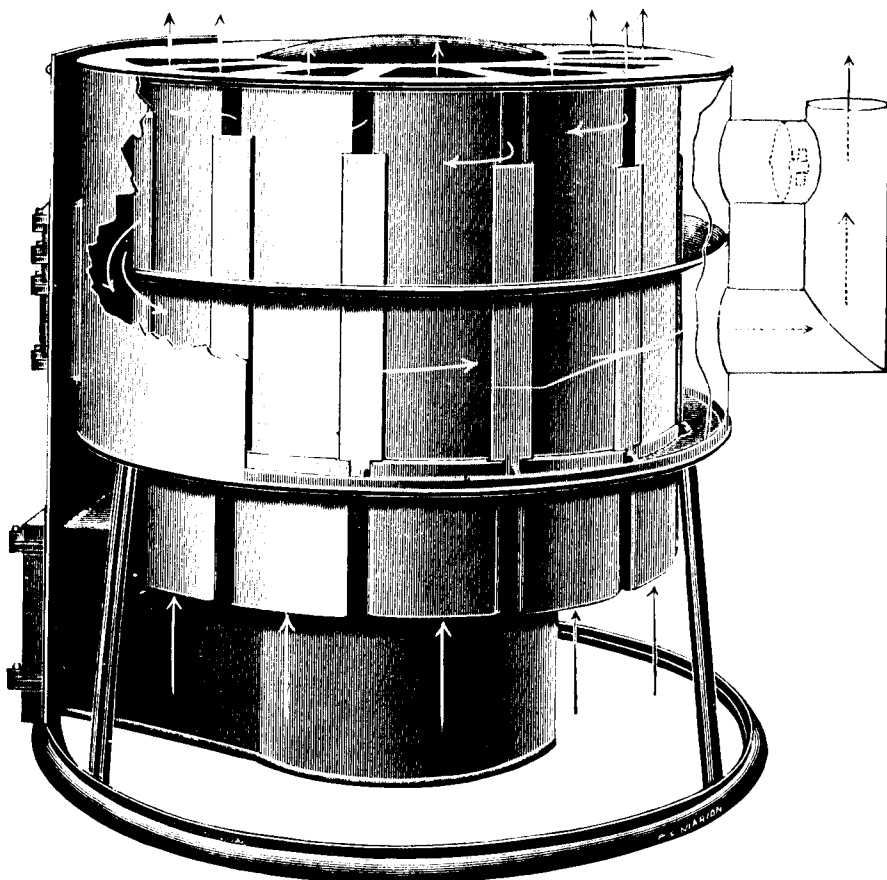
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Calorific
Furnace
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VICTORIOUS
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It is the embodiment of the most scientific and economical points in furnace construction. ∴ ∴ ∴



Sectional Diagram, showing Interior of Combustion Chamber, Position of Hot Air Columns and Direction of Fire Travel. Record Calorific Warm Air Heat Producer.



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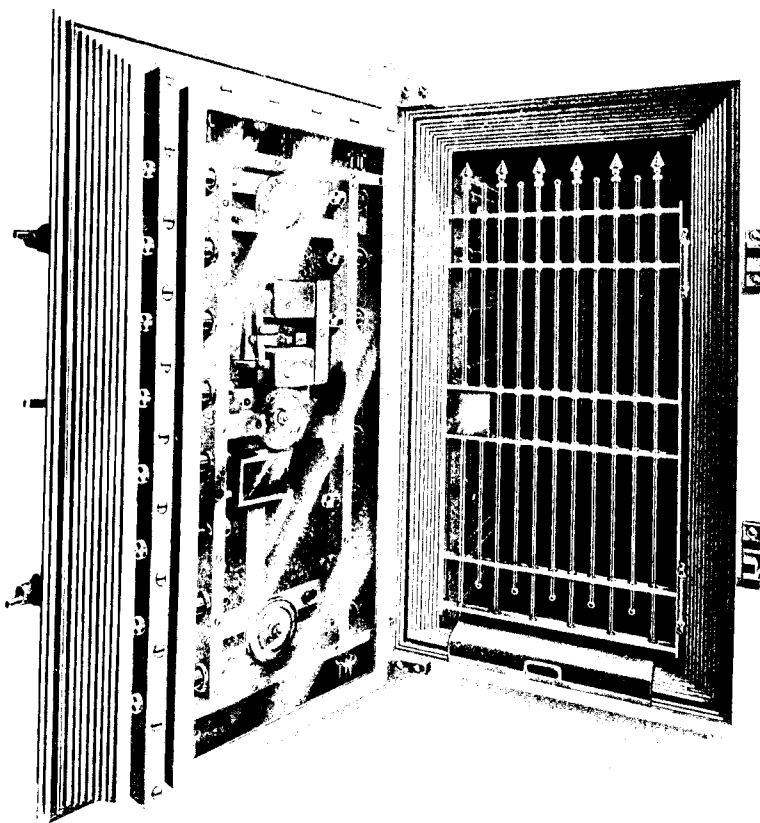


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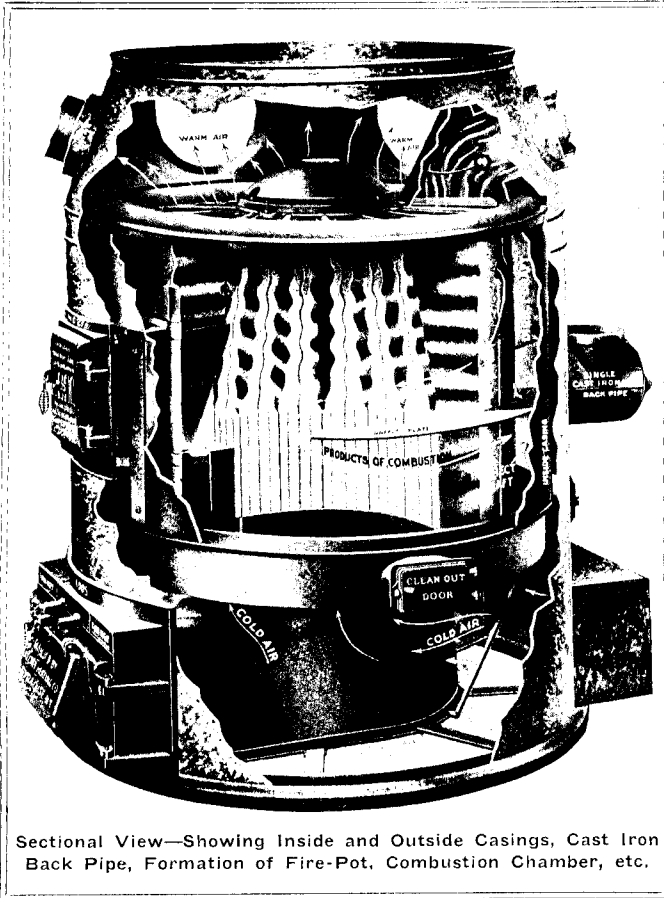
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ASK FOR CATALOGUE, PRICE AND ALL INFORMATION



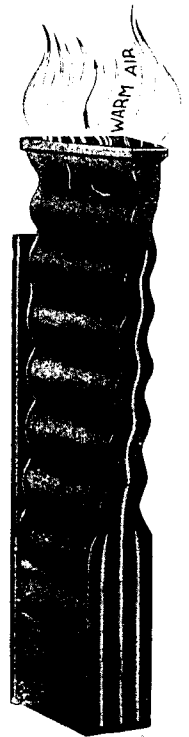
Sectional View—Showing Inside and Outside Casings, Cast Iron Back Pipe, Formation of Fire-Pot, Combustion Chamber, etc.

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The Kelsey System of Heating is acknowledged the finest and most up-to-date warm air system on the market to-day.

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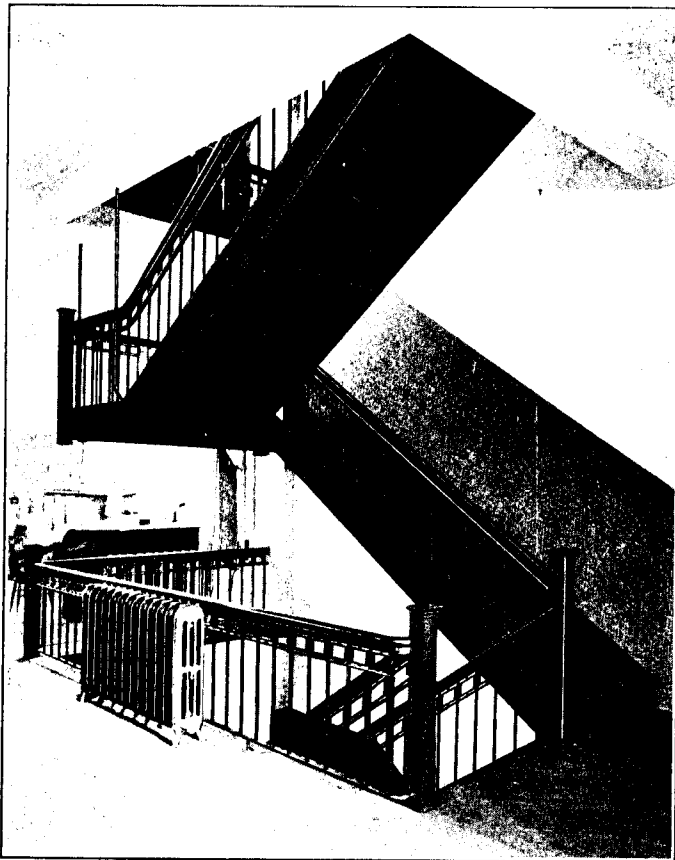
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They are manufactured by *machinery specially designed.*

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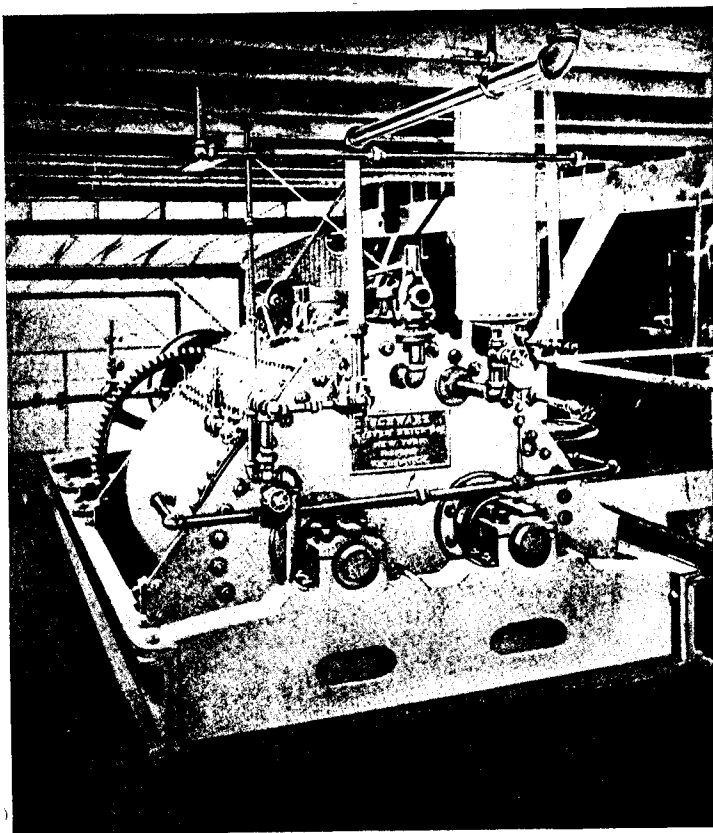
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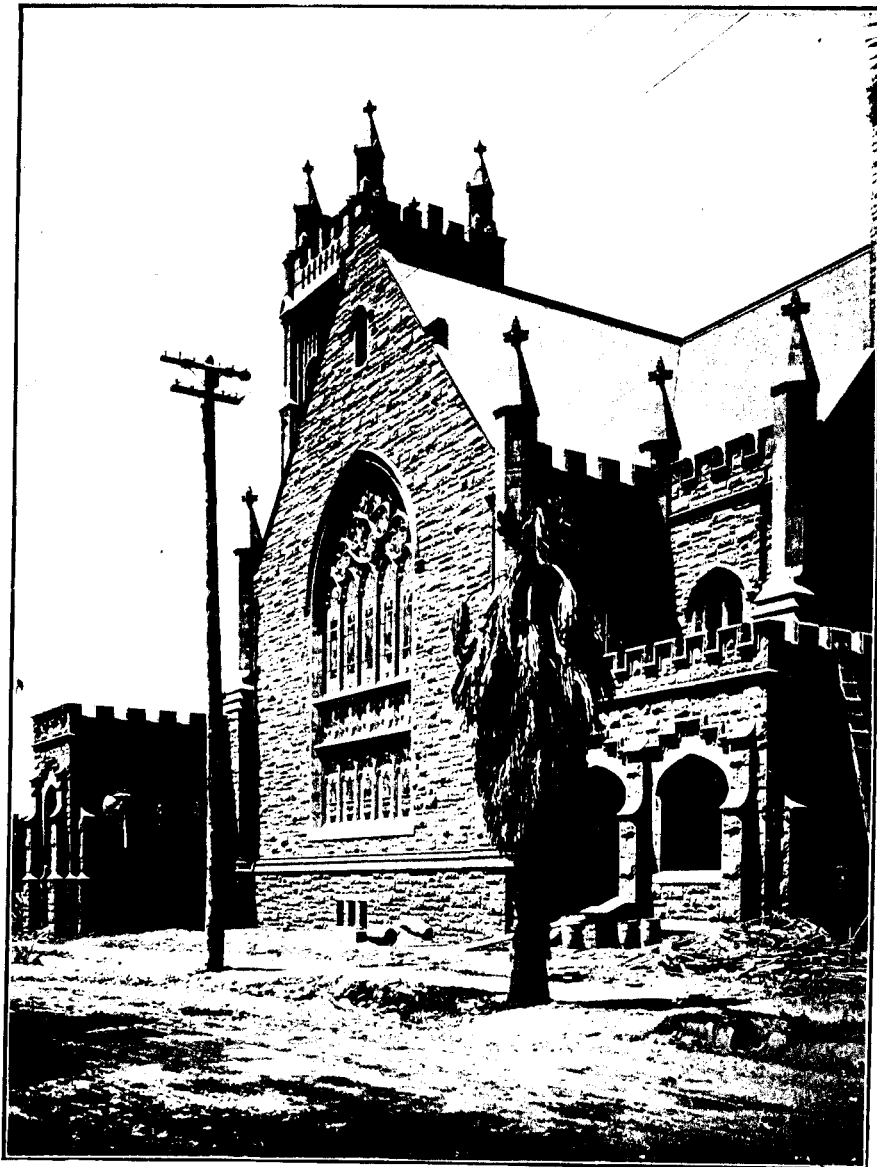
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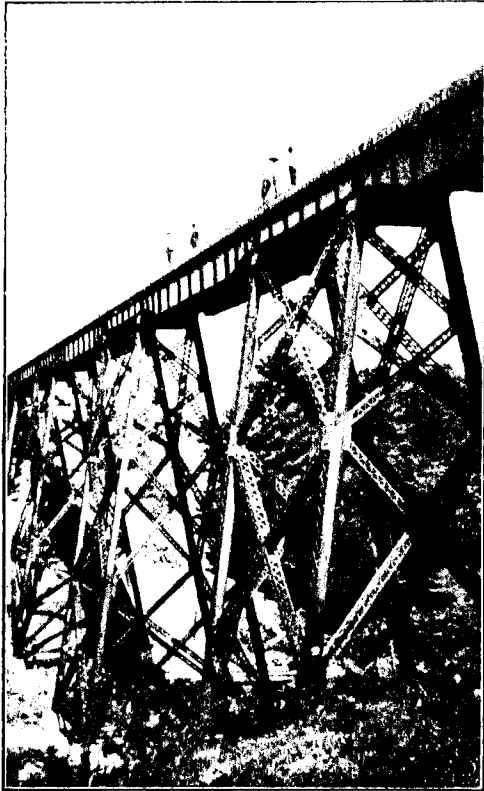
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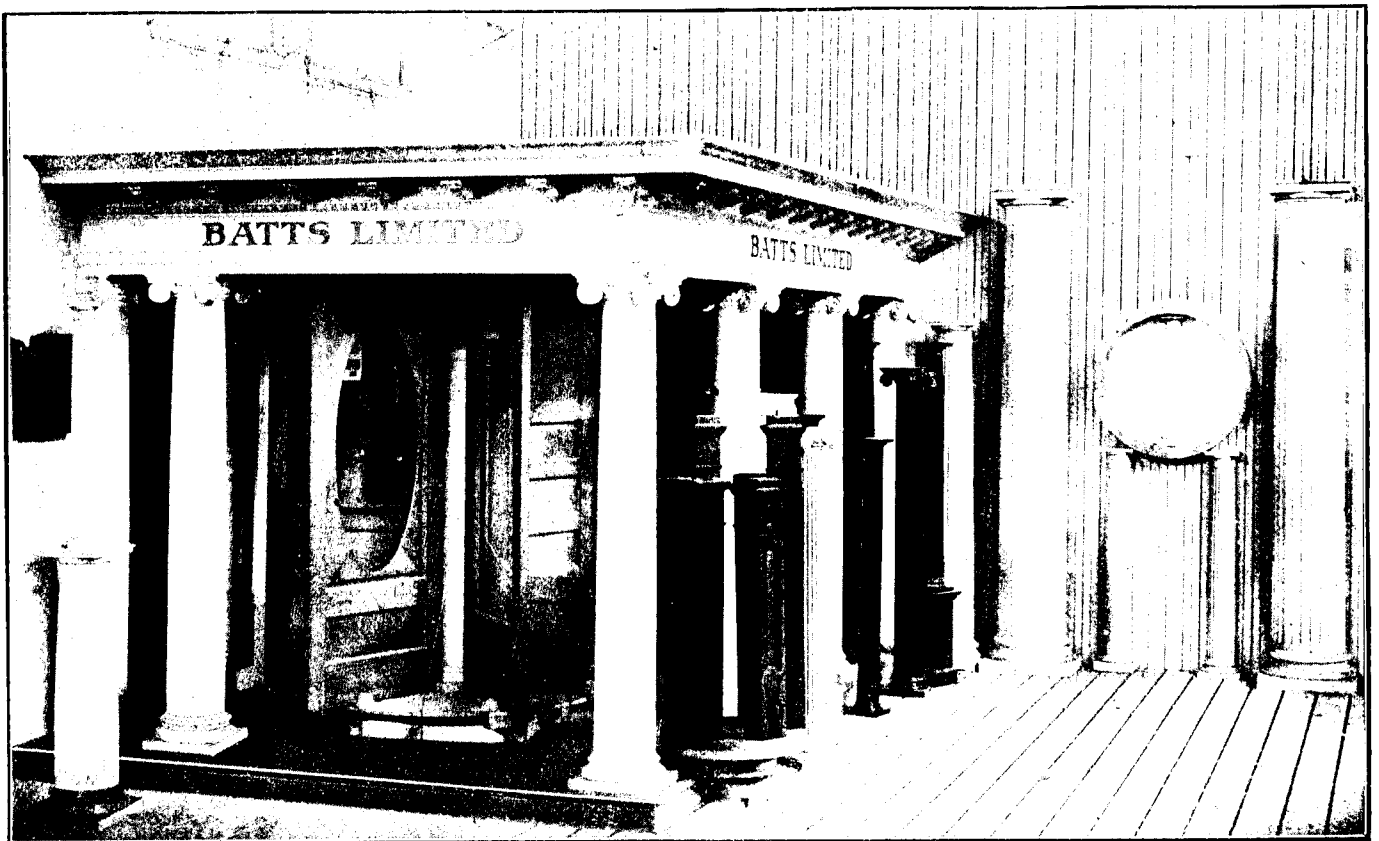
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Beams, Angles, Channels, Plates, Etc.

**Any Size from 1 1/2 Inch to 24 Inches,
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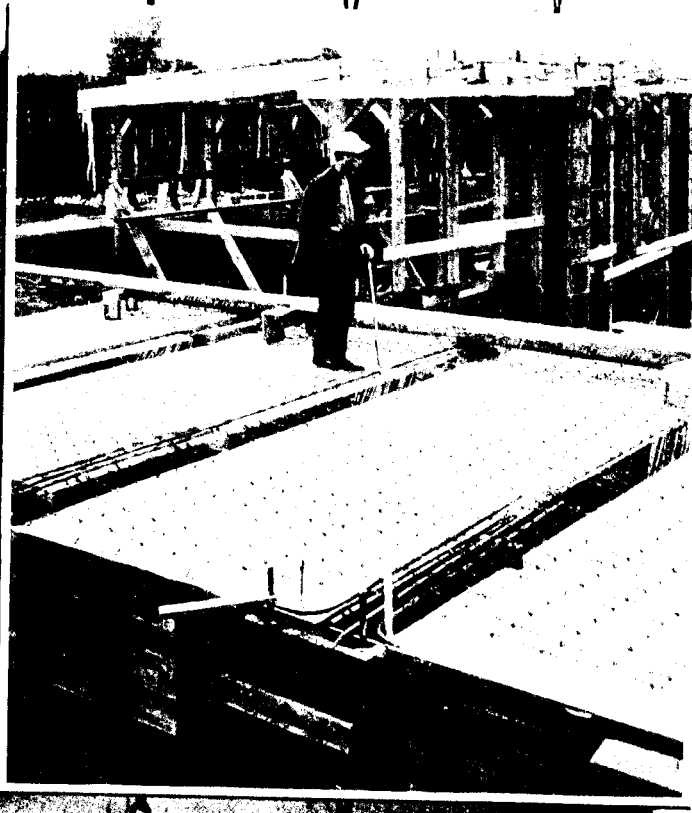


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SAVED \$2500



ON THIS JOB

*Let our engineers
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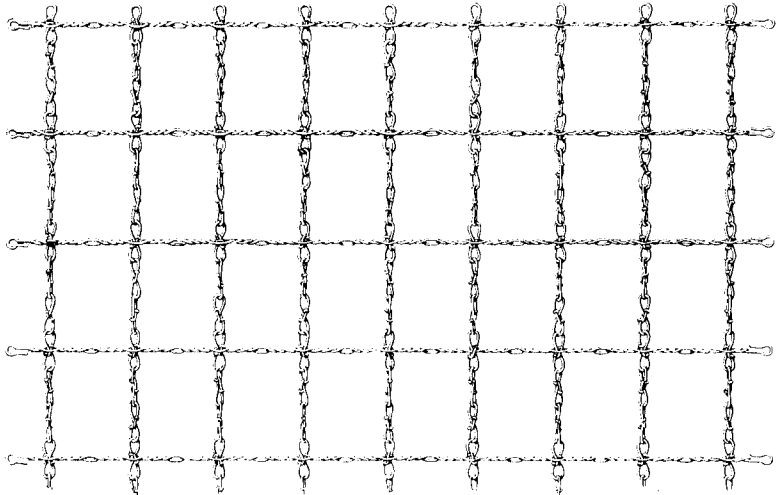
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COMMUNITY CHAIN FABRICS
LABOR-SAVING REINFORCEMENTS

We assemble Community Chain by means of stiff transverse stays into fabrics of various designs for different kinds of reinforcement work. The method of assembling the Chains is such that the maximum flexibility for handling and putting in place is given (see margins), and accurate alignment and fixation of position of the reinforcement is secured. In our Fabrics especially designed as reinforcements for floor slabs and curtain walls, the stays are so formed that they act as chairs or bridges to keep the chains a proper distance from the forms, so that concrete will flow under the chains for fire-proofing purposes, and they also rigidly space the chains the requisite distance on centers. The ends of the stays are looped so that an easy method of joining adjacent breadths without the waste of overlap is provided, and no necessity for wiring loose parts exists.

The fabric which is peculiarly adapted as the reinforcement for concrete lining of flumes, ditches or any revetment work, is illustrated



Community Chain Fabric as above will follow any contour. Made in six sizes.

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PATENTED IN THE U.S. AND FOREIGN COUNTRIES

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No.	Safe Tension Per Foot Of Width	Safe Load Per Foot of Width of Slab—6 ft. Span—Depth of Slab Being—				
		4 in.	5 in.	6 in.	7 in.	8 in.
1008	1650	95.43	129.79	162.24	194.63	227.13
1006	2200	127.24	173.0	216.32	259.58	302.8
1004	3300	190.86	259.59	324.48	389.27	454.26
908	1800	101.25	137.7	171	206	240
906	2400	135	193.6	228	275.4	320
904	3600	202.5	275.4	342	412.1	480
808	2175	138	172.5	235.5	282	330
806	2900	184	230	314	376	440
804	4350	276	345	471	564	660
708	3000	172.5	234	292.5	351	409.5
706	4000	230	312	390	468	556
704	6000	345	468	585	702	819
508	3750	217.5	295.5	369	443.7	517.6
506	5000	290	394	493	590	690
504	7500	435	591	738	887.4	1035.3

The above figures may be used on the understanding that the center of tension of the chain fabric is 1 in. from the bottom of the slab, and that the effective depth (d) is only 85 per cent. of the depth from center of tension to top of slab, and with the formula $Td = \frac{WL}{10} \times 12$. When T = Safe tension in steel, d = Effective depth in inches, W = Load per square foot, L = Span in feet.

Note.—For safe loads per square foot of slab for other spans multiply the loads given above by the fraction $\frac{L}{12}$ where L = span in feet from center to center of supports.

We originate new forms of reinforcement for special uses if our regular lines do not answer requirements, and should be glad to answer questions, quote prices and send samples, if same are requested, by letter addressed to

HARDWARE, DEPARTMENT R.

Oneida Community, Ltd., Oneida, N. Y.

Canadian Representatives, PITT and COMPANY, Niagara Falls, Canada

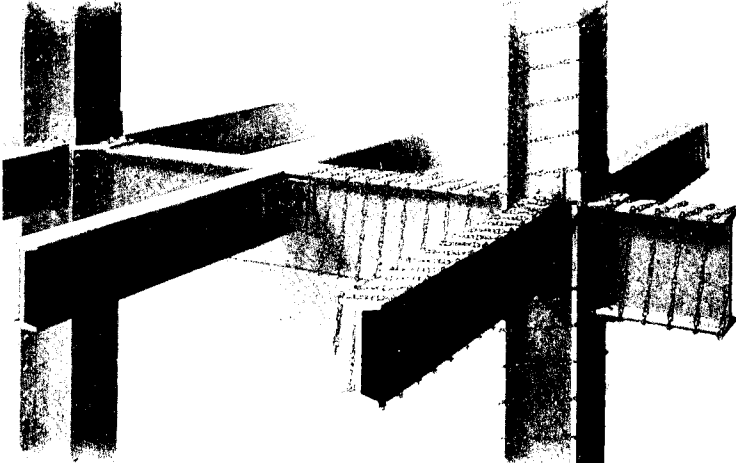
ONEIDA
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COMMUNITY CHAIN REINFORCEMENT

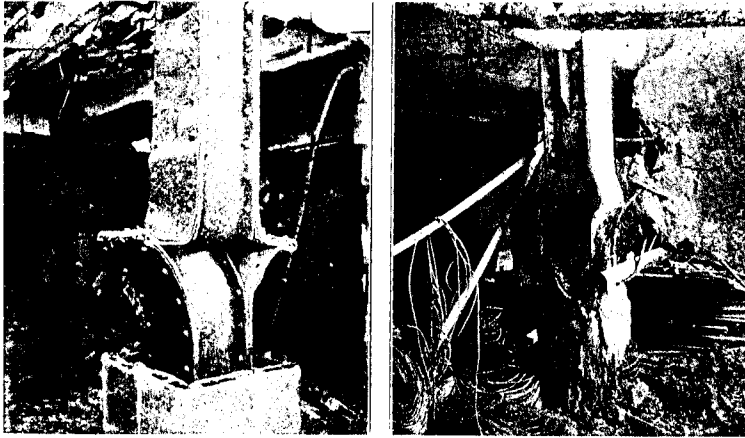
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Buildings were erected and equipped with special machinery and appliances for the manufacture of

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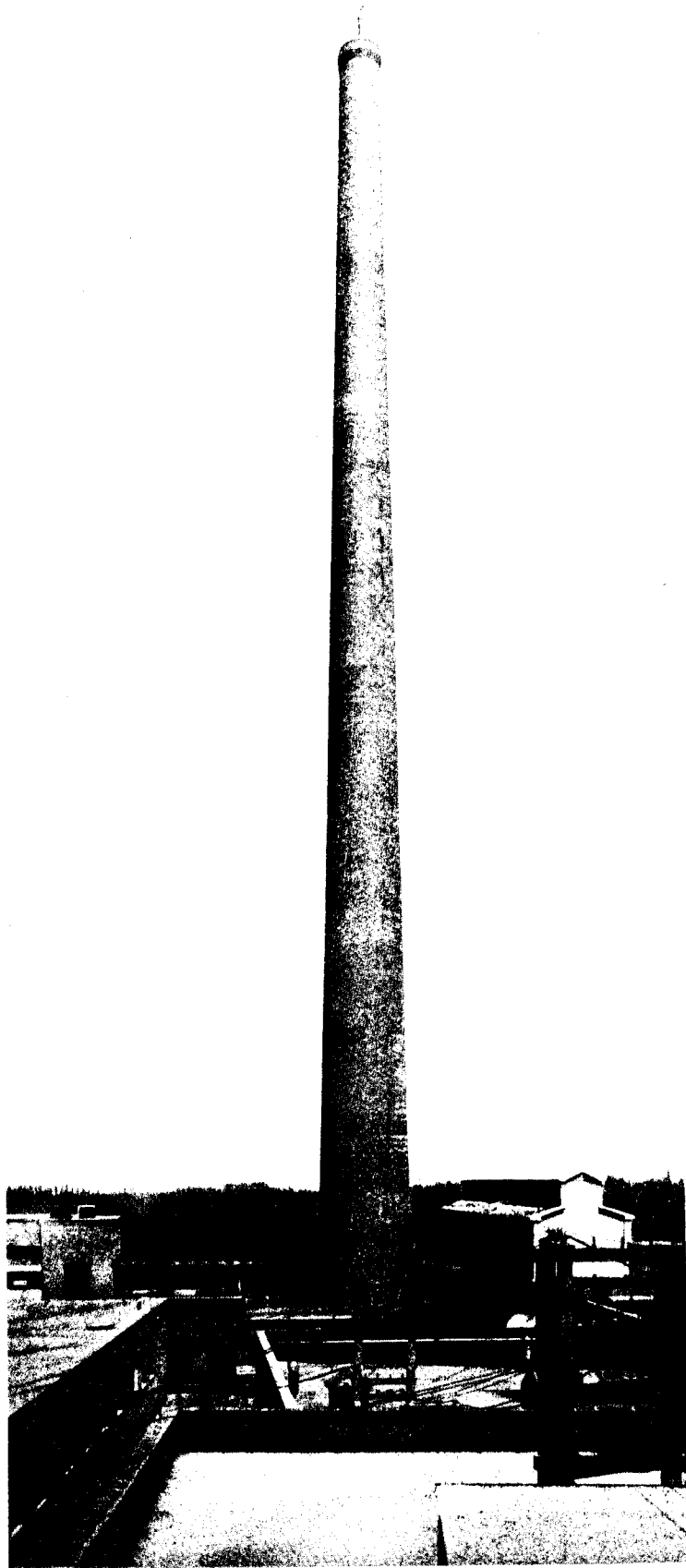
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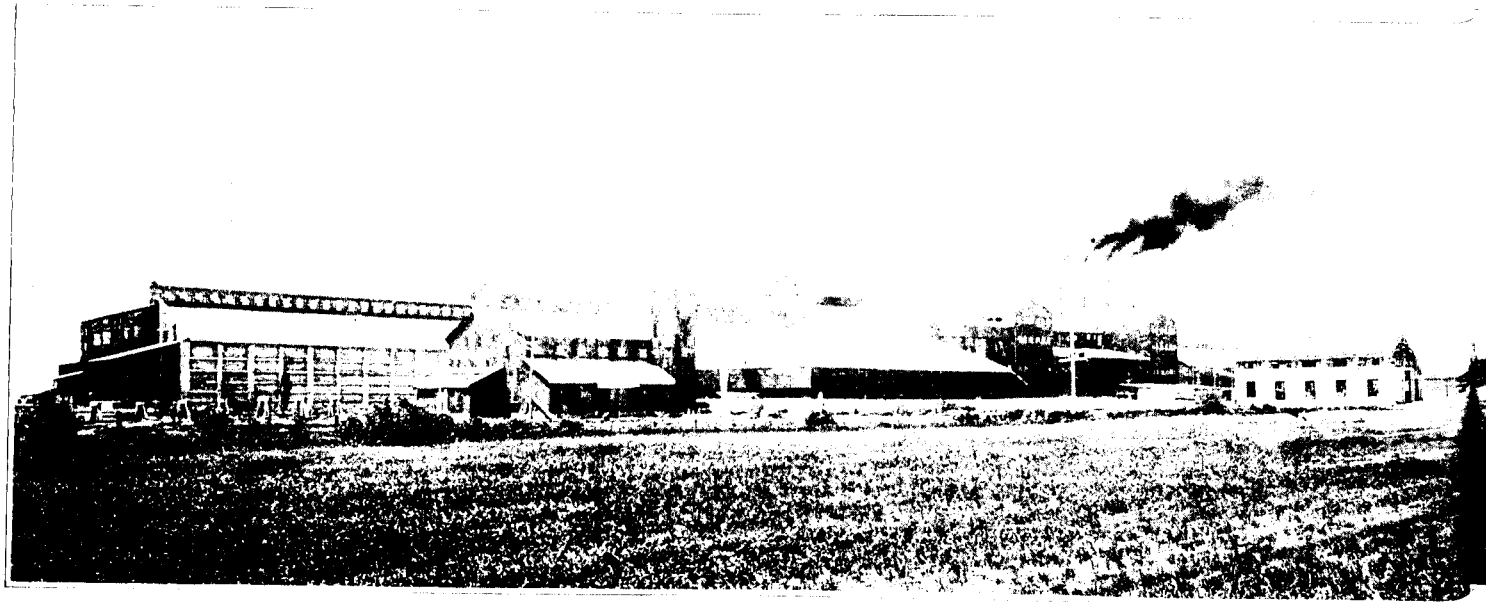
MONTREAL

TORONTO

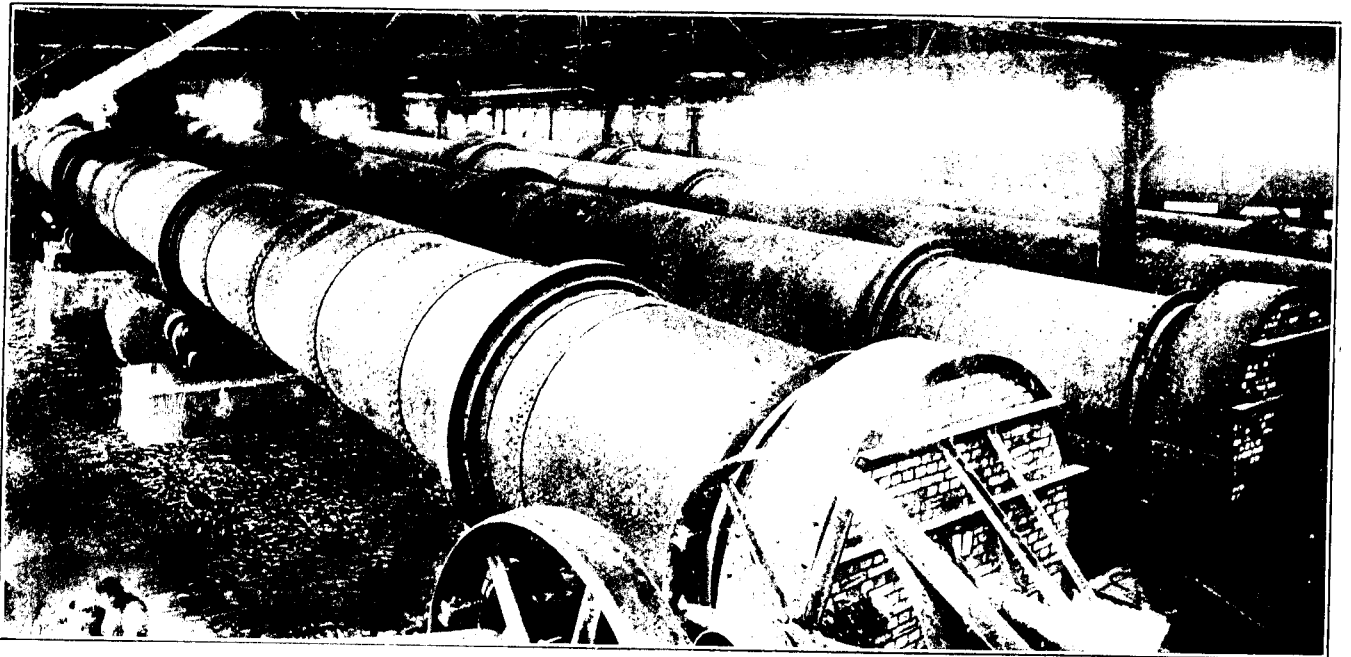
WINNIPEG

ST. JOHN, N. B.

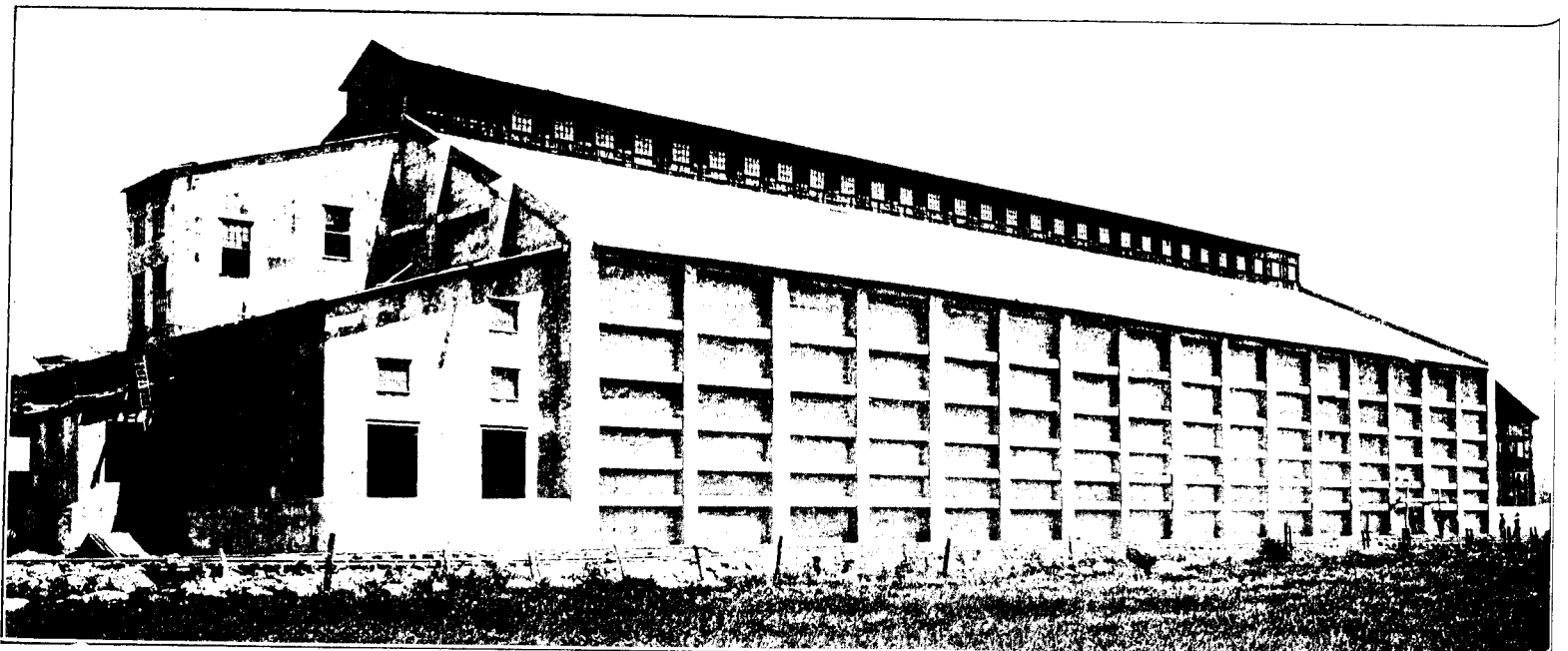
VIEWS OF VULCAN PORTLAND CEMENT



A COMBINED VIEW OF THE WORKS. SHOW



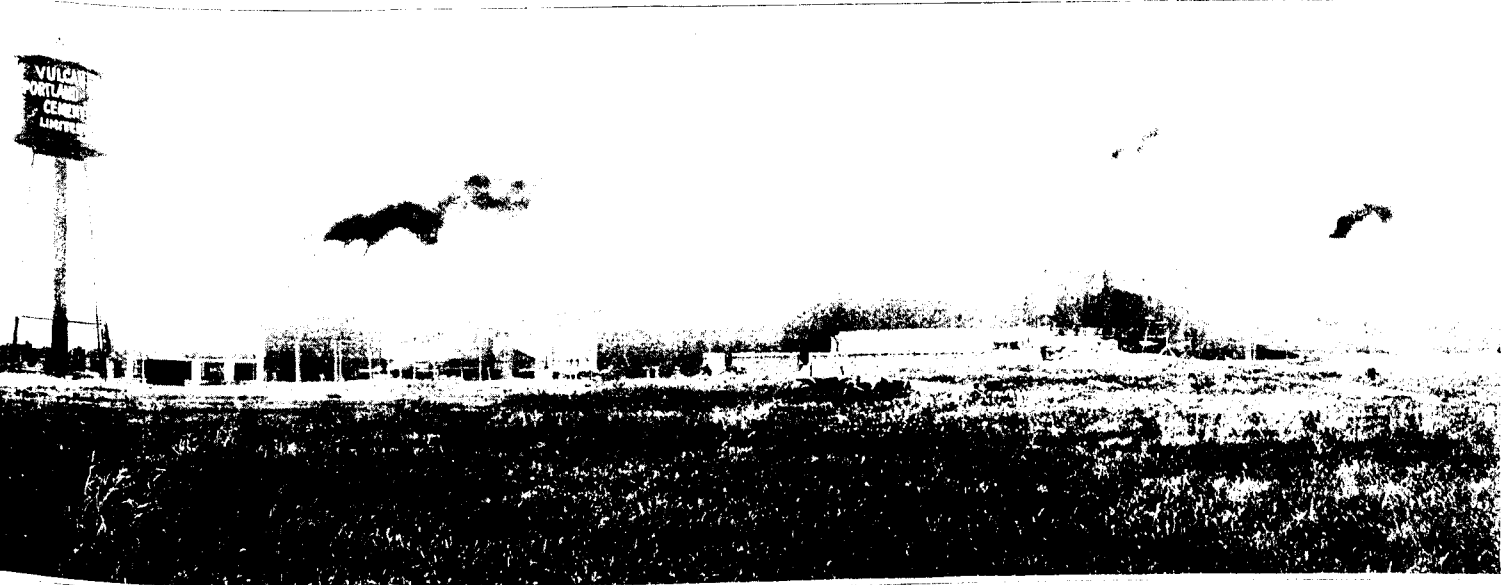
INTERIOR VIEW OF KILN BUILDING.



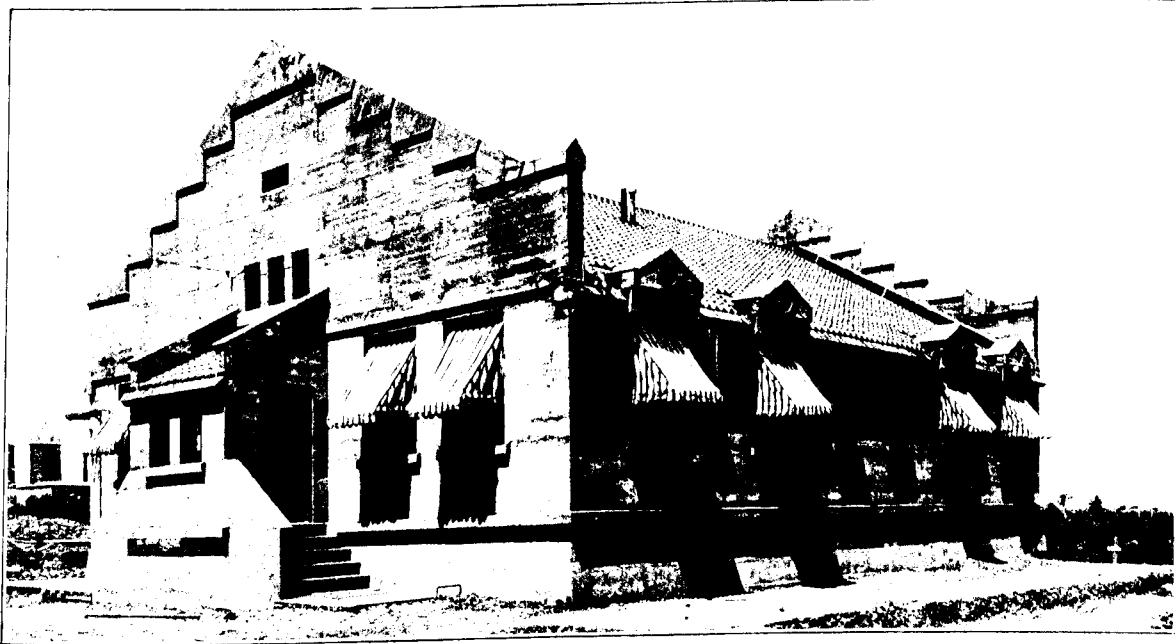
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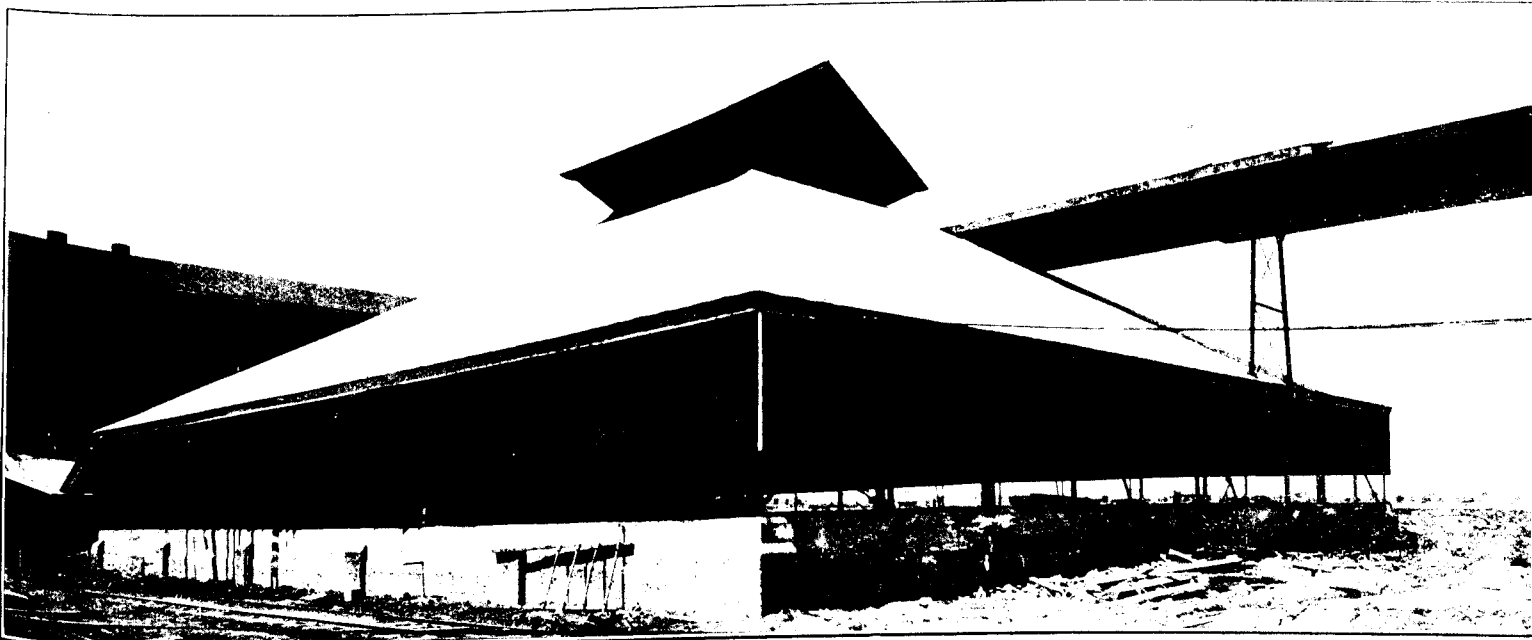
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GEO. W. GOUINLOCK
ARCHITECT
SUITE 1108, TEMPLE BUILDING, TORONTO, ONT.
PHONE MAIN 4508

Toronto, January 5th, 1909.

Dear Sir,—

Answering your enquiry as to the quality of brick and terra cotta fireproofing as manufactured in this Country in comparison with that of the imported article, I beg to say it has always been my practice, as far as values and prices would permit, to endeavor to construct the buildings that come under my supervision, of Canadian materials, believing fully that a great responsibility rests upon the Architect to aid in promoting this Country's welfare.

From time to time I have experienced some difficulty in consistently adhering to this principle, but in the matter of brick and terra cotta fireproofing the question has been fully settled in my mind, for I feel that much of these materials produced in Canada, are of equal quality and value to any similar materials that may be procured from abroad.

Yours sincerely,

Dict.— G. W. G.



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'CONSTRUCTION'

.. A JOURNAL FOR THE ARCHITECTURAL ..
ENGINEERING AND CONTRACTING INTERESTS OF CANADA

Vol. 2

January, 1909

No. 3

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WHY

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Menominee, Mich.,
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 Ideal Concrete
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 South Bend, Ind.
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 We received your "Ideal" Ma-
 chine some time ago. Have oper-
 ated it almost continually since,
 and we are more than pleased with
 it. We are turning out perfect
 blocks. It is rapid and simple to
 operate. There is no doubt about
 its durability. We readily recom-
 mend it to anyone wishing to pur-
 chase.

Yours truly,
 Spencer & Riley.

FACE DOWN

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 Sept. 5, 1908.
 Ideal Concrete
 Machinery Co.,
 South Bend, Ind.
 Gentlemen:
 Your outfit has proven entirely
 satisfactory. I believe your ma-
 chine to be the simplest, most
 easily operated and the best there
 is on the market. I saw all the
 leading block machines in operation
 at the Buffalo Cement Exposition
 in January of this year, and yours
 surely takes the lead.

Yours very truly,
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 Prosperous

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FACE DOWN **FACE DOWN**

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 More
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 in Use
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 Combined

FACE DOWN

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 Machinery Co.,
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 Dear Sirs:
 The 8 x 8 x 16 in. Outfit we
 purchased of you about two
 months ago is doing nice work
 and a plenty of it. Have just
 completed a house which is per-
 fectly satisfactory to our cus-
 tomer. Have entirely discarded
 the machine we were using.

Yours truly,
 N. B. Nicolls.

FACE DOWN

Lansing, Mich.,
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 Gentlemen:
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 Machine is certainly great. My
 business has doubled in the
 short time I have used the
 Ideal.

Wishing you all kinds of suc-
 cess, I remain,
 Respectfully yours,
 Fred Hilliard.

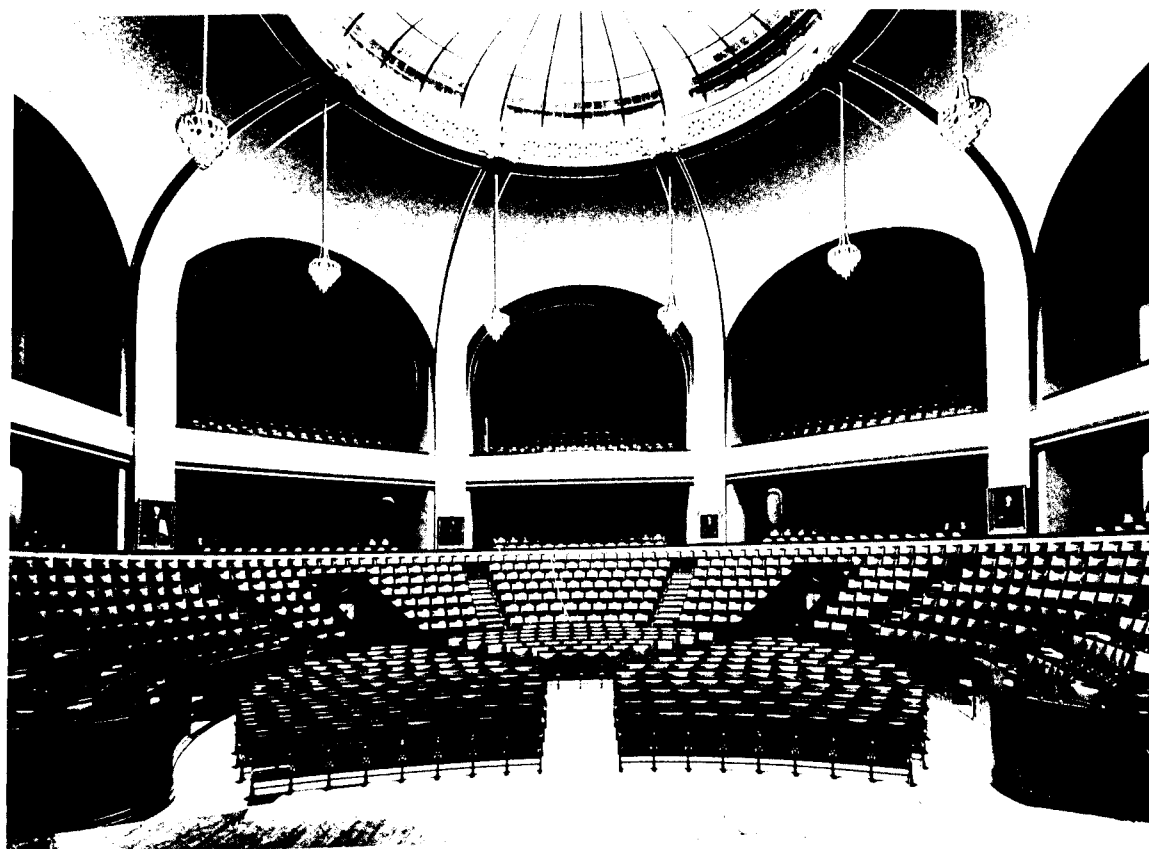
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DARLING & PEARSON, ARCHITECTS.

