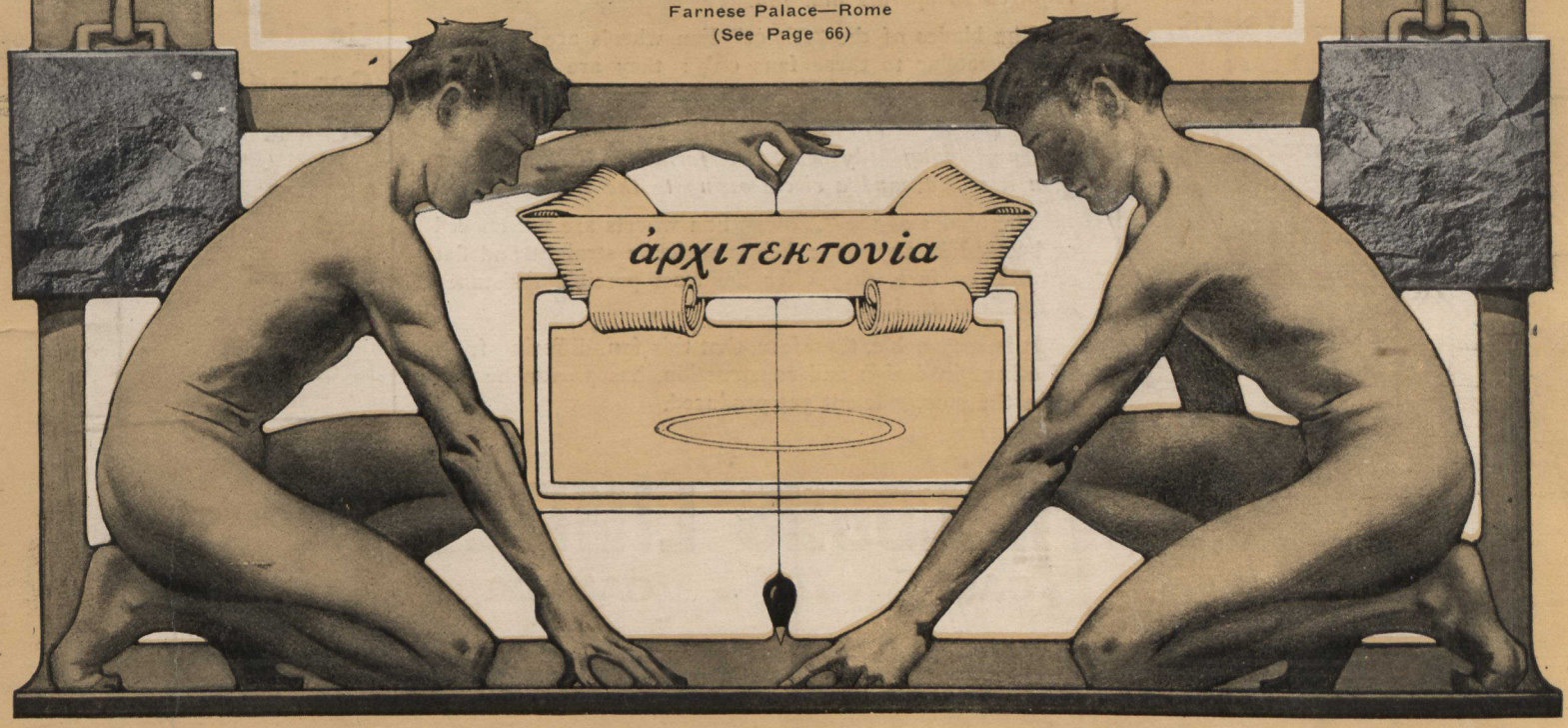
CONSTRUCTION

A JOURNAL FOR THE ARCHITECTURAL ENGINEERING AND CONTRACTING INTERESTS OF CANADA

Vol. 3, No. 4. MARCH, 1910 $3.00 PER YEAR

Farnese Palace—Rome
(See Page 66)



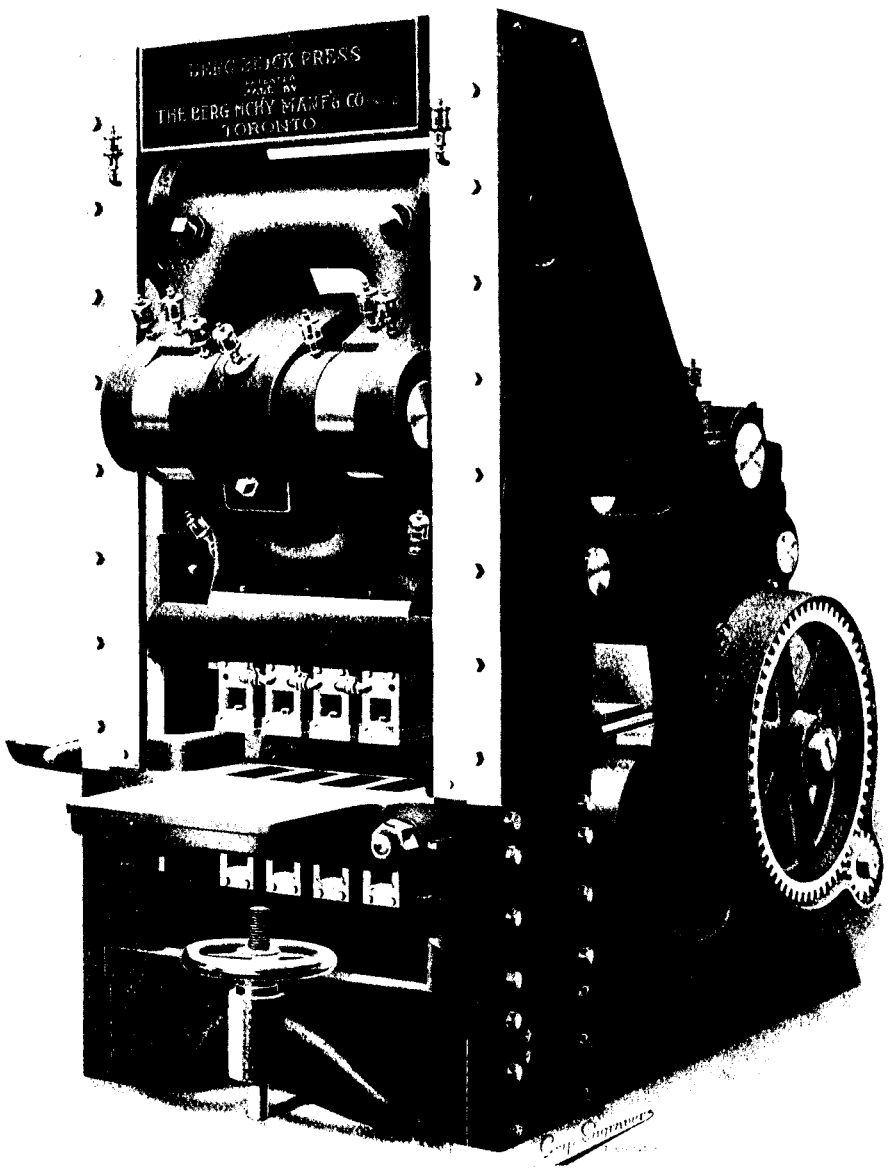
- MONTREAL - OFFICE OF PUBLICATION 'SATURDAY NIGHT' BUILDING, TORONTO - LONDON, ENG. -

Entered at Toronto Post Office as Second Class Matter

What's in a Name...

SIMPLICITY STRENGTH DURABILITY — ACCESS TO ALL PARTS — GREATEST PRESSURE — BEST PRODUCT

The "Berg Press" is the Highest Development in the Art of Brick-making Machinery, so Pronounced by the U. S. Government



IMPROVED BERG BRICK PRESS

THE BERG PRESS EXCELS
for
Shale Pressed Brick
Clay Pressed Brick
Sand-Lime Pressed Brick
Sand-Cement Pressed Brick
Fire Brick

THE BERG PRESS
Gives THREE Distinct PRESSURES
Result is :
No Granulated Centers

THE BERG PRESS
HAS ALL WORKING PARTS ABOVE CLAY LINE

THE BERG PRESS
is fitted with "THE BERG PATENTED MOLD BOX" the DELIGHT of brickmakers, and which many others have tried to IMITATE

All Sizes and Shapes Can be Made
Molds Can be Changed in a Few Minutes
Owing to the
SIMPLE MECHANICAL CONSTRUCTION

Cut Gearing, and many other steps forward in **Improvements,** and built of the **Highest Grade of Material and Workmanship. Fully Guaranteed** as to its **Success.**

Manufactured by its inventor in Toronto, Canada, exclusively. Also all equipments for Pressed Brick Plants to make **Sand-Lime Brick, Sand-Cement Brick, Shale Brick, Clay Brick and Fire Brick**

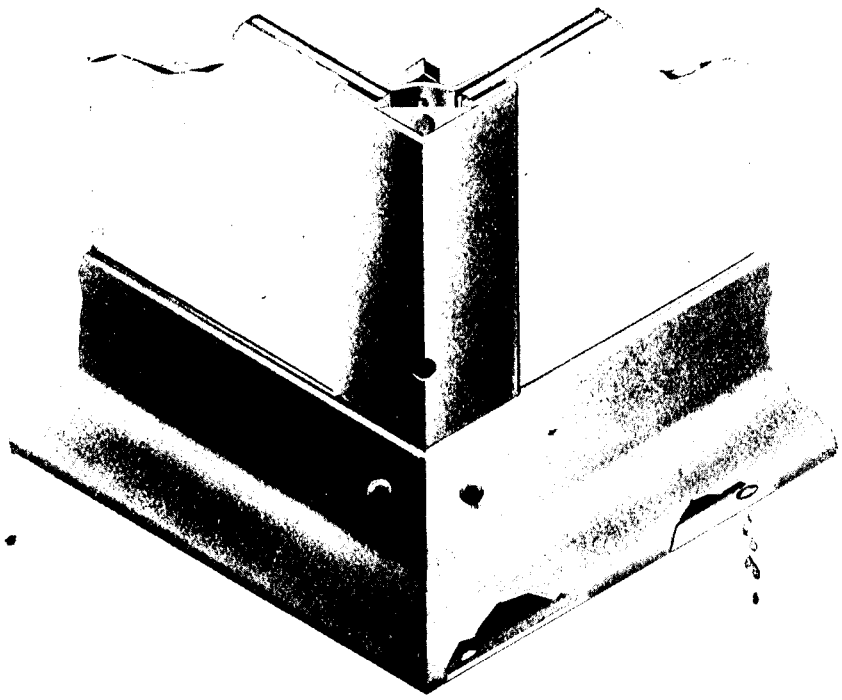
CORRESPONDENCE SOLICITED

The BERG MACHINERY MANUFACTURING CO., Limited

Office and Works: Bathurst and Niagara Sts., Toronto, Canada

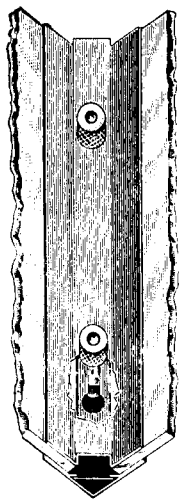
Thorne Hold-Fast Metal Bar

A comparison of this store front construction with any other will quickly demonstrate its many advantages over all others.