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ALEXANDRA WARE



“Alexandra” Baths

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The bathtub is primarily the most important fixture in the bathroom, and the past twenty years have done much for us in the development of the sanitary properties and artistic design of this fixture.

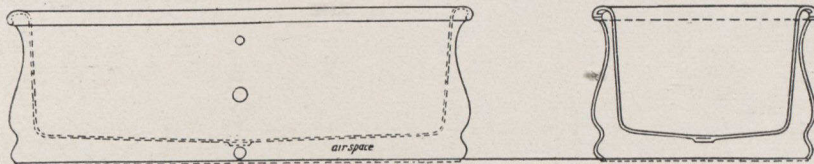
It is not many years since the *Copper or Tin lined wooden tub* was the only fixture available for the ordinary, or even higher priced dwelling. Then came the *so-called solid porcelain ware*, then the Porcelain enamelled cast iron ware, and to-day we have ALEXANDRA WARE.

So called “*Solid Porcelain*” baths, are made from porous fire clay, covered on the exterior with paint and on the interior with a thin glazed coating, which, when crazed or cracked, allows the water to seep through into the *Porous Fire Clay* and this causes it to become water logged and unsanitary. *Clay baths* are extremely heavy and cumbersome to handle and install, and on account of their thickness, time and great quantities of hot water are required to heat them.

ALEXANDRA BATHS have been designed and constructed so as to overcome all of these defects. They are constructed in two parts—more convenient to handle and install; they are heavy Porcelain enamelled both inside and out, instead of being painted on the outside; they have a space of pure air instead of unsanitary porous clay; they weigh about one-third of Clay baths and can be heated almost instantaneously.

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**Our Catalogue F
shows 48 Patented
Designs in
“ALEXANDRA”
WARE.**



Sectional View of “Alexandra” Bath.

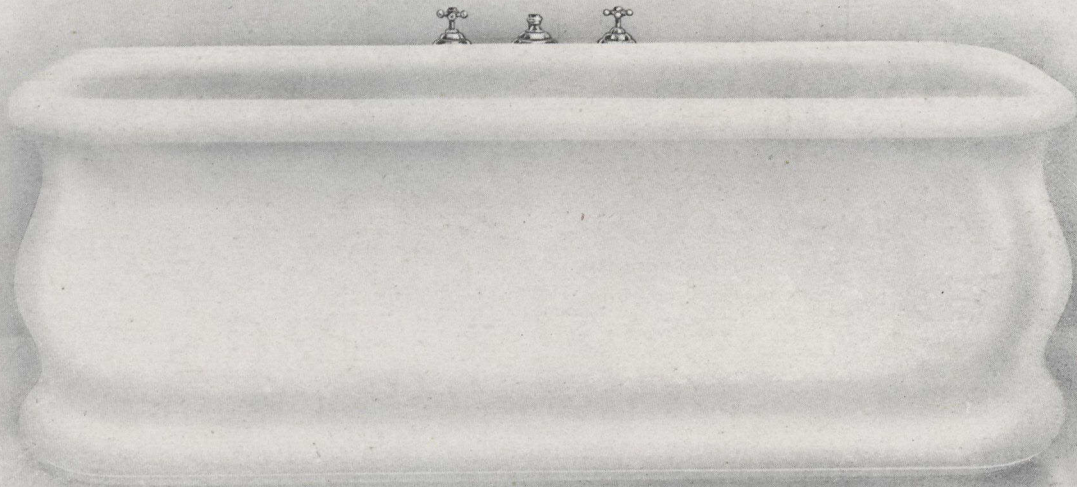
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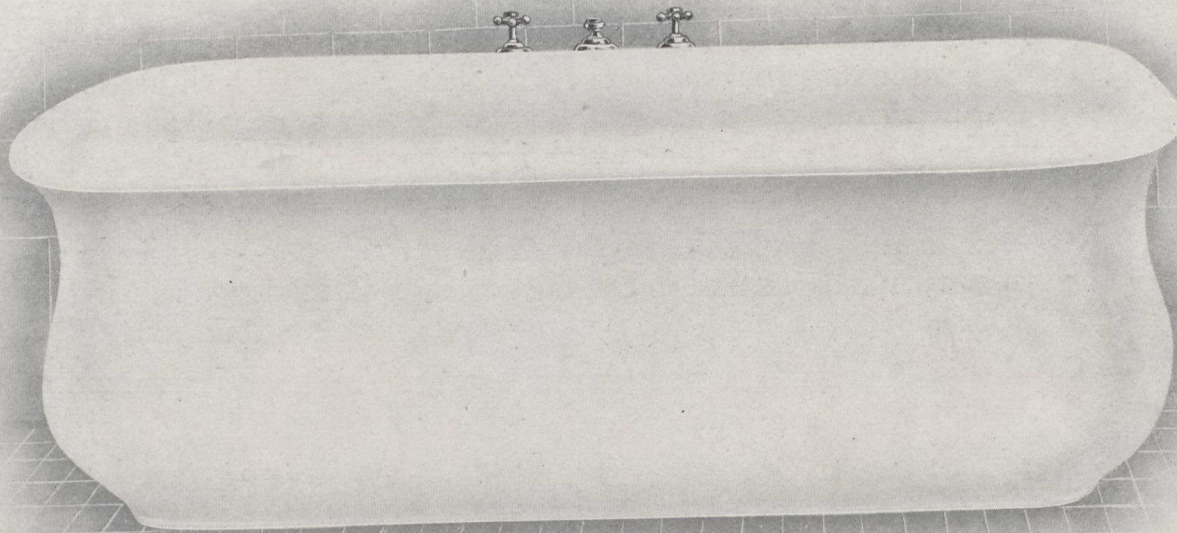


ALEXANDRA
WARE



Patented June 30, 1908.

"ALEXANDRA" WARE-PLATE F. O. 3—DIM., Width of Roll Rim, 3 1-4 inches. Width over All, 32 1-2 inches. Height to Top of Rim, 23 inches. Depth Inside, 18 1-4 inches. COST, 5 foot, \$215.00; 5 1-2 foot, \$225.00.



Patented June 30, 1908.

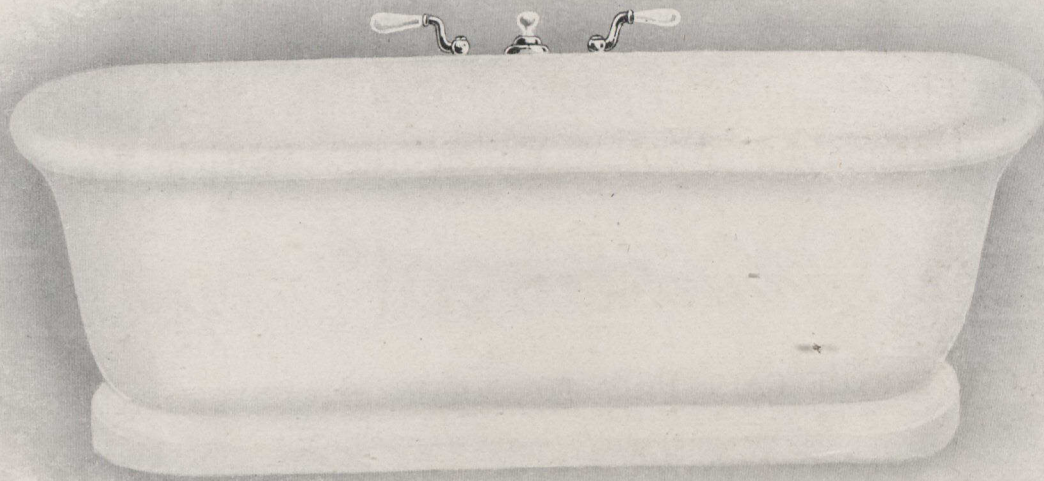
"ALEXANDRA" WARE-PLATE F. O. 5—DIM., Width of Roll Rim, 3 1-4 inches. Width over All, 32 1-2 inches. Height to Top of Rim, 23 inches. Depth Inside, 18 1-4 inches. COST, 5 foot, \$215.00; 5 1-2 foot, \$225.00.

The Above Baths are First Grade Enamelled Outside and Inside, and have Nickel Plated Low Down Bell Supply and Waste Fitting China Indexes on Waste and Handles. Center Outlet.



Patented June 30, 1908.

"ALEXANDRA" WARE-PLATE F. O. 11—DIM., Width of Roll Rim, 3 1-4 inches. Width over All, 30 inches. Height to Top of Rim, 23 inches. Depth Inside, 18 1-2 inches.—This bath is designed for setting in tile wall, and can be furnished for either right or left corner. COST, 5 foot, \$215.00; 5 1-2 foot, \$225.00.

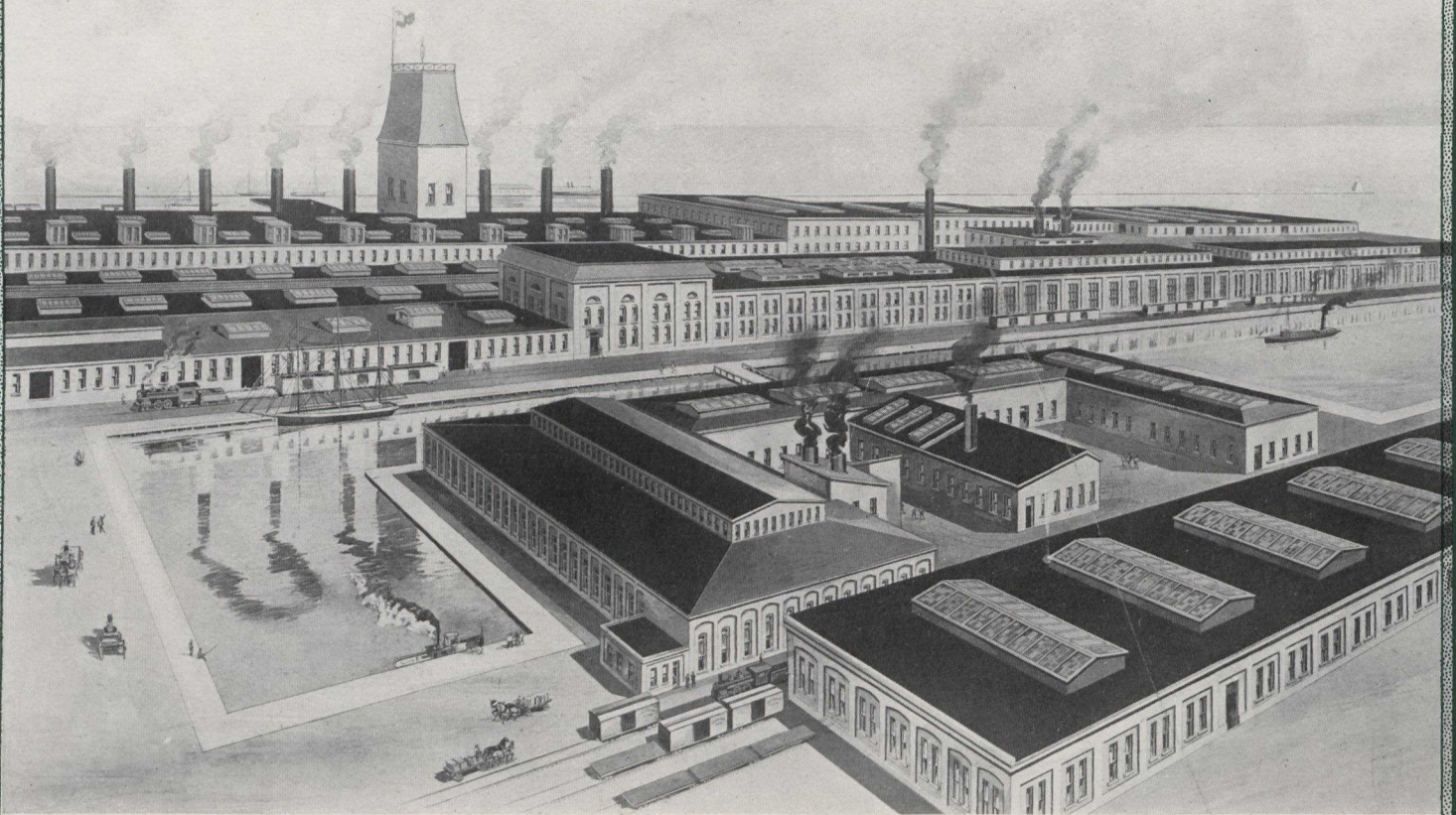


Patented June 30, 1908.

"ALEXANDRA" WARE-PLATE F. O. 7—DIM., Width of Roll Rim, 5 inches. Width over All, 34 3-4 inches. Height to Top of Rim, 23 inches. Depth Inside, 18 inches. COST, 5 1-2 foot, \$249.00.

The Above Two Baths are First Grade Enamelled Outside and Inside. F. O. 11 has Nickel Plated Indexes Low Down Bell Supply and Waste Fitting, with China Indexes on Waste and Handles. F. O. 7 has Nickel-Plated Fuller Low Down Bell Supply and Waste Fitting, with China Handles and China Knob on Waste. Center Outlet.

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ALEXANDRA WARE



SUMMARY OF BUILDING OPERATIONS IN CANADA FOR 1908—FALLING OFF MUCH LESS THAN ANTICIPATED EARLIER IN THE YEAR—OPERATIONS IN DECEMBER UNUSUALLY ACTIVE.

A REVIEW of the building operations for both the month of December and the year 1908, shows a much more wholesome and satisfactory condition throughout Canada, than even the most sanguine had anticipated. Comparative figures as supplied CONSTRUCTION from fifteen representative cities, and which can be accepted as a reliable basis for estimating the amount of work carried on in various sections of the Dominion, while placing the loss for the year at 14.03 per cent., records a substantial gain in ten cities submitting comparative figures for December, over the corresponding month of 1907.

In view of the unprecedented activity of the preceding year, and considering the uncertain prospects early in the season, when, owing to the depressed condition of the money market, much proposed work was either abandoned or laid over, these figures speak volumes for the building progress of Canada; and had Kingston and London supplied figures for 1907, to permit of ascertaining their relative gains, the loss per cent. on the year, as given, would have been materially reduced, as both of these places prospered to an unusual degree in the past twelve months.

The largest decrease noted for the year's work is in the case of Stratford, where the falling off amounted to 78.71 per cent., and the next largest decrease that of Brandon, which is given as 58.55 per cent.

Toronto, while suffering a decrease of 12.50 per cent., the smallest loss recorded, still bears the palm for the greatest volume of business, having issued permits for new buildings for \$12,447,467, as against \$14,225,800 for 1907.

On the other hand, the phenomenal growth of Fort William is strikingly reflected in a gain of 95.09 per cent., which places this city at the head of the list for increased building operations during the year. Not only has this city virtually doubled her total, but the amount of work in prospect at the present time, indicates that 1909 will see another record breaking total.

Halifax has also finished the year with a substantial total, having an increase of 25.80 per cent. to her credit, while the only other two cities reporting, which have exceeded their figures for 1907, are Edmonton and Vancouver, the gain in each case being 11.82 per cent., and 5.83 per cent. respectively.

Montreal, despite the favorable condition prevalent during the latter part of the summer and throughout the fall, was unable to overcome the slump experienced earlier in the season, and records a loss on the year of 29.77 per cent.; while Victoria fell short of equalling the preceding year's figures by only 12.66 per cent.

It is, however, in a recapitulation of statistics for the month of December that we find the most gratifying results as regards the present building situation throughout the country, and more especially so in view of the fact that they not only indicated that business confidence in general has been fully restored, but because they point out in an unmistakable manner the vast amount of work that is being carried on in the very midst of winter when everything in the building line is supposed to be at its lowest ebb.

Of the ten cities supplying comparative figures, only two suffer losses, Regina and Vancouver, the decreases in each case being 50.67 and 60.38 per cent. respectively. Vancouver, however, it will be noted, is ahead on the year's work, and the figures in general show the West to be in a most flourishing condition, several of the places having more than doubled and trebled the amount of work done in the same period of 1907.

Calgary's phenomenal gain of 515.61 per cent., places

	No. of Permits for December, 1908.	No. of Permits for December, 1907.	Total Cost of Bldgs. for December, 1908.	Total Cost of Bldgs. for December, 1907.	Increase Per Cent.	Decrease Per Cent.	Permits for Year 1908.	Permits for Year 1907.	Total Cost of Bldgs. for 1908.	Total Cost of Bldgs. for 1907.	Increase Per Cent.	Decrease Per Cent.
Brantford, Ont.	.....	.....	.....	.....	.....	.....	306	391	289,855	509,945	.....	43.15
Brandon, Man.	.....	.....	.....	.....	.....	.....	137	254	291,864	704,290	.....	58.55
Calgary, Alta.	38	10	71,750	11,655	515.61	.....	423	605	836,950	1,745,220	.....	51.47
Edmonton, Alta.	35	24	45,255	40,455	11.86	.....	689	910	2,549,847	2,280,210	.....	11.82
Fort William, Ont.	5	9	8,100	5,225	55.02	.....	319	353	1,550,735	800,000	.....	95.09
Halifax, N.S.	32	22	33,550	14,200	132.98	.....	636	496	749,125	595,486	.....	25.80
Kingston, Ont.	.....	.....	.....	.....	.....	.....	396	.....	170,600	.....	.....	.....
London, Ont.	.....	.....	.....	.....	.....	.....	242	.....	801,170	.....	.....	.....
Montreal, Que.	27	60	44,870	203,420	141.37	.....	1807	1987	5,062,326	8,406,229	.....	39.77
Regina, Sask.	51	17	501,000	2,970	.....	50.67	253	480	516,646	1,177,840	.....	56.13
Stratford, Ont.	7	.....	1,465	.....	.....	.....	77	114	136,545	641,485	.....	78.71
Toronto, Ont.	.....	.....	707,000	607,015	16.47	.....	.....	.....	12,447,467	14,225,800	.....	12.50
Vancouver, B.C.	141	93	314,408	793,724	.....	60.38	1699	1773	5,950,923	5,622,744	.....	12.66
Victoria, B.C.	40	19	196,525	33,720	482.81	.....	.....	.....	1,214,240	1,390,250	5.83	.....
Winnipeg, Man.	31	41	89,000	37,050	140.26	.....	1546	2433	5,500,000	6,309,950	.....	12.83
TOTALS	407	295	2,012,923	1,749,634	15.04	.....	8530	9796	38,078,293	44,409,449	.....	14.03

her in the premier position, with Victoria a close second with an increase of 482.81 per cent. in her favor. Winnipeg also registers a handsome advance of 140.26 per cent., while Edmonton and Fort William are ahead of the month of December, 1907, by 11.86 per cent. and 55.02 per cent. in order named.

In the Eastern portion of Canada, Halifax still continues to add to the monthly increases made throughout the summer and fall, by recording a gain of 132.98 per cent., while the increase shown by Montreal's figures, that of 141.37 per cent., make plain that the building condition in the Canadian metropolis is not only satisfactory, but most encouraging.

Toronto also shows a healthy increase of 16.47 per cent. for the month, and there is every assurance that operations in the building line in that city, during the coming year, will be carried on most actively.

The monthly and yearly report of St. John, N.B., which was received too late to be inserted in the following table, while showing a decrease of 41.21 per cent. for the year and a loss for December of 88.46 per cent., states the outlook as being "fair."

Reports from the other cities, as regards future prospects, and which strongly presage a record-breaking year, are: Brandon, "Cannot say with any degree of assurance;" Calgary, "Very promising;" Edmonton, "Look for a very brisk season in the spring;" Fort William, "Very bright and promising;" Kingston, "Fair;" London, "Very fine;" Montreal, "Building operations are expected to open up very good in the spring;" Regina, "Better than for year just passed;" Vancouver, "Were never better; looking for an exceptionally good year;" Winnipeg, "Bright."

ARCHITECTS' LICENSE LAW MAKES ARCHITECT RESPONSIBLE TO PUBLIC AS WELL AS HIS CLIENT—MANY ARCHITECTS IN FAVOR OF SUCH LAW.

SOME FEW ARCHITECTS are inclined to oppose more or less strenuously the idea of licensing architects. Their opposition is prompted by one of three reasons. Some are, more or less disposed to look with disfavor upon the increased responsibilities it will fasten upon the architect, and do not like the idea of being forced to comply with a code of regulations, to secure and maintain a license to permit them to practice their profession.

Other architects seem to be under the false impression, that a law providing for Government examination will tend to cause students to devote too much time and attention to building construction and sanitation, at the expense of the æsthetic branch of architecture, and will, therefore, result in producing building engineers instead of architects.

They argue that no practical Government examination could ever be devised such as would test the applicant's knowledge of design and that the real function of a standard of qualifications would be lost by producing false standards in the practice of the profession.

It is further argued, by these highly æsthetic members of the profession, that an examination covering the applicant's knowledge of design and rendering in a perfunctory way, and the science of building construction, strength of materials, laws of sanitation and merit of investment in a thorough manner, would be grossly unfair to the truly artistic student whose stock and trade is his ability to design and not construct.

These gentlemen base their arguments upon an entirely false conception of what society demands of an architect. An architect cannot be just what his own inclinations would lead him to be. He occupies a place in our social and industrial life, and he must, the same as those in any other walk of life, fill this place in society, just as society dictates.

There are still other groundless objections raised by architects, who, because of their associations and their

supreme contempt for anything that would tend to hamper the free and untrammelled liberty of their bohemian conception of the profession, would oppose any measure that would have the effect of injecting business principles into the practice of architecture.

With regard to the first objection, we would point out that any such law would not require any architect practicing at the time of its passage, to pass the required examination. A license would be issued simply upon proof that the applicant was practicing at the time of the passage of the law. As to the increased responsibilities involved, no architect who has practiced his profession along legitimate, honest and efficient lines, would find any difficulty in complying with the regulations of such an act. A license would be revoked, only upon satisfactory proof being produced, before the Licensing Board, of gross incompetence, negligence, or dishonest practice. No architect would surely wish to place himself on record as opposed to such a law upon these grounds.

As to the second objection, it is very evident that this opposition is based purely and absolutely upon a misconception of the real functions of the architect. Architecture, as we all know, is the science and art of designing and constructing buildings or other structures. The Greek term "architektonia" originally applied to the position of the chief worker in wood; carpenter, craftsman.

We know that the ancients regarded architecture as the chief art, the architect being director of works and responsible for whatever sculpture or painting was used in connection with the building, and it was not until the Renaissance period in the fifteenth century, that architecture lost its right to govern other arts.

Architecture was one of the earliest and most constant expressions of civilization and was fundamentally effected on one side by the religious and social elements of society, and on the other by the material elements, such as the influences of climate, of materials of construction and decoration, which limit, or in certain directions stimulate artistic originality.

So we find that architecture in every age is a faithful mirror of contemporary society. To-day we have the commercial age and society demands that our buildings be more of the utilitarian and mechanical type than those erected in the earlier ages. Present day structures must be more economically and scientifically built. Architects of former ages were free to design independent of mathematical calculations of floor stresses, wind stresses, etc. They designed their buildings and built them so substantially that it was impossible for them to fail. They were influenced by the demands of society and the materials they had at hand.

In this commercial age, society demands a type of building in which mathematical calculations form a most important part. Society insists that the architect should satisfy these demands, without the useless waste of materials that have no utilitarian function in the building. Architectural elaboration seems almost to be superseded by utility of plan and economy in construction.

The architect of to-day may be able to create a beautiful design, but society demands that he shall be capable of scientifically and economically adapting that design to the material with which it is most practical to build. To do this, the architect must have practical knowledge of the scientific branch of building construction. Each individual builder may choose the architect who is enabled to render the most acceptable design, but society has a right to insist upon knowing that this architect is capable of safely and honestly erecting a building according to that design, and in accordance with approved methods of construction.

This is the function of an Architects' License Law. It is purely a just demand of society upon the architect that he be made responsible to the community as well as

his client, for the safe and honest reproduction of his design into the building, "de facto."

The argument that a government examination on building design and construction would have a tendency to cause the student to neglect the æsthetic branch of architecture, is a fallacy on the face of it. It is as reasonable to say that it is unwise to teach a boy arithmetic because it will interfere with his history; or that it is ill-advised for an intending law student to take an arts course for fear it will interfere with his law studies; or that it is injudicious for an arts student to take French because it may interfere with his English.

THREE OBJECTIONS TO LICENSING LAW—THE FUNCTION OF THE ARCHITECT IS THAT WHICH SOCIETY DICTATES.

OBJECTION to the adoption of a measure providing for provincial registration of architects, are few and far-fetched. No real practical reason why an architect should not be required to qualify before a provincial board of competent examiners, can be set forth.

The public is justified in demanding that the men, to whom are intrusted the design, plan and construction of their buildings, should prove their practical knowledge of the basic principles of their profession before a body of men competent to judge.

Architects who are practical in their knowledge of building design and construction and who are competent and successful in their application of this knowledge, concede this, the public's inherent right and are highly in favor of such legislation as will tend to fasten increased responsibilities upon the profession; legislation that will protect the building public against the unscrupulous, inefficient operations of the incompetent; legislation that will discriminate between the capable and practical architect and the incapable and impractical so-called architect; legislation that will tend to raise the standard of architecture by demanding that the producer of beautiful pictures shall possess sufficient practical knowledge of building construction, the strength of materials, the laws of building sanitation and merit of investment, to be able to successfully reproduce his artistic conception in brick and stone.

It is not sufficient that the architect of to-day should simply be a student of art in architecture. While it is true that all architects should develop to some marked degree the æsthetic in architecture, it is also essential that he has a thorough and practical knowledge of the science of building construction and sanitation.

An architect is successful in the practice of his profession only in so far as he is capable of combining art and utility in design.

The man who hopes to be successful should not undertake the study of architecture if he has not the inherent taste for the artistic and beautiful, but this artistic talent is only the ground work upon which he must build the practical knowledge which will make him an architect. The architect who is unable to design to suit the tastes of the prospective builder, soon finds it necessary to pull down his shingle, as an architect. The building public will employ the services of the architect who is best able to satisfy in his design. In the ordinary process of securing a client design comes first and construction after. It matters not how capable the architect may be as a building engineer. His knowledge of building construction will not secure for him a single client unless he is able to create a satisfactory design.

So we see it is to the individual advantage of every architect to develop his knowledge of design and rendering, for he will be successful in securing a lucrative prac-

tice just in-so-far as his conceptions in design are acceptable to his clientele.

But it is after the prospective builder has been suited with a design, which as a rule is rendered in bright water colors, that the all important questions arise: has this designer the practical knowledge required to successfully reproduce this beautiful conception in brick and stone? Will a structure erected according to his design be practicable from a utilitarian standpoint? Can it be so planned as to economically and successfully fulfil the purpose for which it is to be erected? Can it be erected for the sum the owner is prepared to expend, or will it have to be trimmed here and "skinned" there, and cut elsewhere before it is completed, to make it come within 25 per cent. of the cost originally intended? Is the architect capable and honest in his methods of awarding contracts and superintending, or will the owner be made a victim of sharp practice, shoddy construction methods, and incompetent supervision? And last, but not least, is the building capable of withstanding the usage to which it is to be subjected; is it safe, or will it stand as a menace to lives and property it contains and to the community in which it has been erected? It is for the protection of the owner and the public at large against these ugly possibilities, that an Architects' License Law should be enacted in the province of Ontario.

The owner (as we have often repeated), with his lack of knowledge of construction methods and details, is unable to protect himself against the dishonest and incompetent reproduction of an attractive design, into a completed structure. The plans and design satisfy, yes, possibly please him, but he cannot judge the adaptability of materials or adequacy of ventilation. He can only criticize the perspective and floor plans; the rest he must leave entirely and absolutely to his architect. An Architects' License Law will make the architect responsible to the people of the province of Ontario, as well as his client, for the faithful, honest and intelligent performance of his duties as an architect and superintendent of every building he erects. The penalty for gross incompetence or dishonest procedure, will be the forfeit of his license to practice the profession in the province.

CONVENTION OF O. A. A.—ARCHITECTURAL REGISTRATION CHIEF QUESTION OF DISCUSSION — MEMBERS WIDELY DIFFER IN THEIR VIEWS.

THE ANNUAL convention of the Ontario Association of Architects was held in Toronto from January 11 to 14, and with an unusually good attendance. The chief topic under discussion was that of architectural registration upon which subject the members present seem to have widely different views. Some were inclined to adhere to the original policy of making further application to the Ontario Legislature with a view of having their present charter amended, which would make the O. A. A. a close corporation.

Others seemed to favor the licensing idea as in vogue in the State of Illinois. They were, however, not of the opinion that it was the function of the association to ask for such legislation; that insofar as legislation of the kind would be enacted principle in the public's interest, some other body than the architects should approach the Government upon this question. There were others who still strenuously opposed any form of legislation that would tend to require architects to pass any sort of an official examination. This contention was based thoroughly and absolutely upon their view in the matter from the standpoint of the architect.

Mr. G. W. Gouinlock, of Toronto, was honored with the presidency for the year 1909.

We regret that we are unable in this issue to further review the proceedings, but the February number will contain a complete account of the entire convention.

LICENSE LAW STRONGLY OPPOSED.-- Mr. J. C. B. Horwood of Toronto, in Letter to "Construction" Gives a Thorough Review of All the Arguments Advanced Against the Licensing of Architects

EDITOR CONSTRUCTION:

I take strong exception to many statements, as well as the conclusions, of both editorials in your issue of November last entitled "Architectural Registration the Public's Only Possible Protection Against the Incompetent or Dishonest Practitioner," etc., and "Provincial Board of Examiners Responsible Only to Government the Correct Solution," etc.

While agreeing with the author of the article, that improvement in architecture in the province of Ontario is exceedingly desirable, and that something ought to be done, and that speedily, to obtain the desired end, I am nevertheless, convinced your writer has given not only an exaggerated account of the real situation, but he has also made a totally wrong diagnosis of the case, and has accordingly suggested an altogether inappropriate remedy.

He has given an exaggerated account of the real situation when he infers that "negligence," "sharp practice," "dishonesty," etc., on the part of the architect exist because of the non-existence of a license law, whereas these evils exist in every profession because of the presence in them of unregenerate human beings. Much, and even more, which he attributes to present conditions without a license law, can be as truly applied to another profession, having not only a license law, but also a committee of professional men of undoubted integrity to look after the conduct of their members. For instance, instead of architect let us read "lawyer" into a portion of his article. Then, by substituting and quoting we have "What happens if his (the client's) confidence has been misplaced and in his selection he has employed a 'lawyer' who is not a 'lawyer'?—but a scamp. What happens if he has placed (his case) in the hands of a man entirely unequal to the task imposed upon him? What happens if he has commissioned a dishonest practitioner (a lawyer) to spend his money in the erection of his building; one who operates and succeeds by the aid of 'sharp practice' rather than through his competency?" "The answer is simple enough, and all too apparent, in object lessons that come before us every day."

It is, therefore, clear that these ills do not proceed from the absence of a license law.

He has made a wrong diagnosis of the case when he states the province is suffering from architectural degeneration caused by lack of a compulsory law. He says: "The practice of architecture in the province of Ontario . . . has degenerated to a very low point, for the sole reason that any one is free to declare himself an architect." This statement is an entire misconception as to the actual conditions. Before your writer can substantiate his statement he will have to show there was a time in the history of the province when the architectural work of the province, taken as a whole, was better than at present. This he cannot do, for the constant trend of the work has been, and is, upward. Moreover, our reputation in architectural work is relatively high as will be seen by quoting from an editorial in the London, England, Builder of September 26, 1908, evidently written by an English architect. He says of Canadian architecture (and your writer will admit that the work of our province is at least equal to the general standard of work throughout Canada): "It must be apparent to all observers that Canada is a well-built country, whose buildings reflect the intelligence and good taste of its people. There is neither extravagant display nor neglect of interesting features."

While we are not suffering in any degree from archi-

tectural degeneration yet the undersigned is of the opinion, that though we are making good progress, we are not making the progress which is possible because there exists a lack of educational facilities to teach the rising generation to express itself architecturally. These special educational facilities are particularly needed because being a comparatively new land, we have as yet few architectural monuments, compared with older countries, to inspire the younger generation to high attainments in their profession.

A license law would never give or develop this inspiration, but a thoroughgoing architectural school would do so, wherein would be taught the principles of architectural composition deduced from the noted monuments of the ages; combined with a well-equipped architectural museum, where the eye of the student would become attuned to models of the best work the world has produced—a museum which would be well worth a pilgrimage from any part of the province for purpose of study.

He has suggested the wrong remedy, because he fails to see the situation as it really exists. His panacea might be worth a trial if the cause of the trouble was refusal on the part of the younger generation to make use of the opportunities of study at hand; but the fact is, willingness to study already exists side by side with lack of the special opportunities absolutely needed in the training of an architect.

Your writer's whole argument is founded on the time worn fallacy that what is needed for the rising generation is a rod to drive them. He fails to see that what is needed is leaders to guide them.

Why are hundreds of thousands of dollars sent out of the province every year to correspondence schools by the rising generation to improve their education? Are they obliged to do this by reason of a compulsory law? Is it because they wish to avoid opportunities for study?

Why do the brightest young men, in even our best architects' offices in Toronto, invariably leave them as soon as their apprenticeship is over and go across the border, having had no systematic instruction in architectural design? Why do these same young men burn midnight oil in the ateliers of New York and become so active and enthusiastic in their work over there?

Does not one answer suit all of these queries?—Because at home we lack the special educational facilities needed to properly develop our youth.

Is not, therefore, the obvious remedy, additional educational facilities?

Is it not really absurd in the extreme to be persistently advocating a compulsory law to force young men to study architecture when they are already willing to do so, and when at the same time we possess neither the needed equipment to study nor the special kind of instructors necessary to properly teach them?

A Board of Examiners under a license law, such as that suggested, cannot give us additional educational facilities as their function properly begins and ends, not with giving instruction but with examining. Such a board would not only fail to supply this great and urgent need of the community, but they also would unwittingly become a huge obstacle blocking the highway of progress in that direction because they would be forced to set up a false standard for an architect with its attendant evils, as is done by the oft-quoted and much praised license law of Illinois.

For, given a board of the best men obtainable, they

(Continued on page 78.)

A MODERN WESTERN BUILDING.---Imperial Bank Building, Edmonton, a Recent Aquisition of a Substantial Character,---Designed in Greek Ionic and Planned for Banking and Office Purposes.---Upper Floor Devoted to Quarters for Banking Staff. . . .

IF THERE is any one thing in the cities and towns in the Canadian West that is more pronounced than their rapid growth, it is their substantial growth. No other country in the early stages of its development has seen as great an expenditure in the construction of individual buildings, or the laws of building design applied to a more marked degree.

While in some instances, as will be found even in the more advanced sections of fully settled countries, the architectural treatment is not all that could be desired, yet on the whole enough has been accomplished to make the awakening of Western Canada pre-eminently distinctive in this respect, and to show beyond all doubt that the importance of design in building construction is being fully taken into consideration.

This exceptional development in both construction and design is due to many reasons, one of which is the unbounded faith reposed in the future of the country. The knowledge of its great natural resources, its stability of character, its commercial and industrial possibilities, the readiness with which outside capital is advanced for its exploitation, has led owners in erecting new buildings, to feel absolutely safe in their investment, and to build along permanent lines.

The fact that a large number of capable architects have found it expedient to locate there and to identify themselves with the growth of the country, has also had a most wholesome and beneficial influence, and again there is another condition which has been conducive to stability in construction and a higher expression in building design. The West is rapidly recognizing the evils of unsafe methods in building construction and the different municipalities are either revising their by-laws in this regard, or enacting new ones to conform with the safest measures that have been adopted for that purpose, thus in most cases

making the services of an experienced architect necessary.

An idea as to the substantial character of some of the Western building, can be gathered from the accompanying illustration of the new building of the Imperial Bank of Canada at Edmonton. This building, which occupies a commanding position at the corner of Jasper and McDougall avenues, was erected in 1907, and is the work of Architect R. Percy Barnes of that city. It is of solid masonry construction with fireproof floors and partitions, and cost when completed about \$100,000.

The exterior of the building is of Greek Ionic character, worked out in Calgary stone, over foundation walls of Tyndall sandstone. The principal facade overlooking Jasper avenue has as its main feature a large portico formed by four massive Ionic columns running through the entire height of the building and supporting the base of a projecting pediment of simple design.

In the centre, flanked on either side by the plinths of the inner columns and having electroliers at the street line, are broad easy ascending stone steps leading to the entrance of the vestibule.

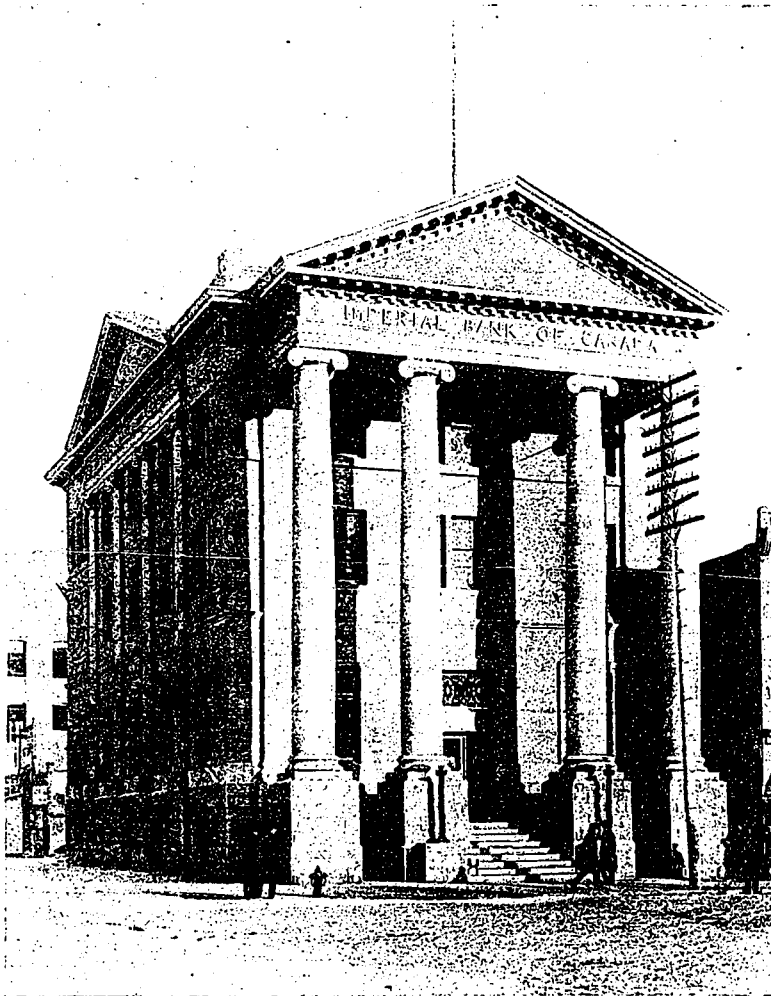
On the McDougall avenue side the same architectural motif is repeated with Ionic capped pilaster instead of columns, the back of the lot towards the street being fenced with a heavy railing of special design, carried

out in wrought iron.

In addition to three floors, the building contains a high basement, the front portion of which is occupied by the Canada Permanent Loan Company.

The whole of the ground floor is taken up by the banking room of the Imperial Bank, access to which is obtained from the main entrance, through a richly pannelled vestibule in quarter-sawn oak.

To the left and right on entering are the manager's room and ladies' waiting room, also finished in quarter-



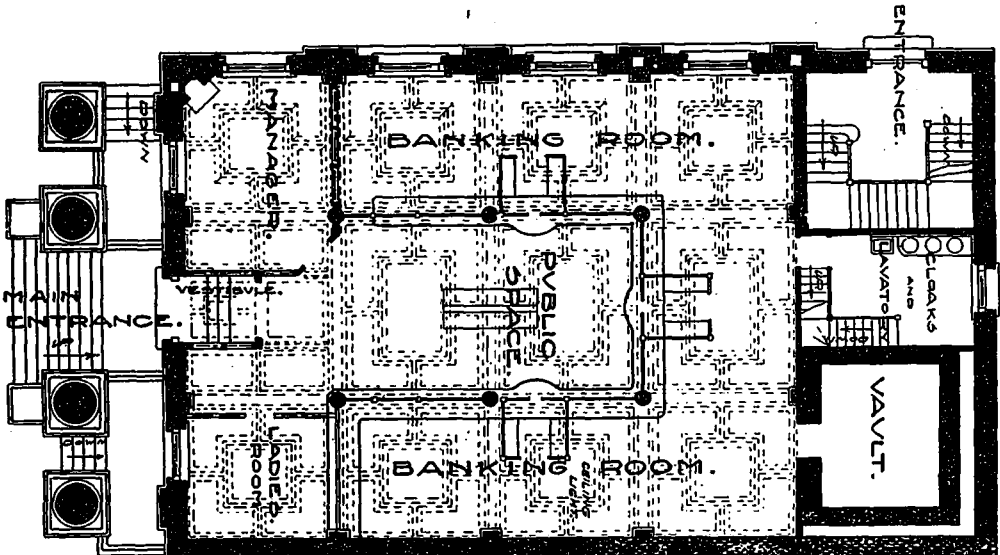
IMPERIAL BANK OF CANADA BUILDING, COR. JASPER AND MCDUGALL AVES., EDMONTON. R. PERCY BARNES, ARCHITECT.



VIEW OF BANKING ROOM, IMPERIAL BANK OF CANADA BUILDING, EDMONTON. R. PERCY BARNES, ARCHITECT.

sawed oak, and extending along the sides and the rear, forming the public space, are the banking counters of Rouge Royal and Tennessee marbles. These are sur-

The ceiling, which is coffered and pannelled, is supported by columns finished in Scagliola in imitation of Verde antique, and the floor of the public space is of



GROUND FLOOR PLAN, IMPERIAL BANK OF CANADA BUILDING, EDMONTON, SHOWING THE ARRANGEMENT OF THE BANKING COUNTERS, AND THE LOCATION OF THE MANAGER'S OFFICE, LADIES' ROOM, VAULT AND ENTRANCE. R. PERCY BARNES, ARCHITECT.

mounted by screens and electric fixtures done in statutory bronze, while in the centre of the public space is a large double oak desk provided for the use of the bank's patrons.

white mosaic marble with a rich colored border. At the rear, centrally located back of the end counter, is a cloak room and lavatory facilities for the staff, while to the right is a large modern fireproof vault. In addition to

the windows on the Jasper and McDougall avenues sides, light is also furnished the banking room from a well placed skylight.

The second floor of the building consists entirely of office suites, while on the top floor accommodations are found for the banking staff, consisting of comfortable and inviting bedrooms, living room, billiard rooms, etc., furnished in a manner consistent with the character of the building.

The upper floors are reached through an entrance at the rear of the building on the McDougall avenue side, which also gives access to the basement in addition to the entrance leading in from the street, between the right hand columns at the front of the building.

The building is heated throughout by low pressure steam, and the plumbing is of the most modern type. The general contractor for the building was W. H. Gardner, of Edmonton, while the sub-contracts were executed as follows: Bronze work, The Robert Mitchell Co., Montreal; marble work, Drake Marble Co., St. Pauls; oak fittings, Canadian School and Furniture Co.; plumbing and heating, J. A. Lockerbie, Edmonton.

FUTURE OF CEMENT.---Production will be Influenced by General Business Conditions ---Poorly Managed Plants a Menace.

AT THE SECOND DAY'S session of the annual meeting of the Association of American Portland Cement Manufacturers, held at the Hotel Knickerbocker, New York, on December 8, Edwin C. Eckel, one of the leading experts in the industry and until recently in charge of the cement work for the United States Geological Survey, stated that while the actual annual output of Portland cement may be expected to increase as population increases and as new uses are found for the product, it cannot be expected that this increase will, in the future, be as steady as it has been in the past. The astounding growth of the industry, from 42,000 barrels in 1880 to more than 46,000,000 barrels in 1907, has now ceased, the production for 1908 being estimated at about 47,000,000 barrels, or two-thirds of the capacity of the existing plants. Two of the three business depressions that the industry has passed through left it unscathed, but the third one, that of last year, brought the fact home to the cement manufacturers that henceforth the course of the trade will be marked by successive periods of high and low output, corresponding to the condition of general business at the time. Mr. Eckel also stated that prices will, if left to absolutely unrestricted competition, tend to fall to a point which will yield a fair profit only to the largest and best mills. The future decrease in prices, however cannot be comparable in amount to that which has already been experienced, since manufacturing costs show little prospect of marked decrease.

In reviewing the growth of the manufacture of Portland cement in the United States, Mr. Eckel made the following statement:

"Up to 1907, the American cement industry had shown practically uninterrupted progress so far as annual output was concerned, and many manufacturers seemed to expect that this pleasant condition would continue indefinitely. The number of plants under construction or in course of promotion increased rapidly, and heavy increases in productive capacity were indicated.

In January, 1907, the speaker, as cement expert of the United States Geological Survey, in discussing conditions in the cement industry of 1906 called attention to an impending change in these conditions in the following statement:

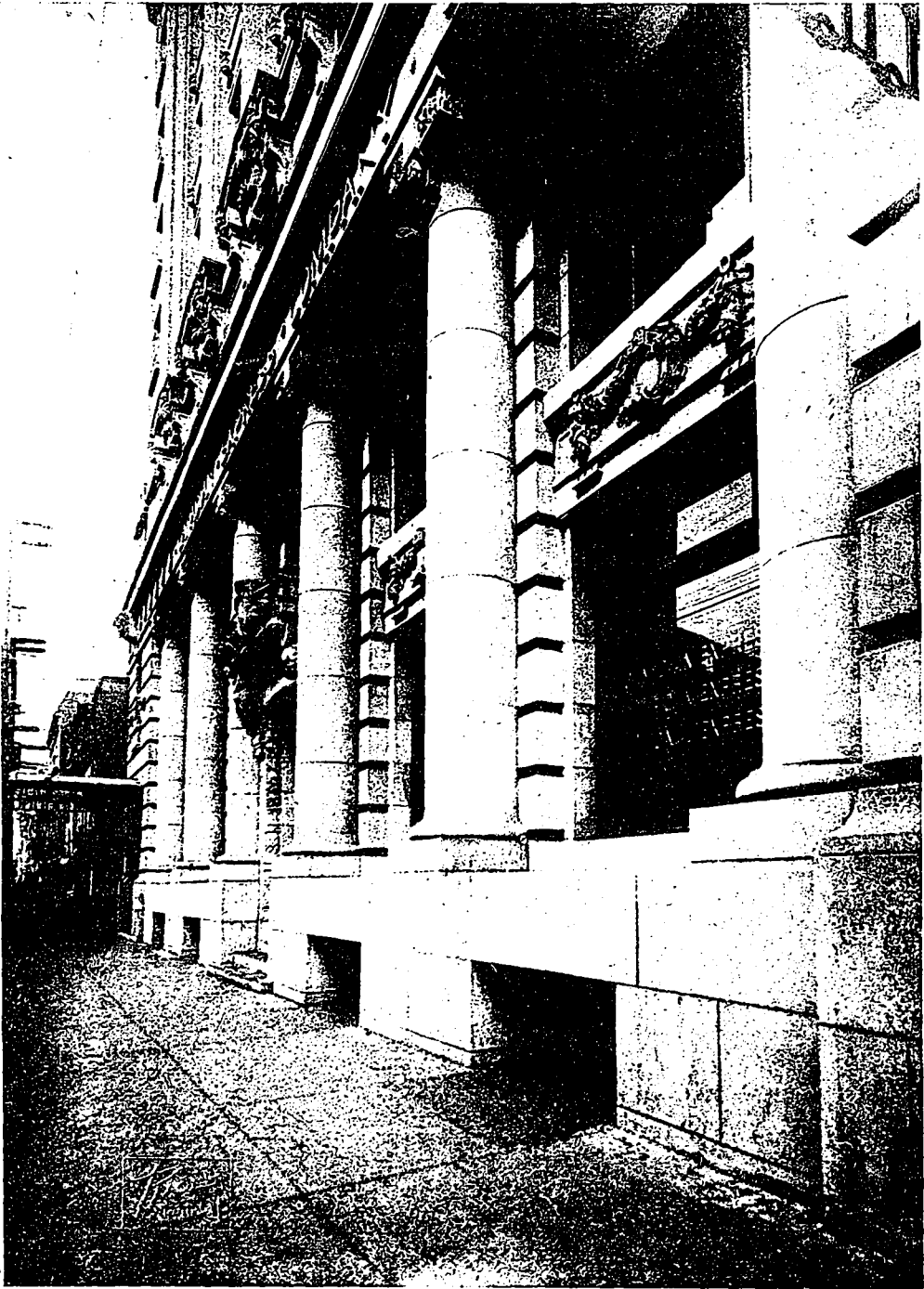
"The cement output, as yet, has not suffered markedly from financial depression. Prices have fallen off in poor years, it is true, but the annual output has always

increased. The rise in yearly output from 1885 to 1906 has not only been continuous, but has even shown a tendency to increase its rate of increase. Of course such a condition of the industry cannot be expected to continue indefinitely. Within a few years we must expect to see the rate of increase lowered and finally, in some period of business depression, some year will show a lower output than the preceding year. This will mark the end of the youth of the cement industry, and the beginning of its period of maturity. Though the present condition of the industry is as prosperous as might be desired, it is possible that the change in rate of growth may be quite near at hand. New construction in 1906, and plans for 1907, will provide a great increase in mill capacity. If the succeeding years are generally good, this increase will be taken up without difficulty; but a general financial depression in 1908 would probably result in a temporary check to the cement industry. So far as can be estimated now, the plants which will be in operation before the end of 1907 will turn out cement at the rate of 50,000,000 barrels per annum, and it is doubtful whether such an output could be absorbed if the United States were not generally prosperous."

"When this statement was published, several cement-trade journals commented on it in interesting fashion. As one editor noted: "The absurdity of such gloomy prophecy, at a time like this, is obvious to any one acquainted with the true condition of the cement business. The rush for cement never was greater than it is now. All mills are working to full capacity and the managers only wish that they were bigger."

"Later in 1907 the humor of the situation did not seem quite so obvious, and now, near the close of 1908, it seems fairly safe to say that the American cement industry reached a distinct turning point in the latter part of 1907, and that from now on the matter of output must be handled differently. Hereafter we may expect that the cement production will be related very closely to general business conditions; that in times of prosperity we may temporarily fall behind in capacity, but that the approach of business depression will be marked either by radical decrease in cement output or by its alternative—which is general demoralization in the trade. The cement industry has no longer room for poorly managed plants or for weakly financed companies, for in times of industrial stress such plants and companies become a menace to the entire industry."

A NEW AND UNDOUBTEDLY LARGE FIELD for the consumption of metal lath and cement is about to be opened by the growing popularity of the cemented, or what is commonly called "stuccoed," house, says a contemporary. This has proved an important influence in the development of a rapid and more economical method for making metal lath, which has come about coincidentally with the excellence and cheapness of the Portland cements. The scarcity and advancing price of lumber also have much to do with stimulating this form of exterior finish which is now well established as a fashion for new construction, but there is a much wider field for its use in the covering of the old frame houses now standing. The fact that, at a comparatively small cost, the appearance of such houses can be greatly improved and the comfort of the occupants, both in winter and summer, considerably increased appeals strongly in favor of the undertaking. It is said that the saving in fuel and repairs will in most cases run from 10 to 20 per cent. on the cost of the improvement, making it attractive from an investment standpoint. It would be impossible to estimate the great tonnage of sheet steel and cement likely to be required for this purpose, but beyond that it is certain that the wide distribution of demand and more general acquaintance of the public with the possibilities of these materials for reconstruction work will extend the use to stables and out-houses for animal protection.