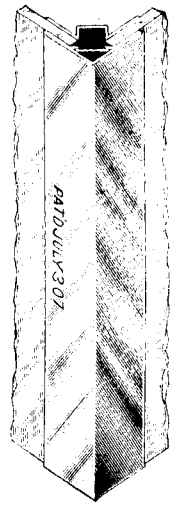


The installing of a modern store front is not an expense but an investment which will show quick returns in increased business.

The detail above shows the outside view with method of construction of the solid copper patent drop sill, and show window ventilation.



INSIDE



OUTSIDE

We Carry in Stock for Building Purposes
Every Description of

GLASS

Write for Prices and Illustrated Booklet.

Sample of Bar Mailed on Request.

We can supply this in Plain Copper Finish, Polished Copper Finish, Oxidized Copper Finish, Nickel Plated Finish, Gun Metal Finish, Bronze Finish.

SOLE CANADIAN AGENTS FOR THESE BARS

The Hobbs Manufacturing Co., LIMITED

Toronto — Factories and Warehouses LONDON — Winnipeg

PARIPAN

A LACQUER-ENAMEL OF QUITE UNIQUE PROPERTIES

Glossy or Flat (Dull), White and all Colours, for both Interior and Exterior Work.

For Painting Walls, Doors, Woodwork, Ceilings and Outsides of Houses, Hospitals and Institutions, Also for Railway Coaches, Locomotives, Tramcars, Steamers and Yachts.

The Advantages of PARIPAN

FOR HOUSES.

Applied with a brush in the usual way, Paripan forms the most artistic, durable and washable surface possible.

Over twenty years' practical use proves that Paripan will last in perfect condition for ten years and upwards and "the more you wash it, the better it looks" is literally true.

Nearly all the trouble of re-painting and annual cleaning is done away with.

Paripan, by reason of its durability, costs far less than ordinary paint.

Paripan Glossy gives a surface like glass, the Flat (dull), a delicate, dull silk-like effect—both perfectly washable.

FOR HOSPITALS.

Paripan for walls and ceilings of wards, corridors and operating theatres furnishes a surface far superior to glazed tiles at a mere fraction of their cost.

Paripan may be washed with soap and water or the usual disinfectants and lasts for years. The London Hospital has about Fourteen Acres of Paripan work and has proved that this enamel is cheaper than even distemper.

Paripan is largely employed for the painting of radiators and hot water pipes.

FOR RAILWAY COACHES, ETC.

The Paripan method of painting produces a finer and more durable effect than the usual treatment, with a less number of coats.

It means a very large saving in maintenance charges and a great increase in efficiency.

Paripan stands all climatic conditions perfectly. After washing and leathering in the usual way, it always comes up fresh and new.

No varnish is required.

Architects, Surveyors, Engineers, Railway Companies, and all interested in Paripan are cordially invited to send for our Illustrated Book with Color Chart, prices and "Opinions," mailed free by return. We will gladly answer any special queries and send samples for trial.

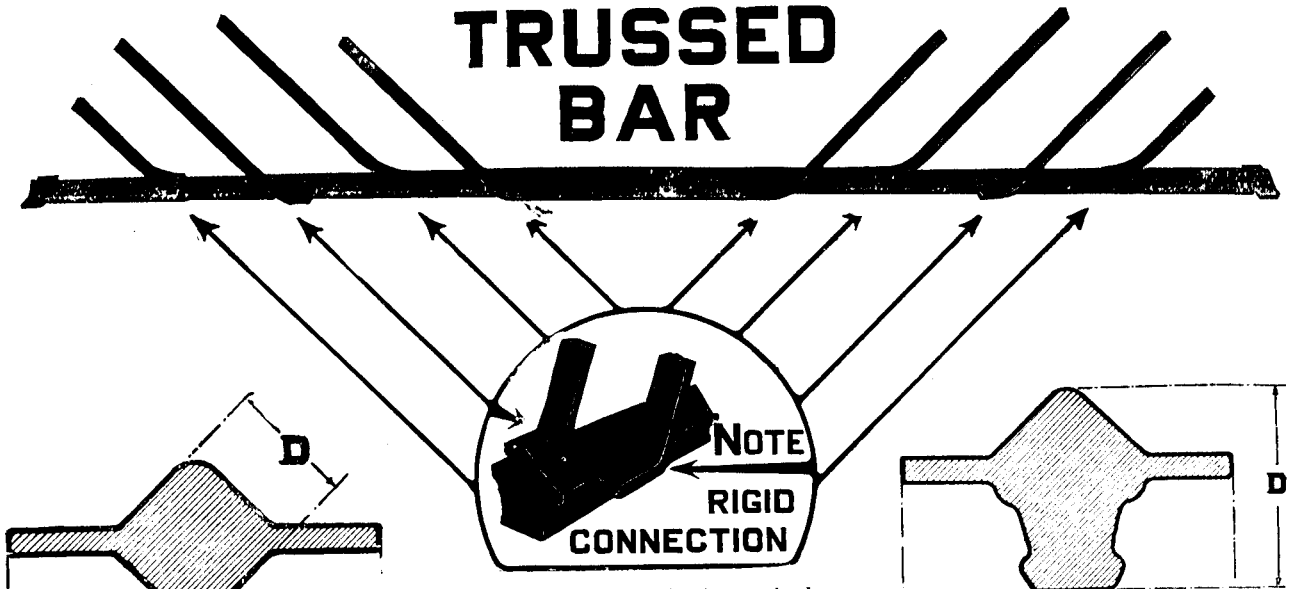
Randall Bros., London

ENGLAND

PALMERSTON HOUSE, OLD BROAD STREET: E.C.

ESTABLISHED 1855 **Works: Egham, Nr. Windsor** **Telegrams: "Polishable, London"**

KAHN TRUSSED BAR

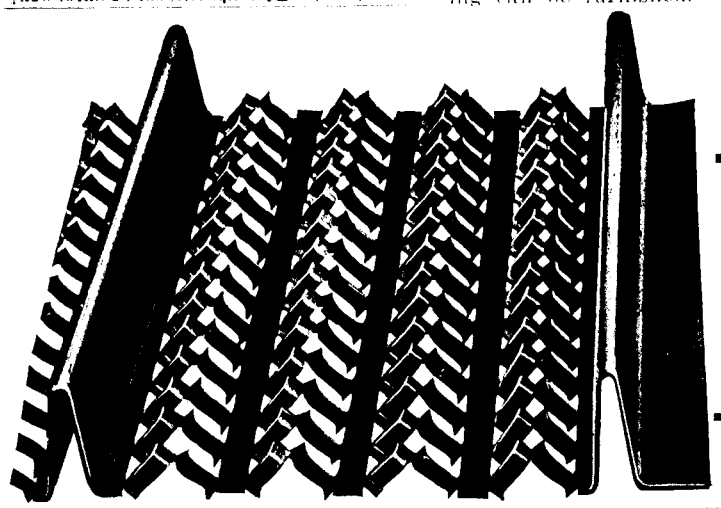


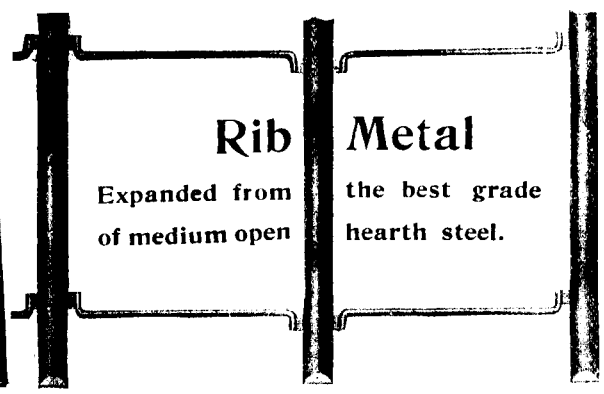
D. & B.	Weight per lineal foot	AREA	Length of Diagonals
½ x 1½ in.	1.4 lbs	0.41 sq.in.	**6** in., **8** in., 12 in.
¾ x 2 3/16 in.	2.7 lbs	0.79 sq.in.	**12** in., 8 in., 18 in.

Rigid connection of diagonal shear members is the one essential requirement of reinforcing steel for concrete.

Kahn Trussed Bars are shipped cut to exact lengths—Bars up to 60 feet are carried in stock. Any desired length of diagonal or type of shearing can be furnished.