CANADIAN EXPRESS COMPANY'S BUILDING, MONTREAL, SHOWING DETAIL OF COLONNADE OF MAIN FACADE.
MESSRS. HUTCHINSON & WOOD, ARCHITECTS.

CANADIAN EXPRESS COMPANY'S BUILDING.---One of the Recent Additions to Montreal's Business Architecture.---A Noteworthy Design in Modified French Renaissance.---Massive Colonnade a Feature.---Building of Fireproof Construction.

WHATEVER may be said for or against tall business buildings, the fact still remains that they mirror in no mistakable manner the growing importance as a business centre, of the community in which they are located.

In Montreal, as in other cities of first magnitude, the marked tendency toward the centralization of business, the steady increase in trade, and the demand for better business and office accommodation, has, of necessity, in districts where available ground space is limited, led in a number of instances within the past few years, to the erection of buildings above the usual height.

While as yet there has been no attempt to approach the extreme altitude that has been attained in tall building construction, it is nevertheless impossible to lose sight of the fact that the gradual growth of structures of a greater height is coming to have an important bearing on the architecture of the business district.

One of Montreal's most noteworthy additions of recent date in this respect is the new office building of the Canadian Express Company—a structure which lifts itself several stories above its neighbors.

This building has a frontage on three streets, St. Paul, Place d'Youville and McGill street, with the principal facade on McGill street, where it has a frontage of 113 feet, while it extends back about 80 feet on the other two streets. It is ten stories high above the basement, of skeleton steel construction, and faced on the principal elevations with Grey Canyon Ohio sand stone. All floors and the roof are of concrete and the building is as thoroughly fireproof as modern building science has made possible.

The style of architecture is a modified French Renaissance; the lines are graceful and the general

treatment is such as to impart a well-balanced, stable and dignified aspect to the whole.

The first two floors and a part of the third and the basement are occupied by the Canadian Express Company, the money order and shipping departments on the ground floor being practically separated from each other by the main entrance hall, which is reached through the centre of the colonnade forming the principal feature of the lower portion of the McGill street facade. Both of these departments have individual entrances leading from this street, while at the rear, connecting the two is a large shipping room where all express goods are received and delivered.

In the main entrance hall which also gives additional access to the Money Order and Shipping departments, the walls are finished in marble, the lower ten feet in a strongly veined Skyros, and the upper four in Sienna inlaid with light colored Skyros. The floor is tiled in a

light grey marble from the Phillipsburg quarries, and the ceiling is richly decorated in plaster work, panelled and finished in old silver.

Immediately opposite the doorway are two high-speed hydraulic passenger elevators and a staircase leading to the several floors, and back of the elevator, by which it is screened, is a large modern vault, connecting directly with the money order department.

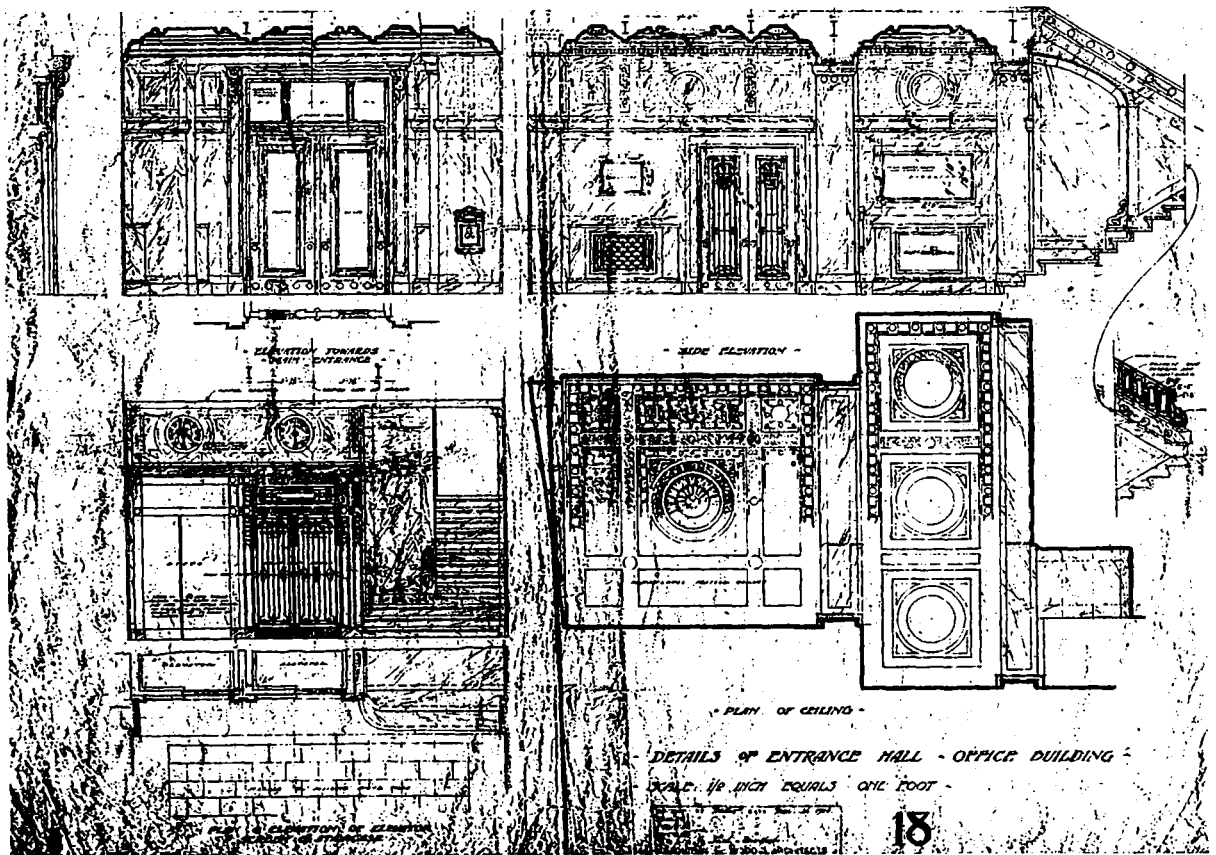
The stairs throughout have marble treads supported upon iron carriages and the sides of the stairs, from the first to the second floor, are finished with a dado of Skyros marble and the walls of the staircases in all the other floors with a dado of blue Vermont marble. The elevator halls and corridors in the second and third floors also have dados of blue Vermont marble and floors of terrazzo with marble borders. All doors and trimmings in



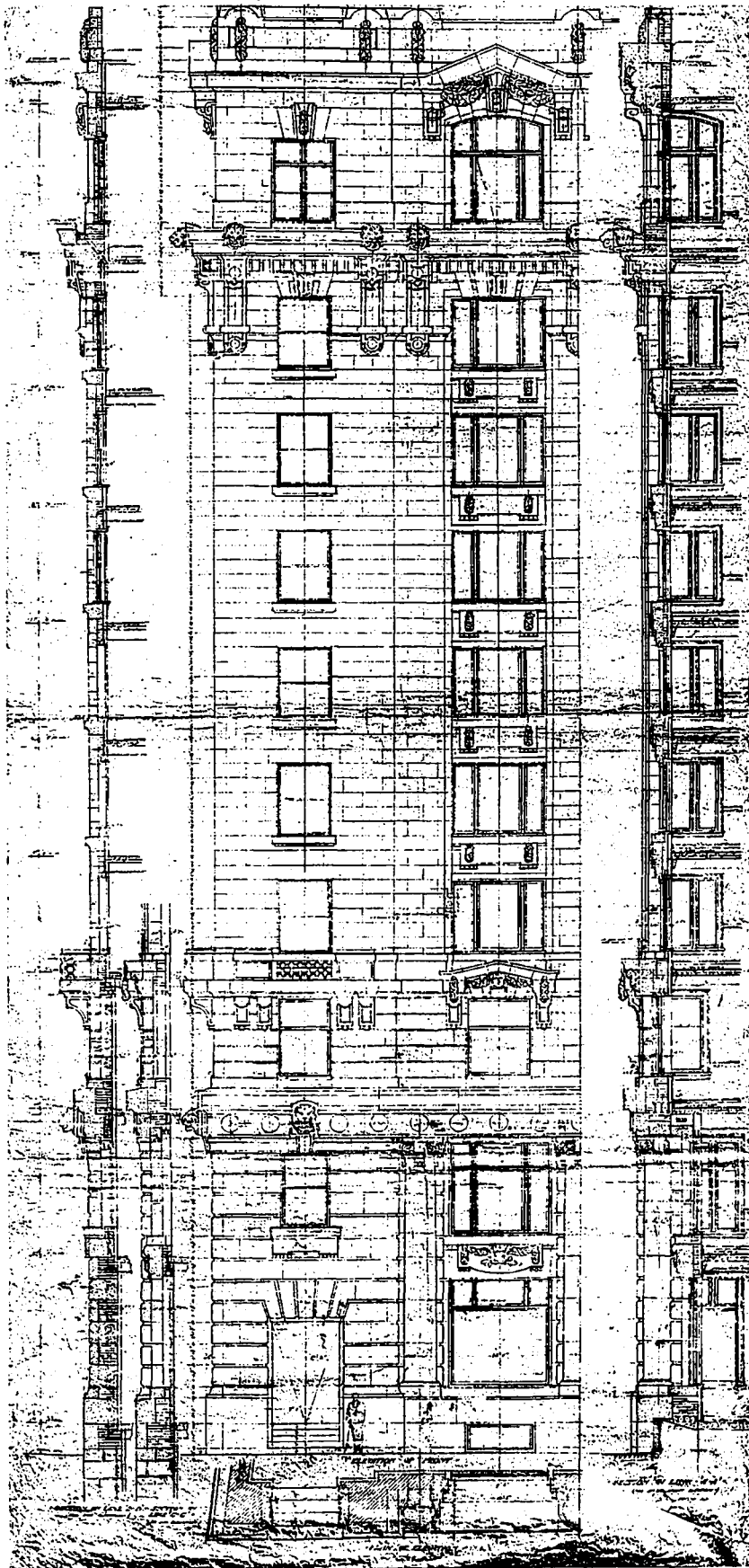
CANADIAN EXPRESS COMPANY'S NEW BUILDING, MONTREAL.
MESSRS. HUTCHINSON & WOOD, ARCHITECT.



CANADIAN EXPRESS COMPANY'S BUILDING, MONTREAL, SHOWING THE COLONNADE OF MAIN FACADE AND CANOPIED ENTRANCES OF SHIPPING AND MONEY ORDER DEPARTMENTS. MESSRS. HUTCHINSON & WOOD, ARCHITECTS.



DETAILS OF ENTRANCE HALL, CANADIAN EXPRESS COMPANY'S BUILDING, MONTREAL. MESSRS. HUTCHINSON & WOOD, ARCHITECTS



DETAILS OF FRONT ELEVATION, CANADIAN EXPRESS COMPANY'S BUILDING, MONTREAL. MESSRS. HUTCHINSON & WOOD, ARCHITECTS.

the entire building are of quartered white oak.

Heat is supplied by low pressure steam, generated in the Grand Trunk office building, on the opposite side of McGill street, the pipes being carried across the street in a concrete tunnel.

The light for the inside rooms of the building is obtained from a large light well, which is faced with enamelled white bricks, and in this well is placed a fire escape, access to which is had from the north and south half of the building on each floor.

All toilet rooms are conveniently situated off the landing of the stairs between each floor. They are equipped with the most modern fixtures and have partitions and other parts of Phillipsburg marble.

The fittings for the Express Company on the ground floor are of very simple character, the fronts of the several counters and walls being lined with strongly marked Phillipsburg marble; and the general arrangement has produced a plain but yet decidedly rich effect.

The building was erected under the supervision of and after plans by Architects Hutchinson & Wood.

The various branches of the work were executed by the following firms: Mason and brickwork, J. H. Hutchinson; structural steel work, Locomotive & Machine Company, Ltd.; fireproofing, Clinton Fireproofing Co.; carpenter work, Simpson & Peel; painting and glazing, Henry Mogan Company, Ltd.; plaster work, John Morrison & son; roofing work, Campbell & Gilday; passenger elevators, Otis-Fensom Elevator Company, Limited; plumbing and heating, W. J. McGuire & Co.; marble work, C. Mariotti; office fittings, Toronto-Waterloo Office Fixture Company; electric light wiring, Collyer & Brock; ornamental iron work, H. R. Ives Company, Limited.

WORLD'S LUMBER CONSUMPTION.

IN A RECENT address before the Canadian Club, in Guelph, Ont., Dr. Judson Clark, head of the Forestry Department of British Columbia, spoke of the present timber problem throughout the world, stating that the limit of production had been reached, and predicting that the prices would

now advance to a figure prohibiting its use to a large extent.

Throughout his address the speaker showed the great increase in the use of timber in this manufacturing epoch of the world's history; how each and every continent, including South America, is importing timber. The demand is increasing until at the present time North America will not long be able to withstand the onslaughts upon the forests.

Canada and the United States were now called upon to supply the world with timber, in a practical sense, but the United States was at present using half of the sawn timber of the world, and at that rate within a couple of decades she too would have to import. It, therefore, devolved upon Canada to settle the timber problem of the world with her acreage, which could not be estimated, and which was put all the way at from 250,000,000 to 550,000,000 acres. In the Eastern States a second growth was springing up, but it could not be considered as a factor in the world's timber problems, and the greatest belt that the earth had ever known, Michigan and Minnesota, had been wiped out by the axe and fire until at the present day the conditions resembled those of the prehistoric East, where the forests were wiped out and the deserts now mark where the waving trees stood. In the Southern States and on the Pacific coast there was a big supply, but it would not last long.

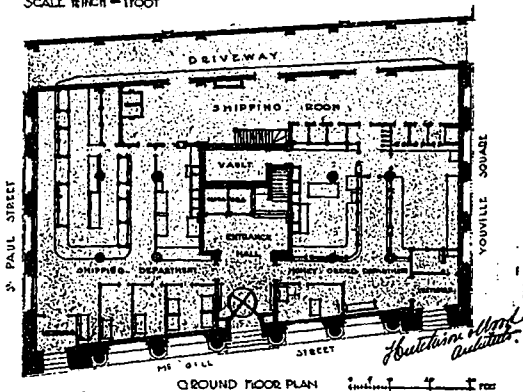
Canada, therefore, and particularly the great north, Ontario and British Columbia, must meet the demand, and

Then there was the other side of the question. A new growth. Reforestry was a part of this phase of the question, but, in the opinion of the speaker, reforestry was not so important as the careful selection of the timber and the allowing of the smaller trees to mature after the good stuff is taken out.

ACCURATE CALCULATION OF ENGLISH ENGINEER.—Makes Connection of Girders of Sunderland Bridge with the Action of the Sun's Heat.

A STRIKING illustration of the influence of the sun's heat on steel bridges, says Engineering. London, was afforded in the course of the junction recently made of the two ends of the central girder which have been in process of erection from the sides of the River Wear at Sunderland during the past seven months. This centre girder, 353½ feet long, had to be 42 feet deep in the centre to carry a double line of railway on the top platform and a roadway on the lower platform, and thus the weight of each girder complete is 960 tons, and the weight of the span 2,600 tons, exclusive of the temporary works. This equals 7½ tons per lineal foot. The length is exceeded by only one or two spans in this country, and the weight for the length is greater than in the case of any existing independent span in Britain. The clear height above high-water level is 85 feet. The River Wear Commissioners would not allow any staging in the river piers. On account of this great weight, erection by protrusion or bracketing was out of the question; and, after a very full and careful consideration of various schemes, it was decided by Sir William Arrol & Co., Limited, Glasgow, whose tender and scheme of erection were accepted, to temporarily convert the main girders into cantilevers, and erect the span by overhang from each pier. When the two projecting ends were nearing each other the closing lengths were measured with length rods and these were sent to the works at Glasgow, where the various plates and angles forming the closing lengths were cut and drilled and forwarded to the site. These units were connected to one end only; the other was free, the gap being about 1¼ inches. By noon on Thursday, Dec. 15, the temperature had risen sufficiently to cause the steel work to expand and the gap to be closed. The holes in the cover plates were then opposite the holes in the projecting end, and barrel drifts were immediately driven into a large proportion of the holes to retain the ends in position. These were replaced rapidly by bolts. Following upon this the whole joint was permanently riveted up. As this operation was being completed, the rocker bearings for the river pier at one end, were released, so that the 350-foot span was free to move longitudinally according to temperature changes. During the following night, with a drop in temperature of about 13 deg. Fahr., the movement on the rockers was 5-16 inch. It will be understood that before the connection at the centre had been made the bearings were locked on the river piers, and all expansion and contraction took effect at the gap in the centre. During the last week of construction, measurements were taken and these showed a temperature variation of about ¾-inch in the length of 350 feet. During the recent spell of hot weather the projecting ends of the girders moved about 1¼-inch westward from the forenoon sun, and again eastward to the same extent in the afternoon. The projecting ends also rose and fell daily about ¾-inch. It will thus be recognized that the question of temperature was an important factor in the success of the closing of the ends. The parts of the structure were designed with absolute precision to ensure accurate meeting when the temperature was 60 deg. Fahr. But hydraulic jacks were provided at the shore ends, so that had Thursday been abnormally cold or hot the whole structure could have been tilted or moved longitudinally until the ends met. The day, however, was of suitable temperature, and these jacks were not applied.

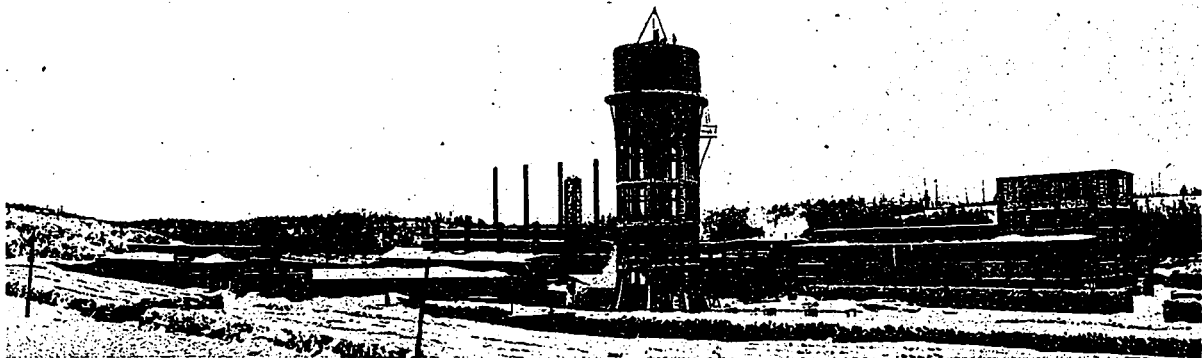
CANADIAN EXPRESS COX.
OFFICE BUILDING
SCALE 1/8" = 1'-0"



GROUND FLOOR PLAN CANADIAN EXPRESS COMPANY'S BUILDING, MONTREAL. HUTCHINSON AND WOOD, ARCHITECTS.

at that Ontario with her 30,000,000,000 feet of white pine played a small part, as this would stand but for six years of the onslaught that was made in Michigan, and only some years longer stand the present rate of use. The great north and the Pacific coast with its Douglas fir, would have to deal with the whole world. Transportation was the great problem, but in a few years with increased railway facilities the timber would come out in large quantities. Later, too, the Panama Canal would permit of steamship routes with all ports of the world, whereas now only sailing vessels could afford to make the trip around the Horn.

Another phase of the problem as dealt with by Dr. Clark was the preservation of the supply. He told of the inroads being made in the north by the fires, and called upon the Government to first consider this fire problem, the most important of the preservation of forest wealth campaign. In Michigan this year alone \$400,000,000 worth of timber had been destroyed.



PANORAMIC VIEW OF NEW PLANT OF WOOD PRODUCT COMPANY, DYSART, ONT., TAKEN FROM THE WEST, DEC. 15TH, '08, SHOWING THE PLANT COMPLETED WITH THE EXCEPTION OF THE WATER TOWER, WHICH REMAINS ONLY TO BE STRIPPED. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

REINFORCED CONCRETE CHEMICAL PLANT.---New Plant of Wood Products Company Just Completed at Dysart, Ont.---Chain Fabric and Plain and Twisted Bar Reinforcement Used Throughout.---Many Novel Features, Including Concrete Dam, Water Tower and Tank. By E. D. PITT*

AN INTERESTING piece of reinforced concrete work, introducing several new features in structural engineering, and in which the constructive cost has been minimized by the use of aggregates common to its vicinity, has just been completed in the erection of the new plant of the Woods Products Company, Ltd., of Canada, at Dysart, Haliburton County, Ontario, about one hundred and fourteen miles on the line of the Grand Trunk, north of Toronto.

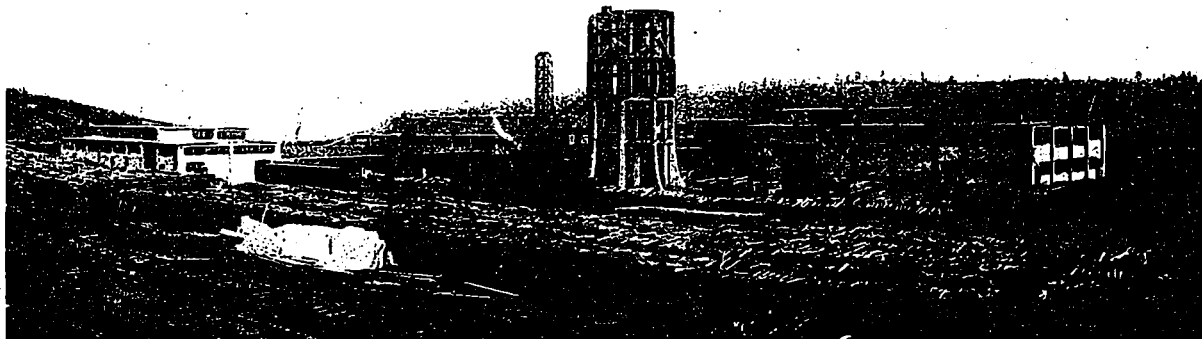
The purpose of this plant is for the production of wood alcohol and acetate of lime with by-product of charcoal by a process of treating birch, beech and maple, which are found in large quantities in the adjacent territory.

In general, this industrial comprises four buildings, an oven house, still house, charcoal house and boiler house, together with two auxiliary features consisting of a 50,000 gal. reinforced concrete water tower and a small concrete storage dam. All buildings are constructed of reinforced concrete, with brick curtain walls in the main, the intention being at the time the work was undertaken, to build as entirely a fireproof plant as the limit of economy would make possible.

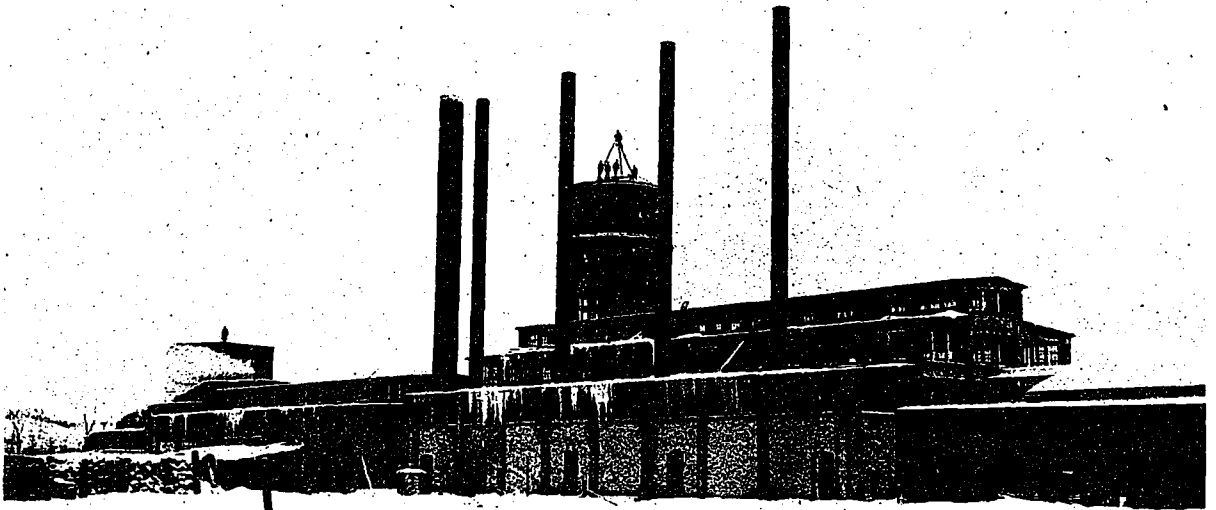
It was found advantageous, early in the period of construction, to use sand from the site of the mill as a component part of the concrete; the concrete being composed, in addition to its essential aggregate, of crushed limestone, and in part of limestone sand and quartz sand. Careful analysis made during the process of construction showed the results from these materials to have been exceedingly good. The concrete for the foundations was composed of 1:3:5 parts of cement, sand and stone respectively, while for a large portion of the superstructure the proportions were 1:2:5 and 1:1-4.2:4 cement, sand and stone in order named. In the construction of the dam, the concrete used consisted of 4:1-2 parts of stone to 1 part of cement and 2:1-2 of sand.

The reinforcement for the beams throughout the entire job consisted of Niagara bar, formed from commercial squares and flats, with an attached flat steel shear member, this form of reinforcement affording a high

*Ed. Note.—Mr. Pitt: was the designing engineer of the entire works with the exception of the chemical plant, and was also in entire charge of the construction as general manager of the firm of Pitt & Company, Niagara Falls, Ont., who were the general contractors.



NEW PLANT OF WOOD PRODUCTS COMPANY—PANORAMIC VIEW TAKEN FROM THE WEST, SHOWING THE ENTIRE PLANT DURING PROCESS OF CONSTRUCTION. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.



PLANT OF WOOD PRODUCTS COMPANY—REAR VIEW OF OVEN HOUSE AND BOILER HOUSE, SHOWING THE STILL HOUSE IN THE DISTANCE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

shear resistance and sufficient elasticity in its application to meet all of the requirements of the work. All the floor and roof slabs in the entire plant are reinforced with Community chain fabric, with 6-inch spacing of chains for the floors and 8-inch spacing for the roofs; while the columns throughout are square in form, with square hooped plain round rods as reinforcements, the hooping in all cases being formed of annealed steel wire, usually of a pitch equal to one-sixth the diameter of the column.

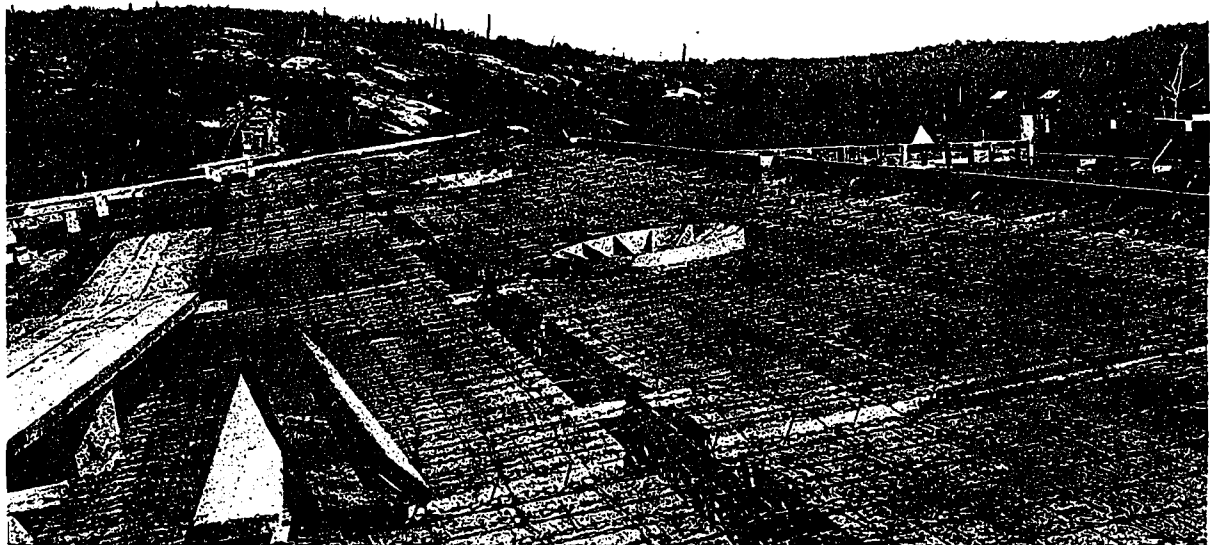
In the construction of the curtain walls and fire walls, bricks of the standard sand-lime variety were employed, the quality of the brick being satisfactory and giving promise of developing a greater crushing strength with time.

During the early part of the construction work, a coarse sand gravel was used in connection with the stone from a pit about forty miles down the line on the Grand

Trunk Railway, at Fenelon Falls. Later experiment and analysis indicated that the grade of sand found on the site would answer equally as well for use with the stone in making the concrete. This, therefore, was done, although an additional percentage of cement was used and proved up very satisfactory in every way.

The stone used for foundation work, etc., was that equivalent to a 2 1-2-inch mesh screen, while for all structural work two grades were employed—one passing through a 1-2 or 5-8-inch screen and the other a 1-inch screen—the combination of these two grades in connection with the sand used, producing an exceedingly dense concrete. The crushed stone was peculiar in its fracture, in that it was a semi-conchoidal, semi-splintered fracture, with very little dust, and more in the nature of a flint limestone than anything else.

The boiler house is approximately 52 by 90 feet, one

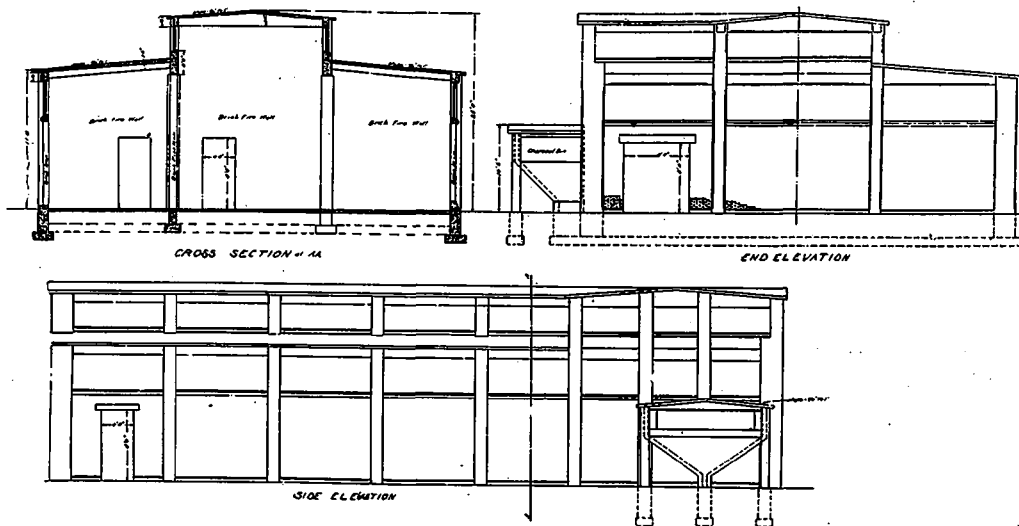


PLANT OF WOOD PRODUCTS COMPANY—ROOM OF OVEN HOUSE SHOWING CHAIN FABRIC REINFORCEMENT READY FOR THE POURING OF THE CONCRETE. NOTE THE OPENINGS FOR VENTILATING STACKS OVER OVEN. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

storey high, with a monitor roof which is characteristic of all the buildings. It contains a battery of four boilers of 150 h.-p. capacity each, which are estimated as being amply capable of supplying all the steam required for the

distillation process. This charcoal braise is stored ready for use, in a reinforced concrete bin at the side of the room.

To the north of the boiler house stands the oven

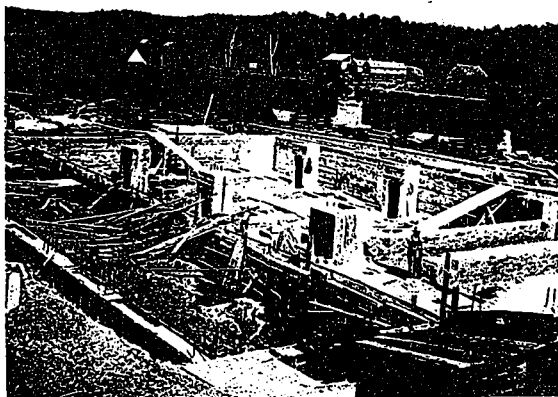


PLANT OF WOOD PRODUCTS COMPANY—CROSS SECTION AND END AND SIDE ELEVATION OF BOILER HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

various processes in connection with the working of the plant. The fuel used is the soft and refuse hardwood

house, approximately 78 by 109 feet, with a battery of four pair of twelve cord ovens—six cords to each retort—installed therein. The arrangement of the retorts, ovens, trackage, turntables and coolers follows the usual lay-out for single ended retort oven used in the majority of wood chemical plants. This building offers some interesting features of the structural side of the work. The entire roof work is carried by six large reinforced concrete columns resting on a divided footing. This divided footing was rendered necessary in order to provide a passageway for the workmen from one side of the building to the other, between the ovens.

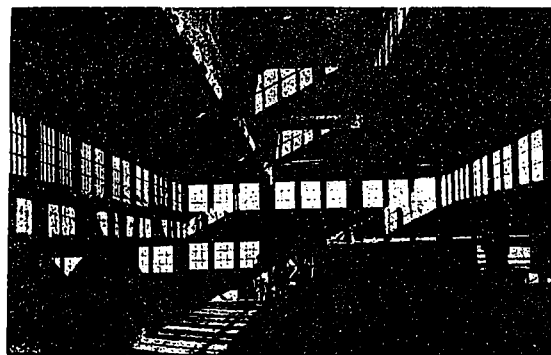
At the line of the first roof, the beams providing for a 32-foot span, have been handled in a novel manner, owing to the fact that the ventilating stacks standing over the front of the ovens centered on the division line between the pairs of retorts. In order to develop a struc-



PLANT OF WOOD PRODUCTS COMPANY—VIEW SHOWING FOUNDATION OF OVEN HOUSE WITH DIVIDED FOOTING FOR THE SIX CENTRE COLUMNS. THE DIVIDED FOOTING WERE MADE NECESSARY TO PROVIDE A PASSAGE FROM ONE SIDE OF THE OVEN HOUSE TO THE OTHER. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

from the adjacent limits, and the large quantities of marsh gas and wood tar which are by-products from the destructive distillation process. The boilers are located in the north end of the building and immediately in front of them is a large wood storage capacity with wide open-

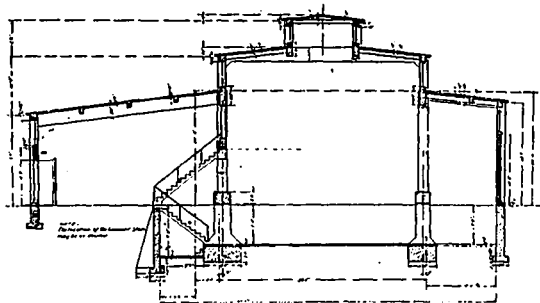
closed off with Ormsby rolling steel shutters. Adjoining the boiler compartment is the producer gas and power room, in which are installed a 125 h.-p. gas engine, a large triple-action pump, and a 1,000-gallon duplex Underwriters' pump. The vertical triple acting pump is driven by a belt from the gas engine, which is also directly connected to a generator for supplying the entire plant with electric light and current for operating small motors used in connection with the pumps and other light machinery. The gas engine is driven by producer gas, the fuel used being refuse charcoal braise which is accumulated during the handling of the charcoal in the ovens and other handling as a result of the destructive



PLANT OF WOOD PRODUCTS COMPANY—ACETATE ROOM OF OVEN HOUSE WHICH STANDS OVER THE TOPS OF FOUR PAIR OF 12 CORD RETORTS AND IS USED FOR DRYING MOISTURE FROM ACETATE OF LIME. ENTIRE ROOM SYSTEM IS CARRIED ON THREE GREAT GIRDERS SHOWN IN THE FOREGROUND. DIMENSIONS 33 FT. X 107 FT. X 16 FT. HIGH. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

tural system in which the beams would have practically a uniform loading, the main girders for the roof are carried on alternate pairs of beams diverging from single

exterior columns. (See oven top and roof plan.) On the opposite side of the building a modification of the



PLANT OF WOODS PRODUCTS COMPANY—TRANSVERSE SECTION OF OVEN HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

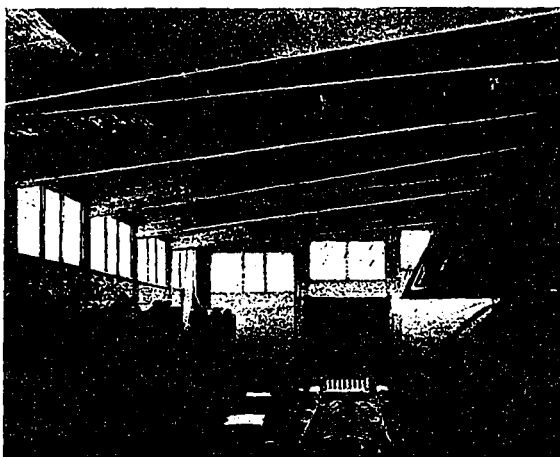
roof system was necessitated as the stacks leading from the ovens are also centered on the same central lines as the ventilating stacks at the front of the ovens. By this arrangement the upper central portion of the building is provided with a span of about 35 feet on centres, which is carried by three large girders resting upon six concrete columns. This makes a room over the ovens of about 32 feet wide by 107 feet long, absolutely clear of any supports interfering with the use of the oven floor. The floor of this room gives access to an acetate storage house of galvanized iron at the north thereof, and is connected by stairways with the lower levels of the oven house.

At the end of the destructive distillation process occurring once in 24 hours, the charcoal is pulled from the retorts and carried by stages of twenty-four each, through steel coolers which are hermetically closed in order that the charcoal may cool off without burning. After having stayed for 48 hours in these coolers, the charcoal stands for another period in the open air, to be absolutely sure no traces of fire remain. The trackage from the columns extends into the charcoal house through doors leading therein, and the charcoal is unloaded from the

ing and embedded at a level with the floor, the head of the winch standing about two feet above the surface.

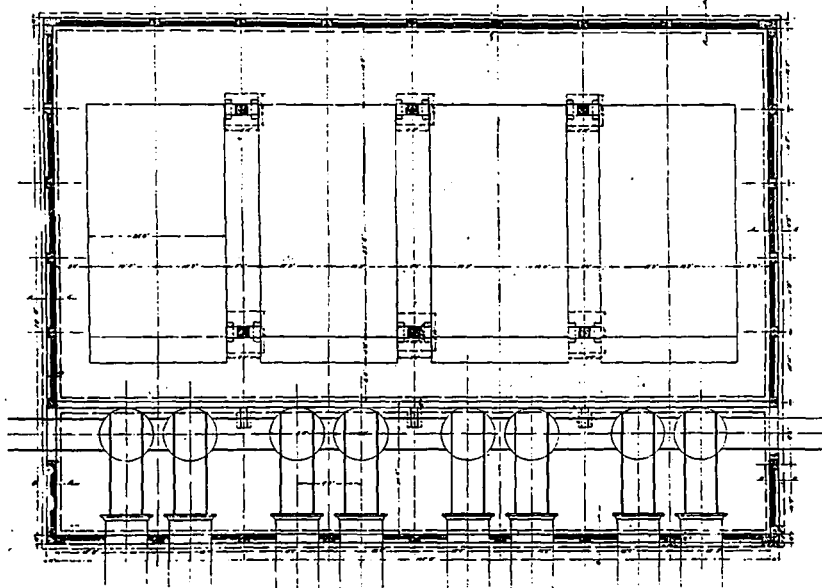
The charcoal building is 45 by 100 feet, with roof girders carried on a central line of columns and exterior columns. The columns of the monitor roof are carried on the inner third point of these girders, producing an arrangement giving a maximum of light at the point required, as well as a comparatively clear floor space.

By far the most elaborate structure in its general layout, of any of the buildings constructed as a part of the plant, is the still house. This building in its greatest width is 73 feet, while its length is 129 feet 6 inches. It comprises the neutralizing room, tank room, main distil-



PLANT OF WOOD PRODUCTS COMPANY—INTERIOR VIEW OF OVEN HOUSE, SHOWING DIVIDED BEAMS WHICH CENTRE AT ONE END ON A SINGLE COLUMN. THE DETAIL OF THIS ARRANGEMENT MAY BE SEEN IN THE ROOF PLAN OF THIS BUILDING, PUBLISHED HEREWITH. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

lery room and refinery, the latter being located in the four-storey part of the building. The raw products of the distillation are pumped from the collecting tanks in the



PLANT OF WOOD PRODUCTS COMPANY—FOUNDATION PLAN OF OVEN HOUSE, SHOWING THE SIX DIVIDED FOOTINGS, ALSO THE FOUR PAIRS OF TWELVE CORD RETORTS. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

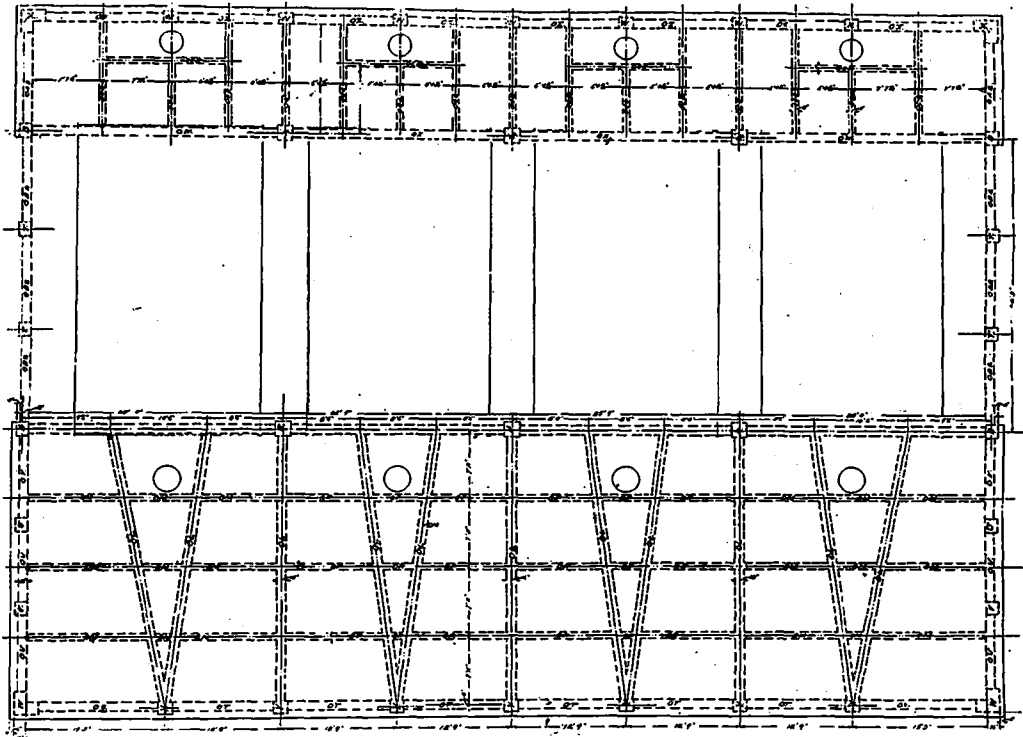
cars and stored until shipped. The cars are handled through the coolers and in the charcoal house by means of an electric winch, centrally located in the latter build-

ing and embedded at a level with the floor, the head of the winch standing about two feet above the surface.

move the acetate acid, and to increase the percentage of alcohol of the resultant liquors.

The structural features of the still house present some very interesting points. At the north end is an exceed-

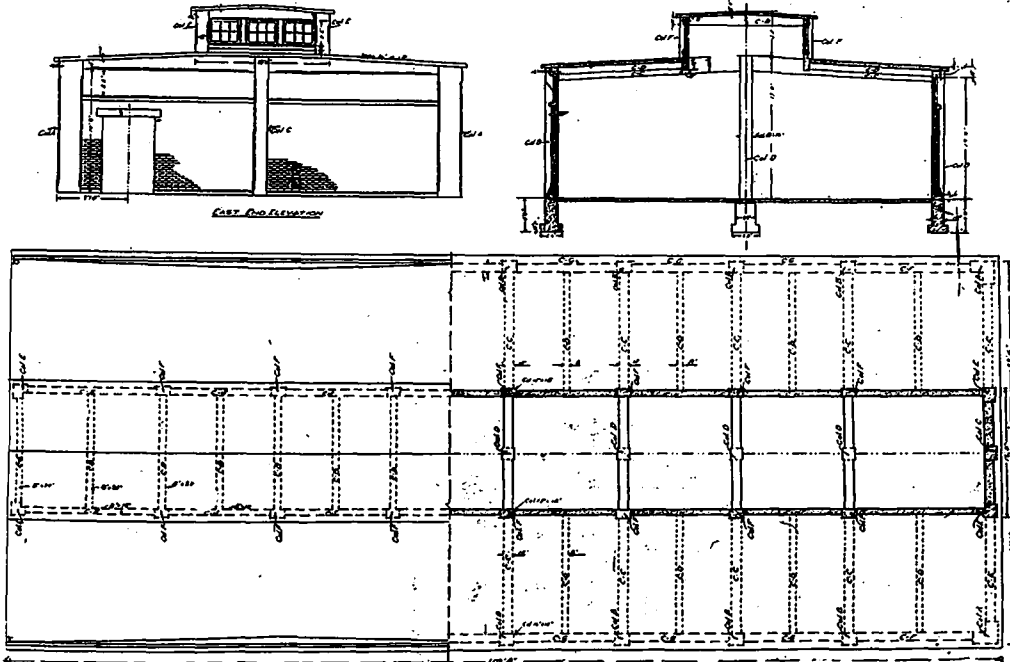
pounds per square foot. Opposite in the refining end of the building, large openings, 9 feet 6 inches in diameter, are left for the purpose of making room for the final alcohol stills. Here the levels have been constructed for



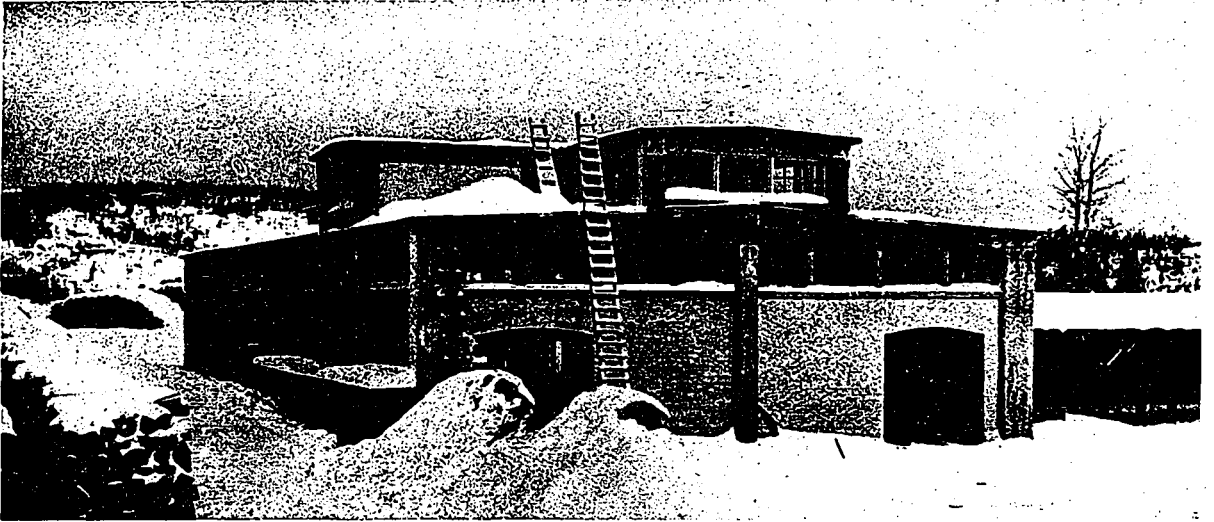
PLANT OF WOOD PRODUCTS COMPANY—ROOF PLAN OF OVEN HOUSE, SHOWING DETAIL OF ARRANGEMENT OF THE DIVIDED BEAMS WHICH CENTRE AT ONE END ON A SINGLE COLUMN. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

ingly strong floor system capable of sustaining a load of four 3,500 gallon tanks for holding raw liquors. This floor is placed at an elevation of 14 feet 6 inches above the grade and its bearing strength is estimated at 400

a safe loading of 450 pounds per square foot on the second floor, and 350 pounds on the third and fourth floors. In the centre or main room, the roof system is carried on some very high columns. The columns are 22 inches in



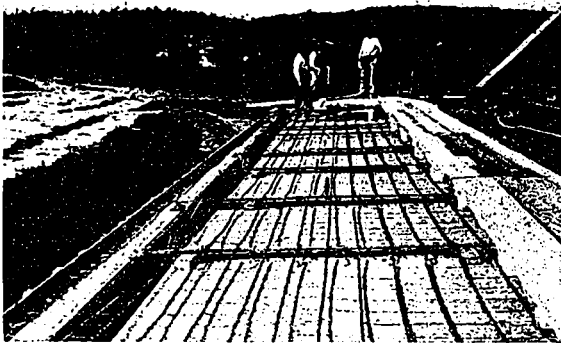
PLANT OF WOOD PRODUCTS COMPANY—EAST END ELEVATION, TRANSVERSE SECTION AND ROOF PLAN OF CHARCOAL HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.



PLANT OF WOOD PRODUCTS COMPANY—VIEW OF CHARCOAL HOUSE, TAKEN FROM THE SOUTH, SHOWING THE SAND LIME BRICK CURTAIN WALLS. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

diameter and approximately 23 feet in height to the monitor. These were poured in one operation from the top,

tent experimental, but it was found upon removal of the forms, that the concrete work at the base of the columns was perfect in every instance. While it is not considered



PLANT OF WOOD PRODUCTS COMPANY—ROOF OF CHARCOAL HOUSE, WITH REINFORCEMENT READY FOR THE POURING OF THE CONCRETE. ALL ROOFS ARE FIGURED FOR 125 LBS. LIVE AND DEAD LOAD. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.



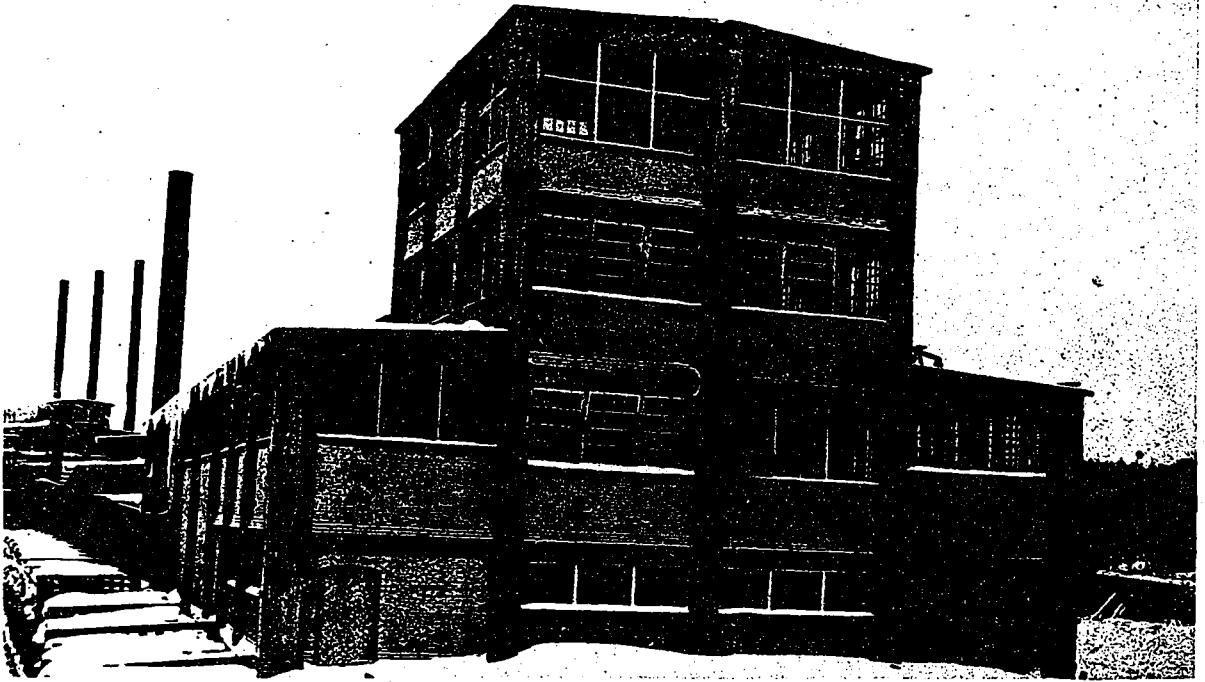
PLANT OF WOOD PRODUCTS COMPANY—INTERIOR VIEW OF CHARCOAL HOUSE IN FINISHED CONDITION. NOTE THE MONITOR ROOF RAISED ON THE INNER THIRD POINTS OF THE MAIN GIRDERS. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

a specially graded concrete which would enable the base of the column to be poured without separation of the aggregates being used. This work was to a certain ex-

good practice to pour concrete columns at a greater height than twelve to fourteen feet, the exigencies of construc-



PLANT OF WOOD PRODUCTS COMPANY—FORM WORK PARTIALLY ERECTED AND COMPLETED FOR THE FIRST TOWER OF THE CHARCOAL HOUSE. THIS FORM WORK WAS PRACTICALLY ERECTED COMPLETE IN A DAY AND A HALF. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.



PLANT OF WOOD PRODUCTS COMPANY—END VIEW OF STILL HOUSE COMPLETED. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

tion in this instance made it inadvisable to attempt to pour these columns in separate runs.

Another roof system having a considerable span has been developed in the main portion of this building. This



PLANT OF WOOD PRODUCTS COMPANY—FIRST STORY AND ROOF FORM WORK FOR THE STILL HOUSE. IT IS WORTHY OF NOTE THAT THE LUMBER FOR THE FORM WORK WAS USED ONLY ONCE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

is carried on girders of approximately 32 feet span with secondary beams connecting therewith, running longitudinally with the building.

The stairways throughout the whole plant are constructed entirely of reinforced concrete with unsupported landings, and the windows in all the buildings are of a special type of rebatted factory windows, all pivot hung and made with heavy muntings for the sash through-out.

The water tower is a structural undertaking in connection with this plant that is particularly noteworthy, in that it not only furnishes several unique features in detail, but is the first reinforced concrete water tank resting on a high tower of openwork construction which has been built in Canada.

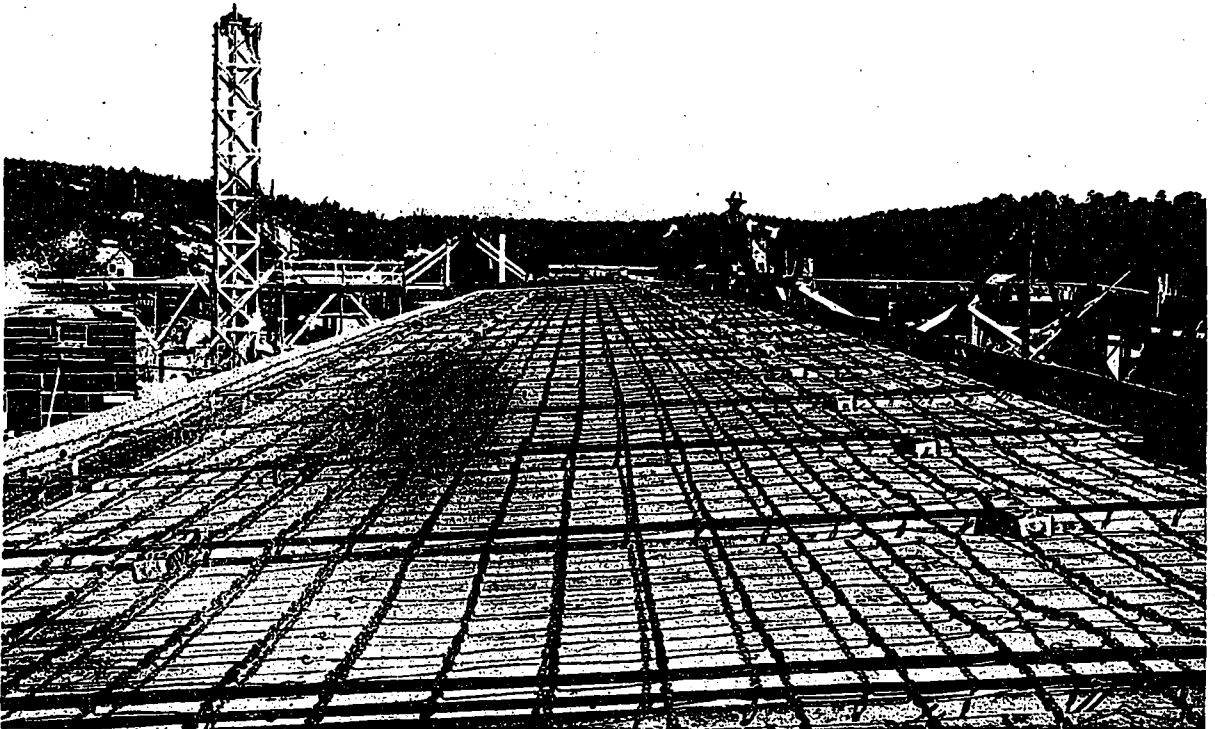
In developing the plans of this structure it was early decided upon that the use would be made of the full dia-

meter of the tank in placing columns, so as to carry the weight of the tank to the best possible advantage. It was considered inadvisable to use a spread footing for the piers in the sense that the columns would then stand on a batter. It was found very satisfactory, in working out the design, to use a buttress type of exterior columns and later, during the process of construction, the square central hollow column was changed to four 16-inch columns standing at the corners of the box column shown in the drawings. These central columns will eventually be bricked in between with a hollow brick wall to furnish a frost-proof box for the water pipe.

The capacity of the tank is fifty thousand gallons, and the tank stands from grade line to top of roof 93

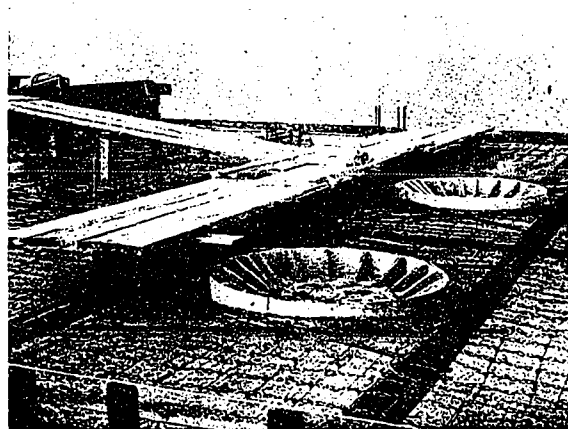


PLANT OF WOOD PRODUCTS COMPANY—VIEW SHOWING STEEL CHAIN FABRIC ON THE TANK FLOOR OF STILL HOUSE, USED IN CONNECTION WITH THE NIAGARA BAR FOR BEAMS. THIS FLOOR WAS FIGURED FOR 400 LBS. UNIFORM LIVE LOAD; IT IS NOW LOADED TO OVER 50 TONS CONCENTRATED LOAD, AND THERE IS NO APPARENT DEFLECTION AND IT IS IN PERFECT CONDITION. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.



PLANT OF WOOD PRODUCTS COMPANY—VIEW OF LOWER FLOOR OF STILL HOUSE—17 FEET WIDE AND 128 FEET LONG. ATTENTION IS CALLED TO THE USE OF CONCRETE BLOCKS FOR HOLDING THE CHAIN FABRIC AND REINFORCING BARS IN SUITABLE POSITION TO RECEIVE THE CONCRETE. THESE BLOCKS HAVE A DOVE-TAILED SECTION ENABLING THE CONCRETE, AS POURED, TO HOLD THEM SECURELY IN PLACE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

feet in height. During the process of construction, use was made of the space between the four central columns above mentioned for the purpose of hoisting concrete to

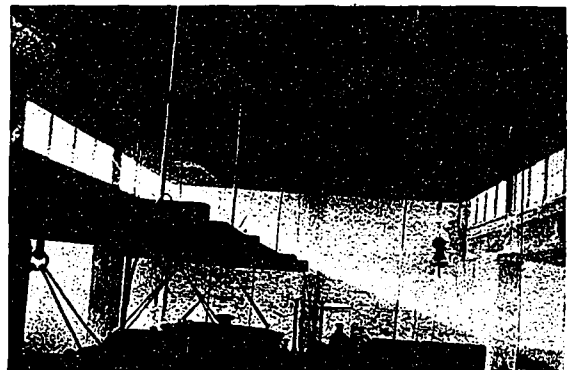


PLANT OF WOOD PRODUCTS COMPANY—VIEW SHOWING STEEL CHAIN FABRIC ON THIRD STORY OF STILL HOUSE AND THE FORM WORK FOR OPENINGS LEFT IN THE FLOOR FOR THE REFINING APPARATUS. NOTE THE MANNER IN WHICH THE REINFORCEMENT IS CARRIED AROUND THE OPENINGS. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

the upper levels. This hoisting was done in connection with a small belt driven hoist attached to the planing mill shafting (forming a part of the construction equipment), which stood immediately adjacent to the water tower, and proved very satisfactory in speed and operation throughout all conditions of weather. The hoisting arrangement was handled by a tripod with 14-inch boom block in the peak of the tripod, this being carried up from

floor to floor as the work progressed until finally the entire framework of the tank, including the roof was set in place, and the tripod set on top of the form work. This necessitated leaving a 3-foot square opening at the centre of the roof through which to handle the concrete. The bucket holding the concrete was dumped at the peak of the roof and flowed down the slope, dropped into the side walls of the forms with great ease and in a very satisfactory condition.

It may be interesting to note that the temperature, during the process of pouring the tank, dropped in one instance to nine degrees above zero. During part of the time it was, of course, found desirable to heat the materials to some extent. In no case, however, did the

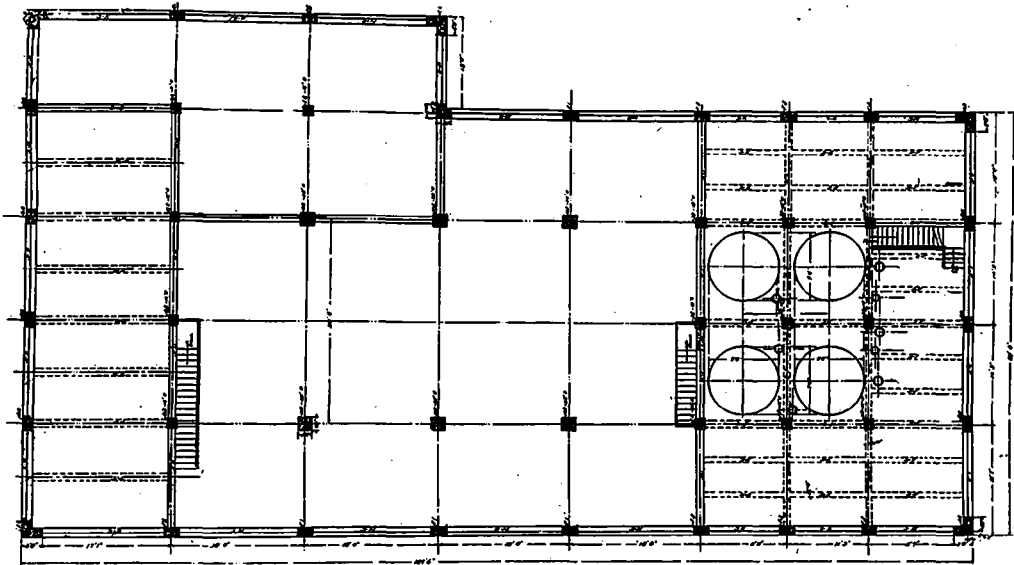


PLANT OF WOOD PRODUCTS COMPANY—THIS VIEW SHOWS THE WIDE SPAN ROOF CONSTRUCTION OF THE MAIN DISTILLERY ROOM OF THE STILL HOUSE. THE SPAN HERE SHOWN IS 32 FEET IN THE CLEAR FOR THE GIRDERS, WITH 18-FOOT LONGITUDINAL SPAN FOR THE BEAMS. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

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

concrete come through to the concrete buckets of a sufficiently high temperature to evidence any injury. As shown by the details of steel in the water tank, twisted steel bars were used almost exclusively in connection

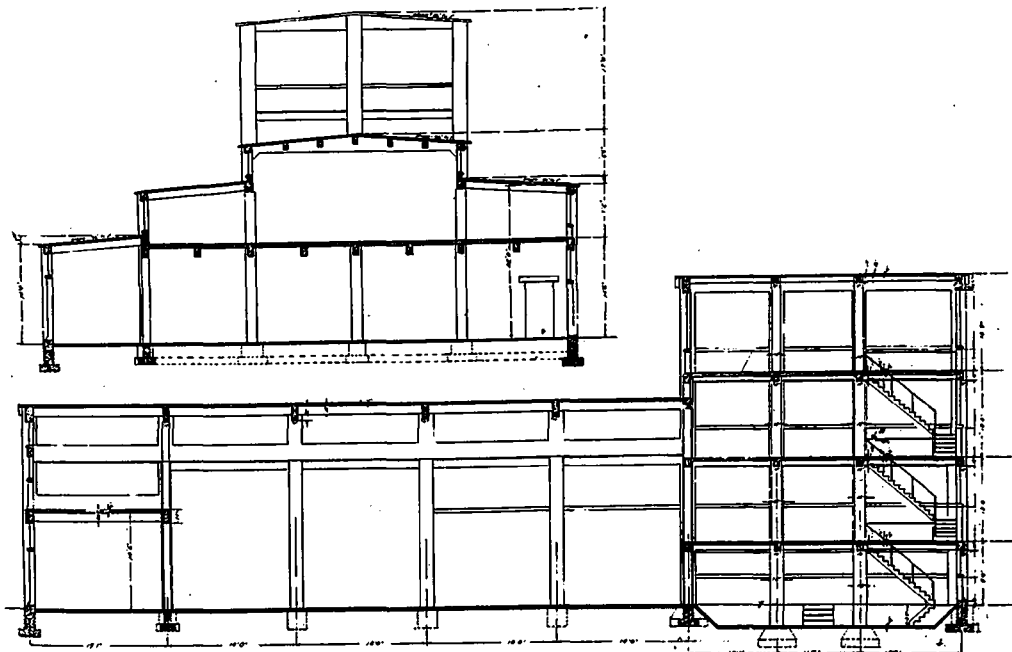
Careful consideration was given to the amount of flood water annually sent down through the valley of the Burnt River, and in figuring the dam for the flood rather over one foot in height throughout the entire length, it was



PLANT AND WOOD PRODUCTS COMPANY—FIRST STORY PLAN OF STILL HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

therewith. No modifications were made of this detail, except that instead of two lines of twisted steel shown in the lower portion of the tank, these two lines were merged into one line resting more nearly at the centre line of the tank walls. The walls of the tank are 12 inches thick, which will, perhaps, be considered by some to be unnecessarily thick, but this was decided upon as enabling a more complete prevention against leakage, the same thickness being also adopted for the floor of the tank.

decided that the dam would be amply safe under these conditions. One peculiar feature was encountered, however, in the construction of the dam, in that the bed rock that it was intended to rest upon sloped off so deeply at the north end so as to be approximately 24 feet below the normal head of the dam. It had been the intention to carry a concrete cut-off wall entirely to bed rock, but at a level of approximately 16 feet below the normal heel, a bed of very fine compact sand was encountered into which sheet piling was driven several feet.



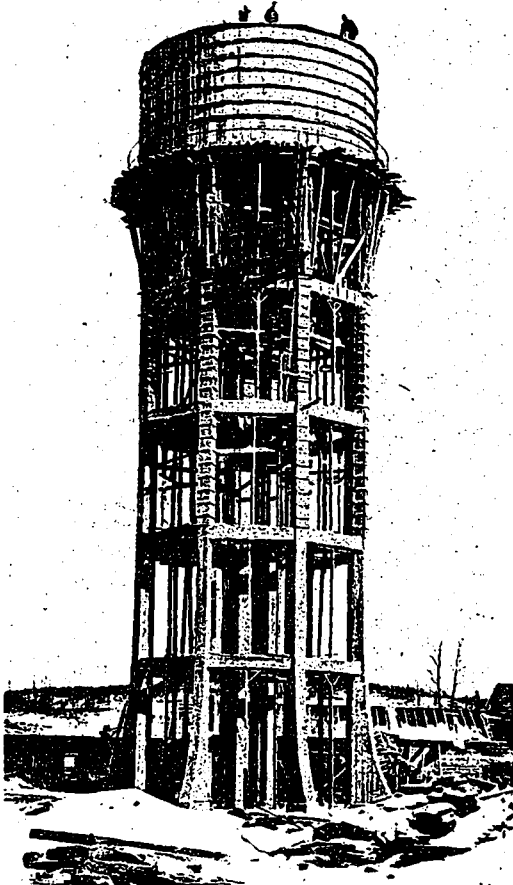
PLANT OF WOOD PRODUCTS COMPANY—LONGITUDINAL AND TRANSVERSE SECTION OF STILL HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER

The final feature of the construction work is a small concrete dam 214 feet long, exclusive of the wing walls, for carrying a normal head of about 9 feet of water.

This was decided upon as making an amply firm bed for holding the dam, in consideration of its comparatively small normal head. Therefore, a 2 1-2—4-foot cut-off

wall was founded upon this as a continuation of a cut-off wall extending to rock throughout the greater portion of the dam. At the normal spillway the entire structure is founded on rock. Suitable reinforcement of twisted bars

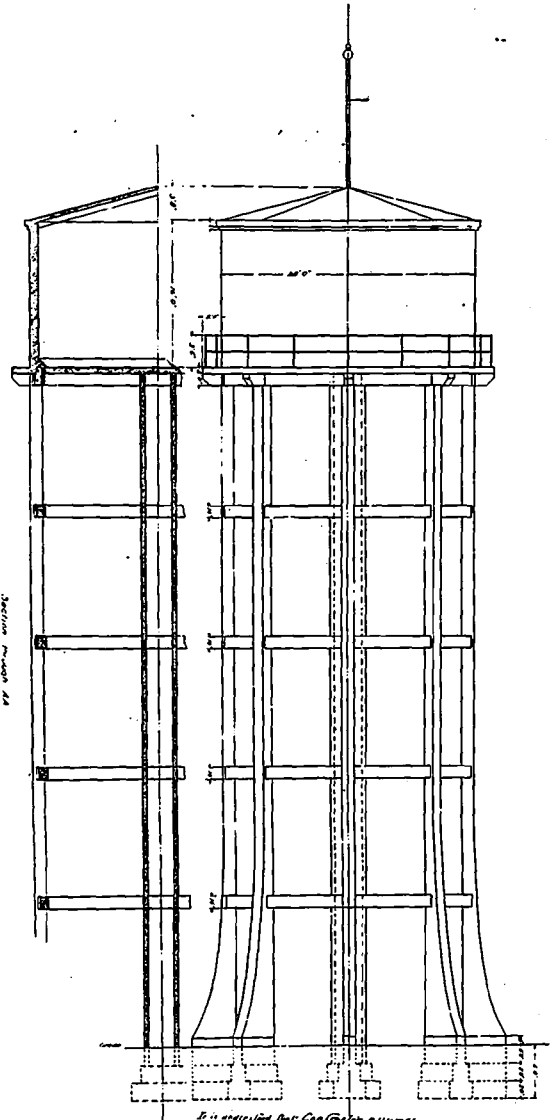
the barest limits, and still give good and sufficient service, the chain being handled with an ease and rapidity which has proven remarkable. Of course, in this first work, special pains were taken to make everything as perfect as possible in connection with the work, yet we found on comparatively difficult roof work, where the space covered was not large, that the cost of applying, in comparison with other forms of reinforcement, proved to be remarkably small. Steel chain fabric was decided upon as to its use in competition with a bar form of roof made up of the Niagara bars. It was found by the use of the chain fabric that approximately 1-3 of the concrete could be eliminated in connection with the roofs, this being an item of considerable value in connection with placing concrete at the points required above the ground. Four-inch roof slabs were used throughout with intermediate beams, whereas, if a bar system of reinforcement had been used, it would have been necessary to



PLANT OF WOOD PRODUCTS COMPANY—VIEW SHOWING THE WATER TOWER PRACTICALLY COMPLETE AND TANK READY TO POUR. THIS IS THE ONLY CONCRETE TANK RESTING UPON AN OPENWORK CONCRETE TOWER, THAT HAS BEEN ERECTED IN CANADA. IT IS INTERESTING TO NOTE THAT THE WATER TANK WAS POURED WITH THE TEMPERATURE AT ONE TIME NINE DEGREES BELOW ZERO, AND INVESTIGATION SINCE THE TANK WAS COMPLETED, SHOWS THAT THE CONCRETE IS IN FIRST-CLASS CONDITION. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

was incorporated into the body of the dam to prevent the possibility of structural cracks. This has been found to be ample for the purpose required, as no structural cracks have occurred at the point where the dam leaves the rock and is resting upon the sand foundation. Indications point to the fact that the condition of the work is thoroughly safe for all requirements. The storage pond formed by the dam is approximately one and one-half miles long, with an average width of about 400 feet.

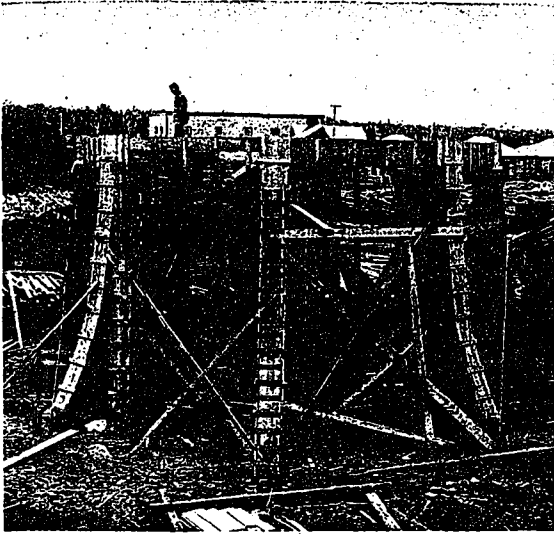
Finally, we wish to give the results of our experience in using Community steel chain fabric, this being the first job of any extent upon which this style of reinforcement has been used. We have found after the initial work was done upon this job that the force of men employed in laying the steel chain could be reduced to



PLANT OF WOOD PRODUCTS COMPANY—ELEVATION AND TRANSVERSE SECTION OF WATER TOWER. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

have used a six-inch slab in the main. One remarkable feature in connection with the use of the chain fabric has been that by the very nature of its construction the steel chain is automatically held above the point of con-

tact with the roof forms, and no evidence is given of any of the chain showing when the forms have been removed, therefore indicating that the fireproofing feature of the automatic spreaders has been very carefully considered



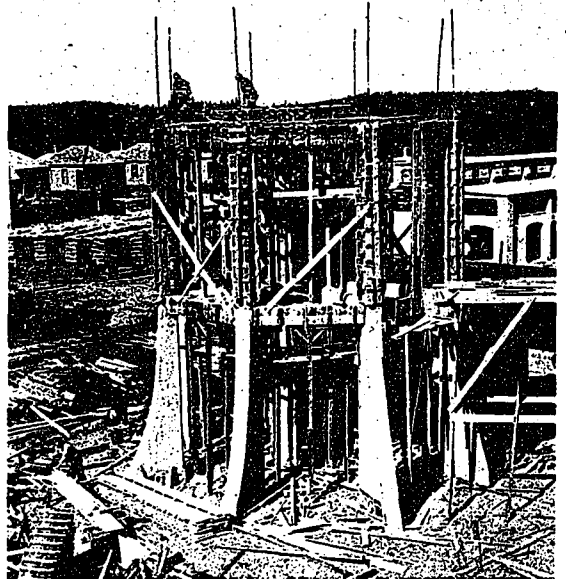
PLANT OF WOOD PRODUCTS COMPANY—SHOWING FIRST FORM WORK FOR THE REINFORCED CONCRETE WATER TOWER READY FOR POURING. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

and has worked out with entire success. In connection with the use of the Niagara bar, plain square and flat steel negative reinforcement was used throughout the job. It was found very satisfactory to use this plain steel reinforcement without additional shear members, owing to the fact that the steel chain fabric furnished such a high mechanical bond in connection with the slab, that the use of shear members in the negative reinforcement was not considered necessary. One or two interesting points in connection with the long spans have proven quite satisfactory, that is, that for compression reinforcement in the longest span used, a 52-foot span beam over the top of the boilers in the boiler house, we used twisted steel with excellent success. The Niagara bar in this particular beam was of the following form—3-4 x3 inches, 54 feet long, five bars with shear members 30 inches long spaced 3 inches on centres for the outer quarters of the beams and 6 inches on centres up to a space about 4 feet wide at the centre of the beam. In this connection, the compression resisting bars of twisted

owing to the fact that the beam itself is somewhat lacking in depth. It would have been preferable to have used 52 inches as the minimum depth of this beam, but the considerations of construction limited it to 42 inches

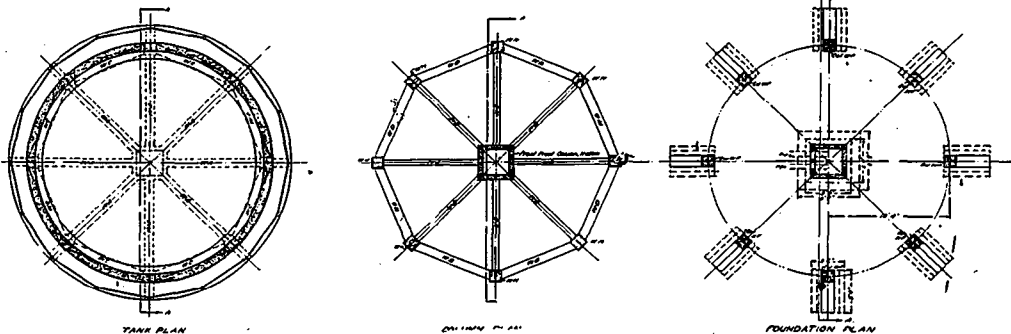
The cement used upon the work was of two brands—Monarch Cement, made by the Lakefield Portland Cement Company, and Star Brand Cement, manufactured by Canadian Portland Cement Company. Both of these brands proved exceedingly satisfactory in their general working qualities.

In connection with the form work for the entire job, but very little other timber than hemlock was used. For some of the heavier first-storey columns 2-inch hemlock surfaced one side with undressed joints, just as it came from the saw, were found exceedingly satisfactory. For the floor forms and similar beam work, 1-inch hemlock dressed one side was used. The strut work throughout



PLANT OF WOODS PRODUCTS COMPANY—WATER TOWER WITH FIRST SECTION COMPLETED, AND FORM WORK OF SECOND SECTION READY TO POUR. THE TWISTED STEEL DOWELL BARS, AS WILL BE SEEN, ARE IN PLACE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

the entire job was 4 x 4 hemlock and spruce. For the finer form work, such as cornices, etc., some pine was



PLANT OF WOOD PRODUCTS COMPANY—FOUNDATION, COLUMN AND TANK PLANS OF WATER TOWER. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

steel were carried down into the body of the beam for additional shear resistance, not that it was considered absolutely essential, but that it was considered advisable

used, but the writer has found in his construction work that very little form work is of any value for second use, and it is much better, taken all in all, to calculate on us



PLANT OF WOODS PRODUCTS COMPANY—DAM IN PROCESS OF CONSTRUCTION, SHOWING THE EXCAVATION INTO THE SAND FOUNDATION AT NEARLY ITS LOWEST POINT. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

ing inch stuff throughout the work, with no provision made for using any more of this the second or third time than is absolutely necessary. Only in rare instances does form work come through the stripping process of sufficient value to be of further use.

PLANT REQUIRED FOR CONSTRUCTION.

The main feature of the construction plant was a No. 2 1-2 Smith mixer with Ransome hoist bucket and tower complete. In connection with the hoisting apparatus, a 5 x 7 single drum hoisting engine was used. Steam was furnished for the entire job by a 65 h.-p. locomotive type boiler. One Deane pump, 7-6-4-5, furnished water for the mixer. This, with a small Worthington pump at the site of the dam, was found amply capable of doing everything required in connection with water furnishing, and also unwatering at the site of the dam.

It was found necessary to install a fairly complete wood-working plant for the manufacture of the dressed lumber, and for making up the forms. At the point where the work was located it was practically impossible to ob-

tain anything but undressed stock at advantageous figures, and therefore the planing mill proved of great service in connection with this work. The mill comprised a 25 h.-p. horizontal engine, pony planer, rip-saw, band-saw, swing-saw, sticking machine and emery wheel.

During the process of excavating at the heel of the dam for a concrete cut-off, it was found necessary to install a Pulsometer pump for handling the final unwatering at the greatest depth in excavation reached. The various runways leading from the hoist tower to the separate buildings were found much more advantageous than to have had a smaller concrete unit which could have been moved from place to place—the central unit necessitating only central stock piles for sand and stone, and, of course, also being closely adjacent to the cement storage house, as will be seen by the general plan, the lay-out of the buildings and the plant for handling material in connection therewith; this central location served well for everything except the work of erecting the water tower.

The chemical engineer under whose direction the entire works were constructed, is Mr. William H. Oliver, of Toronto, and his assistant on construction was Mr. J.



PLANT OF WOOD PRODUCTS COMPANY—VIEW OF COMPLETED DAM FOR STORAGE PURPOSES—214 FEET LONG OVER A NORMAL HEAD OF 9 FEET. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

E. Wilson, C.E., a graduate of the School of Practical Science, Toronto.

The rolling steel shutters closing off the wood storage room from the boiler room were supplied and installed by A. B. Ormsby, Limited, of Toronto.

“BURNT MONEY.”—A Sensational Indictment of American Extravagance. --- Building Reform Necessary.

IN VIEW of the great fire losses sustained in this country, even within the past year, those in Canada who are concerned with the conservation of our substantial building growth and the elimination of all unsafe and dangerous methods of construction, will find of absorbing interest an article, under the title of “Burnt Money,” appearing in the January issue of Everybody’s Magazine.

While the article in question relates solely to conditions as found in the United States, the writer has inadvertently pointed out a state of affairs which is all too



PLANT OF WOOD PRODUCTS COMPANY—VIEW OF DAM IN PROCESS OF CONSTRUCTION, SHOWING WASTE-WAY FOR THE NORMAL FALL OF THE BURNT RIVER, IN THE RECENT DRY SEASON. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

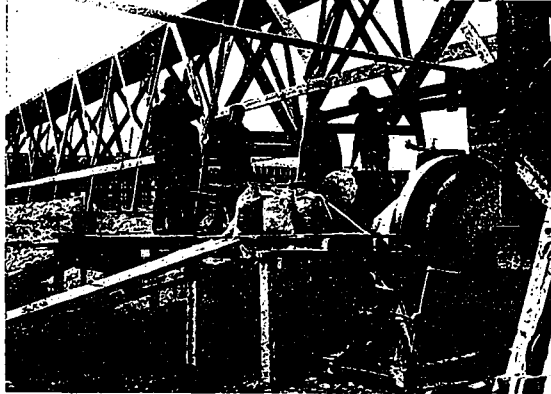
evident in many parts of the Dominion, and which, if we are to profit from the experiences of our neighbors to the south, calls for a number of urgent and necessary reforms in the building codes of many of our municipalities.

Some years ago it was realized that the generally shoddy construction of our buildings made great conflagrations in our cities not only possible but certain and a fire-prevention movement was set afoot. Mr. F. W. Fitzpatrick, of Washington, started it. He had studied the situation, and, being one of the foremost architects and authorities upon construction in the country, was eminently qualified to advise how to go about the work. He organized the Building Inspectors and other societies, whose main purpose is to secure better buildings in our cities; he induced municipalities to revise their building codes; the insurance companies helped and the architects have helped. Mr. Fitzpatrick has put the matter plainly before the people and has written much upon the subject.

Articles by him have appeared in McClure's and other periodicals and newspapers and now Mr. Samuel Hopkins Adams, one of the original muckrakers, and who has been instrumental in securing many needed reforms in many directions, has assisted Mr. Fitzpatrick by writing this splendid article for Everybody's.

The Editor of Everybody's prefaces the article by saying: "This is a record of shame. A sensational in-

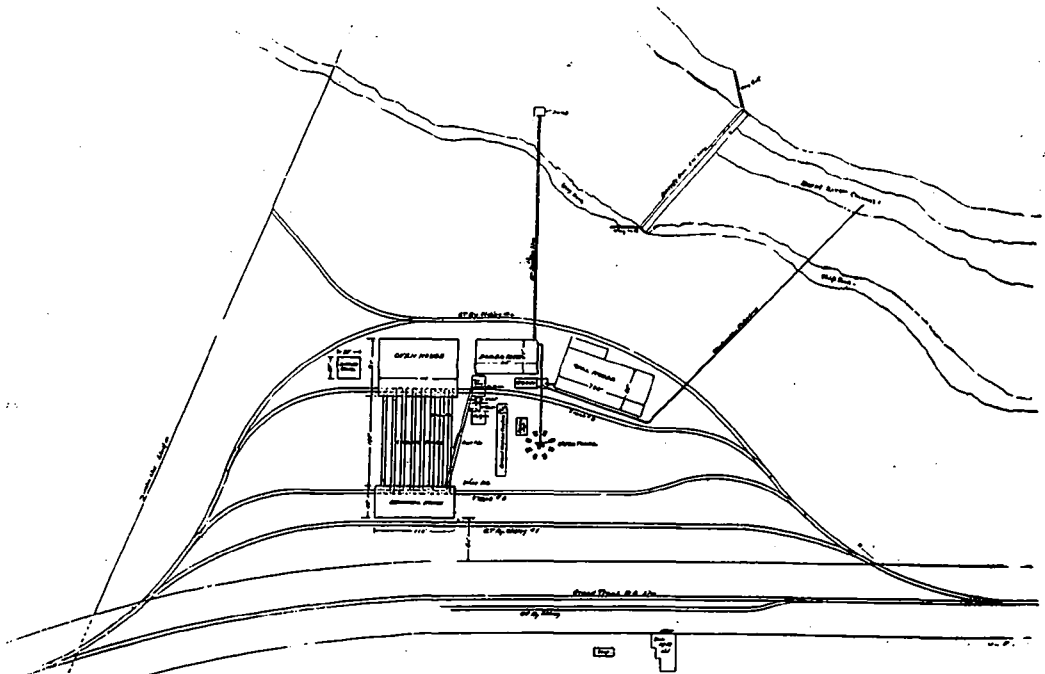
you. Not satisfied with slaughtering our forests, we are burning up our homes at a killing pace every year. We are pervaded with pride over our superiority to the rest of the world, while actually our fires cost us more than the combined loss of any other six civilized nations. Here are the figures straight in your faces. You can change the record. Mr. Adams shows how. Remember, we cannot as a nation waste our substance and prosper."



PLANT OF WOOD PRODUCTS COMPANY—SHOWING THE NO. 21-2 SMITH MIXER THAT WAS USED ON THE JOB, ALSO THE 125-FOOT RUNWAY FROM HOIST PLATFORM TO CHARCOAL HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

A MODEL coal handling plant has recently been completed on Gaspé street, near Laurier avenue, Montreal, for the Harte & Adair Coal Company. It has a capacity for 6,000 tons, and in construction is reinforced concrete throughout. The coal is all stored overhead, 15 feet from the ground, in a large circular-shaped structure, supported by massive concrete piers which are set 18 feet apart, thus allowing clear driveways in every direction for carts and coal wagons. The walls, which are 6 inches at the base and 4 inches at the top, are held by buttresses 30 inches thick, placed nine feet apart. One hundred and sixty-two miles

of steel rods were used in reinforcing, and the floor, which is only 5 inches in thickness, is doubly reinforced. The incoming coal is dumped from the cars into a hopper which feeds a continuous pocket elevator having a capacity of 60 tons an hour. Two men are all that is re-



PLANT OF WOOD PRODUCTS COMPANY—PLAN OF ENTIRE PLANT, SHOWING LOCATION OF DAM, WATER TOWER, TRACKS, STILL HOUSE, OVEN AND BOILER HOUSES, AND CHARCOAL HOUSE. E. D. PITT, DESIGNING AND CONSTRUCTING ENGINEER.

dictment of American extravagance. We know that our national fire bill was startling, but the facts and figures that Mr. Adams presents here shocked us. They'll shock

quired to handle 600 tons per day of 10 hours; an electrician who runs the machinery, and a man to open the car hoppers.

NEW PAROCHIAL SCHOOL, BELLEVILLE, ONT.---Erected for St. Michael's Parish,---Entrance Tower of Ecclesiastical Design.---Plan Compact and Entrances Well Placed.---Provides for Eight Class Rooms.---Lighting, Heating and Ventilation Thoroughly Considered.

AMONG the large number of school buildings which have of late been erected in Canada, one that combines design, construction and equipment—as regards heating, lighting and ventilation—in a noteworthy manner, is the parochial school built at Belleville, Ont., for St. Michael's Parish.

The general plan of the building is a most compact and satisfactory arrangement of an eight-roomed school for the use of both sexes. It is economical in construction and is very successful from the point of view of controlling the pupils while in the corridors and halls.

Every effort has been made to utilize to the best possible advantage every foot of floor space and to have all class rooms and halls bright and thoroughly heated and ventilated.

The class rooms on first floor are 32 feet 3 inches by 26 feet 3 inches, and have a clear height of 14 feet, with windows kept within 6 feet of the ceiling so that the light will be thrown down as much as possible from above. These windows are arranged for left hand lighting only. The class rooms will accommodate conveniently fifty pupils for the higher grades and fifty-six in the lower grades. Slate blackboards are placed at the front walls of each class room and composition blackboards on the rear and sides opposite windows.

There is a double cloak room 7 feet by 26 feet off of each class room, with a low screen partition across the centre and two entrance doors, the boys and girls being kept at opposite ends. These cloak rooms are arranged with seats and subdivisions and provided with hooks for pupils' clothes. The entrance doors to each class room are double hinged swing doors, in two leaves with floor door stops.

The kindergarten is somewhat larger than the other class rooms, being 38 feet 3 inches by 26 feet 3 inches, and has a large fireplace at one end with two additional windows. Connected with this kindergarten is a specially large cloak room so that the teachers may assist the small children with their wraps. Off this cloak room is a lavatory for the use of this kindergarten only.

Through the centre of the building runs the main corridor twelve feet wide with exits at either ends and staircases running from basement to second floor, each flight being six feet wide. The main entrance under the front tower leads into a small entrance hall which is used by the principal as an office if necessary, and which in case of emergency can also be used as an additional exit.

The arrangement of the second floor is similar to the first except that a class room is placed over the kindergarten. These class rooms are of similar shape and size to the ones below.

A room for the use of the teachers with a private lavatory is placed in the centre of the building in rear of the corridor, and a recitation-room is placed in front of the corridor over the entrance hall and vestibule.

As has already been mentioned, the staircases are six feet wide, and have landings midway between the floors of a similar width. Instead of balustrades, double sheeting is carried to the height of five feet on the open side of staircase, and is capped with a heavy rail, heavy hand rail of iron being run at a convenient height from the steps. On each landing large windows are placed practically the same width as corridors. The sills are kept high up, from floor, and the sashes are glazed with prismatic glass, which not only diffuses the light through the corridors but prevents the children from loitering on the landings to

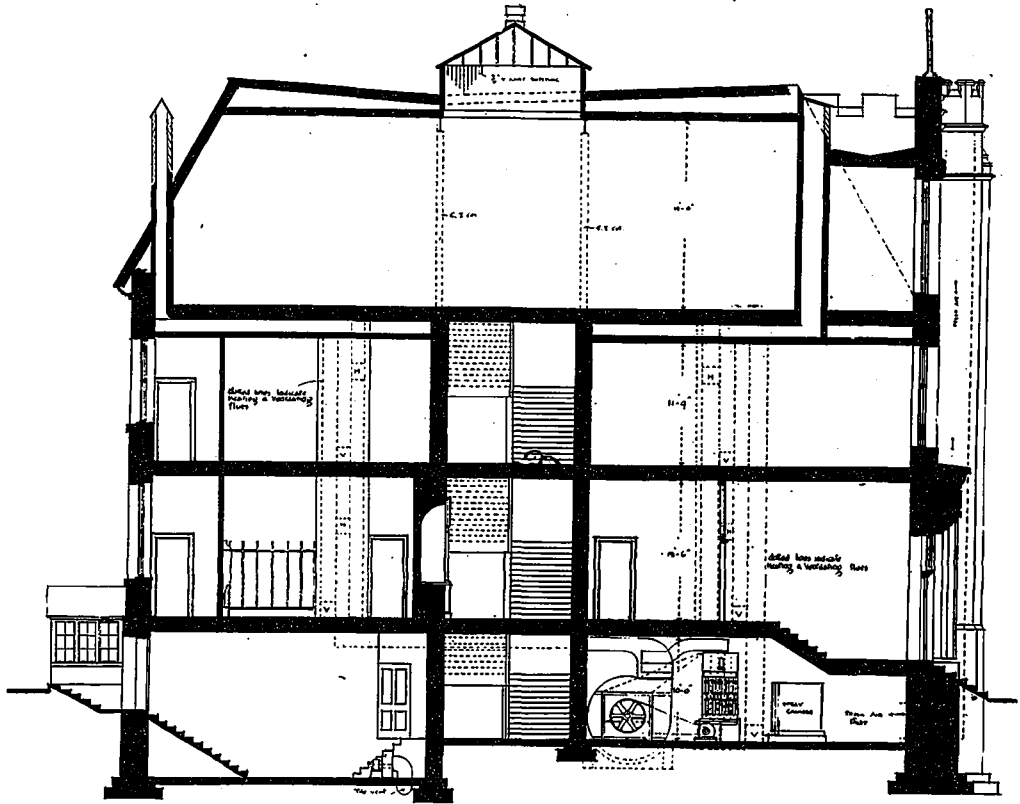


FRONT ELEVATION, ST. MICHAEL'S PARISH SCHOOL, BELLEVILLE, ONT., SHOWING DETAIL OF CENTRAL TOWER, MAIN ENTRANCE AND WINDOWS. MR. C. P. MEREDITH, ARCHITECT.

look out of the windows. A burlap dado is carried about all class-rooms and halls.

The top or third floor is used as an assembly hall, one stair leading to the hall and the opposite stair lead-

beams in thickness of the floors. The floors are of hardwood and deadened, and the ceilings are covered with metal. The heating, which is of steam, is both by the direct and indirect systems, and is controlled by the



SECTIONAL END ELEVATION, ST. MICHAEL'S PARISH SCHOOL, BELLEVILLE, ONT., SHOWING LOCATION OF FAN-ROOM AND HEATING AND VENTILATING FLUES. MR. C. P. MEREDITH, ARCHITECT.

ing to the stage and dressing rooms, etc. This second stair can also be used in case of emergency. The assembly hall, which is sixteen feet high, has, in addition to side windows, a large ceiling skylight.

The arrangement of the basement is such that, after the pupils leave the first floor and are therefore not under the eye of their teachers, the boys and girls are entirely separated. Play-rooms of 40 feet x 26 feet are situated at opposite ends of the building at the foot of staircase, and the lavatories, which are 14 feet 8 inches by 26 feet, are placed back to back, with a double partition wall between, this space being used for the plumbing and ventilating pipes. The boiler is placed in rear in centre with fan-room immediately opposite in front.

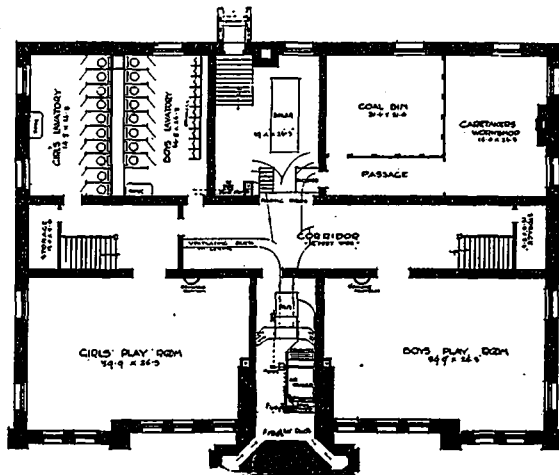
The construction of the building, unfortunately, is not fireproof, but as the class-rooms are only on the first and second floors there is little or no danger from fire with staircases and exits arranged as they are.

The exterior walls of the building and corridor walls are of solid masonry, and the joists are carried on steel

Johnston system of automatic temperature regulation throughout. The large boiler is kept about four feet below basement floor.

The Buffalo forge system of ventilation is used; the fresh air being brought in through two large flues from

above the roof to the fan-room, where it passes through the temporary coil air washer and reheater and into the large fan, 71 inches in diameter, by which it is forced through the various ducts into the class-rooms and halls. This system will deliver 16,600 cubic feet of air per minute and will raise it from 20 degrees below zero and deliver it to 78 degrees. The exhaust air is carried off from each cloak-room and hall out through the roof. No fresh air is sent direct into the cloak-room but into class-rooms, and the exhausts are carried out from class-rooms through open parcels to the cloak-rooms, so that there is no danger of foul air passing from cloak-room to class-room.



BASEMENT FLOOR PLAN, ST. MICHAEL'S PARISH SCHOOL, BELLEVILLE, ONT., SHOWING THE LOCATION OF RECREATION ROOMS, BOILER ROOM AND FAN ROOM. MR. C. P. MEREDITH, ARCHITECT.

A small one-horse-power motor is used for exhausting the air from the lavatories and carrying it through separate duct to the open air.

Care has been taken in selecting the plumbing fixtures so that the lavatories may be kept as sanitary as possible. Drinking fountains are placed in play-rooms and corridors, and basins in class-rooms.

The various halls and class-rooms are connected with the principal's room by a fire alarm system. There is also

watchfulness. It would not be anything of a hardship either, if our cities would be sensible enough to legislate that nothing but thoroughly fireproof buildings should be erected hereafter.

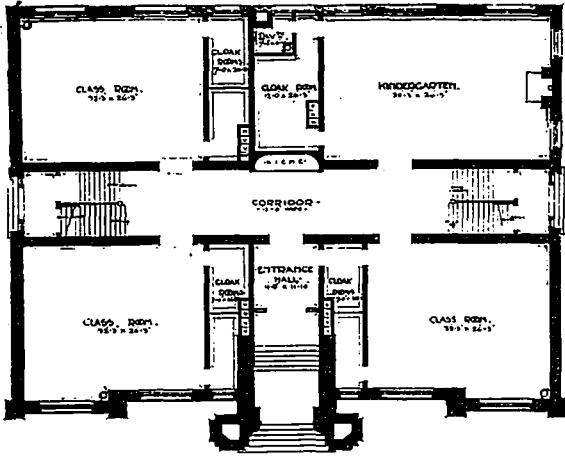
A BIT OF ANCIENT HISTORY.---Nero's Reason for Burning Rome.

THE CONFLICT that is being waged in the United States between the cement and clay journals, in their effort to discredit the materials of the interests which each other represents, has not been without its humorous side. Under the heading of Newly Discovered Facts in Ancient History, CEMENT AGE, in a recent issue prints the following:

"We find among the publicity items sent out by the interest opposed to concrete the following interesting and instructive paragraph":

The records show that in old Rome, when they used concrete construction in their larger buildings, a protest was made to Nero by the conservative element in his entourage against the use of that material because its accidents and collapses caused so many deaths among the slaves who worked upon those buildings that it was feared those workmen would mutiny.

"The savant who dug this bit of information from the archives of the past is entitled to the distinction of having suggested the solution of what has long been a problem to historians, namely, why Nero burned Rome. Had concrete, which is the best fireproof material extant, been used exclusively in Rome, it would not have occurred to Nero to attempt to destroy the city by fire. Doubtless this truculent Emperor chuckled to himself in granting the request to suspend concrete construction and then tuned up his fiddle and prepared the torch for the conflagration



GROUND FLOOR PLAN, ST. MICHAEL'S PARISH SCHOOL, BELLEVILLE, ONT., SHOWING THE ARRANGEMENT OF CLASS ROOMS AND ENTRANCES. MR. C. P. MEREDITH, ARCHITECT.

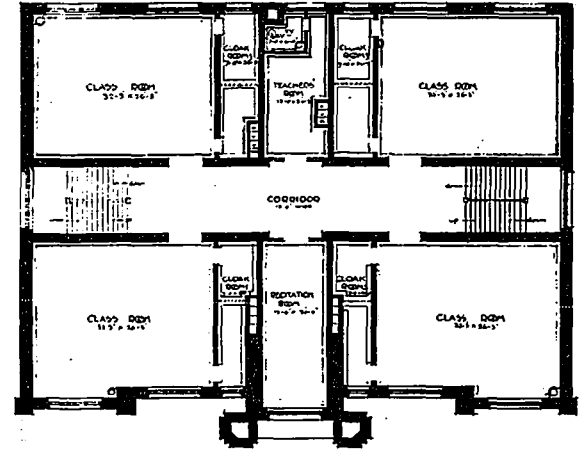
an inter-communicating telephone system between all class-rooms.

The building was designed and erected under the supervision of Architect C. P. Meredith, of Ottawa, who has had a broad experience in this class of work in Eastern Ontario, having erected a number of schools for both Public and Private School Boards.

NEARLY \$500 PER ALARM!--- Enormous Figures of One City.---Owners' Carelessness and Shoddy Construction Responsible.

A WRITER in Munsey's SCRAP BOOK states upon authority that there have been 14,597 fire alarms in the city of New York during the last twelve-month. Ten per cent. of these were false alarms. Each alarm sent in costs \$481.17, and the total cost of maintenance of the Fire Department was \$7,000,000. The alarms will average fifty a day and the average loss per fire is \$540, while the total loss to the city was \$7,250,000, and at each fire an average of 10,000 gallons of water is used. Further, it is stated that fully one-third of these fires are the result of gross carelessness.

All this gives added force to the suggestion made by the International Society of Building Inspectors that the European law of "neighborhood liability" be enacted on this continent too. That means that the person upon whose premises fire originates, a fire caused by neglect or carelessness on the owner's or the agent's part, is held liable at law for the damages done to other people's property by the spread of that fire beyond his own premises. In Europe this works to a charm in making people exceedingly careful in handling ashes, waste paper, etc., etc. Our insurance companies could also aid materially in reducing our fire waste by making their policies read that they would be liable for only 50 per cent. of the damage done by fire caused directly by carelessness and neglect. It is always easy to trace up the causes of fires and these regulations would do wonders to lessen the number. In Europe they have not one-sixth of the fire losses that we suffer and largely because of fires and these regulations would do won-



SECOND FLOOR PLAN, ST. MICHAEL'S PARISH SCHOOL, BELLEVILLE, ONT., SHOWING HOW THE SPACE BETWEEN CLASS ROOMS HAS BEEN EMPLOYED FOR TEACHERS' QUARTERS AND RECITATION ROOM. MR. C. P. MEREDITH, ARCHITECT.

that marked the climax of his brutality. Thus we have further evidence to prove that where concrete is not, fire will lay waste."

THE UNITED STATES FORESTS now cover about 550,000,000 acres, according to the Forest Service, while the original forests covered at least 850,000,000 acres. The Government owns about a quarter of the total forest area, which contains one-fifth of all timber now standing. The timber lands privately owned are generally more valuable than those of the Government, but are far less carefully managed.



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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. 2 January, 1909 No. 3

Current Topics

OTTAWA PROPOSED BUILDING BY-LAW is at the present time undergoing another series of amendments after which the measure will be finally dealt with by the Fire and Light Committee.

A STAINED GLASS WINDOW depicting scenes from the "Pilgrim's Progress," says the Illustrated Carpenter and Builder of London, is to be placed in the north aisle of Westminster Abbey as a memorial of John Bunyan. The estimated cost of the window is given as £1,200.

GLASS BRICKS ARE NOW USED in Silesia for building purposes. They are said to be of a durable nature and are made in various tints. These bricks have been used quite extensively of late in the construction of residential houses.

ACCORDING TO A STATEMENT made to the London press by a prominent railway official, Canada shows a greater railway development at the present time than any other country in the world. The advance, he said, is marked on every hand, and the amount of new construction in progress was quite unequalled.

HIS EXCELLENCY, LORD GREY, the Governor-General of Canada, has notified Mr. Alcide Chausse, secretary of the Architectural Institute of Canada, that he has the pleasure of accepting the invitation to become the patron of that organization. The moral support of so high a dignitary should not only add to the prestige of the Institute, but should exert a strong influence in the promotion of its aims for the betterment of architecture throughout the Dominion.

THE SUBLICIAN BRIDGE AT ROME, according to the State Trade Journal, Hull, Eng., is the oldest in history. It has twice been rebuilt, but is in a state of ruins at the present day.

SCOTLAND HAS THE LARGEST town clock in the world. It is located in the tower of the Glasgow University. The hammer weighs 129 pounds, the pendulum 300 pounds, and the whole clock about a ton and a half.

WORK ON A 4,000,000 BUSHEL ELEVATOR has been started at Fort William by the Grand Trunk Pacific Railroad. The structure is designed to be a model of its kind, and the machinery equipment will introduce a number of new features for the handling and storing of grain. It is to be of absolute fireproof construction and will be ready to receive grain shipments by November, 1909.

OTTAWA'S NEW MAYOR is Charles Hopewell, a builder and contractor. As his name is somewhat significant, Ottawa has every reason to be optimistic. Being well grounded in the rudiments of his regular calling, the city can expect much in the way of constructive legislation and the prompt execution of its affairs. This is not, however, Mr. Hopewell's debut in a civic capacity. He has been prominent for a number of years past in municipal affairs, and last year was a member of the Board of Control. May it be said at the end of the year that Hopewell did well.