D. & B.	Weight per lineal foot	AREA	Length of Diagonals
1½x2¾ in	4.8 lbs.	1.41 sq. in	**24**, 18, 30, 36 inch
1¾x2¾ in	6.8 lbs.	2.00 sq. in	**24**, 18, 30, 36 inch
2 x3½ in	10.2 lbs.	3.00 sq. in	**30**, 24, 36, 48 inch





HY-RIB.

Self-centering reinforcement for concrete floors and roofs.

A unit of lath and studs for Walls, Partitions and Ceilings.

Width of **Hy-Rib** sheets, 10½ inches. Standard lengths, 6 ft., 8 ft., 10 ft., and 12 ft. Intermediate and shorter lengths as ordered.

Ribs of **Hy-Rib** are 13-16 inches high and 3½ inches apart.

Hy-Rib is furnished in either flat or curved sheets. The shop-bending assures absolute accuracy of curve.

Cross sectional areas of **Hy-Rib** per foot of width: 28 gauge, .165 sq. in.; 26 gauge, .198 sq. in.; 24 gauge, .264 sq. in.

Above gauges carried in stock. Other gauges can be supplied within a reasonable time.

FOR SLABS, FLOORS, ROOFS, WALLS, SEWERS AND CONDUITS.

A series of straight bars rigidly connected by cross ties formed from one sheet of steel. **Rib-Metal** provides maximum area of reinforcement in the direct line of strain. A rigid reinforcement that stays where it is placed. **Rib-Metal** is manufactured in seven sizes of mesh and in lengths up to 18 feet. **Rib-Metal** is furnished in either flat or curved sheets. The shop-bending assures absolute accuracy of curve.

Size No.	Width of Standard Sheet	Square Feet per Lineal Foot of Standard Sheet	Area per Foot of Width
2	16 in.	1.33	.64 sq. in.
3	24 "	2.00	.36 "
4	32 "	2.67	.27 "
5	40 "	3.33	.216 "
6	48 "	4.00	.18 "
7	56 "	4.67	.154 "
8	64 "	5.33	.135 "

Catalogues of **Kahn System** products—**Kahn Trussed Bars, Hy-Rib, Rib-Metal, Rib-Lath, Rib-Studs, Cup-Bars.** Also catalogues describing tests, structures of every kind, and "Kahn System Standards"—the best handbook on reinforced concrete design.

WRITE FOR OUR CATALOGUE ON "TRUS-CON" CHEMICAL PRODUCTS.

TRUSSED CONCRETE STEEL COMPANY OF CANADA, LIMITED

Head Office and Works, Walkerville.

Sales and Engineering Office, 23 Jordan St., Toronto.

BRANCH OFFICES:

Union Bank Building, Winnipeg.
Loo Building, Vancouver.
Cor. St. James and Dalhousie, Quebec.
Merchants Bank Building, Montreal.
132 Hollis Street, Halifax.

The Plain Truth Sells My Lath

EVERY word my men or I say about Pedlar Perfect Expanded Metal Lath is said sincerely and has the facts behind it to make it good. You have my personal word for it, that every claim made in this advertisement is absolutely true. My lath needs no exaggeration to make it sell. Send for a sample of it and you will soon see why.

G. A. Pedlar

MADE BY A BETTER PROCESS

The Pedlar process makes a metal lath that is easily 100 per cent. more serviceable than the ordinary kind. Special machinery produces it in standard meshes with all the temper of the sheet metal retained after expanding it. As it is galvanized or painted after making, it is the one kind that will never kink nor rust, and the one kind that will show by actual tests the maximum of tensile strength. Get a sample of it and test it for yourself. That's real proof.

MAKES MOST POSITIVE KEY

Pedlar Perfect is the one lath that does best for two-coat work—work which usually calls for grounds ⅜-in. Pedlar Perfect is the lath that clinches plaster vise-tight because it is so made that the dip of the strands is inward and downward when the metal faces the wall. That throws the key on the far side of the metal instead of toward the workman—as often happens when the metal is wrongly meshed. You will never hear a "kick" about any plastering done on Pedlar Perfect; and the workman can get through quicker besides.

FAR AHEAD OF OTHER KINDS

Surpasses all other metal lath in tightness of key, ease of handling, rigidity, economy in nails or staples, resistance to fire and rust. Baseboards, window and door trim, moulding, can be fastened to it without weakening the wall or causing cracks from strain. The very fact that it has been preferred for such buildings as this advt. names ought to tell you the superiority of Pedlar Perfect Expanded Metal Lath. Get a sample of it.

PEDLAR PERFECT EXPANDED METAL L-A-T-H

These Are But A Few Of The Pedlar Perfect Constructions

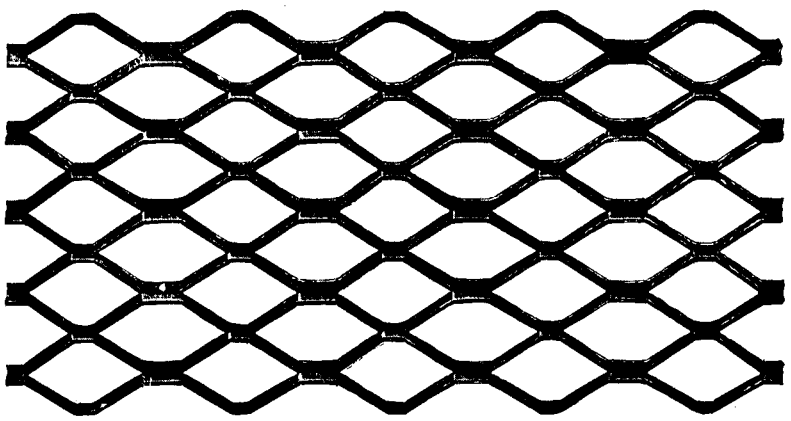
Royal Victoria Museum, Ottawa; New Mint, Ottawa; Royal Victoria Hospital, Board of Trade Building, Sir Wm. MacDonald's Agricultural College, St. Anne de Bellevue, Merchants Bank Building, Windsor Hotel, Bank of Montreal, M.A.A.A. Building, Royal Bank of Canada, Alexandra Hospital, Coristine Building, Mark Fisher, Sons & Co., Mount Royal Club, Sherbrooke Apartments, New Harbor Sheds, Maternity Hospital, Henry Morgan & Co., all of Montreal.

Our galvanized lath was chosen in competition for McGill Medical Building, Montreal.

Architects, Brown & Vallance.

Contractors, Peter Lyall & Son.

We could name hundreds of other cases, showing the accepted superiority of PERFECT EXPANDED METAL LATH. We'll gladly send such indisputable proof to you on request.



PRICED LOW ENOUGH YOU'LL ADMIT

PEDLAR PERFECT EXPANDED METAL LATH

PAINTED

26-gauge costs 10c. a square yard.
24-gauge costs 13c. a square yard.
23-gauge costs 15c. a square yard.

GALVANIZED

24-gauge costs 16c. a square yard.
23-gauge costs 17½c. a square yard.

SEND NOW FOR SAMPLE and BOOKLET "FIRE-PROOF" No. 53

Pedlar Perfect Is The Best Re-Inforcing You Can Get

Does better for all purposes: Ceilings, partitions (either solid or hollow), walls, beams, columns, stucco work, lighthouses, tanks, etc., etc. Absolutely the best material ever offered to the building public for Ceilings.

The PEDLAR PEOPLE of Oshawa

ESTABLISHED 1861

HALIFAX	ST. JOHN, N.B.	QUEBEC	MONTREAL	OTTAWA	TORONTO	LONDON	CHATHAM
16 Prince St.	42-46 Prince William St.	127 Rue du Pont	321-3 Craig St.	423 Sussex St.	111-113 Bay St.	86 King St.	200 King St. W.
PORT ARTHUR	WINNIPEG	REGINA	CALGARY			VANCOUVER	VICTORIA
45 Cumberland St.	76 Lombard St.	1901 Railway St. South	1112 First St. W.			821 Powell St.	434 Kingston St.

203 ADDRESS OUR NEAREST WAREHOUSE. WE WANT AGENTS IN SOME SECTIONS. WRITE FOR DETAILS. MENTION THIS PAPER.

Interior of Second National Bank, Cincinnati, Ohio. Finished in Missisquoi Marble.

Missisquoi Marble

The demand for our material, not only in Canada, but in the United States as well, has grown so much faster than our most sanguine expectations permitted us to hope, that we are again obliged to make very large additions to our plant.

Contracts have been let for twelve additional gang saws, as well as larger engines, and increased boiler capacity. These additions should be complete by the middle of May, and we shall then be able to handle promptly a very much increased volume of business.

We appreciate the support we have had from a very large number of the leading Architectural offices, and we are using our utmost endeavors to merit it.

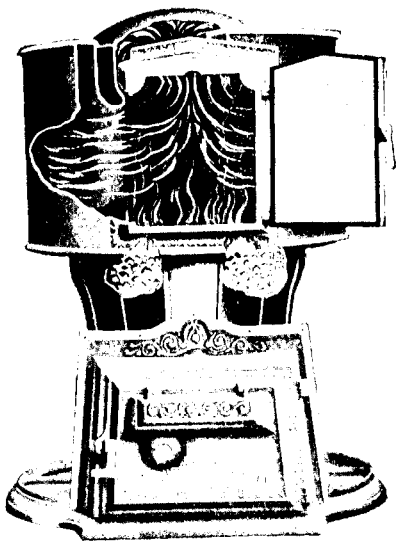
The Missisquoi Marble Co., Ltd.

PHILIPSBURG, QUEBEC **CORISTINE BLDG., MONTREAL**

DISTRICT SALES AGENTS.

DAVID McGILL, MONTREAL.
EADIE-DOUGLAS, LIMITED, TORONTO.
BOSSE & BANKS, QUEBEC.
C. N. BARCLAY, WINNIPEG.
WM. N. O'NEIL & CO., VANCOUVER.
GENERAL CONTRACTORS' SUPPLY CO., HALIFAX.
JAS. ROBERTSON & CO., LIMITED, ST. JOHN, N.B.