TORONTO ELEVATOR BY-LAW providing that all elevators in buildings be licensed, went into effect January 1. The cost for each car is \$2 a year, or \$1 for the last six months. The measure provided for a more rigid inspection on the part of the city in the future than has been customary in the past, so as to bring the elevator service in all buildings up to a greater degree of safety, by precluding as far as possible the occurrence of accidents, through regular examination of all equipment. Toronto is setting a good example for other municipalities where there is an absence or lax enforcement of a similar law.

CANADIAN TRADE COMMISSIONER J. S. Larke, at Sydney, Australia, reports that the Victorian Government has under consideration a scheme involving the construction of a storage reservoir, 60 miles from Melbourne, which would impound 60,000,000 cubic feet, nearly double that conserved by the Assouan dam on the Nile. The dam would have to be 1,700 feet long and 140 feet high at the deepest part of the river it would cross. The estimated cost is £1,500,000, which is considered low for the advantages that will flow from it, as it is calculated to irrigate over 300,000 acres of land and to supply power for electrical development.

THE ENTIRE DOME of Philadelphia's great City Hall is to be covered with gold, and more than 10,000,000 sheets of gold leaf will be used before the task is completed. So that as little of the precious metal as possible shall be wasted, each workman will be enclosed in a screen adjusted about his waist as he puts the metal in place, leaf by leaf, hundreds of feet above the streets. The gold leaf to be used is being manufactured especially for the city in book form, each book containing 25 leaves, 3 3/4 inches square. These are delivered in packs of 20 books. To allow a single leaf for every 3 inches of space to be covered will necessitate the use of 20,461 packs, which makes 409,220 books, or 10,230,000 leaves.

THE MANCHESTER GUARDIAN in a recent issue speaks of the benefits that will be derived from a bill going through the British Parliament which will allow builders in Manchester to secure requisite strength in walls thinner than those they now make of brick. The object is to use re-enforced concrete, the advantages of which are now so widely recognized that other municipalities are asking Parliament to give them powers like those being sought by Manchester. Government buildings, which are exempt from local laws, have already been so constructed.

* * *

AN INNOVATION known as "a practical experience afternoon," wherein a majority of the manufacturers present recounted their experiences and discussed the many trying problems with which they have to deal, was one of the features of the annual convention of the Canadian Clay Products Manufacturers, which was held at Brantford, Ont., January 12, 13 and 14. This combined with the large attendance and the number of excellent papers and addresses delivered at the several sessions, made the convention a most successful and enjoyable affair in every respect.

* * *

THE PERSONNEL OF OFFICERS for the ensuing year as voted on by the Winnipeg Builders' Exchange at their regular annual meeting, is as follows: President, W. H. Carter; 1st vice-president, F. H. Davidson; 2nd vice-president, T. Black; secretary, A. Pearce; treasurer, T. D. Robinson. Messrs. G. W. Murray, J. Bourgeault, J. Hooper and F. Hinds were elected as directors for three years ending 1911. The vacancy caused by the resignation of Director A. T. Davidson, whose term expires this year, will be filled by Mr. J. W. Morley, the retiring president.

* * *

THE BUILDERS' EXCHANGE, MONTREAL, inaugurated the New Year by holding an "open house" to its members and friends on January 2. More than two hundred gathered to exchange fraternal greetings and to informally discuss the outlook for the year. Refreshments were served and throughout the reception a general feeling of optimism prevailed, most members believing that the coming season will be a most active one. The visitors were received by Mr. Thomas Ford, the president; Mr. J. N. Arcand, vice-president; Messrs. Alex. Bremmer, W. E. Ramsay and J. T. Castle, directors, and Mr. J. H. Lauer, secretary. Among those present were Messrs. George Hood and N. J. T. Gagnon, past presidents, and Mr. James Simpson, who was the first president of the association at its foundation.

* * *

ONE OF THE QUICKEST pieces of concrete work done in the Dominion has recently been completed in the construction of the piers for the huge Chaudiere dam across the Ottawa river. The expeditious manner in which this part of the task has been carried out, will result, it is anticipated, in the completion of the entire dam considerably ahead of the schedule time, which is set for December 1, 1909. The main portion of the dam consists of 49 piers and two abutments, all of solid concrete reinforced with a powerful network of steel rods which are bolted by 1½-inch bolts to the solid rock of the river bed. It is arranged on part of the true arc of a circle having a radius of 546 feet 9 inches, the centre of the arc being within the big kettle of the natural falls at this point. The piers are each 39 ft. 5 in. long and four feet thick up stream and two feet thick down stream. To protect them from ice in the spring each is faced on the up stream side with curved half-inch steel plate set into the cement. The preparatory work, such as the building of coffer dams, etc., was commenced August 13 last, and the first concrete was laid as late as October 1.

EXPERIMENTS WITH SULPHITE PITCH, recently made, proved it to be most successful as a dust layer for roadways. When dissolved with water to a certain consistency and sprayed over roads, it affords a dressing which is sufficient to prevent dust arising for at least six weeks. This method of dust laying, it is said, is much more preferable to the use of oil or tar, is much less expensive, has no odor, and does not destroy vegetation.

* * *

THERE HAS BEEN A GREAT INCREASE in the building operations projected at various points in the West. At Fort William there has been considerable activity, no less a sum than \$6,000,000 having been invested in improvements during the present season. Navigation is the foundation upon which the future of this city depends, and for improving the entrance into Fort William for larger vessels, half a million dollars has been spent, largely for dredging. At Westfort a large slice of territory will be added to Fort William by the construction at a cost of half a million dollars, of the Grand Trunk Pacific bridge. In the erection of new buildings half a million dollars will be spent, and for new elevators \$2,000,000. With so many improvements being added to this port, it is necessary for the civic authorities to make many improvements in the form of sewers, streets and lighting. For this purpose half a million dollars will have to be spent.

* * *

A ST. LOUIS, MISSOURI, BUILDER in order to demonstrate his contention that it is possible to make excellent use of space that has heretofore been considered of no avail in residence work, has erected a house on somewhat novel lines. The principal feature of this new house is a so-called balcony on the third floor. It might be better called a third-floor roof-garden. The third storey of the house, or rather the walls of the third storey, are built about eight feet in from the walls of the lower storey. The roof is at the same time so constructed that it reaches out beyond the outer walls, thus forming an eight-foot walk in open air, around the third storey of the house, the whole being protected from the elements by the wide spreading roof which forms a sort of cover to the walk. This walk can be entered from doors in the third storey, which open right on this open space. In the summer time it forms an ideal spot for rest and cool air, while in the winter time there is no inconvenience from the cold because the main part of the house remains as thoroughly closed as if the walls went right straight up to the roof.

* * *

SIX UNDERGROUND STOREYS are to form a part of a forty-three storey building to be erected in New York city at 50 Broadway. This undertaking will probably inaugurate a new era in business building construction, as no previous attempt has been made to carry a building to such an extreme depth. Five of the six floors will be below the water level, and with improved methods of lighting, ventilation and heating, the architect, William S. Hazlett, claims that the underground rooms will in every way be just as healthful as thousands of offices above the street level where artificial light is used during the day. The building, when completed, it is said, will be the tallest single compact building in the city. It is to be put up for the Broadway and New Street Realty Company at a cost of \$3,875,000, and will be of the best type of fireproof construction, being entirely devoid of wood. All the subterranean floor space has already been rented on a long lease, which will bring in a total rental of \$1,000,000. As it is expected that the proposed ordinance restricting the height of buildings will shortly become operative, this structure will probably be the last building of an extreme height to be erected in New York city.

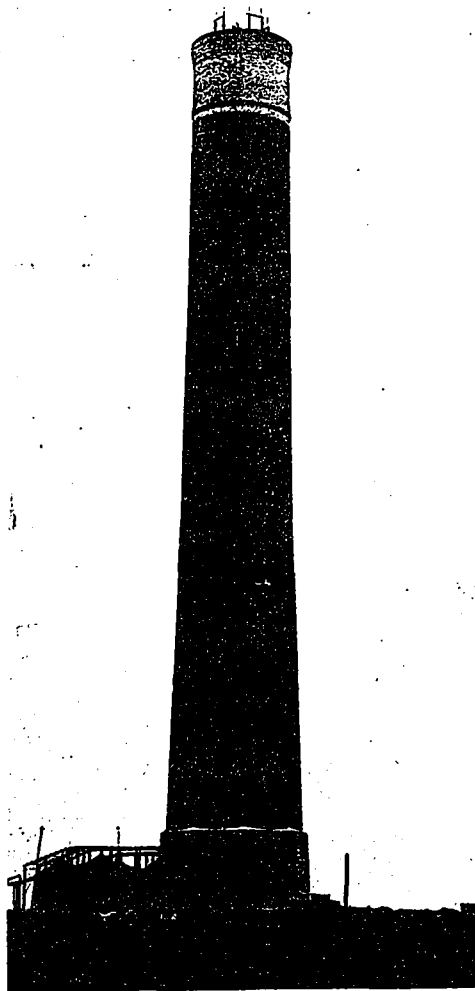
WORLD'S GREATEST CHIMNEY.---Built at Great Falls' Montana Smelting Works.---Towers 506 Feet Above Its Foundation.---Internal Diameter at Top 50 Feet.---Designed to Remove 4,000,000 Cubic Feet of Gases per Minute.---Problems Involved in its Construction.

EXTENDING to a height of 506 feet from its base, and rising 500 feet above the grade of the surrounding district, the largest and highest chimney in the world has recently been completed at the smelting works of the Boston and Montana Consolidated Copper and Silver Mining Company, at Great Falls, Montana. This gigantic stack is 140 feet higher than the greatest height that has heretofore been attained in chimney construction. It has an internal diameter at the top of fifty feet and has been designed to carry off from the copper smelter 4,000,000 cubic feet of gases per minute at an average of 600 degrees Fahr. The special character of its construction, together with the problem involved in calculating wind stresses, its ability to resist corrosion from gaseous acids, and the fact that it is built so as to carry sixty feet of additional height with but small increase in maximum pressure, renders this chimney, both in design and construction an exceedingly interesting engineering accomplishment.

The smelters are of great size and located on the north bank of the Missouri River, some three miles down stream from Great Falls, the site being a sloping area which rises gradually to a general elevation of about 250 feet above that of the furnace buildings. There are a large number of blast and reverberatory furnaces and converters, and the gases from them have been removed by a 186-foot stack on the upland at the rear of the plant, some 1,500 feet distant, to which they are conveyed through three large rectangular flues buried level with the surface of the slope. This original stack rises about 400 feet above the furnace charging floor, and, with the ordinary temperatures of flue gases and outside temperature, it has a capacity of approximately 700,000 cubic feet of gas per minute. It was built of plain brick and cement mortar and had become seriously disintegrated in recent years by the action of the acid that forms in wet weather from the sulphur dioxide in the waste gases, and furthermore both it and the connecting flues and dust chamber had become entirely inadequate for the increased requirements resulting from recent extensions of the plant. As a consequence, it was decided to provide both a much larger dust settling chamber and a large new stack on the hill, which in combination will be adequate for even further extensive additions to the smelters. The importance of the recovery of the dust is due to its metalliferous character, it being found highly profitable to reclaim and treat it for recovery of sulphur, silver and arsenic in addition to copper.

In the design of the new chimney it was decided to provide for practically double the capacity that is at present required when the plant is operated to its maximum. This maximum duty involves the handling of approximately 2,000,000 cubic feet of gases per minute, and the chimney accordingly was designed for the removal per minute of 4,000,000 cubic feet of gases at about 600 degrees Fahr. A site for it was chosen at the rear of the plant near the old chimney and a short distance further away, in order to secure a slightly higher elevation, the new site being approximately 2,000 feet from the furnace flue connection in the smelter house and having an elevation of 246 feet above the charging floor of the furnaces. The disposal of the gases high enough above the surrounding country to render them inoffensive to vegetation and animal life was, of course, a consideration in the selection of the site, but the location of the original stack upon the hill at an elevation of some 500 feet above the city of Great Falls had proved ample for this requirement, so that the height of the new stack was based rather on its draft-creating capacity than on any particular intention to avoid creating a nuisance. With this height and the gas issuing at the expected final temperature of about 600 degrees Fahr., the chimney will have an effective draft of about 3 3-4 inches, which, with its internal diameter of 50 feet, gives it a capacity sufficient for the operation of approximately 150,000 boiler horse-power, if it were to be used for power plant operation, with five pounds of coal burned per boiler horse-power.

The specifications limited the maximum bearing pressure due to both static load and the wind pressure of a 125-mile gale to 21 tons per square foot at any section, and required the construction to be capable of resisting the action of the sulphur gases. This practically limited the design to a brick chimney with an acid-proof lining, and, as it was specified further that it should be so designed that 60 feet of additional height can be added without raising the maximum bearing pressure above 22 tons per square foot, the radial brick construction with perforated blocks was selected as best adapted for securing the degree of stability required for the great height and wind load of 33 1-3 pounds per square foot of projected area. The construction of the chimney was intrusted to the Al- phons Custodis Chimney Construction Company, of New York, the contract being awarded to them on December 22, 1906. The work of construction began early in 1907, the greater part of the year being required for the construction of the foundation. 111 feet in maximum diameter and 22 1-2 feet deep, and a manufac-



GIGANTIC CHIMNEY ERECTED AT THE SMELTING WORKS OF THE BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY, GREAT FALLS, MONTANA. FROM FOUNDATION TO CAP IT IS 506 FEET HIGH.



VIEWS SHOWING FALSE WORK OF FOUNDATION AND CONSTRUCTION OF OCTAGONAL BASE OF 506-FOOT CHIMNEY, RECENTLY ERECTED AT THE SMELTING WORKS OF THE BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY, GREAT FALLS, MONTANA.

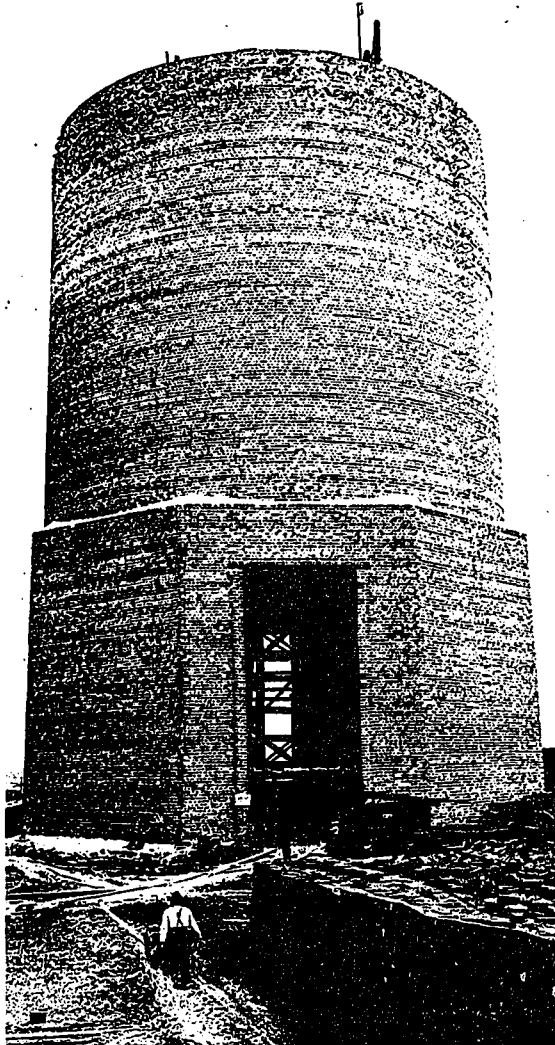
turing plant for the brick required for the stack, as it was advantageous to make the brick locally, in view of the large quantity and special forms required. The cornerstone of the stack proper was laid on April 7, 1908, and the chimney was topped out on October 23.

One of the first features on which the design of the stack was based was the foundation conditions afforded at the site. The material in the vicinity of the smelter is a hard shale to all depths to which borings have been made. While not equal to good solid rock in bearing capacity, it was considered amply strong to support the new chimney, which had been calculated to weigh between 17,000 and 18,000 tons, if the foundation were spread for sufficient footing. It was at first decided to carry the foundation mass down to a depth of about 30 feet, with the base spread for a bearing of less than five tons per square foot, the form of foundation block chosen being a pyramidal frustum, with a conical open space within, for, owing to the interior diameter of the chimney at the base being 66 1-2 feet, it was not necessary to fill in the central portion under the open flue. During the progress of the excavation, however, the shale proved to be of such a uniform character that, at a depth of about 20 feet, it was decided to test the bearing capacity of the material to ascertain whether it was necessary to carry the foundation down 30 feet. The tests were made by loading jointly four cast-iron plates, each 2 feet square, with a total of over 200,000 pounds

of steel rails, the weight of which was distributed between the four bearing plates by a cradle. Deflection indicators were arranged at each of the four corners of the cradle, and rails were added until a deflection was noted. The loading which caused deflection was 208,395 pounds, corresponding to a bearing pressure of 6 1-2 tons per square foot on the shoes, and this settlement did not increase during the period of the tests.

As a result of these determinations and of calculations subsequently made, indicating that, with the foundation terminated at about this point, the bearing pressure resulting from the total load of the chimney and foundation would not exceed 4.83 tons per square foot, the excavation was stopped at a depth of 22 1-2 feet below the surface, and the foundation mass begun with the octagonal outer edge, 103 feet across the flats, and the circular inner edge, 47 feet in diameter. The outer pyramidal faces of the foundation have a slope of about 6 1-2 to 12, and the faces of the inner portion a slope of 5 to 12, the diameter of the top face of the foundation being 64 feet for the inner circular opening and 81 feet across flats on the outside. The foundation is formed of a 1:3:5 mixture, using a good quality of crushed slag for the aggregate.

There are four flue openings, each 15 feet wide by 36 feet high inside, in four sides of the octagonal base. Owing to their width, the foundation under each of them was reinforced by seven 10-inch 25-pound I-beams,



VIEW OF CHIMNEY IN PROCESS OF ERECTION, SHOWING THE LARGE FLUE OPENINGS IN ITS BASE. THE EXTERIOR AND ACID-PROOF LINING BRICKS USED IN ITS CONSTRUCTION, WERE MADE ON THE GROUNDS BY THE CONTRACTING ENGINEER.

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

about 21 feet long, embedded about 12 inches below the surface at each point to distribute the concentrated loads occurring at either side of the opening. The volume of water liable to be caught and drained on the surfaces of a stack of this height will, especially in a driving rain, be very large. Gutters 30 inches wide and 12 inches deep were accordingly provided entirely around the top edge of the foundation mass to which the drip from the outer surfaces of the stack may drain for removal away from the base. This gutter has a slope 1-8 inch per foot toward the outlets and was formed

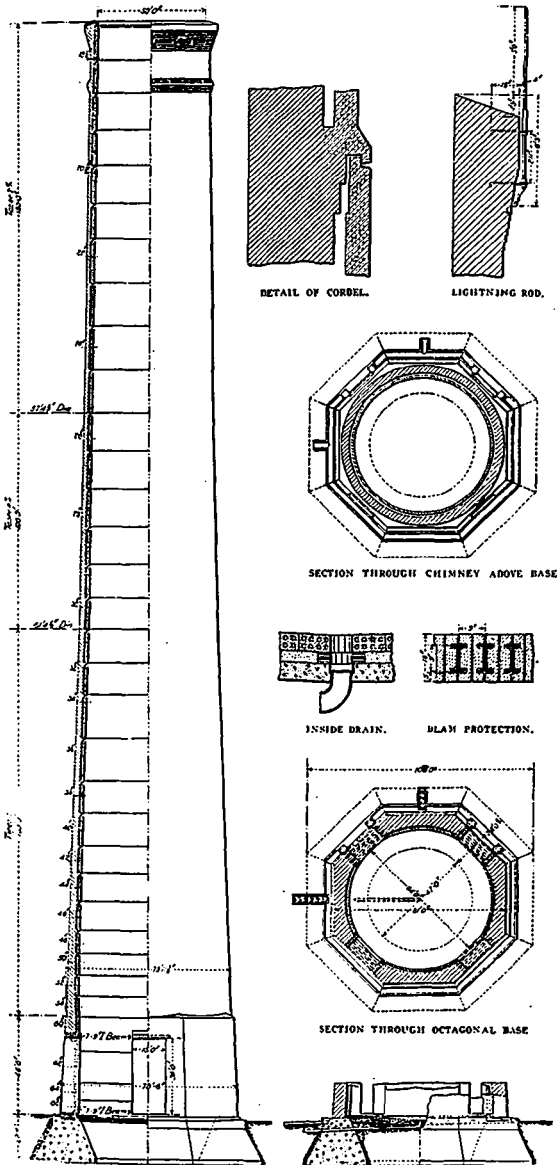
perforated brick. The drainage outlet is a 6-inch vitrified tile duct, with an elbow terminating in an 8-inch drainage opening through the pavement. The screen in the drainage opening is lead, in order to resist the attack of appreciable amounts of sulphuric acid that is formed from the waste gases with rain.

The stack proper consists of an octagonal base, 46 feet in height, which has a taper of 8 per cent., and above this a circular barrel, with three different tapers, the first 180 feet above the base having a taper of 7 per cent., the next 100 feet a taper of 4 per cent., and the remaining 180 feet to the cap a taper of 2 per cent. These variations in taper, which were adopted to obtain the desired bearing pressures, due to both weight and wind loads, give the chimney a very graceful appearance despite the large diameter.

The chimney was built in twenty-three different sections, nineteen of which are above the octagonal base, the minimum thickness of the chimney wall varying from 66 inches at the base to 18 1-8 inches at the top by uniform decrements of 2 inches per section, excepting at the section immediately above the top of the base, where the thickness decreases from 60 inches to 54 inches. The outside diameters of the stack are 78 1-2 feet at the base, 53 feet 9 inches at the base of the cap, while the inside diameters range from 66 1-2 feet at the foundation line to a clear opening of 50 feet at the top. The heights of the sections in this chimney vary widely, those of the octagonal base section varying from 7 to 16 feet, and the nineteen sections of the chimney barrel from 10 to 50 feet, as indicated in the detail drawing of the chimney. At the top of each of the sections above the base there is a corbel provided in accordance with the usual Custodis construction for the support of the sectional lengths of the chimney's lining.

The octagonal base, by which increased wall thickness was secured to compensate for the support withdrawn by cutting the four flue openings into it, ranges in thickness at the bottom from 66 inches through the flat side to about 9 1-2 feet at the corners. The thickness at either edge of the flue openings is approximately 7 1-2 feet, and the sectional area of the supporting wall at the section through the upper part of the flue openings is greater than that in the circular section immediately above the base. The weight above each of the flue openings is distributed to the sections of the wall at either side by seven 9-inch 21-pound I-beams, 19 feet in length and projecting 2 feet beyond the openings at each edge. They rest on bearing plates of steel plate, 2 feet wide by 7 feet long by 1 inch thick. These I-beams, being directly over the flue openings, are protected by special brick, 4 1-2 inches thick by 16 inches deep, shaped at the brick yard to tightly enclose the I-beams. They are applied to the I-beams with the surfaces of the latter and all joints flushed with acid-proof mortar, so it is thought there will be no danger of the steel being attacked by the sulphur gases from below. But two flue openings are to be used at present, and the other openings are bricked up with 15-inch walls that may be knocked out when necessary. In the blank walls clean-out doors have been installed, 2 x 3 feet in size, through which the metalliferous dust accumulating at the base of the stack may be removed.

The chimney blocks were made in five different lengths, 4, 5, 7 1-8, 8 5-8 and 10 5-8 inches, and vary in width from 6 1-4 to 6 11-32 inches, but are all of the standard thickness of 4 5-8 inches. Owing to the large radii here encountered, the curvature of the inner and outer faces is so slight as to be scarcely perceptible, the curved edges of the blocks departing from the chord across the corners by but 1-32 inch. The blocks are laid up in 1:2:5 mortar of cement, lime and sand, the lime being added in this proportion to render the finished structure sufficiently elastic to withstand the vibration caused by strong winds. The outer face of the brick work is, for a distance of 100 feet below the cap, pointed with an acid-proof mortar to render it imper-



DETAIL OF 506-FOOT RADIAL BRICK CHIMNEY AT GREAT FALLS, MONTANA.

with the foundation mass, and is in two sections, between points of flue connections to the stack. These outlets are gutters leading away from the foundation, to which each is tied and reinforced by seven 3-4-inch round rods from 10 to 16 feet in length. For the drainage of the inside of the stack, the floor of the flue is paved with perforated brick laid in acid-proof mortar, and the entire circular area pitched with a slope of 1-2 inch to the foot toward an outlet at the centre. This pavement has a foundation of concrete 6 inches thick, over which sand was spread to a thickness of 4 inches to carry the

vious to the action of the gases; this is the cause of the whitened appearance of the upper portion of the stack.

In order to withstand the acid action of the gases, the lining is acid-proof brick, formed in 4-inch radial perforated blocks and installed in the usual Custodis sectional method, the individual sections being supported on corbels built out from the inner surface of the main chimney barrel. These bricks, which were, like those used for the main wall of the chimney, made locally, are composed of materials containing no ingredients subject to attack from acids. The acid-proof mortar which is used for laying the lining brick, and also at other points, as above referred to, is a strong cement of silicate of soda, asbestos wool and other ingredients, capable of resisting the action of strong acids as well as a temperature of 2,000 degrees Fahr. The lining is laid throughout with a 2-inch air space, and at the top of each lining section a special construction is employed to prevent either metalliferous dust from the gases or acid condensation from gaining access to the air space. A special acid-proof brick, with an overhanging lip, is here used for the outer edges of all corbels, which overlap the top bricks of the lining sections. In addition to this protection, mineral wool is stuffed into a recess behind the top of the lining underneath the corbel. There is one lining section to each section of the chimney barrel proper, where the latter sections are 20 feet in height or less, but the lining is divided where the heights of sections are greater. For instance, at 196 feet above the top of the foundation, the chimney wall sections increase to 30 feet or more, and for the next six main sections there are two sections of lining, while for the top two sections of the barrel, which are each 50 feet in height, there are three sections of lining, it not being considered desirable to erect the sections of lining in single brick thickness to a height greater than about 20 feet.

The cap for the protection of the top of the chimney walls from the weather and the acids that may form from the gases is formed from special terra-cotta blocks, with interlocking sections for the joints. The cap is laid on a section of the chimney wall that is 43 inches in thickness and is set 9 3/4 inches higher at the inner edge to give a drainage slope in an outward direction. There are three forms of bed tile used, varying in length from 14 to 18 1/2 inches and laid on the stepped blocks, with the upper tiles overlapping the lower ones. Over the joints between these bed tiles there are special interlocking tile caps. The bed tiles are jointed to the tops of the stepped blocks with acid-proof mortar, and the interlocking joints between them and the joining caps, which are more exposed to the gases, are also made with such mortar. The terra-cotta tiles were formed of materials carefully selected with respect to resistance to the action of acids and were well glazed and 160 of each form were used for the construction of the cap, or 900 tiles in all.

Protection to the chimney from lightning is provided by a multi-point arrester at the cap, with connections to ground plates through two lines of soft copper cable carried on opposite sides of the stack. There are sixteen points around the cap, each formed of a 1-inch copper rod rising 5 feet above the highest portion of the cap and terminating in a 1 1/4-inch platinum tip, and these points are connected at their lower ends to a ring of 1 1/4-inch copper rod that encircles the lower portion of the cap. The point rods are firmly anchored by braces of galvanized wrought iron bricked into the cap from 18 to 20 inches, so as to carry the rod at a distance of about 4 inches outside of the walls. In order to stiffen the supports for the rods within the braces, lengths of 1 1/4-inch iron pipe are brazed vertically in their outer ends, through which the rods are passed. All of the lightning-rod work is protected with a coating of sheet lead 1/8 inch thick throughout the upper 50 feet of the chimney in order to resist corrosion by acids formed by the chimney gases in wet weather. The anchor braces are lead coat-

ed for a distance of some six inches within the brickwork, and the lead sheathes of both the braces and the rods are carefully joined to form a continuous coating over all the metal surfaces. The ground plates to which the two large conductors at the sides of the chimney connect are heavy copper plates about 3 feet square, which were buried some distance from the foundation.

The chimney has an outside ladder from the base to the cap, which is fitted with body-guards at every second rung. Both the rungs and guards are formed of 3/4-inch painted round iron rods, the rungs 12 inches in length and the guard loops 30 inches, giving a clearance over the ladder of 18 inches, and for a distance of 50 feet below the cap they are lead coated.

The design of the chimney of this height was favored by its great diameter, no difficulty being experienced in



VIEW OF WORKMEN'S SCAFFOLD INSIDE OF STACK. THE SPEAKING TUBE SHOWN AT X IS PART OF A COMPLETE SYSTEM OF COMMUNICATION WHICH CONNECTED WITH EACH ELEVATOR.

eliminating any tendency toward tension in the brickwork, even with assumed wind pressures far exceeding those ordinarily provided for on this continent, although in order to fulfil the specification for bearing pressure it was found advisable to form the barrel of the stack with tapering tapers. The method of calculations used in the design involved the determination of the unit pressures per square foot at the bases of the various sections of the chimney, due to the weight of the entire portion above, to which unit pressures were added those computed for the corresponding sections as a result of wind action for obtaining the increased bearing pressure occurring on the lee side during a wind storm, and from which are subtracted the same computed amounts

to obtain the diminished pressures on the windward side resulting from the tension effect. Owing to the prevalence of severe winds in the region of the chimney and, further, its location, with its base at an elevation of 3-549 feet above sea level, the allowances made for wind pressure upon the chimney structure are considerably greater than is customary for chimney construction on this continent. In the calculations a maximum wind velocity of 100 miles per hour, exerting a pressure on a flat surface of approximately 50 pounds per square foot, was primarily provided for, but in place of the usual assumption for round chimneys that the total effective pressure of the wind on its barrel is equivalent to one-half of this unit pressure, or 25 pounds per square foot on the plane of its projected area, the total effective pressure was here assumed at two-thirds of the actual wind pressure on a flat surface, or 33 1-3 pounds per square foot. This assumption corresponds with the common practice in German and will, it is thought, provide amply for any storms likely to occur at Great Falls.

SCAFFOLD AND TOWER.

The construction of the workmen's scaffold inside the stack was a problem that gave the contracting engineers a great deal of concern. It involved the efficient and safe handling of some 17,000 tons of material, and at the same time the conditions under which the men worked at great heights had to be made perfectly safe. It was impossible to use a single floor beam system on the inside on account of the great diameter of the stack. It was also necessary to design a system that could be raised in the least possible time, when the bricklayers were not working. The bricklayers could not work under the men who were raising the scaffold on account of the danger of falling material. It was necessary to provide sufficient number of elevators of ample size to quickly handle some 200 tons of material per day.

The scaffold consisted of a 12-post tower made of 10 x 10 timbers. At each of the four flue openings these uprights were spaced at the proper distance to take a 6 ft. x 9 ft. elevator. Oak ways were spiked to the 10 x 10's as guides for the elevator. The cat-head or cross timbers at the top of the posts that held the sheaves through which the elevator cables operated, were built of 3 x 10 timbers, and were held in place on top of the 10 x 10's by means of a 3-4-inch dowel pin. This was necessary, as the cat-head had to be removed at each raise of scaffold, their design being such that it could be handled off and on quickly by means of gin poles. The tower was sway braced by 2 x 6-inch timbers and 3 x 10-inch sash braces. The 3 x 10-inch sash braces held one end of the floor beams; the other end rested on the walls of the chimney. Spanning the floor beams were 6 x 6-inch timbers on which 2 x 10-inch plank formed the floor of the scaffold. When the scaffold was raised, the 6 x 6-inch and the 3 x 10-inch planks were carried up, leaving behind the heavy 8 x 10-inch floor beams.

It will be noted that on account of the elevator operating between 8 of the posts, it left one side of each post without bracing. This left the perfect tower system incomplete. This could have been remedied by carrying up four posts in the centre of the chimney, with their sway braces, sash braces, etc. These would have had to have been extended every 17 feet. In order to prevent the crushing in effect of the elevator posts, four intersecting trusses were introduced between these posts at every 30 feet. These trusses were framed and put together on the ground and hoisted to place when necessary, and were designed, not to take a vertical load, but to resist a racking strain. The scaffold was absolutely uniform and symmetrical from top to bottom, each 17 feet being a duplicate of the 17 feet below. The post load was about 18 tons, and during the whole construction of the chimney no settlement or buckling was observed.

The chimney was plumbed entirely from the out-

side by a 5-foot plumb rule cut to the batter of the chimney and equipped with two level glasses set in planes at right angles to each other.

During the progress of the work, the centre was checked by engineers' instruments, and at the finish by the use of a 30-pound plumb bob. It was difficult to detect that the chimney was out of plumb even so much as one inch in 506 feet.

As a means of communication between the men on the scaffold and those working below, a complete system of speaking tubes was kept in operation at each elevator.

One double drum electric hoist, one single drum electric hoist and a 35 horse-power steam engine operated the elevators. The electric power gave a speed of 300 feet per minute; the steam, 600 feet per minute. The engine signals were given by means of an electric bell system controlled by a push button on top of the scaffold.

The design of this chimney is due entirely to the Al-Phons Custodis Chimney Construction Company, of New York city, who also installed the brick plant and executed the entire contract. This company is represented in Eastern Canada by the Eadie-Douglas Company, of Montreal and Toronto. The magnitude of the contract will be better appreciated from the quantities of materials required, there being used 13,000 tons of radial blocks, 3,075 barrels of Portland cement, 5,225 barrels of lime, 4,180 cubic yards of sand and 200 tons of acid-proof mortar for the construction of the chimney, exclusive of the foundation. The foundation, which is formed of a 1:3:5 concrete, required 5,200 barrels of cement, 2,000 cubic yards of sand and 4,000 cubic yards of crushed slag.

VANCOUVER ARCHITECTS have submitted a proposal for the new fire limit by-law, which provides that the city council fix the regulations governing the height and character of buildings that can be erected on a basis of frontage values, graded as follows: \$200 to \$300 per front foot values, buildings to be of ordinary brick and, from two to five storeys; \$1,000 to \$1,500 a front foot, to be of slow burning material and to be limited to five or six storeys; \$2,000 to \$3,000, with tendency to fire-proof structure, seven to nine storeys, and from \$6,000 a foot upward, to be skeleton fireproof, allowing for from ten to thirty stories. The architects contend that under this plan the fire limits would adjust themselves automatically. The building inspector and the assessment commissioner were requested to prepare a map showing approximately how the limits would lie under this arrangement. When this plan has been prepared another conference will be held.

RECENT CABLE ADVICES from Rangoon, Burma, state that the new rolling lift railway bridge across the Ngawun River has been completed and opened for traffic. This structure, which is the largest bridge built in Burma, has a movable span 220 feet long, the total length of bridge being 920 feet. The bridge is connected on the main line of the Burma railways extension connecting Rangoon with Kyngin. The Ngawun River is in the fertile delta of the Irawaddy River, and forms a connection between this river and the Bay of Bengal. The government authorities required the large movable span to expedite the railroad traffic and the heavy traffic on the river carried on by the Irawaddy Flotilla Company's vessels which traverse these waterways from the coast to the interior of Burma as far as Mandalay, more than 400 miles inland. The bridge was designed by the Scherzer Rolling Lift Bridge Company of Chicago and New York, and manufactured in England at the works of Spencer & Company, Melksham, Wilts'ire.

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 our Daily Service.

Mills and Factories

Toronto.—The City Council has decided to accept the offer of the Otis-Fensom Elevator Company for the purchase of twenty-two acres in the Ashbridge Bay area, on which the company will erect a large factory.

Toronto.—Architect R. R. Barbor has prepared plans for a two-storey brick factory to be erected at 732 King street west, near Major street, for M. P. Warren, 90 York street. It will be of brick construction with stone foundation, felt and gravel roof, hardwood floors, hardwood and pine interior finish, open plumbing, hot water heating, combination lighting, fireproof doors and windows, plate glass, electric bells, telephone system, power and equipment. Estimated cost, \$5,000. The owner will purchase all necessary materials, and erect building by day work.

Paris, Ont.—The Harold Sanderson Refrigerator factory, which was recently destroyed by fire, will be rebuilt on a larger scale on a site near the present Plow Works. The Board of Trade and Town Council have provided the company with temporary quarters. The value of the destroyed plant was over \$50,000.

Windsor, Ont.—The Reo Motor Car Company, of Lansing, Mich., have decided to locate their Canadian branch plant in this city, with W. G. Morley as manager.

Windsor, Ont.—The Seeley Manufacturing Company has decided to erect a new building.

Windsor, Ont.—The Lufkin Rule Company has decided to erect a large addition to their building next spring.

Windsor, Ont.—The Postum Cereal Company, Battle Creek, Mich., will erect a factory to cost \$50,000 at this place next spring.

Welland, Ont.—A by-law has been carried, granting a fixed assessment of \$10,000 for ten years to the Dane Manufacturing Company, of Ottumwa, Iowa. The company will establish a Canadian plant, adjoining Welland, for the manufacture of farm implements, for which a site of 130 acres has been secured. Estimated cost of plant, \$250,000.

Norwich, Ont.—Mr. J. J. Rank's grist mill at this place has been destroyed by fire, entailing a loss of about \$13,000, partly covered by insurance.

Dundas, Ont.—The Canada Woolstock company's mill at this place has been badly damaged by fire.

Listowel, Ont.—The following contracts have been awarded in connection with the new Morris Plano Company's factory to be erected here: Brick work, Jacob Kritzer; carpenter work, Bamford Bros. and E. Parry; painting and glazing, J. Seburger. The main building will be three stories in height and the engine house and dry kiln one storey. Ball bearing shafting will be installed.

Lakeside, Ont.—Mr. Vining's grist mill at Lakeside, Ont., has been destroyed by fire. Loss not stated.

London, Ont.—The Murray Shoe Com-

pany will in the near future erect a new factory on Richmond street, adjoining the Unitarian church. The building will be three stories in height, 300 by 50 feet.

Milton, Ont.—Architect P. H. Finney, 43 Victoria street, Toronto, has prepared plans for a \$25,000 factory to be erected here for the C. R. Willmott Company. The building will be of mill construction throughout, with felt and gravel roof, combination lighting. Specifications include concrete reinforcement, one freight elevator, power and equipment.

Brockville, Ont.—The National Manufacturing Company, whose foundry at Pembroke was recently destroyed by fire, will locate in Brockville.

Bridgeburg, Ont.—The Anderson Milling Company's buildings at this place have been destroyed by fire. Loss estimated at \$75,000.

Clinton, Ont.—S. S. Cooper's planing mill at this place has been completely destroyed by fire. Loss \$12,000, with insurance of \$6,300.

Montreal.—Architect Chas. Bernier, 70 St. James street, has prepared plans for a factory to be erected for the Campbell Clothing Company.

Montreal.—The Caledonian Biscuit and Confectionery Company, 102 Christophe Colomb street, are making arrangements for the installation of additional machinery. They also propose erecting at an early date a new building on the lot adjoining their present structure. The capital of the company will be increased from \$48,000 to \$100,000.

Lachine, Que.—A company of New York capitalists is negotiating with the local Council for the erection of a large paper factory. If matters are arranged, work on the building will be commenced next spring.

Three Rivers, Que.—The machine shop of the Canadian Iron and Foundry Company has been completely destroyed by fire. Loss estimated at \$25,000.

Glace Bay, N.S.—The Globe Laundry on Minto street has been destroyed by fire, entailing a loss of \$3,000.

Belfmont, N.S.—Mr. Thomas A. Barnhill's lumber and building materials mill has been destroyed by fire. Some of the machinery destroyed is as follows: Plane and matcher, dove-tail and door and sash machines, pony and buzz planer, sand paper and belt-sanding apparatus. Loss estimated at \$5,000.

Forest Glen, N. B.—The grist and carding mill owned by Mr. T. W. Colpitts has been totally destroyed by fire. Loss approximately \$4,000.

St. John's Nfld.—The Rope Walk, the largest local industrial enterprise, has been destroyed by fire. The loss will probably total \$70,000, covered by an insurance of \$60,000.

New Westminster, B.C.—Seaton Bros., formerly of Vancouver and San Francisco, have closed a deal for the crane-ways on Lulu Island, and also the dry-dock known as the Emmerson dry-dock. It is proposed to open a machine shop, wood-working plant, and later a steel forging plant, as they will in the near future undertake the construction of steel boats.

Vancouver, B.C.—The Western Sheet Metal Works have taken out a permit for the erection of a building on Howe street to cost \$3,000.

Rosland, B.C.—The engineering works of H. W. Cunliffe have been partially destroyed by fire. Loss estimated at \$10,000.

Winnipeg, Man.—British capital is backing a large packing enterprise for Winnipeg, with H. A. Mullins, head of the cattle exporting firm of Mullins & Co., as manager. The sum of \$250,000 is guaranteed to inaugurate a plant as soon as

the new stock yards are ready to proceed with building.

Selkirk, Man.—A site has been purchased for the erection of a large match factory at this place which will at least employ fifty men. The officers of the company are: R. C. Moody, President; Dr. Ross, Vice-President; and J. Mantion, Managing Director. The company is capitalized at \$40,000.

Saskatoon, Sask.—The following companies have decided to locate branches in Saskatoon: The John Deere Plow Company, Chicago; the J. I. Case Thresher Company, Hamilton; the Cockshutt Plow Company, Brantford; the Gray Carriage Company, Chatham; the M. Campbell Farming Mills Company, Chatham; the Singer Sewing Machine Company; the Rat Portage Lumber Company, Winnipeg; and the International Harvesting Company.

Gas Plants, Elevators and Warehouses

Toronto.—The Copp, Clark Company have purchased a site, 90 by 250 feet, on the south side of Wellington street, near Portland street, on which they will erect a large warehouse and bindery.

Port Arthur, Ont.—A contract has been awarded for a large terminal elevator to be erected here for the Thunder Bay Elevator Company. It will be built by the Barnett-McQueen Company, of Fort William, at a cost of \$600,000, and will have a capacity of 1,500,000 bushels.

Glencoe, Ont.—The Municipal Council has closed a contract with the Colonial Engineering Company, of Montreal, for the erection of a gas producer plant of ninety-six horsepower. Contracts have also been awarded for the electrical machinery and for pole line and wiring.

Montreal.—Architect Eugene Payette, 15 St. James street, has prepared plans for a warehouse to be erected for Carl Rosenberg of the British American Import Company at a cost of about \$65,000.

Sherbrooke, Que.—Architect C. E. White has prepared plans for the erection of a six-storey warehouse for the Mitchell Hardware Company.

Halifax, N.S.—The Board of Trade is considering a proposition for the establishment of a large cold storage warehouse in Halifax.

St. John's N.F.—Architects Butler & McDonald have prepared plans for the erection of three warehouses and the rebuilding of a three-storey building on Water street.

Winnipeg, Man.—The T. Eaton Company will build a warehouse at the corner of Hargrave and Graham avenue, to be connected with the main store on Portage avenue by tunnel. The building will be 130 feet by 100 feet. A system of carrier belts will be installed.

Winnipeg, Man.—James Ballentyne and Company's warehouse has been destroyed by fire. Loss, \$50,000, fully covered by insurance. The headquarters of this firm are in Montreal. Mr. Geo. A. Young is manager of the company in Winnipeg.

Winnipeg.—The Atlas Elevator Company of this place will erect at least twenty-five elevators on the Grand Trunk Pacific Railroad during the coming year.

Brandon, Man.—Codville & Co.'s wholesale warehouse has been destroyed by fire, entailing a loss of \$75,000.

Vancouver, B.C.—The main elevator of the Vancouver Milling Company has been totally destroyed by fire. Loss estimated at \$200,000.

Vancouver, B.C.—Lewis & Sills, Vancouver, have taken out a permit for the erection of a frame warehouse on Parker lane, at a cost of \$6,000.

Calgary, Alta.—The Western Milling Company's elevator and warehouse has been destroyed by fire. Loss, \$50,000.

Edmonton, Alta.—Plans have been prepared for the City Council for the installation of a 1,500 h.p. steam or producer gas engine. A supplementary 1,000 h.p. engine is also being considered.

Saskatoon, Sask.—Mr. F. N. Selanders, Commissioner of the Board of Trade, has arranged for a cold storage plant to locate here this year. The plant will be run on the ammonia system.

Saskatoon, Sask.—Tenders will be received from Feb. 1st to Feb. 15th for a two-storey warehouse to be erected on 22nd street for Wilson Bros. at a cost of \$13,000. The building will be of mill construction, with brick walls, concrete foundation, gravel roof, steam heating and electric lighting, structural iron, freight elevator, sheet metal work, plate glass and prismatic glass. W. W. LaChance is the architect.

Carlyle, Sask.—The Farmers' elevator at this place has been destroyed by fire. Loss estimated at \$18,000, covered by insurance.

Electrical Construction

Montreal, Que.—The Montreal Harbor Commissioners are considering the advisability of installing a lighting system on the MacKay Pier at an estimated cost of \$100,000.

Ormstown, Que.—The electric light works and Walsh's rolling mill have been destroyed by fire. The property is insured for \$7,500, which does not cover the loss.

Ottawa.—Application will be made to the Legislature for an act to incorporate the Eastern Ontario Counties Electric Belt Line Railway Company, to connect Cornwall, Brockville, Morrisburg, Winchester and Ottawa, and intervening places. A branch line from Kenmore to the village of Russell would connect with the Ottawa-New York Railway.

Dundas, Ont.—The following places have voted in favor of the Hydro-Electric Power By-law: Dundas, Simcoe, Chatham, Stratford, Port Stanley, Tilsonburg, Norwich, West Lorne, Comber, Amherstburg, Tilbury, Essex, Leamington and Windsor.

Fort William, Ont.—Notice has been given at the Parliament Buildings of a private bill for Fort William for the validation of a by-law to raise \$170,000 for the extension of the electric street railway system, for power to acquire fifty-eight acres of Indian reserve territory, and to complete a contract with the MacKay & Kakabeka Falls Railway Company.

Winnipeg, Man.—Tenders will be received up to 11 a.m. Jan. 20th for supplying 50 luminous or magnetite arc lamps, with necessary station regulating apparatus for controlling same. M. Peterson, Secretary Board of Central Office, Winnipeg, Man.

Bridges, Wharves and Subways

Toronto.—A by-law has been passed by the ratepayers authorizing the expenditure of \$215,000 for the construction of the Wilton avenue bridge.

Toronto.—K. L. Atken, city electrical engineer, and P. W. Sothmann, engineer of the Hydro-Electric Power Commission, will prepare plans for the construction of a six-foot waterproof tunnel on Garrison Common, for the purpose of laying across the railway tracks the electric wires in connection with the power distribution plant.

Brockville, Ont.—The Townships of Edwardsburg and Augusta have made application to the County Council for the erection of a bridge over the Nation River on the townline between the townships named.

Brantford, Ont.—A deputation representing Brantford, Galt and other towns on the Grand River have made application to the Minister of Public Works for provincial aid in making surveys for proposed dams on the river. The Government engineers estimate that four dams may be required. The delegation was headed by Mr. Brewster, M.P.P., Major Craig, M.P.P., and George Pattinson, M.P.P.

Niagara Falls, Ont.—President Thomas Penney, of the International Traction

Company, states that work on the proposed trans-Niagara bridge will be commenced early next spring. The bridge will provide accommodation for both steam and electric railway lines, together with a roadway for heavy teaming.

St. Felicien, Que.—The Government will rebuild the bridge recently destroyed by fire at this place.

Shelburne, N.S.—A grant of \$8,000 has been made towards the construction of a public wharf at this place.

St. John, N.B.—The Navy Island Bridge Committee at a recent meeting took initial steps for the securing of plans and specifications for the proposed new structure. Engineer J. S. Armstrong was instructed to prepare a proposition for the consideration of the Board.

Vancouver, B.C.—Mr. R. H. Sperling, on behalf of the Vancouver Power Company, and their consulting engineer, Mr. J. D. Schuyler, have laid before the Provincial Executive plans for the proposed raising of the dam at Coquitlam Lake.

Prince Rupert, B.C.—The Provincial Government of British Columbia have decided to build a wharf at Prince Rupert, B.C. The section to be built first will be about 60 feet long by 80 feet deep, with a depth of water of 20 feet at extreme low tide.

Regina, Sask.—The plans prepared by City Engineer Smith for the proposed Broad street and Albert street subways will in the near future be submitted for the consideration of the Board of Railway Commissioners. Estimated cost of each subway, \$85,000. As per plans, they will have a span of 100 feet and a width of 94 feet. Provision is made for six railway tracks, with an allowance for more trackage if required.

Waterworks, Sewers and Canals

Toronto.—Tenders will be received up to noon, Jan. 19th, for the construction of the following sewers: Gerrard street, from Carlaw avenue to Pape avenue; Marlborough avenue, from Avenue Road to Sidney street; Sidney street, from Marlborough avenue to Cottingham street. Tenders will also be received for 300 feet of rubber fire hose for flushing sewers. Joseph Oliver (Mayor), Chairman Board of Control, City Hall, Toronto.

Toronto.—The City of Toronto has taken out a permit for a one-storey brick pumping station to be erected on John street at a cost of \$11,100. R. McCallum, city architect.

New Toronto, Ont.—Mr. Andrew F. Macallum associated with Mr. T. Ald Murray, engineers, Toronto, have prepared plans for a sewerage system for New Toronto.

Peterboro, Ont.—Randolph Macdonald, of Toronto, has been awarded the contract for section No. 7 of the Trent Canal. This section extends from Rice Lake to Healey's Falls, a distance of 20 miles. It includes the construction of a dam and lock at Hastings, new guide piers at G.T.R. bridge above Hastings, a swing bridge and guide piers at the Narrows (rent Bridge), and the dredging of the Trent River from Hastings to Healey's falls, to provide a nine-foot draught. Contract price, \$450,000.

Stratford, Ont.—The ratepayers have passed a by-law authorizing the expenditure of \$25,000 for the installation of sewerage disposal works.

Wallaceburg, Ont.—The Town Council is contemplating the installation of a waterworks system to cost \$90,000.

Ottawa.—Tenders will be received up to 4 p.m., Jan. 29th, for the supply of some 150,000 barrels of cement, more or less, required for the construction and maintenance of the various canals of the Dominion. Tenders may be made for the total quantity, or for a portion thereof. L. K. Jones, Secretary, Department of Railways and Canals, Ottawa, Ont.

St. Thomas, Ont.—The ratepayers have passed a by-law providing for the expenditure of \$40,000 for the installation of septic tanks.

Ottawa.—Mr. Johnston Edgerly, manager in Canada of the Montreal, Ottawa & Georgian Bay Canal Company, Ottawa, states that a syndicate of London and Canadian financiers are preparing to undertake the Georgian Bay Canal scheme. The capital stock of the company is \$100,000,000.

Antigonish, N.S.—The Town Council

will in all probability install a sewerage system in the near future. Prof. Lee of McGill University has been engaged to make a thorough test of the engineering difficulties regarding this project.

Winnipeg, Man.—Tenders will be received up to 11 a.m., Feb. 22nd, for the supply and erection of turbine pump, with electric motor, for the city water works. M. Peterson, Secretary, Board of Control Office, Winnipeg.

Victoria, B.C.—At a recent meeting of the City Council it was decided to accept the tender of the D'Oliver Engineering Company, for which J. K. Rebbeck is local agent, for the supply of the following equipment for the installation of the high pressure system. Electric driven unit consisting of motor direct connected to two two-staged turbine pumps provided with bronze runners and diffusion veins, and one steam driven unit consisting of a steam turbine direct connected to a three-staged turbine pump; at a price for the set up complete in place in accordance with the specifications of \$17,630, the installation to be completed by about May 15, 1909.

Vancouver, B.C.—At a meeting of the Reeves of the municipalities adjacent to Vancouver a resolution was passed recommending to the respective councils that a competent engineer be employed to make a survey and report as to the cost of a joint water system from Seymour creek, sufficient to supply 200,000 people residing in South Vancouver, Point Grey, Burnaby, Richmond and contiguous places.

Macleod, Alta.—A by-law has been passed by the ratepayers authorizing the installation of a complete sewerage system at an estimated cost of \$35,000.

Banff, Alta.—Tenders will be received up to noon, Feb. 5th, 1909, for the following sewer pipe and fittings, required for extensions to the Banff sewerage system: 282 feet of 8-inch sewer pipe, 1,810 feet of 9-inch sewer pipe, 600 feet of 15-inch sewer pipe, 30 6-inch off 15-inch sewer junctions, 60 6-inch off 9-inch mfwywaVn junction. The brand and name of manufacturer must be stated in the tender. The whole of the material to be delivered f.o.b. cars at Banff, Alta., on or before April 1, 1909. P. G. Keyes, Secretary, Department of the Interior, Ottawa, Ont. Address tenders to Howard Douglas, Commissioner of Parks, Banff, Alberta.

Railway Construction

Ottawa.—The Canadian Northern Railway will make application to the Government for assistance to build a line from Port Arthur to Sudbury.

Brantford, Ont.—It has been announced by the management of the Grand Valley Radial Road that the proposed line to Port Dover will be rushed to completion next summer, along with extensions to the city lines for the carrying out of which the company has provided a guarantee to the city of \$25,000.

Berlin, Ont.—At a meeting of the Berlin Board of Trade, Mr. W. A. Bugg, of the Woodstock-Guelph Railway Company, outlined the plans for the proposed radial railway from Woodstock to Guelph, a distance of about 50 miles. The estimated cost of construction would be about \$15,000 per mile.

Bristol, N.B.—Superintendent Downie of the C.P.R. states that the company will rebuild the station at this place which was destroyed by fire.

St. John, N.B.—The Intercolonial Railway Company's water tank at Island yard, St. John, has exploded, causing damage, including loss of tank, estimated at \$10,000. The tank had a capacity of 100,000 gallons.

St. Boniface, Man.—Tenders will be called in the near future for the construction of the National Transcontinental railway shops near St. Boniface. Some time ago contract was awarded to Contractor Kely, of Winnipeg, for one of the buildings, but it has been decided to call for tenders for the erection of the whole plant, plans for which are now complete. It is understood that arrangements have been made for the cancellation of the contract for the portion of the plant already awarded.

Brandon, Man.—The Canadian Pacific Railway has renewed its appropriations to be used in connection with the Bran-

don depot and yards. The plans provide for a large main building joining the old portion of the depot.

Brandon, Man.—The Canadian Northern Railway will in the near future commence the erection of the proposed new depot and freight sheds. The depot when completed will cost approximately \$45,000. The freight sheds will take up a block of 500 feet, occupying the site of the old sheds.

Moose Jaw, Sask.—Notice is officially given that the Alberta Central Railway Company will apply to the Dominion Parliament at its coming session for a charter for the building of a railway line from a point on its main line at or near Red Deer, Alta., southerly and easterly to Moose Jaw.

Calgary, Alta.—The Grand Trunk Pacific Railway and the Canadian Northern Railway are negotiating with the Government for the purchase of the Royal North-West Mounted Police barracks property on which to erect a union station.

Public Buildings

Toronto.—The Dominion Government will in all probability erect a new general post office at the south-east corner of Front and Bay streets.

Toronto.—The Library Board has taken out a permit for the erection of a one-storey brick library building on Queen street west, at a cost of \$25,000.

Toronto.—The city has taken out a permit for the erection of a two-storey brick bath house on Stephanie Place at an estimated cost of \$44,000.

Toronto.—Plans and estimates are being prepared, and will be presented to the Legislature when it meets shortly, for an addition to the Parliament Buildings. It is proposed to erect a new wing for library, archives, patents, surveys department, etc. It is estimated that the cost will be approximately half a million dollars.

Toronto.—The Ontario Government has taken out permit for alterations to Osgoode Hall, corner Queen street and University avenue. Estimated cost of improvements, \$50,000.

Toronto.—The city has taken out a permit for the erection of a one-storey frame ferry shed on Bay street at a cost of \$16,000, also a permit for the erection of a two-storey brick wagon house on Agnes street, near Terault street, at a cost of \$14,000. R. McCallum, city architect.

New Liskeard, Ont.—The local Library Board is making application to Andrew Carnegie for funds for the erection of a \$5,000 library building at this place.

Strathroy, Ont.—The ratepayers have passed a by-law in favor of the proposed new Carnegie Library.

Montreal, Que.—Architect R. A. Brasseur, 9 St. James street, has prepared plans for a new armory to be erected for the 65th Battalion on Pine avenue at an estimated cost of \$100,000.

Montreal.—Extensive alterations and repairs will be made to the Art Gallery on Phillips Square and possibly a new building erected on the present site. E. & W. S. Maxwell, 6 Beaver Hall Square, are the architects.

Quebec, Que.—A new post office building is to be erected on the site on the corner of St. Joseph and Dorchester streets, St. Roch, at an estimated cost of \$60,000.

Verdun, Que.—Mr. Isaac Collins, 207 Ash avenue, Montreal, general contractor for the proposed new municipal building, has awarded to the Sayer Electric Co., 14 Beaver Hall Hill, Montreal, the sub-contract for the wiring and electric fixtures. Architects MacVicar & Heriot, 104 Union avenue, Montreal.

Saskatoon, Sask.—The City Council will prepare a by-law for the raising of \$30,000 for the purchase of 80 acres of land located about a mile south of the city and the erection thereon of buildings suitable for the holding of the annual agricultural exhibitions.

Edmonton, Alta.—Inspector MacKinnon has condemned the temporary government buildings at this place for not having fire-escapes, and has ordered fire-escapes to be put in immediately.

Business Buildings

Toronto.—The following contracts have been awarded for a \$10,000 building to be erected at 749-65 Yonge street for

Messrs. Ryrie Bros. & Webster, corner Yonge and Temperance streets; Mason work, Fussell & Thompson, 33 Poplar Plains Road; carpentry work, A. B. Coleman, 191 Dowling avenue; plastering, R. Dancy, 171 Spadina Road; plumbing and heating, Power Bros., 393 Spadina avenue; electric wiring, McDonald & Willson, 137 Yonge street; roofing, G. M. Bryan, 524 Yonge street. Burke, Horwood & White, 28 Toronto street, are the architects.

Toronto.—Messrs. Schultz & Garrett, Room 704 Continental L.L.C. Building, have taken out a permit for the erection of three attached three-storey brick stores and dwellings on the n.w. corner of Bloor and Markham streets. Estimated cost, \$10,000.

Toronto.—Architect J. M. Cowan, 65 Adelaide street east, has prepared plans for a store and dwelling to be erected on Bloor street, near Albany avenue, at a cost of \$3,000. It will be of brick construction, with brick foundation, felt and gravel roof, pine floors and interior finish, open plumbing, hot water heating, combination lighting and electric bells.

Toronto.—R. G. Leaman, general contractor, will receive tenders up to Jan. 25th for all trades, with the exception of heating and plumbing, required in alterations to stores and dwellings at 353-5 Gerrard street, near Broadview, for Margaret Leaman, 353 Broadview. The work includes roughcast and stone work, felt and gravel roof, hardwood and pine floors and interior finish, combination lighting, open plumbing, hot air heating, structural iron, tile, metal ceilings, cornice, plate glass, electric bells, mantels, lead glass.

Toronto.—Mr. J. C. Wilgar has purchased the property at 376 Queen street east, on which he will erect a pair of stores.

Toronto.—Architect J. M. Cowan, 65 Adelaide street east, has prepared plans for a pair of stores and dwellings to be erected on Queen street near Parliament street at an estimated cost of \$6,000. The buildings will be two stories in height, of brick construction, with brick foundation, felt and gravel roof, pine floors and Georgia pine interior finish, open plumbing, combination lighting, hot water heating, metal ceilings, skylights and electric bells.

Toronto.—Miles Vokes, corner Yonge and Adelaide streets, has taken out a permit for a \$35,000 five-storey brick store building to be built on Queen street near Bond street. G. M. Miller, General Trust Building, is the architect.

Toronto.—Messrs. Schultz & Garrett, 704 Continental Life Building, Toronto, will erect fifteen stores and dwellings on the n.w. corner of Bloor and Markham streets at a cost of \$100,000. The buildings will be of brick construction, with stone foundation, felt and gravel roof, hardwood and pine floors and interior finish, open plumbing, combination lighting, heating. Specifications include tile, vaults, metal ceilings, electric bells, plate, art and leaded glass.

Toronto.—Wm. Williamson, 133 Woodbine avenue, has been awarded the general contract for a pair of two-storey stores to be erected on the corner of Queen and Herbert streets for W. H. Coon, 1910 Queen street east. The buildings will be of brick construction, with brick foundation, shingle roof, pine floors and interior finish, open plumbing, combination lighting, combination heating.

Toronto.—Messrs. McDonald & Willson, 137 Yonge street, have purchased the property at Nos. 12-16 Queen street east, on which they will erect a five-storey building.

Hamilton, Ont.—Architect Herbert H. New, 608 Spectator Building, has prepared plans for an office building to be erected for the Hamilton Pressed Brick Company. The building will be of brick construction, with shingle roof.

Markstay Ont.—The store buildings of Robert Roy and A. P. Lefebvre have been destroyed by fire. Loss estimated at approximately \$10,000. Mr. Roy will rebuild in the near future.

Pembroke, Ont.—Architect Colborne P. Meredith, Ottawa and Pembroke, has prepared plans for a two-storey store and office building to be erected here for Mrs. J. H. Munro. It will be 140 by 60 feet, of brick construction with stone trimmings, and will cost \$16,000.

Sault Ste. Marie, Ont.—The Hussey block at Sault Ste. Marie, Ont., has been

completely destroyed by fire and the Coronation block, adjoining, badly damaged.

Montreal, Que.—The Henry Birks & Sons' block at the corner of St. Catherine street and Phillips Square has been badly damaged by fire. Loss approximately \$100,000.

Montreal, Que.—Lamy's departmental store has been destroyed by fire. Loss on building, \$25,000.

Montreal, Que.—Architects Hutchison & Wood, Royal Insurance Building, and Architects Saxe & Archibald, 59 Beaver Hall Hill, have prepared sketch plans for a departmental store building to be erected at the corner of St. Catherine street west and Mountain street for Messrs. Jas. A. Ogilvy & Sons.

Montreal.—Architect A. F. Dunlop, Lindsay Building, has prepared plans for the proposed extension of S. Carsley's building on St. Catherine street west, now occupied by the W. H. Scroggie Company.

Montreal.—The annex to the Sun Life's building has been damaged by fire to the extent of \$5,000, covered by insurance.

Montreal.—It is reported that the H. A. Wilder Company will erect a building on the site purchased by them on the s.e. corner of Bleury and Berthelet streets.

Montreal.—Messrs. Freeman's, who recently purchased Polequin's restaurant on St. Francois Xavier street, will thoroughly remodel the premises and convert the large wine cellars in the basement into a palm garden.

Montreal.—The John D. Duncan Company, 213 Mountain street, has purchased land adjoining their present premises, on which they will next spring erect a building. Architects MacVicar & Heriot, 104 Union avenue, will prepare the plans.

Rosburn, Man.—The block of stores owned by B. W. Johnstone has been destroyed by fire. Loss approximately \$30,000, partly covered by insurance.

Vancouver, B.C.—Dr. L. McKechnie has taken out a permit for alterations to his office building on Granville street at an estimate cost of \$10,000.

Vancouver, B.C.—A syndicate known as "The Exchange Building, Ltd.," has been incorporated for the purpose of erecting a large office building on Hastings street. A high speed elevator service, electric light, steam heating, lavatories, vacuum cleaning systems, etc., for each room will be installed. Mr. Jno. S. Heyler, 518 Hastings street, is the architect. Mr. John Kendall, of Kendall & Sewell, Crown & Willson Block, is Secretary for the incorporation.

Vancouver, B.C.—Dr. Good, of Winnipeg, has purchased the site of the Maple Leaf theatre at this place, on which he will erect a modern building.

Vancouver, B.C.—The National Finance Company will erect a large three-storey building to be used for stores, offices and apartments. Work on the structure will be commenced at once.

Victoria, B.C.—The W. & J. Wilson Company have taken out a permit for the erection of a two-storey and basement business block on Herald street to cost \$25,000. It will be of brick and cement construction. Architect, W. C. Frame. Contractors, Luney Bros.

New Westminster, B.C.—Plans have been prepared by Architect E. G. W. Tait for a brick block to be erected at the corner of Church and Columbia streets for Messrs. Berrett & Denne, real estate brokers. The block will consist of stores, with rooms and offices above, and will cost approximately \$50,000.

Prince Albert, Sask.—The store and offices of Messrs. William Cowan & Co. have been destroyed by fire. Loss estimated at over \$20,000, covered by insurance.

Prince Albert, Sask.—Mr. R. T. Goodfellow has had plans prepared for a large brick block, adjoining his present block at the corner of River street and Central. Estimated cost, \$15,000.

Saskatoon, Sask.—Tenders were recently received for the new Land Titles building to be built of stone, brick, concrete and steel, and absolutely fireproof. It will be erected here for the Provincial Department of Public Works. The vestibule and public space will be finished in Tennessee marble, with tile flooring. Messrs. Storey & VanEdmond, of Regina, are the architects.

Saskatoon, Sask.—Messrs. Emerson & Fisher, hardware and stove manufacturers, with factory at Sackville N.B., will in all probability erect a branch at this place for distribution purposes.

Banks

Toronto.—The Bank of Toronto has purchased the former premises of the National Club on Bay street, opposite Melinda street, on which they will erect a head office building in the near future.

Toronto.—The Imperial Bank has purchased a site at the s.e. corner of Bathurst and Dupont streets, on which they will erect a branch bank. The lot has a frontage of about 50 feet on Bathurst street. They have also purchased a site at the corner of Queen street and Roncesvalles avenue for the erection of a new building. The lot is 120 feet deep, with a frontage of 40 feet.

Pembroke, Ont.—Architect Colborne P. Meredith, Ottawa and Pembroke, has prepared plans for a \$12,000 bank to be erected at Pembroke for Mrs. J. H. Munro. The building will be of brick construction with stone trimmings, one storey in height, 26 by 75 feet.

Montreal, Que.—Architects Cox & Amo, 121 Mansfield street have prepared plans for the erection of a branch bank building for the Quebec Bank at corner of Atwater avenue and Notre Dame street.

Montreal.—La Banque Nationale, corner St. James street and Place d'Armes Hill, have purchased the property at the rear of their present structure, on which they will erect a large new building. Several stories will also be added to their present building.

Three Rivers, Que.—Architects Daoust & Lafont are preparing plans for the erection of a bank building at this place for La Banque Nationale.

Sawyerville, Que.—Messrs. Byers & Anglin, 13 St. Alexis street, Montreal, general contractors for the branch bank to be erected here for the Bank of Montreal, have awarded to the Consolidated Plate Glass Company, 30 St. Sulpice street, Montreal, the contract for plate and other glass.

Winnipeg, Man.—Fire in the basement at the rear of the Molsons Bank building has resulted in damage to the extent of \$20,000. The heaviest losers are the Canadian Importing & Jewelry Manufacturing Company, who had a warehouse and factory in the building. The loss to the Molsons Bank is not known. The Banque de Hochelaga, adjoining, has been damaged to the extent of \$3,000, covered by insurance.

North Vancouver, B.C.—The Bank of British North America have purchased a site at the n.e. corner of Lonsdale avenue and Third street, on which they will erect a bank building.

North Vancouver, B.C.—The Bank of Hamilton have purchased a site at the s.e. corner of Lonsdale avenue and First street, on which they will erect a bank building.

Clubs and Societies

Toronto.—Plans have been prepared for the proposed new club house, to be erected on the Avenue Road site by the Canada Bowling Club. The building will be 90 feet by 32 feet, and will cost approximately \$8,000.

West Toronto.—Tenders will be received from Feb. 1st to Feb. 15th by Architects Ellis & Conery, Manning Chambers, Toronto, for a two-storey Masonic Temple to be erected on Annette street, West Toronto, for the West Toronto Masonic Temple Limited. The building will be of brick construction, with stone foundation, slate roof, maple and pine floors, Georgia pine interior finish, open plumbing, steam heating, electric lighting. Estimated cost of structure, \$15,000.

London, Ont.—The Masons of London purpose erecting a temple in the near future.

Kingston, Ont.—The Knights of Columbus have purchased the Stearns property on King street for the purpose of erecting a club next summer.

Montreal.—Architects Mitchell & Crighton, Inglis Building, have prepared plans for an addition to the Italian Immigration and Society's building at 69 Osborne street.

Winnipeg, Man.—Architect J. A. Har-

vey, Manning Chambers, Toronto, has prepared plans for a three-storey Squash Racket Court to be erected here on Donald street at a cost of \$6,000. The building will be of brick construction, with stone foundation, felt and gravel roof, Georgia pine and maple floors and interior finish, open plumbing, steam heating, electric lighting.

Vancouver, B.C.—The Directors of the Western Club have purchased a site on the s.w. corner of Hastings and Hornby streets, on which they will erect a club building to cost at least \$40,000. The property has a frontage of 52 feet and a depth of 120 feet. Work on the structure will be commenced in the near future. Mr. Lambert Bond is President of the Club.

New Westminster, B.C.—Plans are being prepared for a block, to cost \$20,000, to be erected on Agnes street, near the site of the old Baptist church, New Westminster. The building will be used as Masonic headquarters.

Moose Jaw, Sask.—At a meeting of the business men a resolution was passed, advising the Board of Directors of the Y.M.C.A. to take immediate steps for the completion of the Y.M.C.A. building.

Asylums and Hospitals

Toronto.—Preliminary plans have been prepared for an enlargement to the Western Hospital. In connection with this undertaking it is proposed to erect an Administration building, Nurses' Home, Infectious building, Laundry, Mortuary, Ambulance building, Chapel, boiler houses and other outbuildings. The scheme, as laid out, has been estimated to involve an expenditure of about \$500,000.

Toronto.—Architects Darling & Pearson, 2 Leader Lane, are preparing plans for the new General Hospital to be erected on College street at an estimated cost of \$1,112,000.

Montreal, Que.—Messrs. Reid, MacGregor & Reid, general contractors for the new wing for the Alexandra Hospital, have awarded to H. Andrews & Co., 125 Bishop street, the sub-contract for plastering. Architects, E. & W. S. Maxwell, 6 Beaver Hall Square.

St. John, N.B.—Fire which broke out in the laundry of the Provincial Hospital for Nervous Diseases, at Lancaster, near St. John, N.B., destroyed the centre "L," a three-storey structure about 500 feet long, in which were the boiler house, laundry, kitchen, chapel, attendants' rooms, and one ward which accommodated about twenty-five patients. Loss estimated at \$60,000.

Vancouver, B.C.—The Salvation Army is contemplating the erection of a hospital in Vancouver.

New Westminster, B.C.—Tenders for the construction of the central building of the new Provincial Asylum to be located on the one-thousand acre tract at the confluence of the Coquitlam with the Fraser River, four miles from this city, will be called for in the near future. It is estimated that the structure will cost \$270,000 and will accommodate five hundred patients. Architect, H. S. Griffiths, Toronto. Dr. Doherty is superintendent of the institution and the Provincial Secretary is Hon. Dr. Young.

Edmonton, Alta.—The Public Hospital Board have had plans prepared for a hospital building to accommodate three hundred patients, when the structure is complete. This provides for a central administration building and the main hospital, which it is proposed to build next year. The two wings, which will complete the structure, will be added later on. The amount required for the present undertaking will be not less than \$150,000.

Regina, Sask.—The City Council has adopted the plans and specifications for the proposed municipal hospital, to be known as the Regina General Hospital. The City Clerk will receive tenders up to 5 p.m., Feb. 1st. Copies of plans and specifications may be seen at the Builders' Exchange, Winnipeg.

Churches

Hamilton, Ont.—The congregation of the Herkimer Baptist Church will in all probability erect a new church next spring, to cost \$20,000. Thomas Simpson is the Chairman of Building Committees.

Lindsay, Ont.—The chapel of St. Mary's

Roman Catholic Church has been damaged by fire to the extent of \$7,000.

Eden, Ont.—The Methodist Church at this place has been destroyed by fire. Loss estimated at \$3,000. The pastor is Rev. G. C. Balfour, of Streetsville. The church will in all probability be rebuilt.

London, Ont.—The trustees of the church of St. John the Evangelist, have under consideration plans for the building of a new mission church at the corner of Adelaide and St. James Streets. Work on the building will in all probability be commenced in the spring.

Montreal, Que.—The St. Thomas d'Aquin congregation will erect a church on St. Antoine Street, Montreal, at an estimated cost of \$12,000. Architect, J. A. Karch, 17 Place d'Armes Square. Contractors, Sparrow & McNeil, Coristine Building.

Quebec, P.Q.—The Roman Catholic parish church at St. Ambroise, Indian Lorette, near Quebec, has been destroyed by fire. Loss estimated at \$100,000, with insurance of about \$60,000.

Ancienne Lorette, Que.—Architects Ouellet & Levesque, 115 St. John Street, Quebec, P.Q., have prepared plans for three artificial marble altars to cost \$5,000 for the church of Roman Catholic congregation at this place.

St. Timothee, Que.—The Roman Catholic church at this place has been destroyed by fire. Loss estimated at \$85,000, with insurance of \$35,000.

Coteau Du Lac, Que.—The parish church at Coteau du Lac, Que., has been destroyed by fire entailing a loss of \$60,000.

Indian Lorette, Que.—The Parish Church at Indian Lorette, Que., has been destroyed by fire. Loss over \$95,000; insurance \$40,000.

Ste. Angèle, P.Q.—Messrs. J. H. Morin & Sons, Trois-Pistoles, P.Q., have been awarded the contract for a \$49,135 church building to be erected at this place for the Roman Catholic Congregation. The building will be 180 by 72 ft. and will be of stone construction. Ouellet & Levesque, 115 St. John Street, Quebec, P.Q., are the architects.

Victoria, B.C.—The congregation of St. Barnabas church will erect a new edifice at the corner of Corbook and Caledonia avenue to cost \$10,000. The building will be of stone construction, with concrete foundation, slate roof, hot air heating, electric lighting. Rev. E. G. Miller, rector.

Residences and Flats

Toronto.—The following contracts have been awarded for a two and one-half storey brick dwelling to be erected on Binscarth road, near Glen road, for Messrs. Sim & Smart, 372 Markham street, at cost of \$5,000; Masonry, Chas. Wood, 611 Manning avenue; plastering, W. J. Haddock 790 Crawford street; plumbing, heating and electric wiring, J. R. Seager, 799 College street, Architect, J. H. Galloway, 77 Victoria street.

Toronto.—W. H. Little, 33 Henry street, has been awarded the plastering contract for a two-storey and attic dwelling to be erected on Woodlawn avenue, near Yonge street, for John T. Aggett, 199 Yonge st. The plumbing, heating and electric wiring will be done by day work, the owner supplying all materials. Architects, Eden Smith & Son, 199 Yonge St.

Toronto.—Architect C. J. Gibson, 75 Yonge street, has prepared plans for a two-storey dwelling to be erected on Roxborough street, near Bedford road, for J. A. McEvoy, 30 Prince Arthur avenue. Estimated cost, \$6,500. The building will be of brick construction, with stone foundation, slate roof, oak and pine floors and interior finish, open plumbing, hot water heating, combination lighting, electric bells and mantels. The following contracts have been awarded: Elgie & Page, 21 Havelock street, mason work; T. B. Manual, 658 Bloor street west, carpentry work.

Toronto.—Architect J. A. Harvey, Manning Chambers, is preparing plans for a three-storey apartment house to be erected on Gerrard street east, opposite the Normal School, at a cost of \$40,000. The building will be of brick construction, with stone foundation, felt and gravel roof, fireproof floors, oak interior finish, open plumbing, hot water heating, electric lighting. It will be equipped with fire escapes, dumb waiters, fireproof windows, telephone system, and mantels.

Toronto.—Architect J. A. MacKenzie, 22 Adelaide street east, has prepared plans for a store and dwelling to be erected at the corner of Broadview and Gerard streets, for Mr. F. A. Jacobs, 145 King street east. Estimated cost, \$6,000. The building will be of brick construction, with brick foundation, felt and gravel roof, pine and hardwood floors and interior finish, open plumbing and hot water heating.

Toronto.—Architect Geo. R. Harper, 61 Yonge street Arcade, has prepared plans for a \$6,000 residence to be erected on Glencarn avenue, west of Yonge street, North Toronto, for Mrs. Edith L. Rende, Merton avenue, of that place. It will be two and a half stories in height, of brick construction, with slate roof, pine and hardwood floors and interior finish, combination lighting, hot water heating and mantels.

Toronto.—Architect G. B. Harper, 61 Yonge street Arcade, has prepared plans for three attached dwellings to be erected on Bartlett avenue, near Hallam street, for Mr. H. E. Bell, 40 Yonge street Arcade. The building will be of brick construction, with stone foundation, felt and gravel and shingle roof, hardwood and pine floors and interior finish, open plumbing combination lighting, hot water heating and mantels. Messrs. Tait & Angus, 164 Macpherson avenue, have the general contract. Estimated cost of building, \$8,500.

Toronto.—Architect Geo. R. Harper, 61 Yonge street Arcade, has prepared plans for two two and one-half storey residences to be erected on Major street, south of Lowther avenue, for Mr. E. M. Shildrick, 397 Givens street, at a cost of \$3,000. It will be of brick construction, with stone foundation, slate, felt and gravel roof, pine floors with hardwood borders, hot water heating, combination lighting and mantels.

Toronto.—Architect Geo. R. Harper, 61 Yonge street Arcade, has prepared plans for a two-storey residence to be erected on Pearson avenue, east of Roncesvalles avenue, for Mr. H. I. Clarkson, 335 Clinton street. The building will be of brick construction, with stone foundation, pine floors and interior finish, hot water heating, combination lighting, electric bells and mantels.

Toronto.—Architect P. H. Finney, 43 Victoria street, has prepared plans for two detached two and one-half storey dwellings to be erected on St. George street, near Dupont street, for Wilkins & Company, 70 Wellesley street. The building will be of brick construction, with stone foundation, felt and gravel and slate roof, hardwood floors and interior finish, open plumbing, hot water heating and combination lighting. The structures will cost \$7,000.

Toronto.—Architect J. M. Cowan, 65 Adelaide street east, has prepared plans for a \$3,500 dwelling to be erected on Kendal avenue, near Wills street, for Mr. James Crang, 720 St. Clair avenue. It will be of brick construction, with hardwood floors and interior finish, hot water heating and combination lighting.

Toronto.—Architect J. M. Cowan, 65 Adelaide street east, has prepared plans for a two and one-half storey store and dwelling to be erected on Bloor street, near Lansdowne avenue, at a cost of \$1,000. It will be of brick construction, with brick foundation, felt and gravel roof, pine floors, Georgia pine interior finish, open plumbing, combination lighting and hot water heating.

Toronto.—Architect J. M. Cowan, 65 Adelaide street east, has prepared plans for an apartment building to be erected on McCaul street at a cost of \$10,000. It will be of brick construction with felt and gravel roof, hardwood floors and interior finish, open plumbing, hot water heating, combination lighting, electric bells and mantels.

Toronto.—Architect Jas. L. Havill, Mail Building, has prepared plans for a two and one-half storey dwelling to be erected on Blinacarth Road for Mr. H. Bishopric, 108 Mail Building. The structure will be of brick, with open plumbing, electric lighting, hot water heating, oak and pine floors and interior finish and mantels.

Toronto.—Architect Leonard Foulds, 43 Victoria street, has prepared plans for a three-storey bachelor apartment house to be erected on Bond street at a cost

of \$10,000. The building will be of brick construction, with slate, felt and gravel roof, pine floors and interior finish, open plumbing, combination lighting and steam heating.

Toronto.—Architect Leonard Foulds, 43 Victoria street, is preparing plans for a two and one-half storey residence to be erected on Palmerston Boulevard, near College street, at a cost of \$5,000. It will be of brick construction, with stone foundation, slate roof, hardwood and pine floors and interior finish, open plumbing, steam heating, combination lighting, plastic relief work, mantels and grates.

Toronto.—Architect J. W. Siddall, 75 Yonge street, has prepared plans for a two and one-half storey dwelling to be erected on Indian Road, near Ridout street, for Mr. B. W. Barton, 20 Givens street. It will be of brick construction, with shingle roof, pine floors and interior finish, open plumbing, hot water heating and combination lighting.

Toronto.—Architect J. Hunt Stanford, 34 Victoria street, has completed plans for a two and one-half storey dwelling to be erected on Palmerston Boulevard for Mr. E. Ferris, 292 Victoria street. It will cost \$4,000, and will be of brick construction, with stone foundation, slate roof, oak and pine floors and interior finish, mantels, open plumbing, hot water heating and combination lighting.

Toronto.—Contracts have been awarded as follows for a pair of dwellings to be erected on Major street, near Lowther avenue, for Messrs. Almond & Page, 634 Palmerston avenue: Painting and glazing, A. Longbottom; roofing and tin-smithing, A. Ryan, Bathurst street; plumbing and heating, Chas. Tyler, 1208 Yonge street. Architect, J. Hunt Stanford, 34 Yonge street Arcade.

Toronto.—Architect J. Hunt Stanford has prepared plans for a two and one-half storey residence to be erected on Poplar Plains Road, near Lynwood avenue, for Mr. H. Hutson, 43 Victoria street. The building will be of brick construction, with stone foundation, slate roof, oak and pine floors and interior finish, mantels, open plumbing, hot water heating and combination lighting. Cost of building, \$5,000.

Toronto.—Messrs. Deeth & Son, 44 Gore avenue, will erect two pairs of semi-detached brick dwellings on Dufferin street, near Fisher street, at a cost of \$9,000. They will be two and one-half stories, of brick construction, with stone foundation, pine floors and interior finish, open plumbing, hot air heating, combination lighting. The owners will supply all materials, and the buildings will be erected by day work.

Toronto.—Messrs. Deeth & Son, 44 Gore avenue, will erect two semi-detached brick dwellings on north side of Fisher street, near Dufferin street, at a cost of \$4,000. The building will have stone foundation, shingle roof, pine floors and interior finish, open plumbing, hot air heating and combination lighting.

Toronto.—Messrs. F. Wilkins & Co., 70 Wellesley street, will erect two detached dwellings on St. George street, near Dupont. The buildings will be of brick construction, with stone foundation, felt and gravel and slate roof, hardwood floors and interior finish, open plumbing, hot water heating, combination lighting. Specifications include dumb waiters, tile, ornamental columns, plastic relief work, plate glass, telephone system, electric bells, refrigerator, leaded glass, eight mantels, and two bathrooms. Estimated cost, \$7,000.

Toronto.—Mr. R. L. MacDonagh, 148 Spaurna avenue, will erect a pair of two and one-half storey semi-detached brick dwellings on the east side of Grace street, near Bloor street, at a cost of \$5,000. The buildings will have stone foundation, felt and gravel and slate roof, oak and pine floors and interior finish, open plumbing, hot air heating and combination lighting.

Toronto.—The following contracts have been awarded for a brick dwelling to be erected on Thorold street, near Indian Road, for Mr. Geo. Palin, 32 Montrose avenue: Plumbing and heating, Howard & Atkin, 38 Arthur street; roofing and tin-smithing, Geo. Read, 17 Montrose avenue.

Toronto.—Mr. J. S. Case, 141 Geoffrey street, will erect two detached two and one-half storey brick dwellings, on

Roncesvalles avenue, near Geoffrey street, at a cost of \$3,000. The buildings will have slate roof, oak and pine floors and interior finish, open plumbing, hot water heating, combination lighting, electric bells and mantels. The following contracts have been let: Masonry, Thompson & Turner, 3 Palmerston Square; plastering, Garner & Whiteman, 35 Auburn avenue.

Ottawa, Ont.—Tenders will be received up to Jan. 30th for a \$7,000 two-storey residence to be erected on Lisgar street for Mr. Joseph Hesser, 20 Elm street. The building will be of brick veneer construction, with stone foundation, pitch and gravel roof, hot water heating, electric lighting, enamel plumbing. A. Tracy, 350 Gladstone avenue, is the architect.

Ottawa, Ont.—Tenders will be received up to Jan. 30th for all trades, with the exception of mason and carpentry work, required in the erection of a two and one-half storey dwelling on Lisgar street for Mr. Jos. Hesser, 20 Elm street. The building will be of brick veneer construction, with stone foundation, pitch and gravel roofing, hot water heating, electric lighting, enamel plumbing and mantels. Architect, A. Tracy, 350 Gladstone avenue. Estimated cost, \$3,000.

Brockville, Ont.—James Frederick has been awarded the contract for a large summer home to be erected on Jarvis Point for Mr. Geo. C. Boldt, of the Waldorf, Astoria, New York City. The building will be three stories in height, \$3 by 51 feet, of Swiss design.

Montreal, Que.—A company to be capitalized at \$250,000 is being promoted by G. W. Badgley, 124 St. Peter street for the purpose of erecting an apartment house on the west of Cote des Neiges Road, above Sherbrooke street. The building will be known as the "Seaforth," will have frontage of 220 feet, and contain forty-five apartments.

Montreal.—Architect Eric Mann, 30 St. John street, has awarded the following contracts for the construction of nine flats on Pine avenue for Mr. David Sperber: Brick work, A. E. Wand & Co.; plumbing and heating, Greenberg & Co.

Montreal.—Architect Jas. E. Adamson, Coristine Building, has awarded the following contracts in connection with the erection of a residence at 102 Crescent street for Mr. Chas. Skelton: General contract, Jackson & Co., 335 Hibernia street; masonry, Jas. Young, Outremont; plumbing, Alex. MacKay & Co., corner of St. Martin and Dorchester street west.

Montreal.—Architect Theo. Daoust, 103 St. Francois Xavier street, has prepared plans for a residence to be erected on McCulloch avenue for Mr. Jos. Gravel. The building will be constructed of Deschambeau stone and brick, and cost \$35,000.

Montreal.—Architects E. & W. S. Maxwell, 6 Beaver Hall Square, have awarded to Jas. Morison, 207 Guy street, the contract for the brick and masonry on a residence on Drummond street for Mr. R. B. Angus.

Montreal.—Architects E. & W. S. Maxwell, 6 Beaver Hall Square, have awarded to Messrs. John Quinlan & Co., 412 St. Catherine street, the general contract for the erection of a residence on Peel street for Mr. C. F. Smith.

Montreal.—Architect J. A. Karoh, 17 Place d'Armes Hill, has awarded to Sparrow & McNeil, Coristine Building, the contract for excavation and masonry work for the presbytery to be erected on St. Antoine street for the St. Thomas Aquinas Church.

Montreal.—Architect Chas. Bernier, 70 St. James street, has awarded to Messrs. Elendeau & Soly, 683 Mount Royal avenue, the contracts for roofing, cornice work, plumbing, gas and electric work, and hot water heating, for three tenement houses to be erected on Park avenue for Mr. Napoleon Deslauriers.

Montreal.—Mr. Wm. Lyall, of Peter Lyall & Sons, general contractors, Board of Trade Building, has purchased a large block of land on Western avenue, Notre Dame de Grace (a suburb of Montreal), on which he will erect twenty semi-detached residences in the spring.

Montreal, Que.—Architect Chas. Bernier, 70 St. James street, has prepared plans for the erection of a residence in Hochelaga for Mr. Dufrosne.

Outremont, Que.—Architects Wright & Sons, 204 St. James street, have prepared

plans for a cottage to be erected in Outremont for Mr. J. H. Mackay.

Winnipeg, Man.—The Johnson block, an apartment building, has been damaged by fire to the extent of \$6,000.

Victoria, B.C.—Geo. C. Mesher has taken out a permit for the erection of six dwellings at the corner of Hulton and Cowan streets. The buildings will be one and one-half stories in height, with stone foundation, and will cost \$16,000.

Victoria, B.C.—Messrs. Parfitt Bros., contractors, will erect eight cottages at a cost of approximately \$3,000 each, and a business establishment to cost about \$6,000, for which an acre block fronting Fernwood Road has been purchased as a site.

Vancouver, B.C.—R. Gintzburger has taken out a permit for the erection of a residence on Cordova street, between Cambie and Abbott streets, at a cost of \$9,000.

Vancouver, B.C.—J. Bigerton, Vancouver, has taken out a permit for the erection of six houses at the corner of Nelson and Cardere streets, at a cost of \$17,000; also a permit for the erection of a dwelling on Pacific street, at a cost of \$5,600.

Vancouver, B.C.—Mrs. Mary Hanna has taken out a permit for the erection of a brick store and apartment building on Westminster avenue, near Dupont street, at a cost of \$20,000. A permit has also been granted to J. L. Lougheed and A. McVicar for the erection of four houses at the corner of Fifth avenue and Columbia street at a cost of \$6,000.

Victoria, B.C.—Dr. T. J. Jones will erect an \$8,000 dwelling at the corner of Belcher street and Linden avenue. Architect, W. P. Wilson. Contractor, W. M. Ross.

Saskatoon, Sask.—Architects Webster & Noel have decided to erect a ten suite apartment block to cost in the neighborhood of \$20,000. The building will be two stories in height, 42 by 85 feet, and will have steam heating and electric lighting.

Hotels

Port Arthur, Ont.—Mayor Carrick and Solicitor Keefer state that an agreement has been closed for the transfer of a piece of city property to the Canadian Northern Railway Company, upon which the company will erect a new quarter million dollar hotel. Work will be started early in the spring. They will also do considerable harbor dredging, and make terminal track extensions.

Washago, Ont.—The Northern Hotel has been destroyed by fire, entailing a loss of \$7,000, with \$3,000 insurance.

Coldwater, Ont.—The British Arms Hotel and the Abbott block have been completely destroyed by fire. Mr. Colby is proprietor of the hotel. Total loss estimated at \$40,000, partially covered by insurance.

Montreal.—The Consolidated Plate Glass Company, 30 St. Sulpice street, have been awarded the contract for the leaded glass in the new addition to the Chateau Frontenac, Quebec City.

Montreal.—Vice-President McNicoll, of the Canadian Pacific Railway, is at present in New York, looking over the hotels and railway terminals in that city, with a view to adopting the most up-to-date features in the reconstructing of the Place Viger hotel and station, for which plans have been prepared by Mr. Painter, the architect for the company.

Opera Houses and Rinks

Windsor, Ont.—The curlers of Windsor have decided to form a joint stock company and erect a rink. The following have been appointed as a committee to collect stock and erect the building: J. A. Russell, chairman; Rev. H. A. Harley, secretary; P. W. Dimock, W. M. Christie and R. Paulin.

Montreal, Que.—It is reported that the Sparrow Company will rebuild the Academy of Music on the N.-W. corner of Bleury and Major streets, if their present building is razed for the proposed extension to the S. Carsley Company's building.

Montreal, Que.—Architects Mitchell & Creighton, Inglis Building, have awarded to J. A. Major, 902 Albert street, St. Henri, the contract for the construction of a moving picture theatre for the

Ideolograph Co. at 1691 Notre Dame street, west.

Moncton, N.B.—The Builders Woodworking Co., Ltd., Moncton, have been awarded the contract for the erection of an \$8,000 theatre building at this place for Messrs. Torrie & Winter.

Fire Stations and Jails

East Toronto.—At a meeting of the Fire and Light Committee it was decided to erect a new fire hall and supply new fire engine for East Toronto.

Hull, Que.—City Engineer Farley has been instructed to prepare plans and specifications for the erection of a fire station in Ward 4.

Vancouver, B.C.—Messrs. Morrison & Cowan have been awarded the contract for the construction of the new Fairview fire hall. Contract price, \$6,150, with \$250 extra for laying of concrete foundation over basement.

Asquith, Sask.—A by-law will be submitted to the ratepayers for the purpose of authorizing the raising of the sum of \$16,000 by debentures for local improvements, including the erection of a fire hall, a building for agricultural exhibitions, sidewalks, etc.

Schools and Colleges

Toronto.—The Property Committee of the Board of Education has accepted plans for enlarging the Riverdale High School, for which \$60,000 has been appropriated.

Toronto.—The Alexandra School for Girls is contemplating the erection of a new school building and a new reception building, each to cost \$12,000. The Government will be asked for assistance.

Toronto.—Plans have been accepted for enlarging the Kent street and the Fern avenue schools.

St. Catharines, Ont.—At a regular meeting of the Public School Board the acceptance of the following tenders was recommended for the erection of a new school building, Messrs. Newman Bros., for the whole of the work, exclusive of heating, plumbing and ventilation, \$23,000; Messrs. A. Riddell & Son, for the entire plumbing, exclusive of heating and ventilation, \$1,568.

St. Catharines, Ont.—At a meeting of the Public School Board it was recommended that a four-room school building be erected on the present site of St. James Ward school.

Hamilton, Ont.—John E. Riddell has been awarded the contract for the galvanized iron and slating work of the high school and library buildings at Dundas; also copper skylight and roofing for the Bank of Hamilton at Toronto.

London, Ont.—It has been decided to erect a new school building in Chelsea Green early next spring. The building will contain two rooms, with a seating capacity of two hundred, and will cost in the neighborhood of \$3,000.

Strathroy, Ont.—The Collegiate Institute Trustee Board will in all probability either erect a new collegiate building or make extensive alterations to the present building.

Oshawa, Ont.—F. G. Gale has been awarded the general contract for alterations to local school building. Contract price, \$6,000. The general contractor will sub-let all branches of the work, with the exception of the carpentry work. Architect, P. H. Finney, 43 Victoria street, Toronto. The work will include brick and stone work, shingle roofing, pine floors and interior finish, electric lighting, open plumbing, metal ceilings.

Kingston, Ont.—At a meeting of the School of Mining Governors a committee was appointed to arrange for a delegation to wait upon the Ontario Government to ask for the erection of a new building for the School of Mining, Kingston.

Waterloo, Ont.—The ratepayers have passed the following by-laws: \$15,000 for a new school, \$5,000 for roads, and \$3,000 for an isolation hospital.

St. Hyacinthe, Que.—Architect Maurice Perrault, 15 St. Lawrence Boulevard, Montreal, has awarded to Andre Bonin, St. Hyacinthe, Que., the contract for the erection of a Catholic seminary at this place. The building will be of fireproof terra cotta construction, and will cost \$200,000.

St. John, N.B.—Messrs. Lewis & Sons have been awarded the contract for new

fire escapes for the local school buildings. Contract price, \$13,931.

Halifax, N.S.—The contract for the erection of an extension to the Holy Heart seminary building on Quinpool Road has been awarded to S. H. Brookfield, Ltd. The extension is to connect the main building with the chapel; it will be about forty feet in length, three stories in height, and will be of brick and granite construction.

Montreal.—The Corporation Ecole Hantes Etudes H. Mercier, 216 New York Life Building, have taken out a permit for the erection of a school at the corner of St. Hubert street and Viger avenue at a cost of \$240,000. Architects, Gauthier & Daoust, 180 St. James street. Contractor, Jos. Bourque, Hull, Que.

Montreal, Que.—The Corporation Ecole Hantes Etudes H. Mercier, 216 New York Life Building, have taken out a permit for the erection of a school at the corner of St. Hubert and Laguchetien streets. Estimated cost, \$150,000. Architects, Gauthier & Daoust, 180 St. James street. Contractor, Jos. Bourque, Hull, Que.

Dauphin, Man.—Dauphin No. 1 school, which contained four rooms of public school and four of collegiate, has been destroyed by fire. Loss estimated at \$12,000, with insurance of \$8,000.

Victoria, B.C.—Architect W. C. Framma has prepared plans for a Chinese school to be erected on Fisguard street, above Government street. The plans call for a two-storey building of concrete and brick construction, to contain ten rooms. Cost of building, \$12,000.

Nelson, B.C.—At a meeting of the School Trustees it was decided to submit to the City Council a by-law authorizing the expenditure of the sum of \$17,500 for the completion of the new public school building.

Wilkie, Sask.—Tenders will be received from Feb. 1st to Feb. 15th for the erection of a two-storey school building for the local School Board (J. H. Turnbull, Sec. Treas.). Estimated cost, \$6,000. The building will be of frame construction, with stone foundation, shingle roof, fir interior finish. Architect, W. W. LaChance, Saskatoon, Sask.

Civic Improvements

Toronto.—At a meeting of the Board of Control the following contracts were awarded for supplies for the engineer's department for 1909, viz.: Iron and steel, Russell Hardware Company, 126 King street east, and Thos. Meredith & Co., 106 King street east; brass work, Dean Bros., 184 Richmond street west; rubber valves, Dunlop Rubber Tire Co., Booth avenue, Canadian Rubber Co., 1 Front street east, Gutta Percha and Rubber Co., 47 Yonge street; paving brick, Ontario Paving Brick Co., Weston Road, West Toronto; cedar paving posts, Reid & Co., Esplanade and Berkeley streets; Portland cement, Thorn Cement Co., Belleville; sewer pipe, Dominion Sewer Pipe Co.; general supplies, Thos. Meredith & Co., Russell Hardware Co., Alkenhead Hardware Co.

Sarnia, Ont.—Mr. Frank Guttridge has been awarded the contract for paving Front street with three-inch, twenty-pound creosote wood block; contract price, \$27,000.

Prince Rupert, B.C.—W. W. Forrester, contractor, New Westminster, has been awarded contract for the construction of public improvements at Prince Rupert, B.C., which are being undertaken jointly by the Government and the Grand Trunk Pacific Railway. The contract price is about \$200,000.

Vancouver, B.C.—Tenders addressed to the District Municipal Office, Esplanade, North Vancouver, will be received up to noon, Jan. 25th, for the following: (1) Compound steam 10-ton road roller, with scraper attached; (2) hand truck for fuel, oil and tool tender for roller; (3) watering cart with distribution pipe and suction hose; (4) travelling van and two traction engines of 4-ton capacity; (5) portable compound toggle knapping motion stone-breaker, with screens, elevating and loading machinery; (6) electric motors, with belt and belt attachments for driving the stone-breaker, etc. Specifications and full particulars can be had on application to Mr. Donald Cameron, District Engineer, Alex. Philip, C. H. C.

LICENSE LAW STRONGLY OPPOSED....

Continued from Page 40.

would find themselves unable to insist on any examinations other than those based on a relatively low standard of knowledge and ability. They would find it impossible to make the Government force everybody wishing to practice architecture, take a full architectural course when such will be established in the university. But any standard for an architect, lower than this, the Government should refuse to officially recognize, and they should also refuse to stamp as "architect" even a graduate of the school at the close of his full course and the university, on the other hand, should energetically oppose such a law because of the low grade standard it would set up for the term architect.

The statement that "Architectural registration is the public's only protection against the incompetent practitioner" is also untenable, because, as we have shown, such a law would neither give him nor force him to obtain the instruction worthy of the title "architect," and your writer truly says, "The architect must be a thoroughly trained man." Therefore, a license law would not secure to the public, "competency in architectural design."

Neither would it secure that competency in the construction of buildings, which would be secured by a Provincial building law, because the proposed license law would examine the man at the inception of his career on only a few theoretical problems, whereas, a building law would examine, not only all his propositions on paper, but all the building he may ever erect throughout the whole of his career.

Furthermore, a building law provides for cases of new methods of construction; for instance: Suppose a license law had been in force, say, ten years ago—before reinforced concrete came into vogue—all the old practitioners would be licensed and yet they would not have to be examined by the license law on reinforced concrete construction, and yet by it they would be allowed to practice without examination on this important branch of architectural work. A building law would prevent this and submit all practitioners on all new methods of construction to continuous examination, because plans and specifications of all new methods of construction would have to be submitted for approval before a permit to begin erecting would be granted. Therefore, a law specifying the structural requirements of building is much more effective protection for the public than a license law examination.

Again, while it is clear that to submit plans and specifications of every proposed building project to a government official for a permit before proceeding with the erection of a building, is the best possible protection of the interests of the public; it is also very clear this method of protecting the public would be quite inapplicable to the three professions, whose laws are frequently cited as examples for the architectural profession, viz., law, medicine and dentistry, because it would be obviously absurd to compel a lawyer to submit his brief, a physician his prescription, and a dentist his method of treatment, to a government official to obtain permission for each case before acting. Therefore, the best method of controlling the practice of the profession of architecture, in the public interest, must be different to the best method of controlling the profession of law, medicine and dentistry in the same interest, or to state it negatively: The architectural profession must not be controlled, in the public interest, in the same manner in which the three aforesaid professions are controlled in same interest.

Again, if a resident of the province can continuously draw plans and specifications of buildings which meet the requirements of a proper building law, he is surely by that means passing a continuous government examination. He should, therefore, be entitled to earn his

living by drawing plans and specifications without hindrance.

As to the statement, "The prospective builder in the province of Ontario has absolutely no means whereby he may distinguish between the incapable imposter and the competent designer," it is sufficient to say, in the light of the foregoing, he has exactly the same means of knowing this as he knows the difference between any other professional men. Do not the public, in the outlying districts, evidence their knowledge in this respect when they come to the larger places to select architects of experience in a given line when they have important commissions to award? The public are wiser than your writer gives credit.

My conclusion is: It is not "Architectural Registration," it is not a "Provincial Board of Examiners responsible only to the Government" which the community needs; but they do stand sorely in need of ample opportunity for their sons to adequately study architecture to the extent that they may become "thoroughly trained men." This means a thoroughgoing architectural school and also an architectural museum more amply equipped than such needs to be in a community possessed of historical monuments. The community also needs a comprehensive and moderate provincial building law specifying the requirements to be fulfilled in the construction of various classes of buildings. These the community are entitled to receive from the Government of the province. And the public, the university and the profession should unitedly see to it that no influence will succeed in having half a loaf of stale bread dispensed where a full loaf of the best bread is absolutely necessary to the best architectural health of the province.

The fact that other countries are advocating license laws for the architectural profession is no reason at all for adopting such a law in the province of Ontario, when it is easily seen that such a law would be not nearly as efficient for the general good as would be a thorough educational course, on the one hand for students, and a building law on the other hand for architects.

It is well to take note that we are at very vital stage in the architectural development of our province. We, therefore, need to be extremely careful to avoid laying a foundation in our architectural life, which the next generation will deem unworthy of the superstructure which must ultimately be erected. Let us avoid laying a foundation which they will surely abandon. Let us be wise men. Let us dig broadly and deeply. Let us go to bed rock for our foundation because the superstructure eventually erected will surely be worthy of the very best possible foundation.

If the older men of this generation will not see, we must remember the young men now entering on their studentship and who feel the need of real help to study will become the men of the future, seeing more clearly what is necessary, and they will ultimately do the work which ought to be accomplished in these days.

Your writer having made reference to the O.A.A., and their "opponents," I venture to predict that should the O.A.A. prove themselves in the future to be advocates of this thoroughgoing educational policy, instead of still remaining advocates of compulsory registration, they will find their former "opponents" lined up, not against them, but on their side. "Opponents" of the O.A.A. are in reality only opponents of the very inefficient educational policy hitherto advocated by the O.A.A.

In conclusion, Mr. Editor, allow me to make the suggestion that you devote several articles in your valuable paper, to show what is being done in our province in the way of architectural education and what the equipment is for that purpose, giving samples of the work done by the students. Then, to go no farther afield, cover the same ground, in those States of the Union with which we are most in touch—the States of New York and Michigan. Let your readers become most thoroughly

acquainted with the training students received and samples of the work produced by them, both at home and next door to them. If this is done, and it should be done, I feel confident, the advocates of compulsory registration will see how utterly inadequate anything but a thoroughgoing educational scheme will meet the crying—but unheeded—needs of this great province.

Yours truly, J. C. B. HORWOOD.

ANOTHER PHASE OF THE MATTER.--
Views of Mr. A. H. Gregg of Toronto, as Set Forth
in a Communication to "Construction."---Does Not
Understand Why Architect Should Object to a
Licensing Act.

In view of the fact that Mr. Horwood's letter to CONSTRUCTION was read at the Convention of the Ontario Association of Architects and was there discussed, Mr. Gregg's reply as is published below is perfectly in order.—EDITOR.

Editor CONSTRUCTION:

Your November editorials on the subject of Architectural Registration, advocating the law designed to create a Government standard of competence in the practice of architecture, are so forcible that your readers are impelled to put on their thinking caps, whether or not they agree with you.

At the convention of the Ontario Association of Architects, just concluded, a discussion took place on this good old subject, and the outcome of the discussion was that the association practically shelved certain proposals to bring before the Legislature amendments to the Architects' Act, which would result in making the profession a close corporation as well as a proposal looking towards the establishment of a licensing law, similar to that in force in the State of Illinois. This decided action was, I believe, largely brought about by the general feeling that in view of the evident present-day temper of the legislators, the press and the public, it would only be wasting ammunition to attempt to make architecture a close profession and that a licensing law would only be considered as a measure of protection for the public, and as such it was for laymen and not architects to advocate its enactment.

During the discussion, Mr. J. C. B. Horwood was present and by special request read a letter written by him, which, I understand, is to appear in this number of CONSTRUCTION. In this letter Mr. Horwood expresses strong disapproval of a licensing law as proposed by you, as well as of any system of compulsory education such as is involved in the making of the profession of architecture a close corporation. It is a little curious to note that in last January's CONSTRUCTION, Mr. Horwood stated that "the licensing of architects would be very unwisely placed in the hands of a close corporation of architects," but refers to the fact that in some of the States the licensing of architects "rightly remains with the Government." Now that you propose a licensing act with a Government Board of Examiners, he objects to that also.

There are, however, some tenets as regards architectural education and the architect's relation to the public which, I think, we all hold in common and some of these might be enumerated. All will agree that the architect should be a thoroughly trained man, whose training should not be confined to the practical knowledge requisite for safe building, but should include a most thorough training in all that makes for good architecture as an art. To carry on this training, all will surely agree that there is need of the educational facilities of schools of architecture with proper staff and equipment. And whatever the efficiency of the architect, by whatever system or lack of system it may be produced, all will agree that the safety of the public demands that stringent building laws should be enacted and well enforced.