Repairs and After Cost



The New Idea Warm Air Furnace.

PROBABLY the largest item of repair expense in maintaining a furnace is the matter of fire-pot repairs.

Every few years the fire-pot in an ordinary furnace is liable to burn out, and in a large percentage of cases it does burn out. Not so with the New Idea It is a solid, substantial, one-piece fire-pot, scientifically made with heavy flanges that strengthen the pot and increase radiation. Actual tests of various types of fire-pots years ago convinced us that this was an exceptionally durable construction, and experience has shown that we were right.

During the past twelve years we have made and sold thousands of New Idea Furnaces and the average number of fire-pots repaired or replaced during that time has been less than two per year and where we have investigated the reason for even these being required, we have invariably found very bad misuse or abuse in some form or another.

We have always claimed and the above **actual facts prove** that the New Idea has the **longest lasting fire-pot** made. Do not be misled by flowery talks and pretty pictures circulated by the makers of cheap furnaces; endeavor to get the actual records and you will find it hard to discover another fire-pot that will show a record that the makers would publish.

And that isn't all—**The rest of the New Idea is equally good and durable.**

GURNEY, TILDEN & CO., LIMITED

Head Office and Works, HAMILTON

Branches: Montreal, Winnipeg, Vancouver.

Makers of New Idea Heating for Hot Water, Steam, or Warm Air.
Souvenir Stoves and Ranges. Locks and Builder's Hardware.

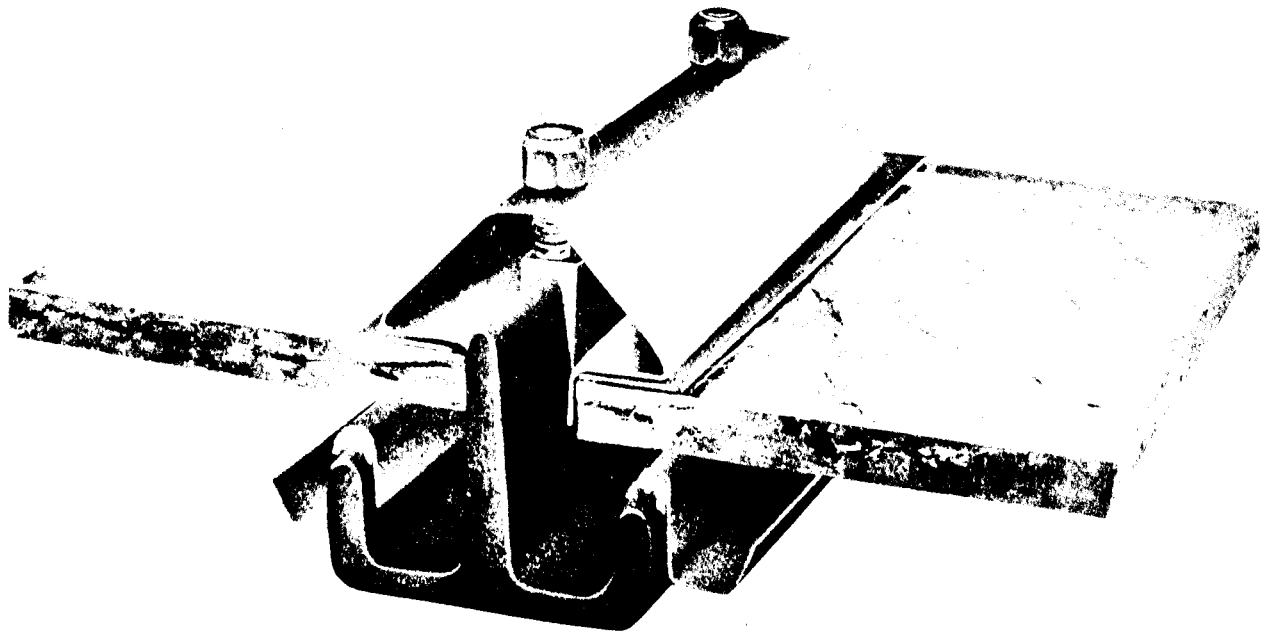
REX SYSTEM

(FORMERLY KNOWN AS THE NATIONAL SYSTEM)
OF

STEEL PUTTYLESS GLAZING CONSTRUCTION

FOR

ROOF LIGHTING, SIDE LIGHTING and PIVOT SASH



STANDARD CROSS SECTION

Patented Aug. 25, 1903; Mar. 7, 1905, and Nov. 21, 1905. Other patents allowed and pending

For Factories, Machine Shops, Foundries, Warehouses, Railway Terminals, Libraries, Dormitories, Halls, Museums, Theatres, Etc., Etc., and Buildings of Every Kind.

DURABLE : WATER TIGHT : PERMITTING EXPANSION : NOT AFFECTED BY VIBRATION : NO FILLING SUBSTANCE USED : NO BROKEN GLASS

MAXIMUM STRENGTH WITH MINIMUM WEIGHT AND THEREFORE LOWER COST is attained by the use of the REX Supporting Bar, which also provides enclosed gutters.

THE ASBESTOS FIBRE CANNOT DETERIORATE because thoroughly protected from moisture and grit.

THE GLASS IS SET SO THAT EACH LIGHT IS INDEPENDENT of every other, and, seated on a flexible and yielding bearing surface.

THE GLASS IS KEPT FREE FROM BINDING AND FROM COMING IN CONTACT WITH ANY RIGID PART by the vertical legs of the spring caps.

REX PUTTYLESS GLAZING is wholly free from the use of putty, roof cement or any other filling substance which binds the glass and causes breakage and wired, cracks and disintegrates in time, thereby causing leakage.

DETAIL DRAWINGS AND ESTIMATES FURNISHED ON REQUEST

SCHALKENBACH AND BUDKE

SOLE OWNERS AND MANUFACTURERS

402 Claremont Avenue :: :: Jersey City, N.J., U.S.A.

William Stewart & Company

SOLE CANADIAN AGENTS

Saturday Night Building, TORONTO :: Board of Trade Building, MONTREAL

Beauty and Stability in Building with IDEAL Concrete Machine-made Blocks

BRILLIANT examples of building with *Ideal Concrete Machine-made* blocks reach us every few days. This month we reproduce the photograph of a home at Paisley, Scotland, which must reveal to the contractor and builder the great possibilities that the machine affords.

The IDEAL Concrete Block Machine has revolutionized the use of concrete. It has placed right in the builders' hands a machine that produces effects equal to the finest cut stone; and produces them in such great variety as to meet every taste, to meet every emergency that arises in building.

In the present illustration, we call the builder's attention to the entire absence of monotony of the rock face. It is relieved by panel blocks, plain blocks and broken ashlar effects. Attention is also directed to the ornamental work, such as balls, spindles, rails, etc. The actual building is pleasing to the most critical eye and is practically beyond criticism. All the old-time plain wall-like disagreeable effect is overcome by the interchangeable IDEAL machine, which is limited only by the builder's ideas.

Scotch builders are particularly keen for IDEAL machines and a great number are to be found in constant operation all over that country. The Scotch are utilizing the wonderful opportunities the machine offers and are creating beautiful structures monuments to this admirable building material and machine!

The IDEAL is notable for simplicity, durability, adaptability, and economy. It is the only block machine legally built on the face-down principle so that faces are quickly and easily changed. Cost is greatly lessened by use of coarser and cheaper material back of the facing.

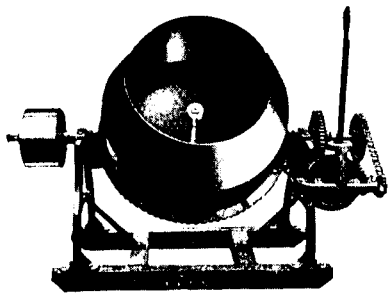
Another attractive feature in the IDEAL is its adaptability to all dimensions within capacity. It permits the architect and the builder to secure effects that in stone would add tremendously to the cost.

We want you to know the splendid possibilities of the IDEAL machine; to realize the rich reward the future must bring to the builder who grasps the opportunity that offers NOW!

CAUTION.

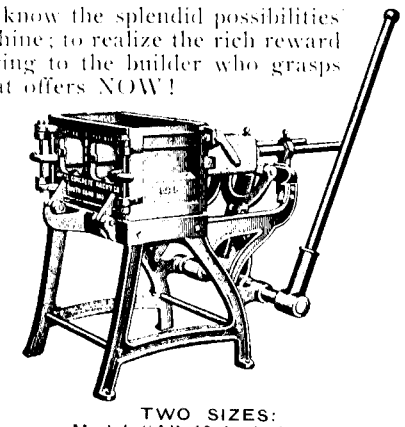
Our patent covering the FACE-DOWN Horizontally Movable Core type of Concrete Block Machine was upheld by the High Court of Justice at London, Canada, on Nov. 21st, 1906. The infringing manufacturer was enjoined from MAKING, SELLING or USING such machines. We regard machines of this type as infringements of our patent rights. We caution buyers to make careful investigation before purchasing such machines. The patent of the Ideal Concrete Machinery Company, of South Bend, Indiana, was also upheld by the United States Circuit Court for Indiana on Oct. 4th, and by the United States Circuit Court for Western Michigan on Dec. 20th, 1909.

OPEN DRUM BATCH MIXERS



The attention of contractors is particularly called to our Open Drum Batch Mixers. The only Mixer on the market which mixes the material in sight of the operator, permitting proper gauge of the material and moisture desired, and examination as to when batch is ready to dump. It is also cleanable to an extent which entirely eliminates the caking of concrete, imparting to the machine long lasting qualities.

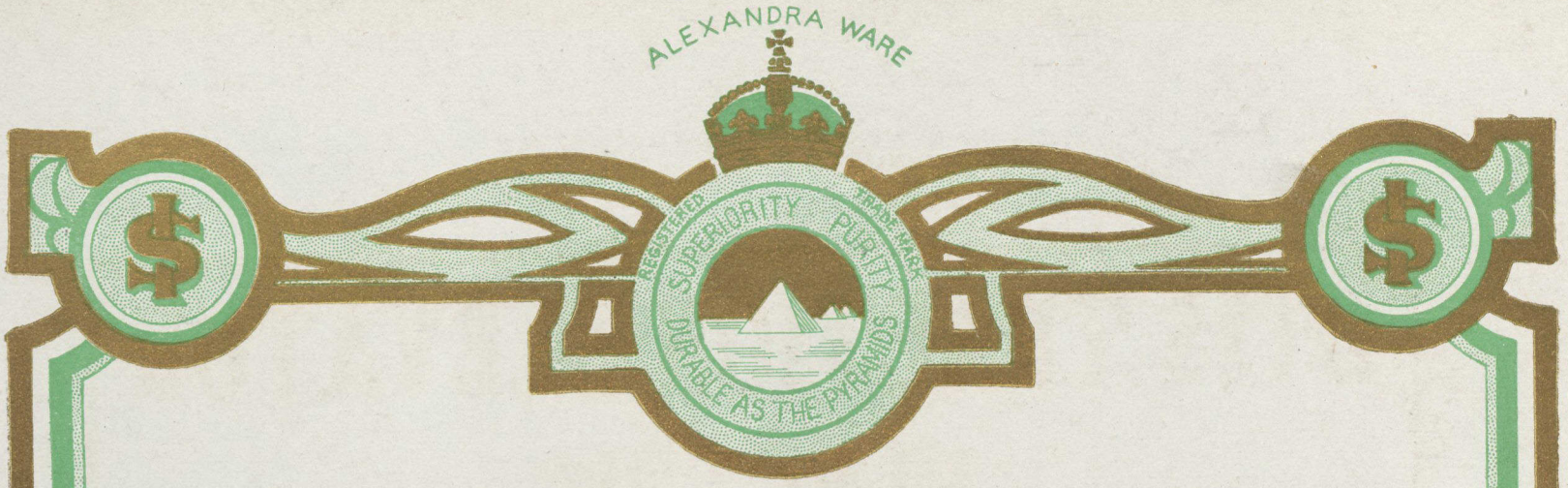
Valuable catalogue, showing full line of Ideal Block Machines, Mixers, Automatic Tampers, Brick, Step, Sill and Lintel Machines sent free. A practical encyclopaedia of the concrete industry. Shows various plans, designs, and enables accurate calculations of building costs and profits.



TWO SIZES:
Model "A" 16 inch length.
Model "E" 24 inch length.
Interchangeable to 4, 6, 8, 10 and 12 inch widths, 4, 6 and 8 inch heights.

IDEAL CONCRETE MACHINERY CO., LIMITED

221 King Street **LONDON, ONTARIO**



FOUR of MONTREAL'S MORE RECENT BUSINESS BUILDINGS IN WHICH THE PRODUCTS of the STANDARD IDEAL COMPANY, Ltd., HAVE BEEN INSTALLED ∴ ∴ ∴ ∴ ∴

THE EXCELLENCE OF OUR PLUMBING WARE is best proven by its popularity with Canada's *foremost Architects.* From the Atlantic to the Pacific, Canada's newest and best buildings have been equipped with *Plumbing Ware* from our manufactory at *Port Hope, Canada.* We manufacture every type of plumbing fixture that is required for any and every character of installation. Artistic design, high quality, elegant finish, perfect construction, quick and efficient service, are the factors that have made our products the standard in Canadian Architects' specifications for Plumbing Ware.

Our Cast Iron Enamel Ware embraces every superior feature and improvement in design and manufacture of plumbing fixtures.

The Standard Ideal Company Ltd.

PORT HOPE, Ontario, Canada

Montreal Light, Heat
& Power Building

J. Rae, - Architect
Garth Co., - Plumbers

Bank of Commerce,
Montreal

Darling & Pearson,
Architects

W. J. McGuire,
Plumber

Jacobs Building,
Montreal

Mitchell & Creighton,
Architects

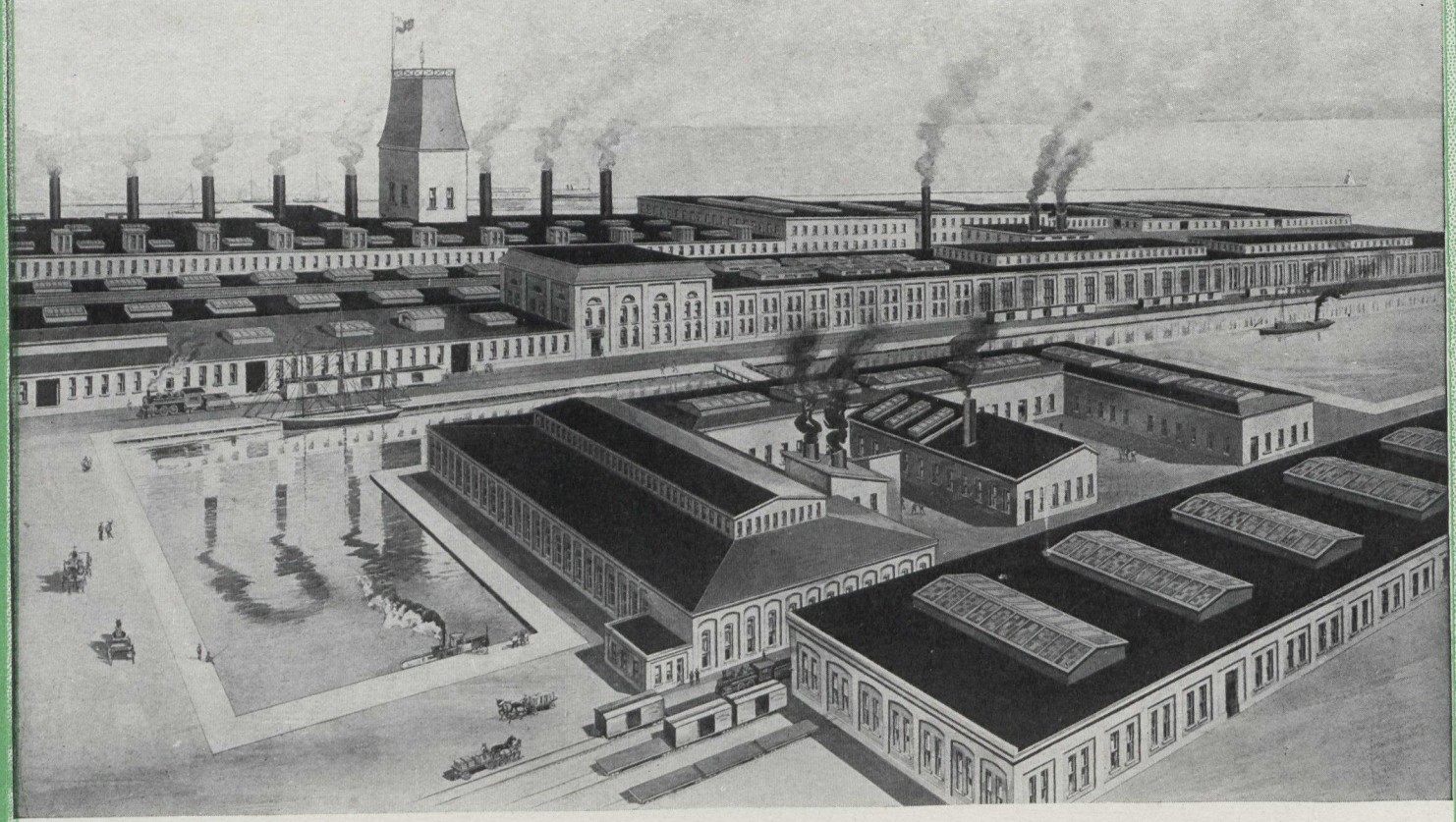
W. J. McGuire,
Plumber

Eastern Townships
Bank Building, Montreal

Darling & Pearson,
Architects

James Ballantyne,
Plumber

ALEXANDRA WARE



OUR HEAD OFFICE AND FACTORIES AT PORT HOPE, CAN., WHERE "ALEXANDRA" WARE IS MADE.

The Largest Exclusive Cast Iron Porcelain Enameling Works under the British Flag.

500 HANDS EMPLOYED. CAPACITY 110 TONS OF IRON MELTED DAILY.

The Standard Ideal Company Ltd.

MANUFACTURERS OF CAST IRON PORCELAIN ENAMELED SANITARY WARE

HEAD OFFICE AND FACTOR IES :

PORT HOPE, - - CANADA.

SALES OFFICES AND SAMPLE ROOMS

TORONTO, 50 Colborne Street. MONTREAL, 128 West Craig Street WINNIPEG, 156 Lombard Street

ALEXANDRA WARE

Building Statistics for January.

THERE IS EVERY INDICATION that Canada is just entering on the greatest period of building activity the country has ever experienced. Judging from the pace established at the outset, the volume of work to be undertaken will practically double that which was recorded in the remarkable year just past. January completely submerged all previous high water marks for that month, and all sections between orient and occident, and from boundary to hinterland, went flying past the boards as regards previous operations at this time of the year.

The average gain for the month, as based on comparative figures supplied CONSTRUCTION, was 94 per cnt. and of the nineteen cities reporting, only two show a falling off. These losses are noted in the case of Brantford and Sydney, but the amounts recorded for both last year and this, in either instance, are of such small proportions as to really denote nothing except a usual condition of mid-winter inactivity.

St. John, N.B., with a gain of 860 per cent., has the biggest increase for the month. Regina has the second highest standing, with an advance of 719 per cent. and Calgary comes next with a gain of 319 per cent.

The largest volume of work, however, was registered at Toronto, although Vancouver proved herself a most worthy competitor for first place in this respect. Both of these cities exceeded the six hundred thousand mark, which is almost double the amount recorded last year, the increase in either case being 79 per cent. and 72 per cent. in order named.