Differing to some extent from Mr. Horwood as to ways and means, it seems to me that the only hope of inducing systematic study for architectural students is found in some form of compulsion. As a corollary, the only hope that the public have to obtain properly qualified architects is to demand a system, that will guarantee that all who practice as architects have at least the advantages of a thorough education—a system that assumes that there are some things that every architect should be taught. To adopt such a system would not be the wielding of a "rod." It would be merely the placing of a barrier in the road of the student—a barrier that would be promptly let down to those willing to exert themselves for their own betterment.

Personally, I care not how this compulsion is brought about, whether by the making of the profession a close corporation or by a licensing law or by the gentler compulsion brought into action by the gradual recognition by architects and the public of the superior efficiency of the graduates of some school of architecture or of those who have followed the course of study and training presented by some architectural association with the consequent necessity felt by all desiring to obtain positions in architects' offices or to establish a practice on their own account of falling into line. The first method seems to be out of the range of practical politics, the second, the system most readily obtained if advocated by the public as a public safeguard, and the last, the most peaceful way whereby architects interested in architectural education may realize their ideals.

At present, we lack educational facilities. Mr. Horwood proposes that the Government provide well equipped architectural colleges and is prepared to assure the Government that if it do so the class-rooms will be promptly filled with eager students. He states that the younger generation does not now refuse to take advantage of the limited opportunities of self-improvement at hand as evidenced by their willingness to attend the few good ateliers which have been organized, where the flickering effulgence of midnight oil is substituted for the glare of the lights of the hockey rink or the glittering allurements of the vaudeville theatre frequented by less seriously-minded youths. He instances the many who make pilgrimages to such centres as New York with their many opportunities for study. I know something of the conditions existing in New York, and even in that centre of the hundreds and hundreds of architectural students, there is but a very small proportion who, once outside the range of vision of the man who pays their salaries are worried by ambitious desires to study and work. There will always be the elite in any body of men, old or young, those who are willing to do more than their fellows. These will take care of themselves, but it is the greatest good for the greatest number that, I am told, educationalists as well as statesmen must consider.

Were there some universally impelling motive in a new condition to arise, the number of students prepared to take a proper course of study would automatically be so increased that the Government would be warranted in providing proper educational facilities, thus bringing about a state of affairs we all agree should exist.

It is sometimes said that compulsory education involves a system of study and examination, which produces machine made graduates, whose individuality has been crushed in the process. If this be the result, it merely indicates that the system has not been properly worked out. An architectural school should encourage in every possible way individual talents and proclivities, by special courses, study, scientific and artistic, outside the regular courses, by special atelier work, presided over by enthusiastic practicing architects, by travelling scholarships, and by many other means which are even now being adopted by architectural colleges.

The conclusion of the whole matter seems to me to

be that it is the duty of all architects to advocate a system of architectural education which is suitable to the needs of all architectural students, and must be followed by all, a system providing in the fullest manner for the encouragement of individual talents and by advocating such a system support the public in its demand for a higher standard of efficiency in the profession.

Yours very truly, A. H. GREGG.

Toronto, January 16, 1908.

**TORONTO HAS BEAUX ART SOCIETY.---
Atelier System of Study Inaugurated by Draughts-
men of the Various Architectural Offices. . . .**

THE ATELIER system of study, so decidedly in vogue in France, has to all appearances become a fixed mode of education in Toronto, where a number of draughtsmen from the various architectural offices have banded themselves together in what is known as the Beaux Art Society of Toronto. The object of the Society is to provide a better opportunity for the pursuit of knowledge in the theory and application of the laws of building design than is to be obtained in the average office, and up to the present time the movement is evidently meeting with a deserved success.

Although this system of study does not meet with the approval of many members of the profession in Canada, nevertheless the end more than justifies the means and it will answer the purpose admirably in the absence of a more efficient or better method of architectural education.

It will at least enable the students to match their ability by actual competition, give them an opportunity for a greater diversity of subject matter on which to test their skill, and broaden their knowledge by a closer association and a mutual interchange of ideas. Furthermore it will ground them more thoroughly in the ethics of their calling by bringing about a feeling of fraternalism which should in after years reflect to the honor and dignity of the profession.

The Society at the present time comprises thirty members, and at Atelier Lyle, corner of Yonge and Yorkville Sts.—so styled in honor of their patron, Architect John M. Lyle, who is generously devoting two nights a week in giving instructions and setting problems—a large class of young men each night grapple earnestly and enthusiastically with the work that has been placed before them.

With the selection of each subject, the students make a preliminary sketch which is turned in to the Secretary, Mr. I. Feldman, within a limited time on the night the problem is set. These sketches are gradually developed on subsequent nights (a limited time being set for each portion of the work), until the plans, elevations and drawings have been completed and are ready for criticism.

While the Society has only been organized three months, it is making excellent progress, as the students are now working on their fourth problem in competition for a prize offered by one of the local architectural bodies who are in sympathy with the efforts the draughtsmen are making to qualify themselves for the important duty of the profession of Architecture.

CONCRETE TELEGRAPH POLES. . . .

IN CONTINUANCE of the declared policy of the Pennsylvania Railroad system to provide against timber scarcity, the lines west of Pittsburg have just completed and placed in experimental service a line of concrete telegraph poles through New Brighton, Pa. Its construction followed a series of elaborate experiments which have been conducted during the past two years.

Owing to the fact that wooden poles are constantly becoming more expensive and more difficult to obtain,

the Pennsylvania in 1906 began to test the value of concrete as a substitute for wood. Fifty-three reinforced concrete poles were set up in line along the Pittsburg, Fort Wayne & Chicago Ry. near Maples, Ind. A year later they were giving entire satisfaction and showed no evidence of decay.

According to the experiments made so far, it is thought that a concrete telegraph pole will last for many generations, thereby doing away with the frequent changes necessary with wooden poles. Much importance is also attached to the increased strength of the new poles, which hold the strain of the line, even on curves, without any braces.

The poles at New Brighton are of graceful proportions, being about 30 feet long, 14 inches in diameter at the bottom and 6 inches at the top. Their general appearance is particularly pleasing on account of the uniformity in size, shape and color.

ARGENTINE REPUBLIC offers a market for water-works machinery, sanitary supplies, bridge materials and machinery and appliances used in railway construction, that should advert the attention of Canadian manufacturers and supply dealers in these lines, who are looking for outside business. The government of that country has just authorized a large number of public improvements that includes principally that class of work for which the above named machinery and materials will be required. Besides numerous new railroads and extensions to be constructed in various sections, four towns are to be provided with sanitation works which will cost from \$175,000 to \$1,100,000 in each instance; three towns are to have water supply works at an expense of \$225,000 to \$350,000, according to their relative importance; and two new bridges are to be constructed on the road from Santa Fe to Santa Rosa, one over Arroyo Leyes and the other over Arroyo Potero. A decree has also been passed authorizing the construction of docks, wharves, warehouses, grain elevators, transporters, etc., at the mouth of the Arroyo Pareja, near Puerto Belgrano, Bahía Blanca; and plans for similar improvements at Mar del Plata have been approved. It is understood that most of the material necessary will be admitted duty free.

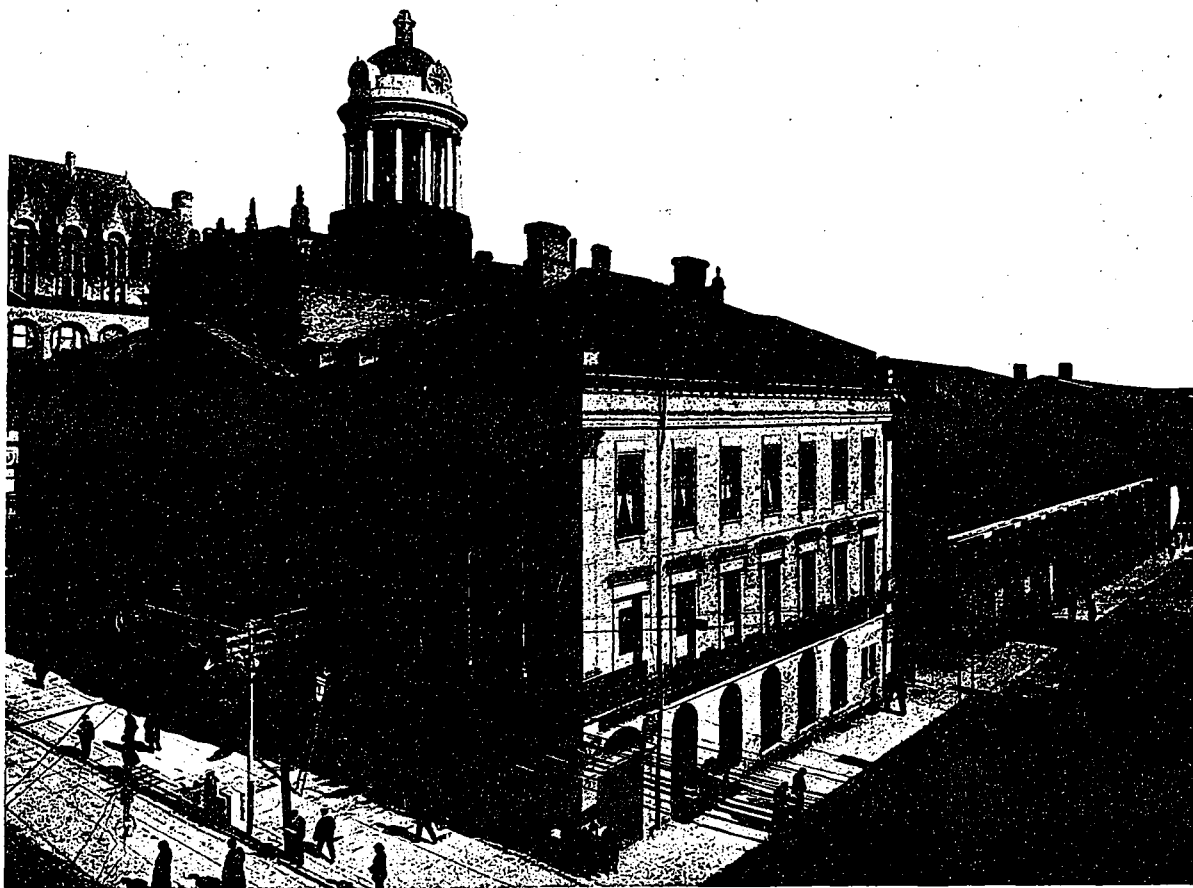
RELIGION AND BUSINESS are to be combined under one roof, according to plans made public by the trustees of the First United Evangelical Protestant German Congregation of Pittsburg, for what will be one of the most unique structures in history, a fourteen-storey joint office building and church. The part to be devoted to church purposes will occupy the middle portion of the building, while around it are to be suites of modern offices. The reason given for this novel undertaking is that a restrictive clause, inserted by the donor in the deed of conveyance made many years ago, provided that the ground on which the building is to stand, "must always and ever be used for church purposes." Several churches have come and gone on this valuable plot at the corner of Sixth avenue and Smithfield street, in the heart of the downtown district, while skyscrapers have grown up all around it. The congregation cannot sell and rebuild in the suburbs, as it would like to do and could do at great profit, so the happy thought was struck that an office building and a church could be combined. The front elevation of the new edifice shows a beautiful cathedral style facade in the centre. The church effect rises with the building for about seven storeys, then permits the office part to continue skyward. There is to be a great chime of bells in the church, and the whole edifice will cost not less than \$1,500,000. The Board of Trustees obtained legal advice before taking this step in erecting an office building on property set aside for church purposes.

CANADIAN DELEGATION VISITS CLEVELAND.---Attends National Cement Users Convention with Good Results.---Many U.S. Firms to Exhibit in Toronto.---C.C.C.A. Convention and Exhibition to be a Big Success.

THAT THE FIRST Convention and Exhibition of the Canadian Cement and Concrete Association will be an unqualified success beyond even the most sanguine expectations of its organizers, was proven by the enthusiastic and wide-awake delegation from the C. C. C. A. to the convention of the National Association of Cement Users, held January 11 to 16, at Cleveland, Ohio.

This delegation, headed by Mr. Peter A. Gillespie, lecturer on the theory of construction, of Toronto Univer-

National Convention at Cleveland, went away without being thoroughly impressed with the fact that the C. C. C. A. is soon to hold their convention in Toronto. Our American friends were profuse in their praise of the progress that Canada has made in the past few years, and all appeared very much interested in conditions in this country. Mr. Nixon, assistant manager of the coming Canadian Cement and Concrete Exhibition, was successful in inducing a large number of exhibitors at the National Show, to bring their exhibits to Toronto.



ST. LAWRENCE ARENA, TORONTO, WHERE THE FIRST CONVENTION AND EXHIBITION OF THE CANADIAN CEMENT AND CONCRETE ASSOCIATION WILL BE HELD FROM MARCH 1ST TO 6TH.

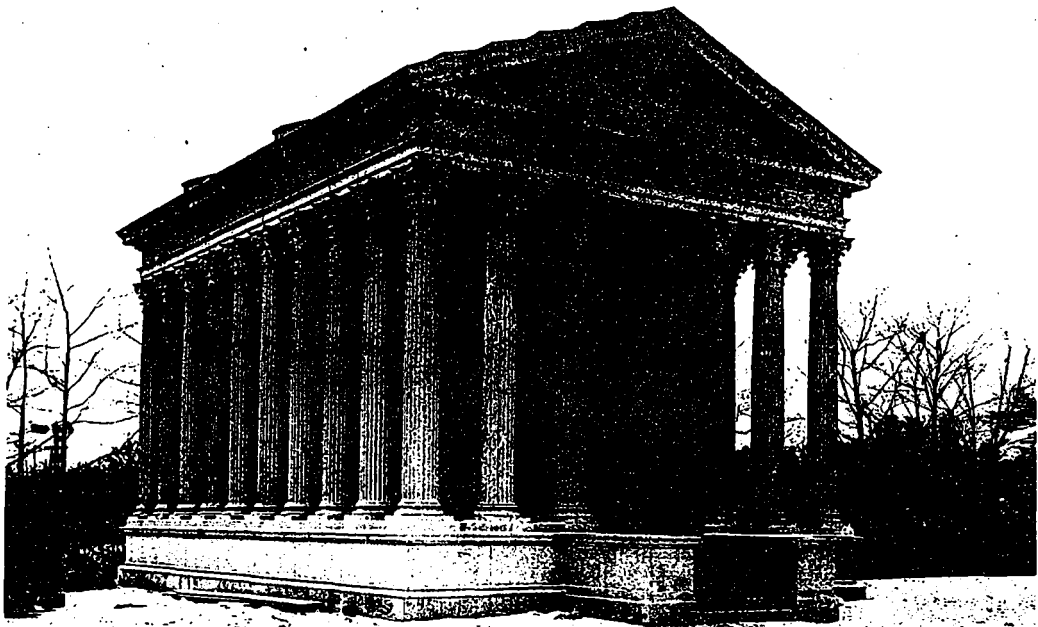
sity, was between twenty-five and thirty strong. Quebec, Montreal, Toronto, London, Brantford, Mitchell and Windsor were among the cities represented in the Canadian delegation. Among these were represented the most prominent firms in Canada, engaged in almost every branch of the cement industry. Some 200 badges, containing the insignia of the association in red and blue, announcing the C. C. C. A. Convention to be held at Toronto from March 1 to 6, and about the same number of small silk Union Jacks were taken along by the delegates, most of whom went in a private car from Toronto on Tuesday evening, January 12; these were pinned upon the coats of the delegates in attendance at Cleveland, and were much in evidence everywhere during the entire convention.

We are safe in saying that nobody who attended the

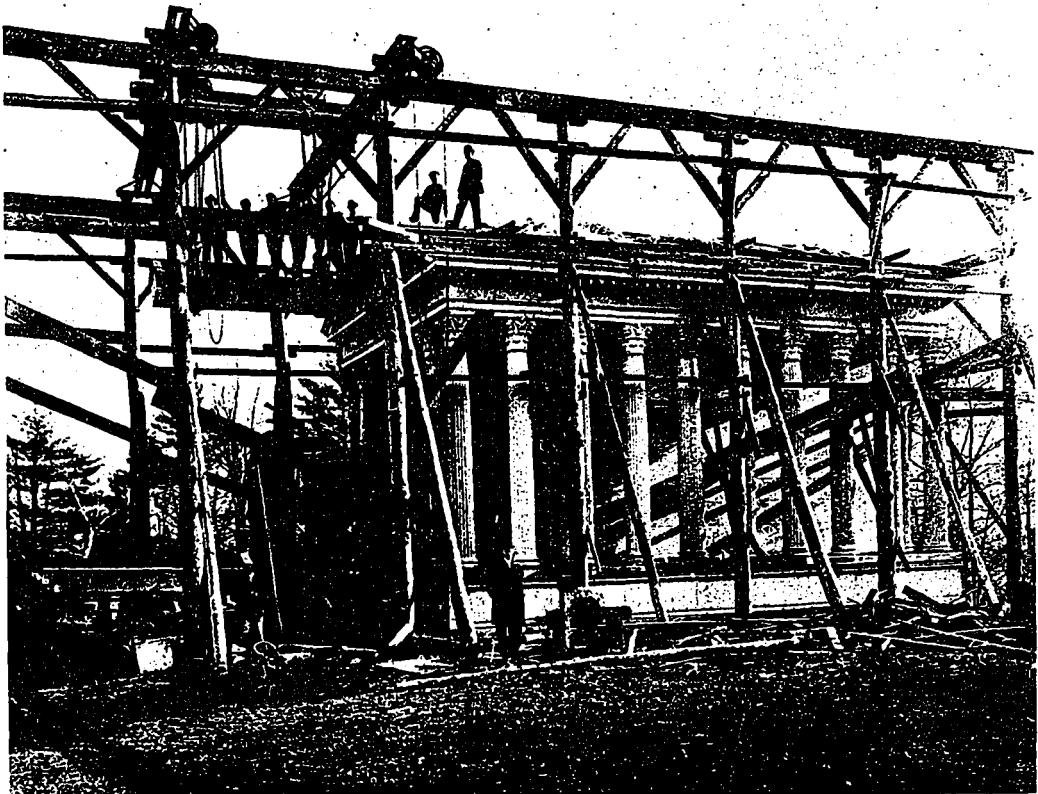
The Canadian firms engaged in any branch of the cement industry, should by all means make arrangements at the earliest possible date, to exhibit at the Canadian Show. Those who took the time to carefully view the large number of exhibits at Cleveland, could not fail to be impressed with the importance of such exhibits, and also with the material, direct benefits gained by the exhibitors in actual sales made on the floor, let alone the advertising value for future business.

St. Lawrence Arena is an ideal auditorium to hold such an exhibition. Its solid concrete floors of great area, and its large entrances make it possible to arrange any nature of exhibit desired.

For further information, plan of Exhibition Hall, etc., prospective exhibitors should address Mr. R. M. Jaffray, manager, 1 Wellington street west, Toronto.



THE EATON MAUSOLEUM RECENTLY ERECTED AT MOUNT PLEASANT CEMETERY, TORONTO. ARCHITECTS SPROATT AND ROLPH, DESIGNERS.



THE EATON MAUSOLEUM, MOUNT PLEASANT CEMETERY, TORONTO, SHOWING SCAFFOLDING USED IN ITS ERECTION. ARCHITECTS SPROATT AND ROLPH, DESIGNERS.

THE EATON MAUSOLEUM.---Massive Structure Recently Completed at Mount Pleasant Cemetery, Toronto.---Designed in Roman Corinthian Order.---Contains Twenty-Two Catacombs.---Built of Stanstead Granite.

THERE HAS JUST been completed in Mount Pleasant Cemetery, Toronto, a mausoleum of unusual size and beauty, which is to contain the remains of the late Timothy Eaton, and which was erected by his family. As shown in the accompanying illustration the structure is of the Roman Corinthian order, modified in detail somewhat to suit the material of which it is constructed, every member being carefully and accurately proportioned and finely finished. The dimensions are 48 feet 6 inches long, 29 feet 2 inches wide and 32 feet 3 inches high.

The foundation is built very deep of solid concrete, from which rises the pedestal with finely molded base, the cap extending under the main wall line forming a wide platform of unusually large and heavy stones, assuring the perfect stability of the superstructure.

On this platform are set the twenty-eight columns in perfect alignment throughout, and the detail and workmanship shows a most perfect rendering in cut granite; the care and skill displayed in the undercut foliage of the capitals and the artistic excellence of the entire work being especially noteworthy for this material. The fluted columns stand in pleasing contrast to the plain walls of the cella, the architrave and entablature of the

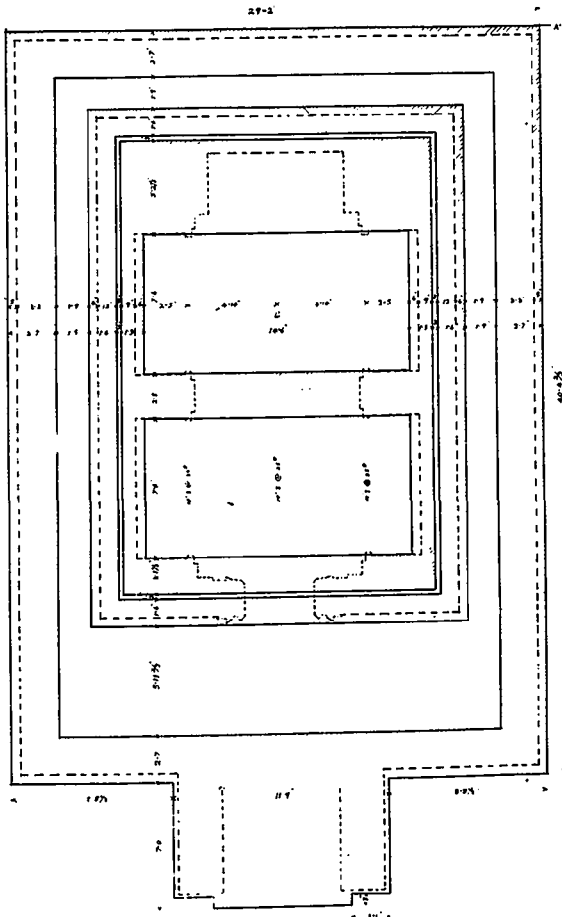
doorway only being relieved by carving of severe conventionality.

Above the columns and molded architrave the wide heavy stones forming the frieze again connect the colonnade and the main wall in solid bond to carry the tremendous weight of the thirty-three roof stones, which run from five to twelve tons each. The whole roof is set on a solid mass of heavily reinforced concrete (100 cubic yards in quantity), each stone so lapped and jointed as to be perfectly weathertight under any conditions. The accuracy with which these stones are cut is attested by the straight lines and fine jointing throughout, no trimming having been necessary in the setting. The work is entirely executed of granite from the quarries at Stanstead, Quebec.

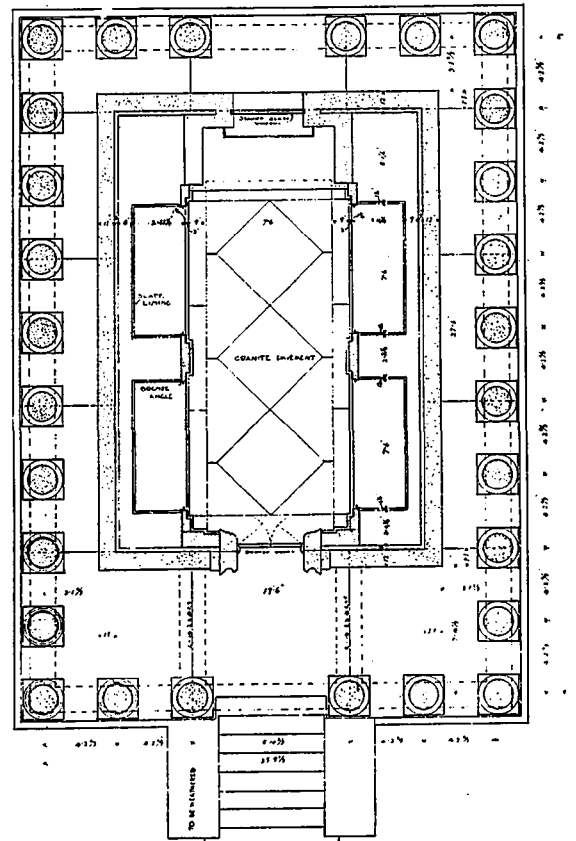
An unusual feature of the mausoleum is the interior, the shelves and every exposed surface, including floor and ceiling, being of highly polished Stanstead granite, some of the stones being very heavy.

There are twenty-two catacombs (none being below the floor) lined with heavy slate and each closed with a slab of polished granite weighing nearly one-half a ton.

The interior is almost a structure by itself, being entirely separated from the outer wall by an air space of 3 inches, carefully ventilated, so that no dampness can come through and cause staining, and each crypt when sealed up will be practically air-tight. The somewhat sombre effect of the interior (not out of place in such a



FOUNDATION PLAN, EATON'S MAUSOLEUM, MOUNT PLEASANT CEMETERY, TORONTO. MESSRS. SPROATT AND ROLPH, ARCHITECTS.



FLOOR PLAN, EATON'S MAUSOLEUM, MOUNT PLEASANT CEMETERY, TORONTO. MESSRS. SPROATT AND ROLPH, ARCHITECTS.

structure) is relieved by handsome bronze fittings and a fine stained glass memorial window, which add a note of rich color to the polished surfaces. The window is protected by a bronze grille, the doors, too, being of bronze, their plain surfaces being of a modelled or matt finish and the grille work machine finished for contrast.

In erecting the mausoleum, a trestle 90 feet long and 34 feet wide and 36 feet high was built, carrying two travelling cranes of 15 tons capacity each. On each of these was used a Yale and Towne 10-inch chain hoist, and for the heaviest stones the chains were doubled.

The mausoleum was designed by Messrs. Sproatt & Rolph, architects, Toronto, and carried out under the direction of Mr. W. R. Mead, supervising architect for the owners. The McIntosh Granite Co., 1119 Yonge street, Toronto, were the contractors for the entire work.

CONCRETE FREEZING TANKS.—An Experiment in the Refrigerating Line.

AN EXPERIENCE in the construction of reinforced concrete freezing tanks was referred to in a paper before the recent meeting of the American Society of Refrigerating Engineers by Mr. Wm. M. Torrance, New York. The tanks are 27½ ft. wide by 39½ ft. long and 4 ft. deep, inside and have a floor and walls 8 in. thick. The latter are reinforced with cold twisted steel bars, 5-8 in. square, placed 12 in. center to center in each direction, so that the entire area of base and sides was gridironed with these bars. By calculation for range of temperature or from -10 degrees F. to +90, degrees F., these rods were found sufficient to take care of temperature strains. The vertical rods in the side were made continuous with those crossing each other in the base, the bend at the corner being made cold so as to preserve for the steel the extra strength due to twisting the rod in the first place. This bend is near the inner surface of the concrete, while the general location of rod is near the centre of the slab. This is brought near the inner surface to take care of the stresses induced at the corner by the hydraulic pressure of the brine against the sides of the tank.

In these tanks the insulation consisted of screened cinders filled with coal-tar pitch, a kind of insulation that is not recommended by some, but, nevertheless, it has much to recommend it. Cinders cost nothing but transportation, as a rule, and coal-tar pitch, besides being comparatively inexpensive, is impervious to moisture, as well as a fairly good insulator. There can be little question but that, being a mineral substance, its life as an insulator will exceed that of a purely vegetable substance, as cork. Being incapable of absorbing moisture, it will always remain insulating. If the cinders are well screened of all dust and the spaces between the individual pieces of cinders deposited loosely, are well filled with the boiling hot pitch, one could not ask for a better result than will be obtained, provided, of course, that sufficient thickness of the insulation be used. Of course, another great advantage of this type of insulation, whether used outside a steel tank or outside a concrete tank, is its additional property of non-absorption of moisture, being, if well placed, a waterproofing. Thus, if the brine or any portion of it could find an opening through the steel or concrete it could not leak away through or into the insulation, thus being wasted and spoiling the insulation at the same time, if this form of insulation were in use.

This insulation was for the floor, placed on the top of the foundation, before the tank was built. That on the sides was placed afterward, the outside concrete forms being moved back and the cinders and tar being placed in the space between them and the finished concrete wall. It was decided that the concrete itself has about the same insulation coefficient as a brick wall or about half that of the cinders and tar, so that for the

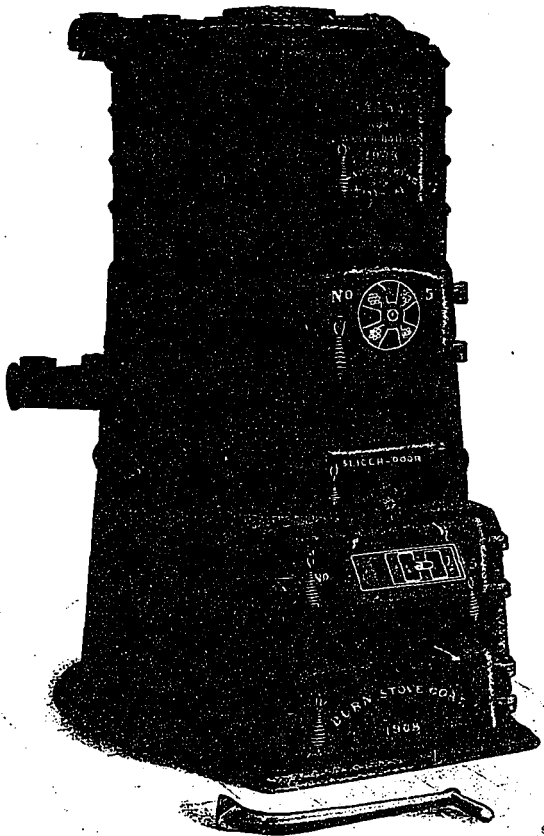
same degree of perfection in insulation several inches of the thickness of this cinders and tar mixture were saved.

Oftentimes steel tanks are worn out after only a few seasons of use. This is often due, as is well known, to the habit of the operatives of strengthening their brine by adding common salt (NaCl) instead of the calcium chloride (CaCl₂), which they should have on hand, but which is either lacking or, from the operatives' standpoint, too expensive. This common salt, of course, rusts the tank out very rapidly. While to many this might not be considered a recommendation for concrete, this practice, Mr. Torrance states, would not injure a concrete tank, as neither NaCl brine, nor CaCl₂ brine would have any chemical effect on well-made concrete. In fact, with a concrete tank installation it might be found to be cheaper to use NaCl altogether and not get the more expensive CaCl₂.—ENGINEERING RECORD.

MONTREAL'S GREATEST TROUBLES seem to lie in the erection of police and fire stations. Following the wrangling, indefinite delays, inconvenience, and adverse criticism when the building was completed, of No. 5 Fire Station, comes another mix-up in the shape of the new No. 13 Police Station at the corner of Frontenac and Forsyth streets, which may lead to the appointment of a royal commission to enquire into alleged irregularities in connection with its erection, and also into the general civic administration of the city. The difficulty in this particular instance is apparently due to the fact that the architect, when he found the land upon which he was authorized to build, ten feet shorter than the measurement of the site as given him from the deed of sale by Notary Morin, modified the length of the structure so as to conform with the available ground area, without notifying the Police Committee. This has brought forth the question as to whether the cost of the building would have been proportionately reduced had the fact not been discovered, and things are astir. The architect, in defence of his position, states that he acted strictly within the limits of his contract, which gave him power to make any modification in the plan found to be absolutely necessary by unforeseen contingencies, and that he had also brought the matter to the attention of Alderman Proulx, chairman of the committee, and Chief of Police Campeau. Had this been the first affair of its kind in Montreal, it could possibly be ascribed to the unlucky number to which the building is heir. Something is seemingly wrong, however, and has been wrong for some time. It might be suggested that Montreal bring about a state of reform by installing a new body of officials, making all buildings fireproof, doing away with the necessity of fire and police stations, and thus obviate exasperating circumstances of this kind in the future.

IN A COMPARATIVE REVIEW of the imports of machinery into Japan, an Osaka newspaper comments upon the peculiarities of the times. It refers to the fact that the value of machinery imported into this country in 1905, \$10,400,000, fell to \$9,235,000 in 1906, but rose to \$13,845,000 in 1907. The tendency to increase is still more pronounced this year, the value for the first seven months of 1908 reaching \$11,185,000, exceeding the figures for the whole of 1905 and being only about \$2,500,000 less than the value for the whole of 1907. If it continues unchecked, the value of the machinery imported in 1908 may amount to as much as \$17,500,000. The figures for the first seven months of the years 1906, 1907, and 1908 were \$5,568,698, \$7,419,478, and \$11,188,890, respectively. The bulk of the machinery now being imported consists of lathes and other machines for iron, electric, and steam works, and spinning, dyeing, mining, and mineral-smelting machinery.

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is the talk some people use when they try to sell their boilers, yet, unconsciously they pay a tribute to the DAISY'S WORTH and PRESTIGE.

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that is just as good, and it is the incomparable, unapproachable pioneer of HOT WATER Boilers, 30,000 of which are in active service—its name, need we tell you, is

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AN UNEXPECTED FIRE TEST.

THE OLD saying "that it's an ill-wind that blows nobody good" was strikingly illustrated in the recent conflagration which swept Pembroke. Regrettable as a misfortune of this kind is, it has not been without its element of good in that it not only emphasizes the fallacy and prodigality of shoddy construction and the use of inflammable materials, but it brought forcibly before the people of that town the virtues of cement concrete as a barrier against fire.

In the very heart of the burnt district, with ruin and desolation on every side, stands the carriage and wagon factory of Alexander Barr, a two-storey structure covering a ground area of 102 by 40 feet. The building was erected in 1905, and its remarkable preservation to-day is due to the fact that it was constructed of cement concrete.

Surrounded almost entirely by a seething mass of flames, which beat unsuccessfully against its walls, and situated at a point at which no water was used, the admirable manner in which this building withstood the fierce onslaught of heat and fire, is best shown in the accompanying illustration, reproduced from a photograph taken after the smoke of the conflagration had cleared away.

The test while unexpected at the time was a practicable and convincing one as regards the fire resisting qualities of Portland concrete cement. The adjoining buildings which stood within eighteen inches of this structure were entirely destroyed, and the heat from these buildings was intensified by five cords of blazing wood which were piled against the factory's wall. The cord-wood was completely consumed, but the wall remained uninjured.

Representatives of the International Portland Cement Company, whose cement was used in the construction of the building, upon going to Pembroke in order to fully ascertain the action of the fire on the building, found the structure standing intact without the concrete showing the slightest indication of disintegration.

The building is but another substantial proof of the

fire-resisting properties of well made concrete. It is a lesson which will, or should at least appeal to the intelligent residents of Pembroke in rebuilding their structures, and be of benefit to the cement and concrete interests throughout the Dominion.

A SERVICEABLE OFFICE CALENDAR

AN ESPECIALLY splendid wall calendar, particularly well adapted to general office use, is being mailed to the trade by Mussens, Limited, of Montreal. In general character and typographical conception, it is perhaps the most conspicuous offering of the year in this respect.

The calendar is printed on rich cream tinted paper with well selected type, and highly illustrated with high class half-tones of the company's products. The month, days and numerals stand out strongly and can be readily seen from any point of the average office. These are printed in black, with the exception of the cardinal dates, which like the intersecting lines and the firm name at the top, are brought out in a vivid red.

The illustrations throughout serve to give an excellent idea of the general character and magnitude of the various lines carried by this company, whose name in Canada has become inseparably associated with everything which pertains to machinery and supplies for contractors, railroads, mines, municipalities, factories, mills, etc.

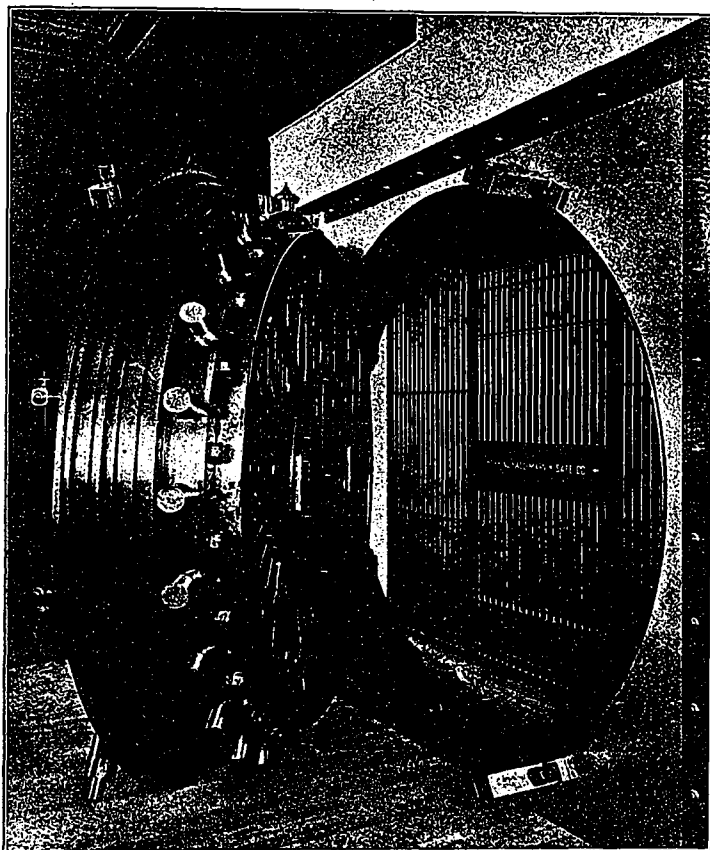
On the first page is featured a portable Smith concrete mixer with patent loading device, which can be supplied in sizes capable of turning out from 50 to 350 cubic yards per day; while other equipment, shown in convenient spaces throughout the calendar, which is of interest to contractors and structural engineers, includes hoisting engines, derricks, portable light, ball-bearing wheelbarrows, and Ideal concrete block machines.

There are also displayed a large array of machinery and supplies for municipal work, such as street sweeper and sprinklers, rollers, scarifiers, scraper and plow, as well. The Mussens, Limited, is the most complete ma-



VIEW OF DISTRICT RECENTLY SWEEP BY FIRE AT PEMBROKE, ONT., SHOWING THE CONCRETE BLOCK CARRIAGE AND WAGON FACTORY OF ALEXANDER BARR WHICH WAS THE ONLY BUILDING THAT SUCCESSFULLY STOOD THE ONSLAUGHT OF THE FLAMES.

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chinery and supply house in the Dominion and the success which has attended its efforts speaks highly of the company's aggressive method and the high quality of its various lines.

The company has a competent staff of engineers in all departments and make a specialty of designing rock crushing, concrete mixing, mining and hoisting plants. Branches are maintained in Toronto, Cobalt, Winnipeg and Vancouver.

LEST YOU FORGET.

FOLLOWING their annual custom, the B. Greening Wire Company, Ltd., of Hamilton, have just issued a particularly fine calendar for general office use during the ensuing year. It consists of a large date pad mounted on highly colored lithographic back, which shows a panoramic view of the company's splendidly equipped plant, set off artistically with a pleasing border design, and half-tones of the present president and early founders whose names it bears.

The month, day and dates are printed in large bold type, while all unused date spaces form to make a series of "gentle reminders" with line cuts of the company's products, such as foundry supplies, wire door mats, galvanized iron strands, light and heavy wire cloth, wire rope, etc.

Underneath the pad are a number of useful tables giving the size, weight, length and strength of wire, wire ropes, sheet zinc, sheet wrought iron and steel, bar iron, and also a table showing the necessary size and speed of wheels and rope to obtain any desired amount of power by wire rope transmission.

Within a fortnight the company will issue a series of new catalogues dealing with the various lines which they manufacture, which in addition to the forementioned products include wire netting, counter railing, window guards, steel wire reinforcement for concrete, wire lath for plastering and kindred lines.

These catalogues are comprehensive in their scope, having been carefully compiled and profusely illustrated. Architects and engineers will find of immeasurable benefit the large number of reference tables and other valuable information which they embody, in specifying any of the above enumerated materials, and anyone interested in products of this character, should make it a point to be on the company's mailing list when these handy volumes are ready for distribution.

A BURNING SUCCESS FOR 20 YEARS.

THE PROBLEM of warming and ventilating the church, the school and the home in a proper, even and sanitary manner, is at all times a most important one, yet it is one that has been and is being successfully solved in all parts of Canada and the United States by the "Kelsey System."

Owing to its many individual features and its special and patented construction, the "Kelsey Warm Air Generator," has much to recommend it to the consideration of the architects, and those who are contemplating the installation of heating apparatus for any character of building.

The fire pot and combustion chamber of this generator, being formed of long, hollow, corrugated section, affords an area of heating surface greatly in excess of that of the ordinary furnace, and three times as much in circulation. This result in the supplying of large volumes of pure, fresh air—and not the scorched, burnt, vitiated kind from which every vestige of moisture, that is so injurious to health and destructive of furniture and hangings.

As an economizer of fuel, it is said, that the "Kelsey generator" cannot be excelled, and by capping the section in groups of two or three it will readily heat distant room, which is an exceptional advantage in residences of large dimensions.

Users of this system speak most highly of its absolute dust and gas-proof qualities, and the fact that there is no radiation of heat in the cellar.

Perhaps the most convincing argument regarding the merits of the "Kelsey" is the fact that since they were first made in 1889, when three were sold, the demand has so steadily increased, that to-day there are 32,000 in use.

The exclusive makers of the Kelsey System in Canada, are the James Smart Manufacturing Company, of Brockville, Ont., and the highly satisfactory performance of its product is borne out by a large reference list which the company has on hand. The company employs competent heating engineers who furnish plans and



ONE OF THE MANY FINE HOMES IN WHICH THE KELSEY WARM AIR GENERATOR HAS SUCCESSFULLY SOLVED THE PROBLEM OF HEATING AND VENTILATION.

estimates for the warming and heating of any kind of building, and who are at the services of the architect and builder.

ONE OBJECTION TO GLASS ROOFS is, that if they are not very steeply inclined the water of condensation collects on their under surface, and instead of running down along the separating ribs of the panes or plates and being led off, drips upon persons or objects below, which is inconvenient and may be very expensive. Even where the panes or strips are short, the path to the trough is too long. The increase in length and width of the plates now used makes the difficulty of more and more importance each year, according to a correspondent of the National Builder.

One way of getting around it is, however, similar to that employed in forests and parks to prevent washing away of the hillside paths; namely, making inclined grooves towards the sides; only in this case the grooves are of horseshoe shape and form a series of parallel corrugations which carry the drops to the ribs which separate the plate; they then follow these without much difficulty down the slant to the trough below. This system may be employed either with glass sheets in which wire is embedded or with plain plates.

A CONCRETE BOAT, 65 ft. long and schooner rigged, is said to have been built several years ago by Mr. Daniel B. Banks, engineer of the high pressure water service of Baltimore.



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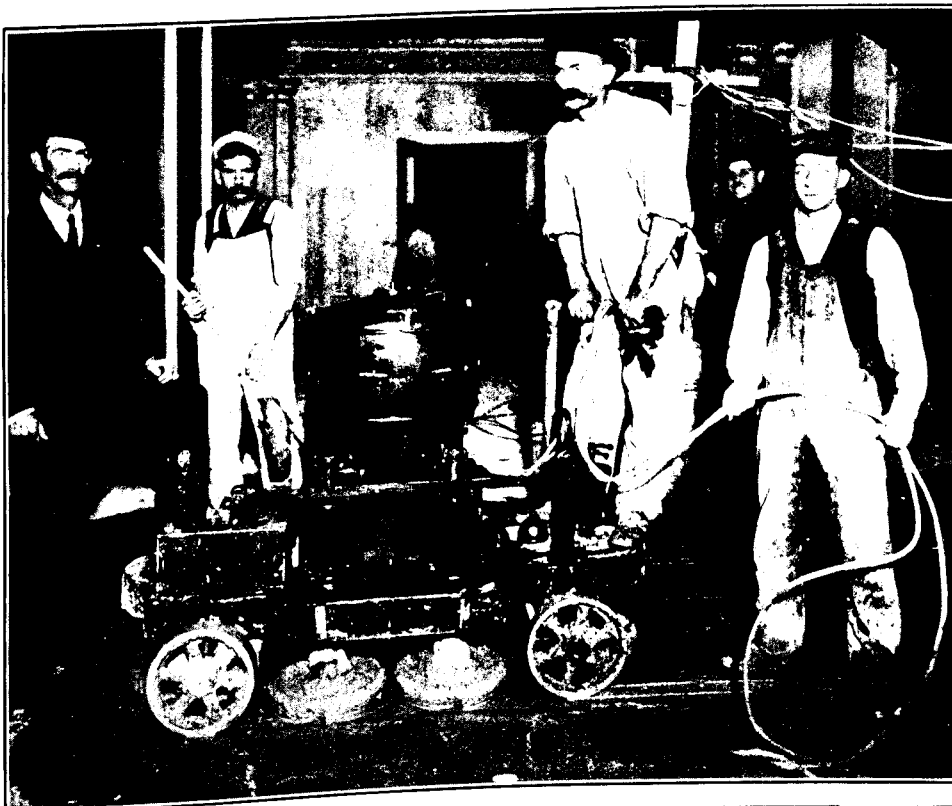
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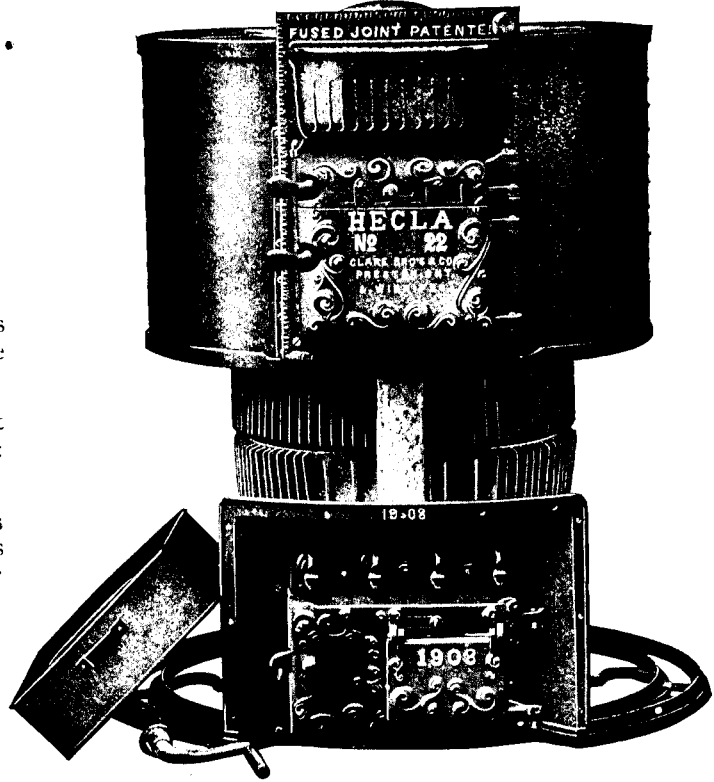
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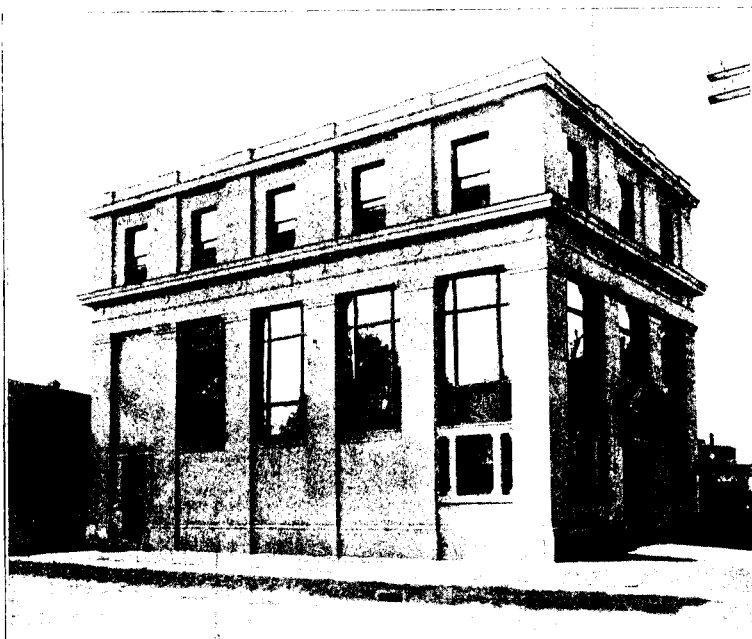
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If you are making your own power by steam, it is costing you two or three times \$20.00.

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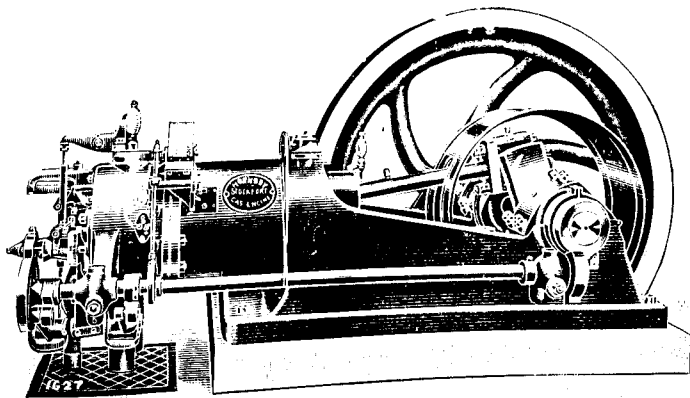
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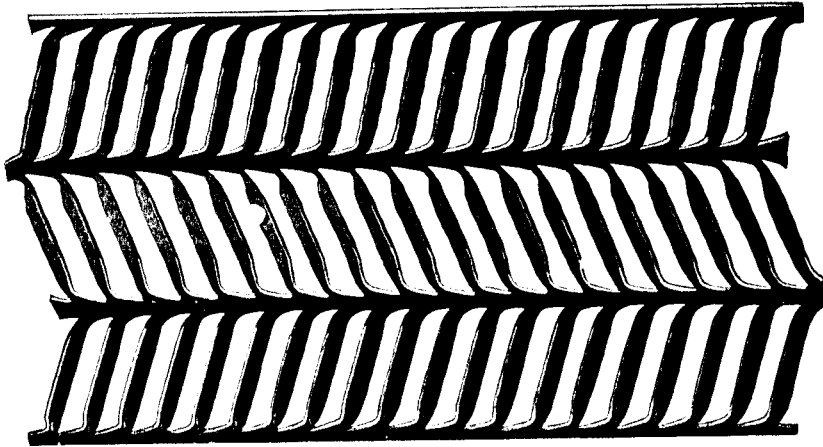
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*Estimates and Samples Furnished
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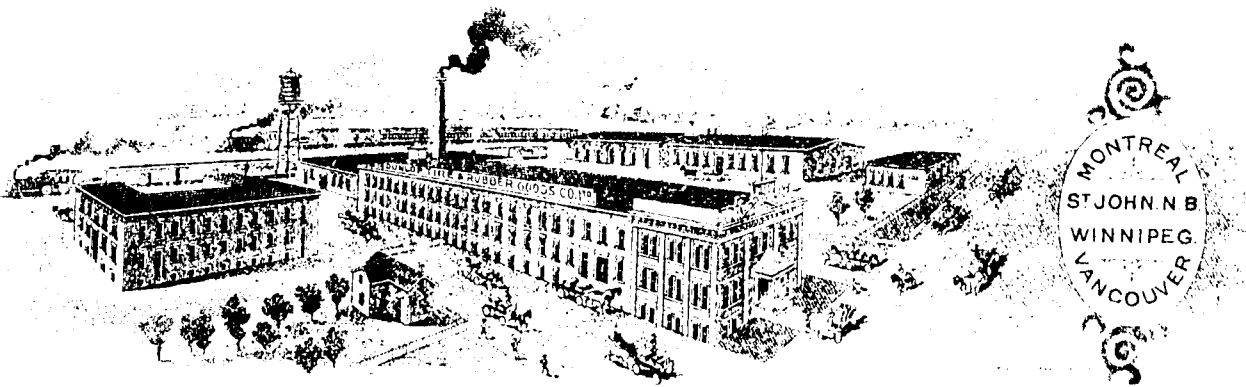
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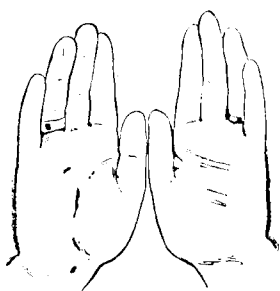
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The Mechanical Rubber Goods factory of the Dunlop Rubber Works is as large as the solid and pneumatic tire section from which the great bulk of the Carriage and Automobile trade in Canada draws its supplies.

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1908—Another year has passed and with its exit, let us forget the trials it has caused us. Let us bury our prejudices.

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Look forward to bigger and better achievements.