In fact, all cities, both large and small, forged ahead most substantially. Winnipeg over-shot last year's mark for the month, to the extent of 264 per cent.; Victoria annexed a gain of 65 per cent.; while Montreal came forward with an advance of 32 per cent. It might be mentioned in this connection, that Winnipeg, during the month, refused permits aggregating $875,000, owing to recent changes made in the building by law regarding the first class fire limits, apartment houses and surface foundations. All of these permits will be applied for again as soon as plans and specifications have been altered to meet the new requirements, so it is quite evident that this city is preparing to hold its own as regards building expansion during the coming year. Montreal and Victoria also, it might be added, have most excellent prospects immediately ahead, particularly in the way of important office and commercial buildings.

Other Western cities besides those already mentioned, to show gratifying increases, are Edmonton, which notes an increase of 117 per cent., and Lethbridge where an advance of 270 per cent. has been recorded. Prince Albert, but as yet an embryo town, indicates by an amount of $16,175, that the place is marching onward in a promising manner, especially so when one considers that in the same period in 1909 not one single project in the way of new buildings was undertaken.

In Ontario, besides Toronto's gain, other advances noted are: Ottawa, 141 per cent.; Peterboro, 210; London, and Fort William, 16 per cent. Windsor neither advanced or fell back, but simply broke even, registering the same amount as was recorded in the corresponding period of last year.

As for the East, this section of the country got away with a much better start than was experienced last year. Halifax, in attaching a gain of 74 per cent., finds herself in the very opposite condition from that which obtained at the beginning of 1909. This increase, together with the splendid advance made by St. John, precedes what is predicted to be one of the most active periods of development the East has ever enjoyed.

Sizing up the situation in general, the prospects are most brilliant. All sections send in promises of big things for the immediate future, and every sign and token indicates that within the next sixty days every branch of the building trades will be moving forward in a manner never experienced before.

	Permits for January, 1910.	Permits for January, 1909.	Increase, Per cent.	Decrease, Per cent.
Brantford, Ont.	$2,350	3,640	.....	35.43
Calgary, Alta.	106,500	21,650	391.91	.....
Edmonton, Alta.	44,090	20,240	117.83	.....
Fort William, Ont.	36,890	17,050	116.36	.....
Halifax, N.S.	30,650	17,545	74.69	.....
Lethbridge, Alta.	51,015	13,770	270.47	.....
London, Ont.	61,810	24,385	153.47	.....
Montreal, Que.	159,510	120,120	32.79	.....
Ottawa, Ont.	57,650	23,900	141.21	.....
Peterboro', Ont.	7,150	2,300	210.86	.....
Prince Albert, Sask.	16,175	.....	.....	.....
Regina, Sask.	24,585	3,000	719.50	.....
St. John, N. B.	24,000	2,500	860.00	.....
Sydney, N.S.	1,200	2,300	.....	47.82
Toronto, Ont.	682,098	380,025	79.48	.....
Vancouver, B.C.	631,311	365,630	72.66	.....
Victoria, B.C.	128,985	78,080	65.19	.....
Windsor, Ont.	5,550	5,500	.....	.....
Winnipeg, Man.	183,400	50,300	264.61	.....
	$2,254,919	$1,153,735	94.34	.....

Technical Education.

TECHNICAL EDUCATION is at present, in Canada, a problem that we in our great measure of development, must solve, and is one in which architects and contractors have reason to take especial interest. The extent of the usefulness to himself and the community of our newly adopted citizen, demands it and the proper utilization of the talents of our own young Canadian, renders it most necessary. Germany is the greatest industrial country in the world, despite the fact that her area is small, her natural resources limited, and her population large. The secret of Germany's industrial supremacy, is a perfect system of technical education. Her people are the greatest genuine producers in the world ,and she is, therefore, enabled to produce a better quality of manufactured product at a lower cost than can any other of the great nations.

Canada, it is true, is an agricultural country and it may be argued that our first and last duty should be to keep our citizens on the farm, and not through the establishment of technical schools, attract them to other occupations. In the first place, this is impossible, and in the second, it is impracticable, for the reason that it matters not how attractive agricultural life may be made, there are many men whom you cannot send to the farms. Then, again, we know that our agricultural greatness demands railroads, steamboats, agricultural implements, building materials, manufactured products of all sorts, and as a nation, we must endeavor to see that these are manufactured at home at as low a cost as the products that may be brought from abroad.

The farmer as a buyer, creates cities, cities consume the farmers' products, and it is in this manner that a country is made industrially rich, and less dependent upon the foreign market. We have in our cities to-day, thousands of capable young men who reach the age of maturity without having been trained for any trade or profession. Farm life does not suit them and their especial make-up would not suit them to farm life, and they float through life working first behind the ribbon counter, driving a bakery wagon, selling books, working as a factory hand, living on their wits or living by whatever occupation they are able to get, at a wage at the best 50 per cent. lower than that which is paid a mechanic. They must have a living, and they employ the most convenient means to secure it.

If these men had been rendered actual producers through a technical education, they would render twice the service to the country and their services would be of double value to themselves. It is discouraging to see the vast amount of American manufactured goods being sold in the West, despite the fact that it has been principally Eastern Canadian money that has made this country possible. The West is made up of people who come from almost every clime. They have come to Western Canada to make money, and the very atmosphere breathes "Get rich quick." The settler in the West has no sentiment. He went West to make money, and has no sympathy with the slogan "Made in Canada." He buys from the most convenient and cheapest market. So what is necessary for the Eastern manufacturer to do to secure the Western market, is first to make it more convenient for people of the West to secure his product, and secondly, through economical methods of manufacture and the thorough training of his workers, be able to produce as cheaply as his American competitor.

Technical schools will go a long way towards solving this problem, and there is no branch of our industrial life that will profit more materially through the establishment of a thorough system of technical education, than the building industry. Defective work in our buildings; bad carpentry, poor masonry, faulty plumbing and heating, together with the scarcity of trained mechanics in the building trades, all may be attributed to the fact that in our rapid growth we have neglected to an alarming extent, technical education. It is, therefore, the duty of every architect, builder and contractor, through their several associations, as well as individually, to give this timely agitation their fullest co-operation.

Report of U.S. Federal Bureau.

IN VIEW OF THE RECENT DECISION of the Ottawa Government to appoint a Commission to investigate what has been accomplished along the lines of technical education in various countries, the Report issued by the United States Federal Bureau of Education, giving the study of the apprenticeship system in its relation to industrial education, by Carroll D. Wright, president of Clark College, will prove of interest. Education by apprenticeship and education by schools has gone on for many generations side by side as two entirely distinct relative forms of education, and the new movements are concerned with bringing these two kinds of education together and making for them a new kind of education which shall train equally for skill and for intelligence. The substance of Mr. Wright's argument and findings is covered in what follows:

There are three methods of securing greater skill for industries. First, the apprentice system; second, trade schools; third, industrial schools. The old system of indenturing young men for industrial purposes was greatly modified by the introduction of labor saving devices and the industrial revolution of the nineteenth century. As, however, the need of skilled workmen still exists and the present system of trade and industrial schools has not proved altogether satisfactory in turning out practical, as well as theoretical workmen, some co-ordination is needed whereby the good of the apprentice system and the modern trade and industrial schools may be combined.

Trade schools have proved themselves inadequate, nevertheless, their power and influence must be recognized. The best equipped public industrial schools, however, have all the machinery and appliances for the instruction of students. In industrial schools as distinguished from trade schools the academic work is the more valuable because allied to industrial training.

Contrary to popular belief, the old system of apprenticeship now exists to a large degree in the United States, but is very quietly and rapidly giving way to the modern. This system varies with localities, but investigation has developed the fact that the apprenticeship system is a power to be recognized with and that it exists in all parts of the Union.

All but three of the States have enacted statutory regulations relating to the employment of apprentices, while the laws of 38 States provide that in addition to the trade, the apprentices must be taught the common English branches of education and receive such schooling as every youth entering business should have.

Trade unions are as a rule opposed to trade schools principally in apprehension that in strikes the apprentices might be employed as strike breakers. This prejudice is not deep-seated, however, as shown by the resolutions adopted by the 1907 annual convention of the American Federation of Labor. Everywhere it is beginning to be understood that industrial education does not injure those already engaged in industry and the antagonism is disappearing. When union regulations relative to the employment of apprentices do exist, they are often disregarded wholly or in part by both unionists and their employers, both of whom must realize that the effectual expansion of the system with an increase of skill and consequently of wages, must prove to their mutual advantage.

The proprietors of the industrial establishments at the present time are not blind to the necessity of training labor in their own works. There is hardly a manufacturing firm to-day, especially in the jewelry and shipbuilding trades, which does not have some form of apprenticeship whereby boys are indentured for a term of years to the trade. The point of consideration is to what extent do these systems meet the arguments advanced for the introduction of industrial education as a part of the public school system. All employers realize the value of such education and those who can afford it, prefer it to their own system. A careful investigation, however, shows a wide variance in their procedures. Some have no system, while the majority have a system of indenture for a term of years and a few have an elaborate scheme of training, comparing favorably with the best public training that can b afforded.

Careful selection of boys fitted for the particular work is the first step. They must pass also a physical,

mental and moral examination. Their rate of pay is determined beforehand and increased now and then for encouragement. The kind of work the boys do is varied, and their future is considered as well as the profits to be derived from their service. In brief, it is a shop course of study, much as any industrial school might be expected to have. Academic work to supplement the work in the shops is arranged for by nearly all the best concerns, and generally imparted by one of the engineering staff. In the case of advanced apprenticeships the boys are paid for their time. This is the essential feature of the modern apprenticeship system. The boys are encouraged to attend evening classes or take correspondence lessons, but investigation shows that this encouragement lacks definite results. The cause of this lack of interest shown by employers in following up the results of this encouragement, and in this respect the apprentice system, as now carried on, differs materially from the work done in the regular industrial schools.

Up to this point the argument has concerned itself with two phases of the apprentice system—one a definite and complete system, which may or may not be substituted for a trade school; the other an indefinite and incomplete system which lacks the fulfilling of a mutual obligation, which is very essential to a properly constructed apprenticeship course. Another type of apprenticeship now in existence is where the lad is indentured to one department only, there to specialize. The plan is popular because it enables the boy to receive higher wages and the employer to get more efficiency in a comparatively short time. As a rule, however specialization limits the capacity and narrows the mind. It is right as it secures special skill, but there should be something more in order to train the all-round man.

The demand for trade schools comes from employers who have no systematic, definite method of training their apprentices. These superintendents of industrial organizations who have this advanced type of apprenticeship, combining shop and academic training, do not feel that the local schools will meet the demand of their factories. This feeling exists very strongly among the managers of the various railroads which have adopted an apprentice system.

Let the Architect "Finish His Work."

AS TO WHETHER CANADA is to have an architecture worthy of the name in her future public buildings is something which at the present time lays wavering in the balance. It seems as though the stimulus in this respect, given by the Government some little time back, in holding a competition for the proposed Departmental and Justice Buildings, is now to be destroyed by setting aside the successful design and entrusting the planning and carrying out of this important project to the architectural staff of the Department of Public Works. When these buildings were first proposed, it looked as though Canada was about to adopt the more advanced methods employed by the progressive nations of the world in the erection of their public buildings; but a more recent announcement indicates that instead the Government intends to take a step which, if persisted in, will result in the development of a class of federal buildings which will place the standard of architecture in Canada in this respect on a plane far inferior to that which has been attained in other countries.

There is every valid reason why the Government should adhere to its original program, and not commit the serious blunder in this respect which in all likelihood it unconsciously invites. To enforce its intention to erect the buildings in question on its own accord would simply mean that the Government violates what was virtually implied and understood by the terms of the competition; and it would be difficult in the fact of this to conceive how any self-respecting architect could have confidence in any future project of the kind that the Government might advance. Thus the best professional service in this, and possibly future undertakings, would be lost to the Government, and the interest of the public would be sacrificed in consequence thereof.

The object of any competition is to bring forth the best talents, and obtain the highest results possible, by spurring men on to extra effort. Without some incentive, creative genius lies dormant. This was fully realized by Hon. Mr. Hyman, at that time Minister of Public Works, when in 1905 the buildings were first proposed, and this was the feeling in 1907 that instituted the competition which gave the Government the best which the collective architectural brains of the Dominion had to offer.

In view of this fact, and especially so, as it was with this understanding that a large number of men were induced to give their time, effort and study to something of national interest, the only fair, reasonable and honorable thing the Government can do is to retain the author of the successful design to carry the work through to completion. It is the author only who in full sympathy with his creation, can carry out the work in a manner that will give the building the individuality, and the artistic and utilitarian value, that such a structure should essentially possess. By developing the design on its own accord, or what would be far worse, to beg and borrow from the four prize designs, as it has announced it proposes to do, the Government would commit a rank injustice to the architects of the Dominion, and in all probability produce a structure belabored and mechanical in character, and more akin to an architectural ollapodria than to anything else.

The failure of the Government to recognize the more progressive method adopted by the United States, Great Britain, Germany, France, Austria, Italy and all other countries where art is encouraged, and where such splendid results are attained, is indeed to be deprecated; and it is sincerely to be hoped that the petition voicing the protests of the architectural bodies of the Dominion, against the proposed policy of the Government in the erection of the Departmental Buildings, will have sufficient weight and influence to deter the Government from taking this unfair step, and to induce it to carry out this work according to the terms of the competition as they were implied and understood.

These protests, it might be added, have the approval and support of the intelligent and broad thinking element of the lay public, which is in sympathy with the efforts that are being made by members of the profession, both individually and collectively, to raise the standard of architecture in Canada to a higher and more esteemed plane.

We believe that the slogan used by the Government in appealing to the electors in the last campaign to let the man at the helm of state "finish his work," might apply just as effectively in this instance. There is just as good or a greater reason for it, as architecture is an important work, a dignified work, one that mirrors more than anything else a nation's progress and culture, and one that is worthy of the broadest support and encouragement that any government can possibly bestow. Let the authors of the successful design "finish their work."

RENEWED AGITATION in support of the proposed Forth to Clyde Canal has been brought about in England and Scotland as the result of the report of the Royal Commission advocating the immediate State control, and upbuilding of Great Britain's inland waterways. This plan proposes neither more nor less than a 35-mile battleship canal between the Firth of Forth, via Stirling, Loch Lomond and Loch Long and the Firth of Clyde. By its consummation the shipping interests of the country would obtain an inland waterway across Scotland, 36 feet in depth and 65 miles in its total length, that would reduce all existing routes by from one hundred to six hundred miles. Engineers have figured that the work could be completed in nine years at an aggregate expenditure approximating $100,000,000.

FEDERATION WITH R.A.I.C.—New Proposal for Consideration of Provincial Associations.

RECENT DEVELOPMENTS indicate that the difficulties encountered in federating the several provincial architectural associations, into one great Dominion body, that will be representative generally of the profession in Canada, will shortly be overcome and that at last the efforts of the organizers and promoters of the R. A. I. C. will be realized. We have pointed out several times the effective work that could be successfully undertaken by a body that would be comprised of architects in every portion of Canada. We have further, pointed out the many problems that the profession is confronted with in Canada at the present time, that cannot be consistently dealt with by any one of the individual provincial organizations It seemed for a while that great difficulties were to be encountered and many stumbling blocks to be overcome, together with some apparently serious grievances of some of the provincial bodies, before the objects of those who worked earnestly and diligently for the consummation of plans for an efficient Dominion organization were to be accomplished.

However, at a joint conference held in Montreal during January, of representatives of the Ontario Association of Architects, and the Province of Quebec Association of Architects, a plan was drawn up to formulate a basis upon which federation of the several provincial associations with the Royal Architectural Institute of Canada could be brought about. This proposal will in due order be submitted to the various provincial associations, and, insofar as it apparently overcomes the differences of opinion that up to this conference had existed in connection with federation, it is altogether probable that it will meet with their unanimous approval.

In drawing up these suggestions, the conference aimed to fully conserve the interests of the representative provincial associations. The report is given in the form of nine clauses.

Clause 1 lays down the principle that a Dominion Institute of Architects must be composed of a federation of provincial associations, and not an affiliation of private individuals. The conference considered that some difficulty would be met with if it were to recognize architectural societies which were not provincial in their scope or nature, and further recommended the formation of such provincial associations in all provinces.

Clause 2 establishes the principle that all provincial associations be organized on the same basis as those mentioned, and that the examination qualifications be of a uniform standard.

Clause 3 aims to insure the autonomy of the provincial associations, and provides that nothing will be done to override their charter. The conference recognized that entrance to the provincial association must come first, and that upon their own shoulders must the onus be retained of upholding the standard of qualifications.

In Clause 4, provision is made for a certain uniformity of standard being upheld, throughout the Dominion and in order to insure this, an advisory board will be appointed by the Dominion Institute, whose duty will be to see that the examinations as set by the provincial boards, are of a satisfactory standard.

Clause 5 provides that membership in the Institute rests entirely upon membership in provincial associations, and that membership, therefore, in the latter will constitute "ipso facto" membership in the former. This is done in order to carry out the full spirit of federation, so that the Institute will be composed therefore, of every member on the rolls of the provincial associations. Provision is also made in this clause to protect the rights of the provincial associations, so that membership in the provincial association is necessary to constitute membership in the Institute, but the converse will not apply.

In Clause 6, provision is made to render the Governing Council of the Institute really a representative body of all provincial associations.

Clause 7 provides for the election of officers by the council, and not by individual members. The conference considered that these delegates or members of council were the proper ones to select the higher officers.

Clause 8 provides for ways and means to carry on the work in the Institute. The exact manner of apportioning the fee is open to discussion, possibly a per capita fee being the most satisfactory.

Clause 9 provides that the existing provincial associations favor federation on the foregoing lines, it is the intention of the conference to approach the executive of the Royal Architectural Institute of Canada, with the request that their charter be amended accordingly.

It is greatly to be desired that the provincial associations in Canada will look favorably upon this plan, and that the R. A. I. C. will appreciate the necessity of acceeding to their wishes by making the requested amendments to their charter.

A MODEL SCHOOLHOUSE.

AS INDICATING the attention which is being given to schoolhouse construction and the thought given to the health and comfort of the pupils, it is interesting to note the movement at present under way to erect in the city of Chicago a school building which will be a model in its way. The features of the school will be a bathroom, kitchen, dining room, ventilated cloak rooms, manual training benches in every class room and emergency exits for all rooms. The "typical classroom," as it is called, will be 22 x 33 ft. in size, and will have seats for 40 pupils. Each child will have an additional square foot of space and 10 cu. ft. of air more than is available for the child of the average classroom now constructed. The seats will be in five rows of eight each, and two sides of the room will have manual training benches with accommodations for 20 pupils at one time. The idea is to have one class of pupils reciting, while another of 20 pupils is working at the manual training benches. The cloak room will extend along the entire length of another side of the room, with sufficient vertically sliding doors thereto, so that all the pupils may get in the cloak room in 15 sec. The blackboard of each room will be of slate and in one piece.

The ventilating apparatus will be so constructed that the air will be forced into the room near the ceiling and forced out near the door, passing through the wraps of the pupils, so that they will receive a thorough airing. Every room will have emergency exits, with automatic locks, opening into the fire escape, or onto the ground, according to the location of the room.

The plans which have been drawn for this model school building call for a fireproof construction, the floor and wall beams being of steel with fire brick between.