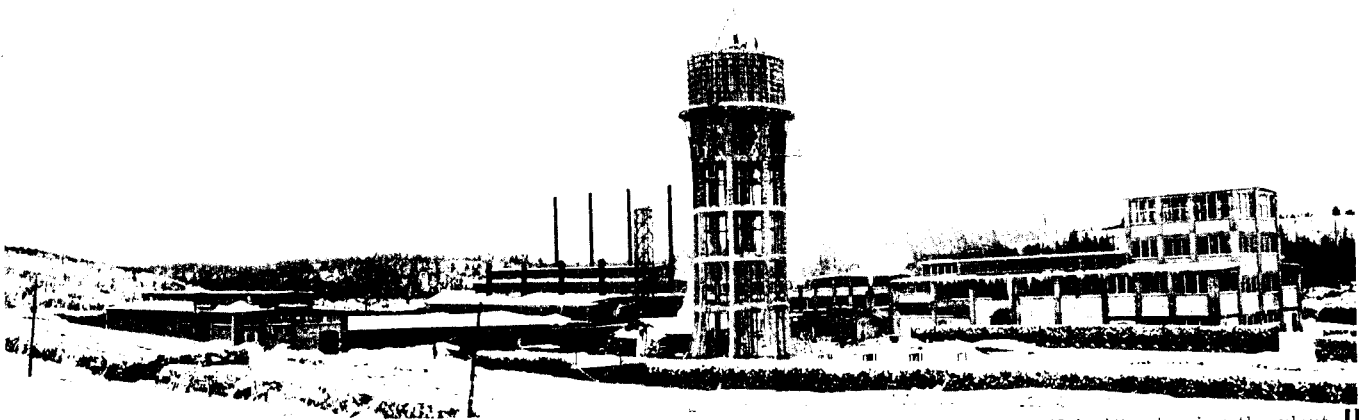
Let us hope we shall all participate in the bountiful harvest, which will be the reward of those whose work is characterized by a sincerity of purpose.

Our hearty thanks are due to our many friends for the many favors shown us during the past year, which we trust will be continued, if we are deserving.

Wishing you all a Happy and Prosperous New Year.

FRANCIS HYDE & CO.

31 WELLINGTON ST., MONTREAL



Panoramic view of new plant of Wood Product Company, Dysart, Ont., taken from the west, Dec. 15th, '08, showing the plant completed with the exception of the water tower, which remains only to be stripped. E. D. Pitt, designing and constructing engineer.

The Rolling Steel Doors for this Plant were Supplied by Us

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For any opening where there is insufficient room for a TIN CLAD FIREPROOF DOOR, these doors are the only satisfactory Fireproof enclosure. They take up but 2 inches on either side of opening, and but one foot above. They are very easily operated, and are automatic heat closing, no matter in what position they are left they will close of themselves. Let us submit prices.

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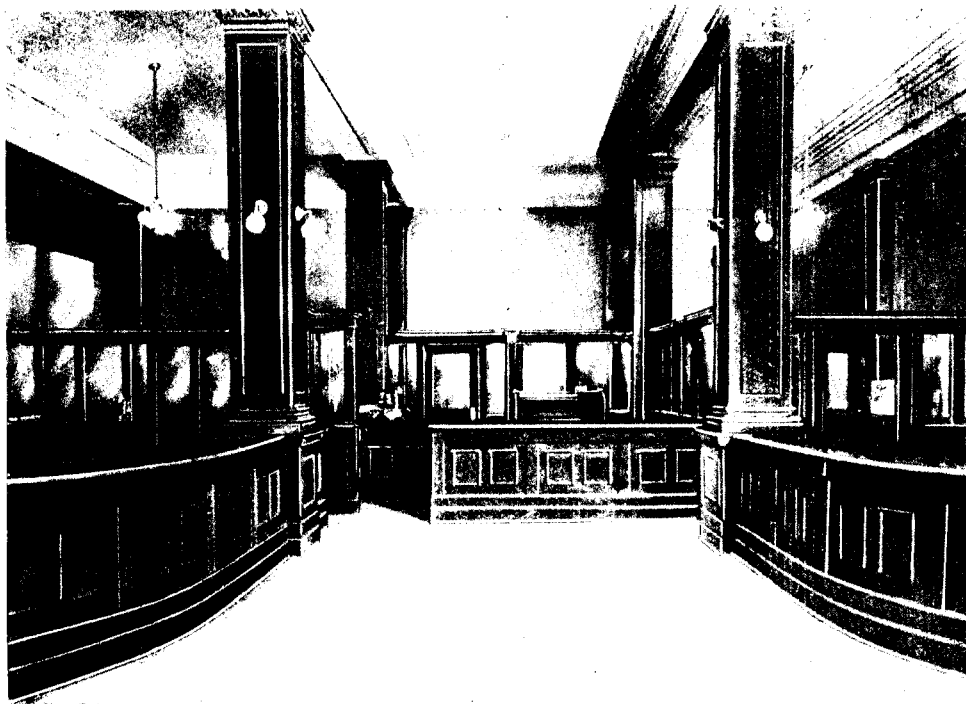
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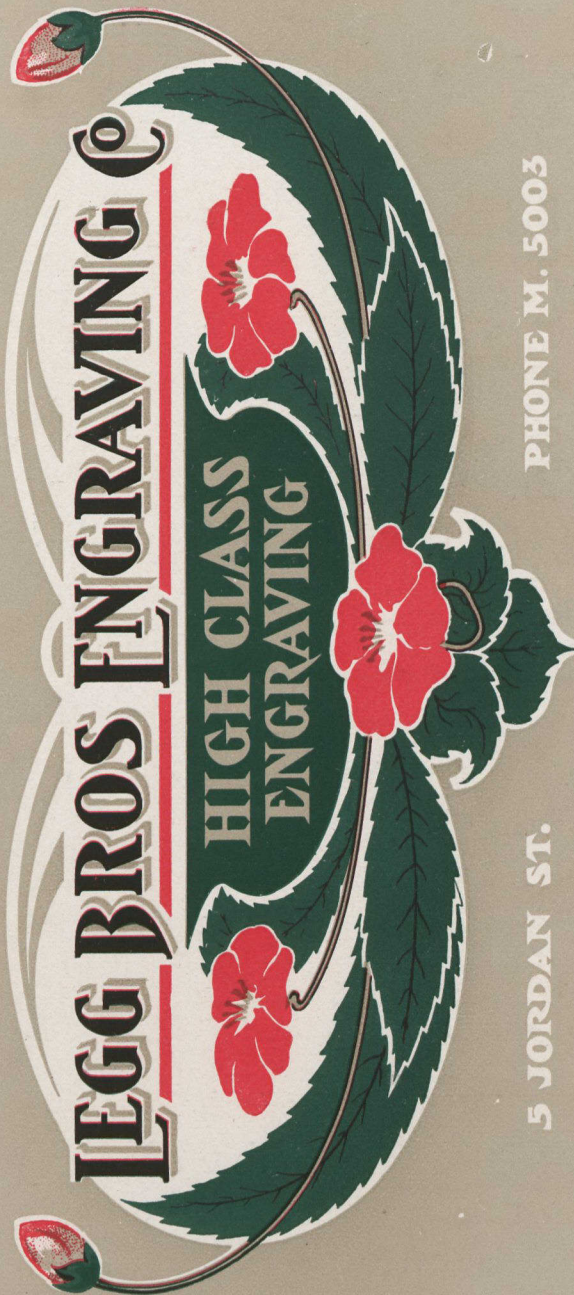
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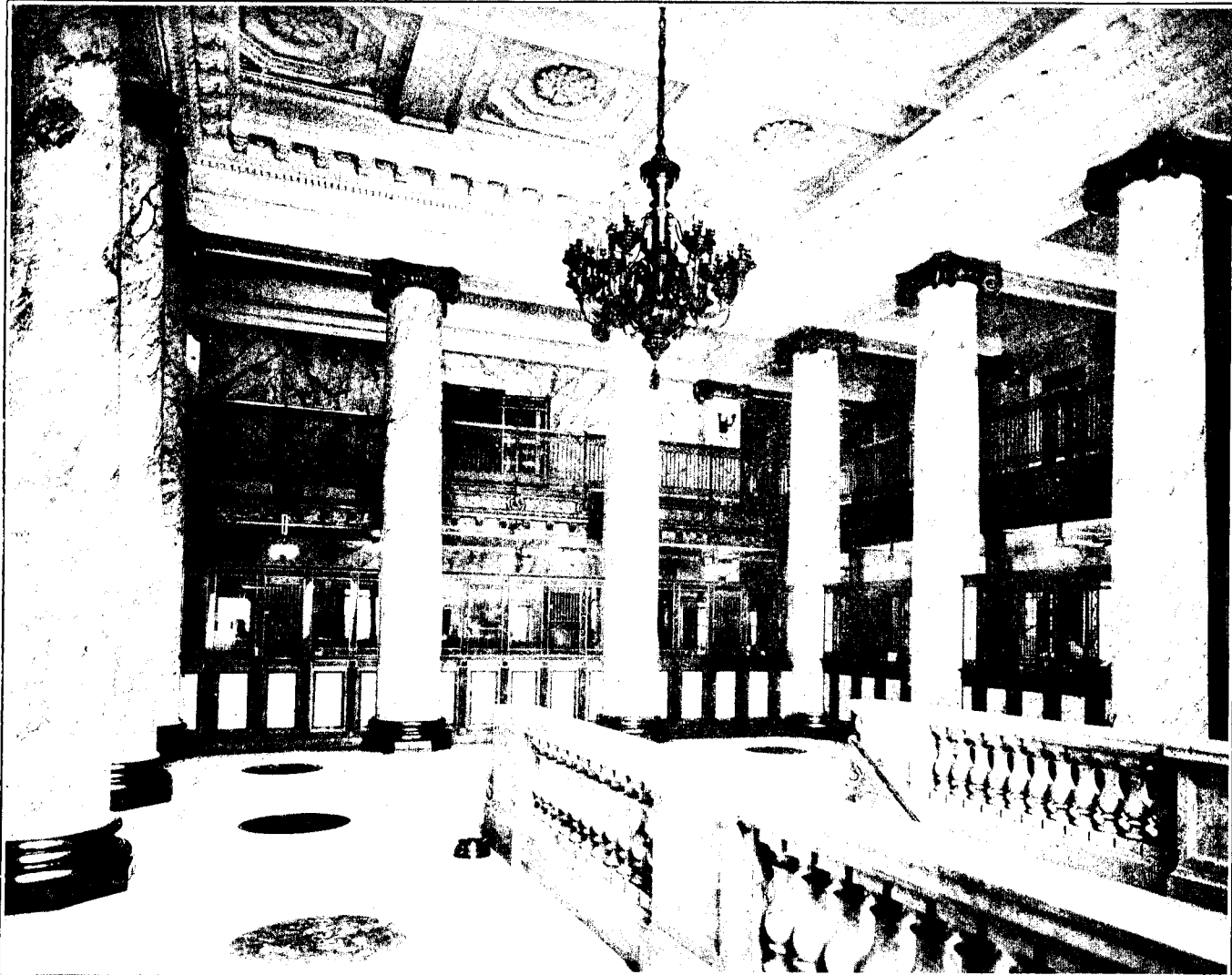
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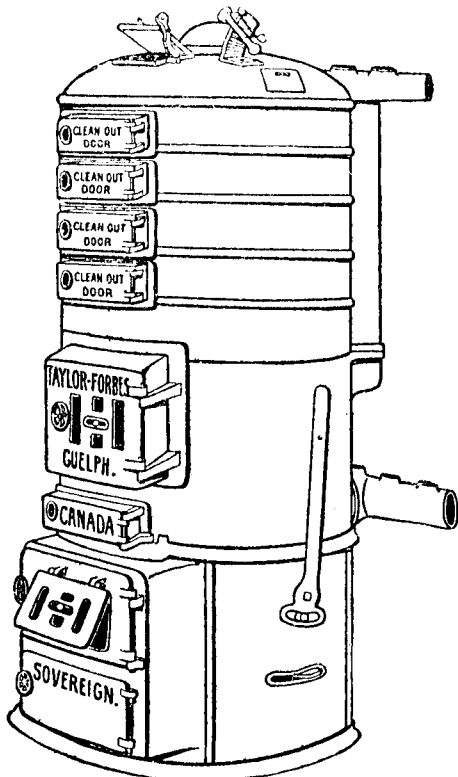
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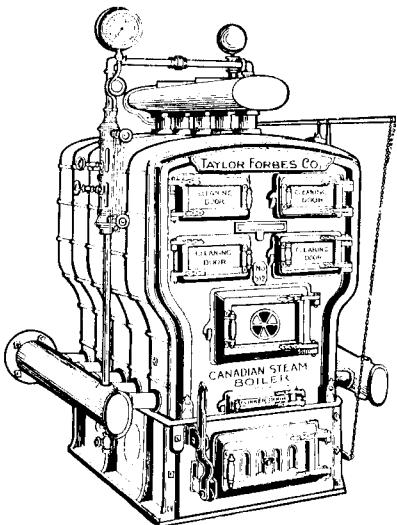
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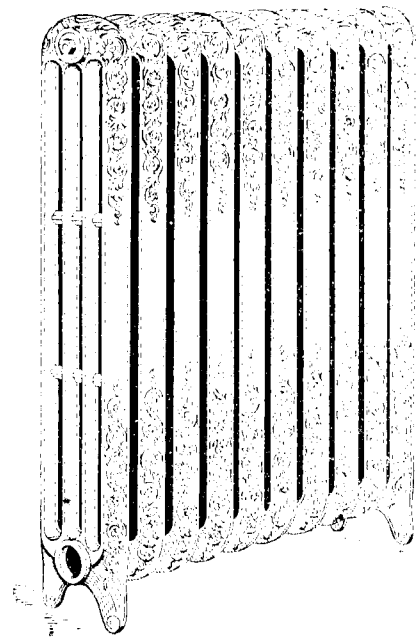
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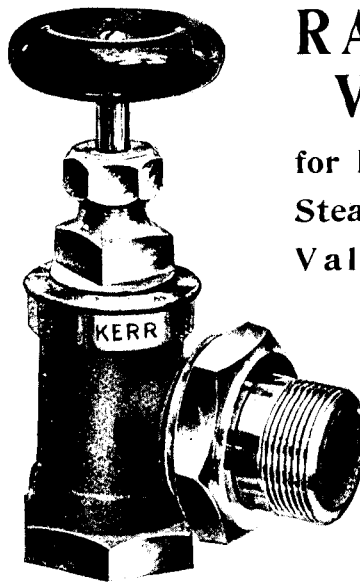
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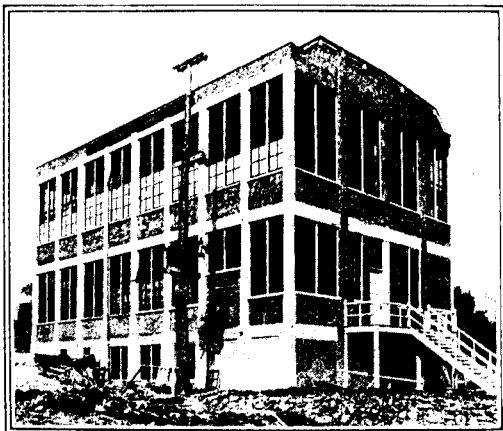
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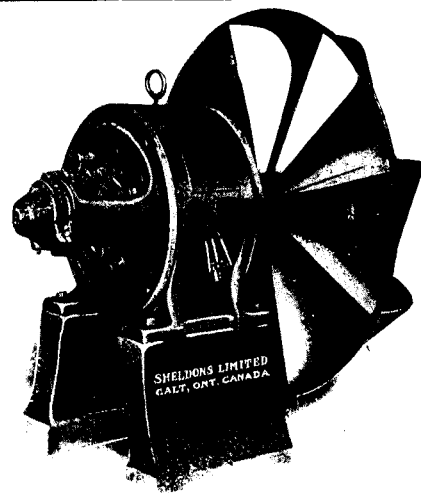
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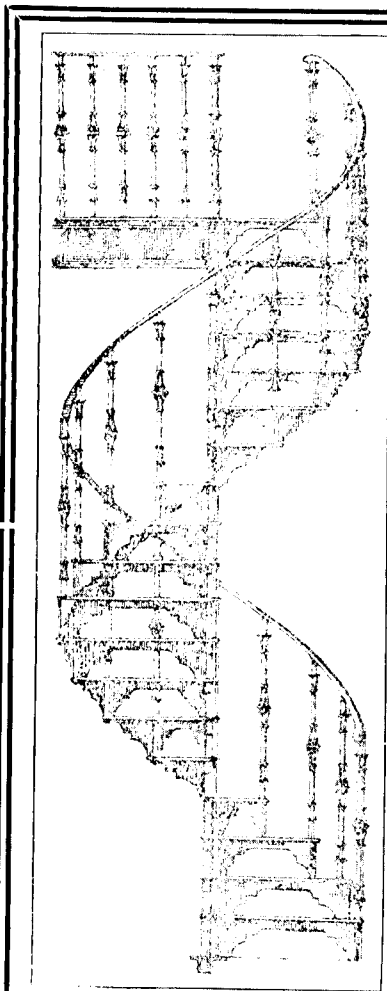
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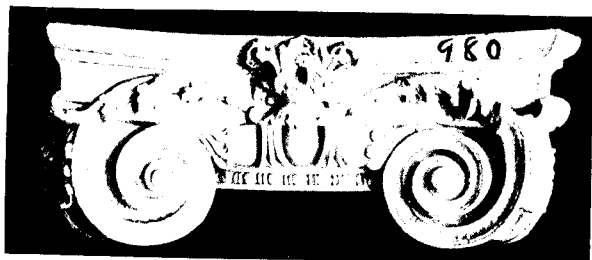
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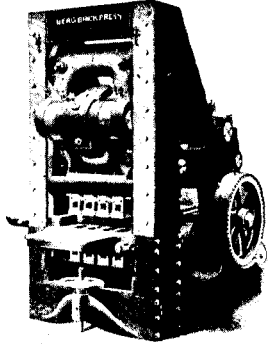
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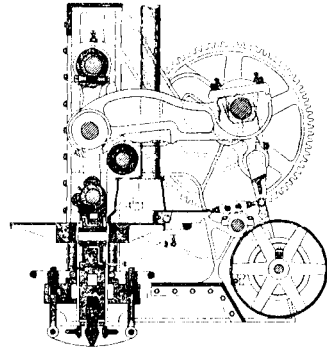
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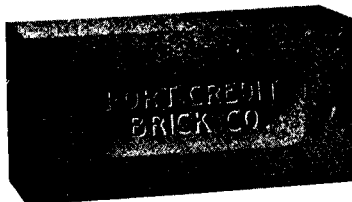
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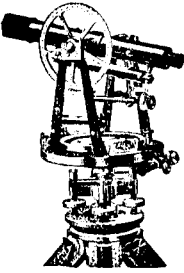
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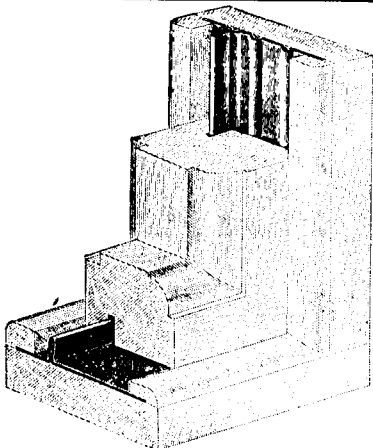
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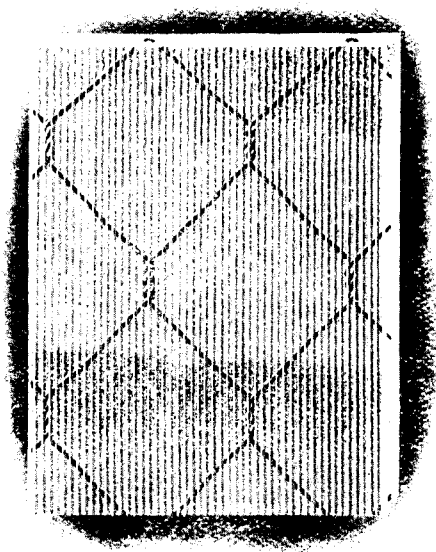
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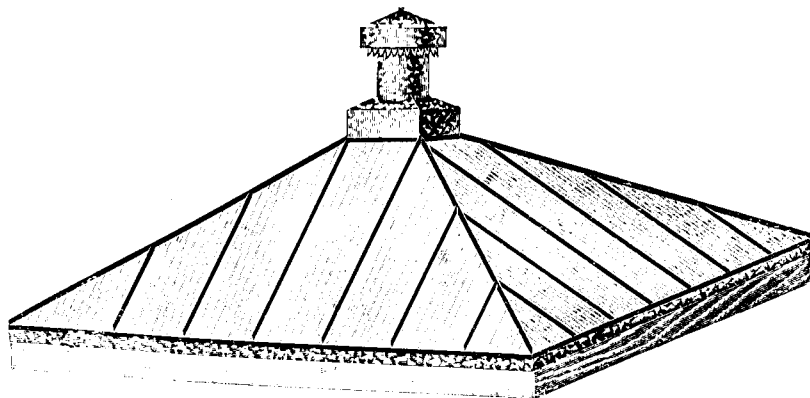
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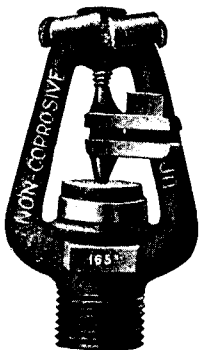
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Alex. McArthur & Co., Limited, Montreal.
- CAPS FOR COLUMNS AND PILASTERS.**
W. J. Hynes, 16 Gould St., Toronto.
- CAST IRON COLUMNS.**
Gaudry & Co., L. H., Coristine Building, Montreal; 76 St. Peter St., Quebec; Roy Building, Halifax.
Dennis Wire and Iron Works Co., Limited, London, Ont.
- CELLAR DOORS.**
Drummond McCall, Montreal and Toronto.
- CEMENT.**
Canadian Portland Cement Co., Limited, 502 Temple Building, Toronto; 203 Board of Trade Building, Montreal.
E. F. Dartnell, 157 St. James Street, Montreal.
Vulcan Portland Cement Co., Ltd., (William Hartranft Cement Co., Ltd., Selling Agent) Bank of Ottawa Building, Montreal.
The Lakefield Portland Cement Co., Limited, Bank of Ottawa Building, Montreal.
Owen Sound Portland Cement Co., Owen Sound, Ont.
David McGill, Merchants Bank Chambers, Montreal.
Francis Hyde & Co., Montreal.
Stinson Reeb Builders' Supply Co., Montreal.
Rogers Supply Co., Toronto.
L. A. DeLaplante, East Toronto.
Leigh Portland Cement Co., Limited, 601 Continental Life Building, Toronto.
Thorn Cement Company, 601 Continental Life Building, Toronto.
Western Canada Cement & Coal Co., Ottawa.
- CHIMNEY CONSTRUCTION.**
Eadle-Douglas Co., Montreal.
- CHURCH AND CATHEDRAL WINDOWS.**
Hobbs Manufacturing Co., Limited, London, Ont.
- CHURCH FURNITURE.**
Canadian Office & School Furniture Co., Preston, Ont.
Globe Furniture Co., Walkerville, Ont.
- COLD STORAGE & REFRIGERATOR INSULATION.**
Armstrong Cork Co., Montreal.
F. W. Bird & Son, Hamilton, Ont.
- COLUMNS, STAVED.**
Batts, Limited, 50 Pacific Ave., Toronto Junction.
- CONCRETE CONSTRUCTION (Reinforced).**
Expanded Metal & Fire Proofing Co., 100 King St. West, Toronto.
Metcalf Engineering, Limited, 80 St. Francois Xavier St., Montreal.
Pitt & Co., Niagara Falls, Ont.
Trussed Concrete Steel Co., 23 Jordan St., Toronto.
- CONDUITS.**
Conduits Co., Limited, Toronto and Montreal.
Francis Hyde & Co., Montreal.
- CORK BOARD.**
Armstrong Cork Co., 521 Coristine Building, Montreal.
- CUT STONE CONTRACTORS.**
E. F. Dartnell, 137 St. James St., Montreal.
Roman Stone Co., Limited, 80-100 Marlborough Ave., Toronto.
Canadian Art Stone Co., Limited, Toronto.
Fred Holmes & Son, Toronto.
McIntos., Gullett, Co., Toronto.
- CUT GRANITE.**
Stanstead Granite Quarries Co., Limited, Beebe Plain, Que.
- DECORATORS.**
Deecker & Carlyle, 26 Yonge St. Arcade, Toronto.
- DEPOSIT BOXES.**
J. & J. Taylor, Toronto.
- DRYING MATERIALS.**
Eugene Dietzgen Co., Limited, 10 Shuter St., Toronto.
- DOORS.**
L. A. De Laplante, East Toronto, Ont.
- DRYING APPLIANCES.**
Sheldons, Limited, Galt, Ont.
- DUMB WAITERS.**
Otis-Fensom Elevator Co., Limited, Traders Bank Building, Toronto.
- ELEVATORS (Passenger and Freight).**
Otis-Fensom Elevator Co., Limited, Traders Bank Building, Toronto.
- ELEVATOR ENCLOSURES.**
Dennis Wire and Iron Works Co., Limited, London, Ont.
Otis-Fensom Elevator Company, Limited, Traders Bank Building, Toronto.
- EXHAUST FANS.**
Sheldons, Limited, Galt, Ont.
- EXPANDED METAL.**
Expanded Metal and Fireproofing Co., 100 King St. West, Toronto.
Galt Art Metal Co., Galt, Ont.
Gaudry & Co., L. H., Coristine Building, Montreal; 76 St. Peter St., Quebec; Roy Building, Halifax.
Metal Shingle & Siding Co., Preston, Ont.
Trussed Concrete Steel Co., 23 Jordan St., Toronto.
Stinson Reeb Builders' Supply Co., Montreal.
- FIRE BRICK.**
E. F. Dartnell, 157 St. James St., Montreal.
David McGill, Merchants Bank Chambers, Montreal.
Francis Hyde & Co., Montreal.
Stinson-Reeb Builders' Supply Co., Montreal.
- FIRE ESCAPES.**
Gaudry & Co., L. H., Coristine Building, Montreal; 76 St. Peter St., Quebec; Roy Building, Halifax.
Dennis Wire and Iron Works Co., Limited, London, Ont.
- FIRE-PLACE GOODS.**
Canada Glass, Mantels and Tiles, Limited, 37-47 Richmond St. East, Toronto.
John Kay Co., Toronto.
- FIREPROOFING.**
Don Valley Brick Works, 36 Toronto St., Toronto.
E. F. Dartnell, 157 St. James St., Montreal.
Eadle-Douglas Co., 22 St. John St., Montreal.

Expanded Metal and Fireproofing Co., 100 King St. West, Toronto.
David McGill, Merchants Bank Chambers, Montreal.
The Milton Pressed Brick Co., Milton, Ont.; 75 Yonge St., Toronto; 204 St. James St., Montreal.
Pitt & Robinson, Manning Chambers, Toronto.
Port Credit Brick Co., 8 King St. West, Toronto.
C. W. Noble, Home Life Building, Toronto.
Trussed Concrete Steel Co., 23 Jordan St. Toronto.

FIREPROOF STEEL DOORS.
A. B. Ormsby, Limited, Queen and George Sts., Toronto; 677 Notre Dame Ave. West, Winnipeg.
Gaudry & Co., L. H., Coristine Building, Montreal; 76 St. Peter St., Quebec; Roy Building, Halifax.
Stinson-Reeb Builders' Supply Co., Montreal.

FIREPROOF WINDOWS.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.
A. B. Ormsby, Limited, Queen and George Sts., Toronto; 677 Notre Dame Ave. West, Winnipeg.
Stinson-Reeb Builders' Supply Co., Montreal.
Metallic Roofing Co. of Canada, Toronto.

FLOORING.
Eadie-Douglas Co., 22 St. John St., John St., Montreal.
Seaman Kent Co., Limited, 123 Bay St., Toronto.

FURNACES AND RANGES.
Cluff Bros., 21-27 Lombard St., Toronto.
Warden King, Limited, Montreal, Que.
Dominion Radiator Co., Limited, Toronto, Montreal, Winnipeg.
Taylor-Forbes Co., Limited, Guelph, Ont.
Record Foundry & Machine Co., Montreal.
Clare Brothers & Co., Preston.
James Smart Mfg. Co., Brockville.

FURNITURE.
T. Eaton Co., Toronto.
Canadian Office & School Furniture Co., Preston, Ont.
Globe Furniture Co., Walkerville, Ont.
John Kay Co., Toronto.

GALVANIZED IRON WORKS.
Galt Art Metal Co., Galt, Ont.
A. B. Ormsby, Limited, Queen and George Sts., Toronto; 677 Notre Dame Ave., West, Winnipeg.
Metal Shingle & Siding Co., Preston, Ont.
Sheldons, Limited, Galt, Ont.
Metallic Roofing Co. of Canada, Toronto.

GAS AND GASOLINE ENGINES.
Canadian Fairbanks Co., Toronto, Montreal, Winnipeg, Vancouver.

GRILLE WORK.
J. & J. Taylor, Toronto.

HARDWARE.
Taylor-Forbes Co., Guelph, Toronto, Montreal, Winnipeg and Vancouver.
L. A. De Laplante, East Toronto

HARDWOOD FLOORING.
Seaman Kent Co., Limited, 123 Bay St., Toronto

HEATING APPARATUS.
Cluff Bros., 21-27 Lombard St., Toronto.
Warden King, Limited, Montreal.
Dominion Radiator Co., Limited, Toronto, Montreal, Winnipeg.
Taylor-Forbes Co., Limited, Guelph, Toronto, Montreal, Winnipeg and Vancouver.
Sheldons, Limited, Galt, Ont.
Record Foundry & Machine Co., Montreal.
Clare Brothers, Preston.
James Smart Mfg. Co., Brockville.
Goldie & McCulloch Co., Limited, Galt, Ont.
Sheldons, Limited, Galt, Ont.

HYDRANTS.
Kerr Engine Co., Walkerville, Ont.

IRON DOORS AND SHUTTERS.
J. & J. Taylor, Toronto.

IRON STAIRS.
Canadian Ornamental Iron Co., 35 Yonge St. Arcade, Toronto.
Gaudry & Co., L. H., Coristine Building, Montreal; 76 Peter St., Quebec; Roy Building, Halifax.
Dennis Wire & Iron Works Co., London, Ont.
Francis Hyde & Co., Montreal.

IRON SUPPLIES.
Kerr Engine Co., Walkerville, Ont.

INSULATION.
Armstrong Cork Co., 521 Coristine Building, Montreal.

INTERIOR WOODWORK.
Batts, Limited, 50 Pacific Ave., Toronto Junction.
Globe Furniture Co., Walkerville, Ont.
Canadian Office & School Furniture Co., Preston, Ont.
Seaman Kent & Co., Toronto.

JAIL CELLS AND GATES.
Dennis Wire & Iron Works Co., Limited, London, Ont.
J. & J. Taylor, Toronto.

JOIST HANGERS.
David McGill, Merchants Bank Chambers, Montreal.
Taylor-Forbes Co., Guelph, Toronto, Montreal, Winnipeg and Vancouver.
Francis Hyde & Co., Montreal.

LAMP STANDARDS.
Dennis Wire & Iron Works Co., Limited, London, Ont.

LATH (Metal).
Expanded Metal & Fireproofing Co., 100 King St. West, Toronto.
Galt Art Metal Co., Galt, Ont.
Gaudry & Co., L. H., Coristine Building, Montreal; 76 St. Peter St., Quebec; Roy Building, Halifax.
B. Greening Wire Co., Limited, Hamilton and Montreal.
Metal Shingle & Siding Co., Preston, Ont.
Trussed Concrete Steel Co., 23 Jordan St., Toronto.
Metallic Roofing Co. of Canada, Toronto.
B. Greening Wire Co., Limited, Hamilton, Ont.
Stinson-Reeb Builders' Supply Co., Montreal.

LAWN VASES.
London Concrete Machinery Co., Limited, London, Ont.

LEADED GLASS.
David McGill, Merchants Bank Chambers, Montreal.
Pilkington Brothers, Ltd., Montreal.
Canada Glass, Mantels and Tiles, Limited, 37-47 Richmond St. E., Toronto.
Hobbs Manufacturing Co., Limited, London, Ont.

LIGHTING AND POWER PLANTS.
Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.
National Light & Mfg. Co., Limited, London.

LODGE FURNITURE.
Canadian Office & School Furniture Co., Preston, Ont.
Globe Furniture Co., Walkerville, Ont.

MANTELS.
Canada Glass, Mantels and Tiles, Limited, 37-47 Richmond St. East, Toronto.
Hoidge Marble Co., 100 King St. West, Toronto.
David McGill, Merchants Bank Chambers, Montreal.
T. Eaton Co., Ltd., Toronto.

MARBLE.
E. F. Dartnell, 157 St. James St. Montreal.
Hoidge Marble Co., Toronto.
Missisquoi Marble Company, Montreal.
Smith Marble & Construction Co., Limited, Montreal.

METAL SHINGLES.
Galt Art Metal Co., Galt, Ont.
Metallic Roofing Co. of Canada, Toronto.
Metal Shingle & Siding Co., Preston.

METAL WALLS AND CEILINGS.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.
A. B. Ormsby, Limited, Queen and George Sts., Toronto; 677 Notre Dame Ave., West, Winnipeg.
C. W. Noble, Home Life Building, Toronto.
Metallic Roofing Co. of Canada, Toronto.

METAL WEATHER STRIPS.
Chamberlin Metal Weather Strip Co., 319 Yongs St., Toronto, Kingsville, Ont.

OPERA CHAIRS.
Canadian Office & School Furniture Co., Preston, Ont.
Globe Furniture Co., Walkerville, Ont.

ORNAMENTAL IRON WORK.
Canadian Ornamental Iron Co., 35 Yonge St. Arcade, Toronto.

Gaudry & Co., L. H., Coristine Building, Montreal; 76 Peter St., Quebec; Roy Building, Halifax.
Geo. B. Meadows Co., Limited, 479 Wellington St. West, Toronto.
Dennis Wire & Iron Co., London.

PACKING.
Dunlop Tire & Rubber Co., Limited, Head Office, Booth Ave., Toronto; City Office, 13 Temperance St., Toronto.
Gutta Percha & Rubber Mfg. Co., Limited, 47 Yonge St., Toronto.

PIPE COVERING.
Armstrong Cork Co., Montreal.

PLASTERERS.
W. J. Hynes, 16 Gould St., Toronto.

PLATE AND WINDOW GLASS.
Canada Glass, Mantels and Tiles, Limited, 37-47 Richmond St. East, Toronto.
Hobbs Mfg. Co., London, Ont.
Pilkington Brothers, Limited, Montreal.

PLUMBERS' BRASS GOODS.
Somerville, Limited, 59 Richmond St. E., Toronto.
Jas. Robertson Co., Limited, Montreal.

PLUMBING FIXTURES.
Somerville, Limited, 59 Richmond St. East, Toronto.
Standard Ideal Co., Limited, Port Hope, Ont.
Jas. Robertson Co., Limited, Montreal.

PNEUMATIC TOOLS.
Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.
Mussons, Limited, Montreal.

PORCELAIN ENAMEL BATHS.
Somerville, Limited, 59 Richmond St. East, Toronto.
Standard Ideal Co., Limited, Port Hope, Ont.
Jas. Robertson Co., Limited.

POWER PLANTS.
Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.

RADIATORS.
Cluff Bros., 21-27 Lombard St., Toronto.
King Radiator Co., St. Helens Ave., Toronto.
Dominion Radiator Co., Limited, Toronto, Montreal, Winnipeg.
Warden King, Limited, Montreal.
Taylor-Forbes Co., Limited, Guelph, Toronto, Montreal, Winnipeg and Vancouver.
Somerville, Limited, Toronto.

RADIATOR VALVES.
Kerr Engine Co., Walkerville, Ont.

REFRIGERATING MACHINERY.
Linde British Refrigeration Co., Ltd., Coristine Building, Montreal.

REFRIGERATOR INSULATION.
Armstrong Cork Co., 521 Coristine Building, Montreal.

REINFORCED CONCRETE.
David McGill, Merchants Bank Chambers, Montreal.
Expanded Metal & Fireproofing Co., 100 King St. West, Toronto.
Pitt & Co., Niagara Falls, Ont.
Trussed Concrete Steel Co., Limited, 23 Jordan St., Toronto.

RELIEF DECORATION.
W. J. Hynes, 16 Gould St., Toronto.

ROOFING PAPER.
F. W. Bird & Son, Hamilton, Ont.
Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.
Lockerby & McCoomb, 65 Shannon St., Montreal.
Alex. McArthur & Co., Limited, Montreal.

ROOFING (Slate).
A. B. Ormsby, Limited, Toronto and Winnipeg.

ROOFING TILE.
David McGill, Merchants Bank Chambers, Montreal.
Francis Hyde & Co., Montreal.
E. F. Dartnell, 137 St. James St., 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.

SAFES, VAULTS AND VAULT DOORS.
J. & J. Taylor, Toronto.
Goldie & McCulloch Co., Limited, Galt, Ont.
Canadian Fairbanks Co., Limited, Montreal, Toronto, St. John, Winnipeg, Calgary and Vancouver.

SANITARY PLUMBING APPLIANCES.
Somerville Limited, 59 Richmond St. E., Toronto.
Standard Ideal Co., Limited, Port Hope, Ont.
Jas. Robertson Co., Montreal.

SCHOOL FURNITURE.
Canadian Office & School Furniture Co., Preston, Ont.
Globe Furniture Co., Walkerville, Ont.

SHEET METAL WORKERS.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.
A. B. Ormsby, Limited, Queen and George Sts., Toronto, 677 Notre Dame Ave. West, Winnipeg.
Metallic Roofing Co., Toronto.

SIDEWALKS, DOORS AND GRATES.
Dennis Wire & Iron Works Co., London, Ont.

SIDEWALK LIFTS.
Otis-Fensom Elevator Co., Limited, Traders Bank Building, Toronto.

SPRINKLER SYSTEMS.
General Fire Equipment Co., 72 Queen St. East, Toronto.

STABLE FITTINGS.
Dennis Wire & Iron Works Co., London, Ont.

STAFF AND STUCCO WORK.
W. J. Hynes, 16 Gould Street, Toronto.

STEAM APPLIANCES.
Sheldons, Limited, Galt, Ont.
Kerr Engine Co., Walkerville, Ont.
Taylor-Forbes Co., Guelph, Toronto, Montreal, Winnipeg and Vancouver.

STEAM AND HOT WATER HEATING.
Cluff Bros., 21-27 Lombard Street, Toronto.
Warden King, Limited, Montreal.
Dominion Radiator Co., Limited, Toronto.
Taylor-Forbes Co., Limited, Guelph, Toronto, Montreal, Winnipeg and Vancouver.

STEEL CASEMENTS.
L. H. Gaudry & Co., Limited, Coristine Building, Montreal.
David McGill, Merchants Bank Chambers, Montreal.

STEEL CONCRETE CONSTRUCTION.
Expanded Metal & Fireproofing Co., 100 King Street West, Toronto.
Metcalf Engineering, Limited, 80 St. Francois Xavier Street, Montreal.
Pitt & Co., Niagara Falls, Ont.; Manning Chambers, Toronto.
Trussed Concrete Steel Co., 23 Jordan Street, Toronto.

STEEL DOORS.
A. B. Ormsby, Limited, Queen and George Streets, Toronto; 677 Notre Dame Avenue West, Winnipeg.

STRUCTURAL IRON CONTRACTORS.
Hamilton Bridge Co., Hamilton.
Reid & Brown, 63 Esplanade East, Toronto.

STRUCTURAL STEEL.
L. H. Gaudry & Co., Limited, Coristine Building, Montreal; 76 Peter Street, Quebec; Roy Building, Halifax.
Hamilton Bridge Co., Hamilton.
Reid & Brown, Toronto.
Dennis Wire and Iron Works Co., Limited, London, Ont.

STORE FIXTURES.
Canadian Office & School Furniture Co., Preston, Ont.
Globe Furniture Co., Walkerville, Ont.

TERRA COTTA FIREPROOFING.
Eadie-Douglas Co., 22 St. John Street, Montreal.
Don Valley Brick Works, 36 Toronto Street, Toronto.
E. F. Dartnell, 157 St. James Street, Montreal.
Francis Hyde & Co., 31 Wellington Street, Montreal.

The Milton Pressed Brick Co., Milton, Ont.; 75 Yonge Street, Toronto; 204 St. James Street, Montreal.
David McGill, Merchants Bank Chambers, Montreal.

TILE (Floor and Wall).
Canada Glass, Mantels and Tiles, Limited, 37-47 Richmond Street East, Toronto.
David McGill, Merchants Bank Chambers, Montreal.
Smith Marble & Construction Co., Montreal.
Francis Hyde & Co., Montreal.
E. F. Dartnell, 137 St. James Street, Montreal.

VALVES.
Kerr Engine Co., Walkerville, Ont.
Somerville, Limited, Toronto.
Taylor-Forbes Co., Guelph, Toronto, Montreal, Winnipeg and Vancouver.
Dominion Radiator Company, Toronto.

VENTILATORS.
Wm. Stewart & Co., Saturday Night Building, Toronto; Board of Trade, Montreal.
Sheldons, Limited, Galt, Ont.

WALL HANGERS.
Taylor-Forbes Co., Guelph, Toronto, Montreal, Winnipeg and Vancouver.

WALL HANGINGS.
Deecker & Carlyle, 26 Yonge Street Arcade, Toronto.

WATER HEATERS.
Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.
Somerville, Limited, 59 Richmond Street East, Toronto.
Drummond McCall Co., Montreal and Toronto.

WINDOW GUARDS.
B. Greening Wire Co., Limited, Hamilton, Ont.

WINDOW SCREENS.
Wm. Stewart & Co., Toronto and Montreal.

• A DIRECTORY FOR • CONTRACTORS' SUPPLIES & MACHINERY

ADAMANT PLASTER.
Francis Hyde and Co., Montreal.
Stinson-Reeb Builders' Supply Co., Montreal.

AIR COMPRESSOR.
Canadian Fairbanks Co., Limited, Montreal, Toronto, Winnipeg and Vancouver.

ARTIFICIAL STONE.
Canadian Concrete Machinery Co., Limited, 510 Board of Trade Building, Toronto.
Canadian Art Stone Co., Price Street, Toronto.
Roman Stone Co., 60-100 Marlborough Avenue, Toronto.

ASBESTOS PRODUCTS.
A. B. Ormsby, Limited, Queen and George Streets, Toronto, and 677 Notre Dame Avenue West, Winnipeg.

BELTING.
Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.
Dunlop Tire and Rubber Co., Limited, Head Office, Booth Avenue; City Office, 13 Temperance Street, Toronto.
Gutta Percha & Rubber Mfg. Co., Limited, 47 Yonge Street, Toronto.

BLOWERS.
Sheldons, Limited, Galt, Ont.

BLOW AND VENT PIPING.
Metal Roofing Co., Limited, Toronto.
Metal Shingle & Siding Co., Preston, Ont.
A. B. Ormsby, Limited, Queen and George Streets, Toronto, and 677 Notre Dame Avenue West, Winnipeg.

BOILERS.
Cluff Bros., Toronto, 21-27 Lombard Street.
Warden King, Limited, Montreal.
Dominion Radiator Co., Limited, Toronto, Montreal, Winnipeg.

Berg Machinery Mfg. Co., Limited, Toronto.
Somerville, Limited, Toronto.
Taylor-Forbes Co., Guelph, Toronto, Montreal, Winnipeg and Vancouver.
Goldie and McCulloch Co., Limited, Galt, Ont.

BRASS WORKS.
Somerville, Limited, 59 Richmond Street East, Toronto.
James Robertson, Limited, Toronto and Montreal.
Kerr Engine Co., Walkerville.

BRICK AND TERRA COTTA.
E. F. Dartnell, 157 St. James Street, Montreal.
Don Valley Brick Works, 36 Toronto Street, Toronto.
Eadie-Douglas Co., 22 St. John Street, Montreal.
David McGill, Merchants Bank Chambers, Montreal.
The Milton Pressed Brick Co., Milton, Ont.; 75 Yonge Street, Toronto; 204 St. James Street, Montreal.
Port Credit Brick Co., Home Bank Building, Toronto.
Stinson-Reeb Builders' Supply Co., Montreal.

BUILDING SUPPLIES.
E. F. Dartnell, 157 St. James Street, Montreal.
Eadie-Douglas Co., 22 St. John Street, Montreal.
Lockerby & McCoomb, 65 Shannon Street, Montreal.
David McGill, Merchants Bank Chambers, Montreal.
The Paterson Manufacturing Co., Limited, Toronto, Montreal and Winnipeg.
Francis Hyde & Co., Montreal.
Stinson-Reeb Building Supply Co., Limited, Montreal.

Roger Supply Co., Toronto.

BRICK MACHINERY.
Berg Machinery Mfg. Co., Limited, Toronto.
Wettlaufer Bros., Stratford and Mitchell, Ont.
Scientific Brick Co., Toronto.

CABLE.
Drummond McCall & Co., Montreal and Toronto.

CAST IRON COLUMNS.
Gaudry & Co., L. H., Coristine Building, Montreal; 76 Peter Street, Quebec; Roy Building, Halifax.

CAPS FOR COLUMNS AND PILASTERS.
W. J. Hynes, 16 Gould Street, Toronto.

CARS (Factory and Dump).
Sheldons, Limited, Galt, Ont.

CELLAR DOORS.
Drummond McCall, Montreal and Toronto.

CEMENT.
Canadian Portland Cement Co., Limited, 502 Temple Building, Toronto; 203 Board of Trade Building, Montreal.
E. F. Dartnell, 157 St. James Street, Montreal.
Imperial Cement Co., Owen Sound.
The Lakefield Portland Cement Co., Limited, Bank of Ottawa Building, Montreal.
Owen Sound Portland Cement Co., Owen Sound.
David McGill, Merchants Bank Chambers, Montreal.
Vulcan Portland Cement Co., Limited, (Wm. Hartrauff Cement Co., selling agent), Bank of Ottawa Building, Montreal.
Francis Hyde & Co., Montreal.
Leigh Portland Cement Co., 601 Continental Life Building, Toronto.

- Thorn Cement Company, 601 Continental Life Building, Toronto.
 Rogers Supply Co., Toronto.
 Stinson-Reeb Builders' Supply Co., Montreal.
 Western Canada Cement & Coal Co., Ottawa.
- CEMENT BLOCK MACHINERY.**
 Canadian Concrete Machinery Co., Limited, 510 Board of Trade Building, Toronto.
 Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.
 Ideal Concrete Machinery Co., Limited, 221 King Street, London, Ont.
 Mussons, Limited, Montreal.
 London Concrete Machinery Co., Limited, London, Ont.
- CEMENT BRICK MACHINERY.**
 London Concrete Machinery Co., Limited, London, Ont.
 Ideal Concrete Machinery Co., London, Ont.
- CEMENT MACHINERY.**
 Berg Machinery Mfg. Co., Limited, Toronto.
 London Concrete Machinery Co., Limited, London, Ont.
 Ideal Concrete Machinery Co., London, Ont.
- CEMENT TILE MACHINERY.**
 London Concrete Machinery Co., Limited, London, Ont.
 Ideal Concrete Machinery Co., London, Ont.
- CEMENT WORKING TOOLS.**
 London Concrete Machinery Co., Limited, London, Ont.
- COLUMNS.**
 Batts, Limited, 50 Pacific Avenue, Toronto Junction.
- CONCRETE MIXERS.**
 Canadian Fairbanks Co., Limited, Montreal, Toronto, Winnipeg and Vancouver.
 E. F. Dartnell, 157 St. James Street, Montreal.
 Mussons, Limited, Montreal.
 London Concrete Machinery Co., Limited, London, Ont.
 Ideal Concrete Machinery Co., London, Ont.
- CONCRETE STEEL.**
 Dennis Wire & Iron Co., London, Ont.
 B. Greening Wire Co., Limited, Hamilton and Montreal.
 Expanded Metal & Fireproofing Co., 100 King Street West, Toronto.
 Pitt & Co., Niagara Falls, Ont.
 Trussed Concrete Steel Co., 23 Jordan Street, Toronto.
 C. W. Noble, Home Life Building, Toronto.
- CONDUITS.**
 Conduits Co., Limited, Toronto and Montreal.
 Francis Hyde & Co., Montreal.
- CONTRACTORS' MACHINERY.**
 Canadian Concrete Machinery Co., Limited, 510 Board of Trade Building, Toronto.
 Canadian Fairbanks Co., Limited, Montreal, Toronto, Winnipeg and Vancouver.
 Drummond McCall & Co., Montreal and Toronto.
 Mussons, Limited, Montreal.
 London Concrete Machinery Co., Limited, London, Ont.
- CONTRACTORS' SUPPLIES.**
 Canadian Fairbanks Co., Limited, Montreal, Toronto, Winnipeg and Vancouver.
 Eadie-Douglas Co., 22 St. John Street, Montreal.
 Drummond McCall & Co., Montreal and Toronto.
 E. F. Dartnell, 157 St. James Street, Montreal.
 David McGill, Merchants Bank Chambers, Montreal.
 Mussons, Limited, Montreal.
 Francis Hyde & Co., Montreal.
 Stinson-Reeb Builders' Supply Co., Montreal.
 Rogers Supply Co., Toronto.
- CRUSHED STONE.**
 Rogers Supply Company, Toronto.
 Stinson-Reeb Builders' Supply Co., Montreal.
- CUT STONE CONTRACTORS.**
 Roman Stone Co., Limited, 80-100 Marlborough Avenue, Toronto.
 Canadian Art Stone Co., Limited, Toronto.
 Fred Holmes & Sons, Toronto.
 E. F. Dartnell, 137 St. James Street, Montreal.
- CUT GRANITE.**
 Stanstead Granite Quarries Co., Limited, Beebe Plain, Que.
- DOORS.**
 L. A. De La Plante, East Toronto.
- DRILLS (Brick and Stone).**
 Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.
 Drummond McCall & Co., Montreal.
- DRILLS (Brick and Stone).**
 Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver.
 Drummond McCall & Co., Montreal and Toronto.
 Mussons, Limited, Montreal.
- ELECTRO-PLATING.**
 Somerville, Limited, 59 Richmond Street East, Toronto.
 Dennis Wire and Iron Works Co., London, Ont.
- ELECTRIC WIRE AND CABLES.**
 B. Greening Wire Co., Limited, Hamilton and Montreal.
 Jas. Robertson Co., Limited, Toronto and Montreal.
- ENGINES.**
 Berg Machinery Mfg. Co., Limited, Toronto.
 Goldie and McCulloch Co., Limited, Galt, Ont.
 Sheldons, Limited, Galt, Ont.
- ENGINEERS' SUPPLIES.**
 Canadian Fairbanks Co., Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.
 Somerville, Limited, 59 Richmond Street East, Toronto.
 Kerr Engine Co., Walkerville.
 Mussons, Limited, Montreal.
- ELECTRIC WIRE AND CABLES.**
 B. Greening Wire Co., Limited, Hamilton and Montreal.
 James Robertson Co., Limited, Toronto and Montreal.
- EXHAUST FANS.**
 Sheldons, Limited, Galt, Ont.
- EXPANDED METAL.**
 Expanded Metal and Fireproofing Co., 100 King Street West, Toronto.
 Galt Art Metal Co., Galt, Ont.
 Gaudry & Co., L. H., Coristine Building, Montreal; 76 Peter Street, Quebec; Roy Building, Halifax.
 Metal Shingle & Siding Co., Preston, Ont.
 Trussed Concrete Steel Co., 23 Jordan Street, Toronto.
 Stinson-Reeb Builders' Supply Co., Montreal.
- FIRE BRICK.**
 E. F. Dartnell, 157 St. James Street, Montreal.
 David McGill, Merchants Bank Chambers, Montreal.
 Stinson-Reeb Builders' Supply Co., Montreal.
- FIREPROOFING.**
 Don Valley Brick Works, 36 Toronto Street, Toronto.
 E. F. Dartnell, 157 St. James Street, Montreal.
 Eadie-Douglas Co., 22 St. John Street, Montreal.
 Expanded Metal and Fireproofing Co., 100 King Street West, Toronto.
 David McGill, Merchants Bank Chambers, Montreal.
 The Milton Pressed Brick Co., Milton, Ont.; 75 Yonge Street, Toronto; 204 St. James Street, Montreal.
 Pitt & Robinson, Manning Chambers, Toronto.
 Port Credit Brick Co., 8 West King Street, Toronto.
 Trussed Concrete Steel Co., 23 Jordan Street, Toronto.
- FIREPROOF STEEL DOORS.**
 A. B. Ormsby, Limited, Queen and George Streets, Toronto, and 677 Notre Dame Avenue West, Winnipeg.
 Gaudry & Co., L. H., Coristine Building, Montreal; 76 Peter Street, Quebec; Roy Building, Halifax.
 Stinson-Reeb Builders' Supply Co., Montreal.
- FIREPROOF WINDOWS.**
 Galt Art Metal Co., Galt, Ont.
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