PROSPECTIVE CONSTRUCTION WORK in Montreal includes three ten story buildings to be erected during the coming summer, within the immediate vicinity of the Post Office. The old Seminary property, which has been leased for a period of ninety years by the Grand Trunk Pacific, will be occupied by a ten story structure. The one on the opposite corner, the old St. Lawrence Hall landmark, will be replaced by another ten story building to be used by the Canadian Pacific for their down town offices, while the third skyscraper will be built on the same street directly opposite the St. Lawrence Hall by the Yorkshire Insurance Company.

COMPETITION FOR DESIGN FOR MEMORIAL TOWER.—

Canadian Architects and Draftsmen are Invited to Submit Competitive Designs for a National Memorial Tower to Commemorate the Establishment of Self Government in Canada.—A Great Patriotic Work.

A wise nation preserves its records, gathers its muniments, decorates the tombs of its illustrious dead, repairs its great public structures, and fosters national pride and love of country by perpetual references to the sacrifices and glories of the past.
—JOSEPH HOWE.

IT IS THIS GREAT NATIONAL and patriotic spirit uttered so beautifully in these words of the great Nova Scotian that has served as the inspiration of the citizens of Nova Scotia in their determination to erect a National Memorial Tower to commemorate the one hundred and fiftieth anniversary of the origin of parliamentary government within the limits of the Dominion of Canada; a historical monument that will commemorate a national epoch of profound significance to every Canadian and to the people of the British world. As Canadians, we owe a duty to ourselves and still more to the Motherland, and to our successors, that we should in a befitting manner commemorate our priceless heritage.

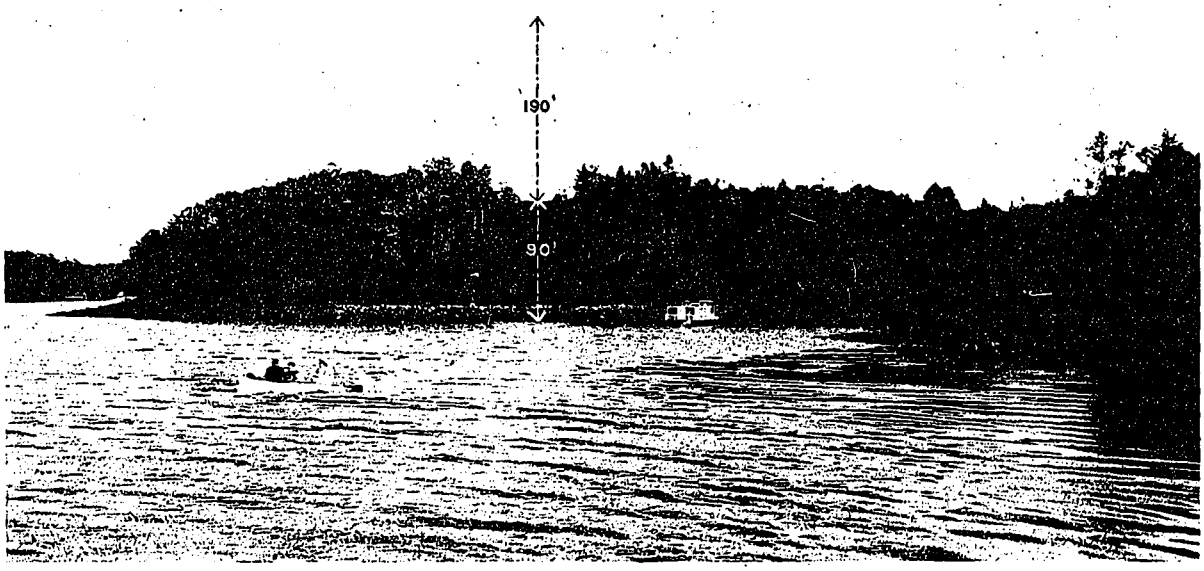
With this patriotic object in view, the citizens of Nova Scotia have undertaken the erection of this Memorial Tower on a beautiful site of about one hundred acres of park land, donated to the province of Nova Scotia by Sir Sandford Fleming. No more entrancing scene could be imagined than that to be had from the top of the promontory, ninety feet above the sea level, upon which the tower is to be located. It will stand at a point which gives a clean sweep up to the head of the Northwest Arm and beyond, looking south, straight to the sea. When it is erected, the view from an altitude of nearly 200 feet will command a portion of the city of Halifax and will reveal the sea and land for many miles around.

Appreciating the patriotic character and national significance of the undertaking, the committee in charge have decided to give every architect and draftsman in Canada, who is a British subject, an opportunity to present a design for the structure, by placing the whole affair in the hands of the R.A.I.C., who will conduct a competition as per the conditions set forth herewith

It is certain that a subject of this character will appeal strongly to every Canadian architect, and though the work entailed will be small, merely the design, practically no planning, the honor of having executed the successful design will be such as to touch the patriotic pride of every architect in Canada, thus rendering the competition an extensive one.

CONDITIONS OF COMPETITION.

It is proposed to erect a Tower commemorative of the Federation of the various Provinces whereby the Dominion of Canada came into existence, in 1867.



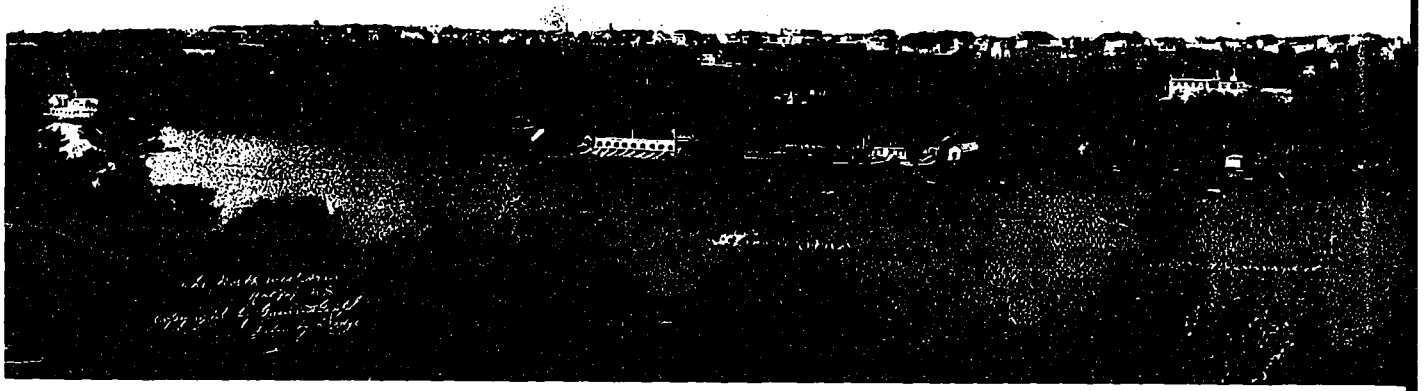
View showing the exact location of the proposed Memorial Tower, giving a fair idea of the beautifully wooded site selected on the promontory at the narrow neck of the North-West Arm. The commanding position of the tower rising 190 feet above sea level is denoted in the illustration.

This Tower is to be erected on the North West Arm at Halifax, N.S.

The competition is open to Canadian architects and draughtsmen who are British subjects, and will be conducted as follows, by the Royal Architectural Institute of Canada:

1st. The official Provincial Association in each Province will invite its members to submit competitive designs for the Tower.

2nd. Each Provincial Association will then select the three best designs from those submitted and forward them to the Royal Architectural Institute, which body will make a final selection from the plans so submitted. Members of the Royal Architectural Institute who reside in a Province where there is no organized Provincial Associa-



Panoramic view of the North-West Arm, showing the City of Halifax in the background, and the 100 acre park donated by Sir Sandford Fleming to the ... will be noted that this proposed site on a promontory 90 feet above ...

tion of Architects, will send their designs direct to the Secretary of the Royal Architectural Institute before the 25th May, 1910. These drawing will be submitted to the Council of the Royal Architectural Institute, who will select three plans to go forward to the final competition as set forth in Condition 6.

3rd. Medals will be awarded by the Royal Architectural Institute suitably inscribed. To the author of the design placed first, a gold medal; author of the design placed second, a silver medal; author of the design placed third, a bronze medal.

4th. The author of the design placed first by the Royal Architectural Institute as the winner of the whole competition will be asked to prepare working drawings and specifications with sufficient details to carry out the work. It is felt that the patriotism of Canadian architects can be counted upon in this respect, the elimination of profit being in the nature of a contribution.

5th. The Tower is to be built of local ironstone rubble laid in cement mortar, cost per cubic foot, 50 cents. All dressed work, such as strings, quoins, etc., to be of granite, cost per cubic foot, $3.

The height of the Tower to be not less than 100 feet. The walls to be solid rubble pointed inside and outside—no plastering. The floors to be fireproof. The stairs also to be of fireproof material.

The location is indicated on the panoramic view of the North West Arm at Halifax.

The cost of the building is not to exceed $22,000.

6th. The drawings submitted in each Province will be submitted to a Board of Assessors composed of the President and two members of the Council of the Provincial Associations, who will select the three plans to go forward to the final competition, where the designs will be submitted to the final selection made by the Professor of Architecture at McGill University, Montreal; the Professor of Architecture at the University of Toronto, and the President of the Royal Architectural Institute.

7th. Any intending competitors wishing to ask any questions may do so by writing to the Secretary at any time previous to April 10, 1910. All questions thus received will be answered in one document, which will be sent to the Secretaries of the various Associations to whom Conditions of Competition have been supplied immediately following the date of the 10th April.

8th. The drawings in each Provincial Competition as mentioned in Condition 2 are to be handed to the Registrar or Secretary of the Association before the 25th of May, 1910, and the final award will be made as soon as possible thereafter. The drawings, which are to be made at the scale of ¼ inch to the foot, are to consist of two sheets, one showing the plan, elevations and sections, and the other a perspective view of the exterior of the building. The latter may be rendered in pencil, pen and ink, pastel, wash or water color, as the competitor may decide, but the perspective is not to be drawn at a smaller scale than ¼ inch to the foot.

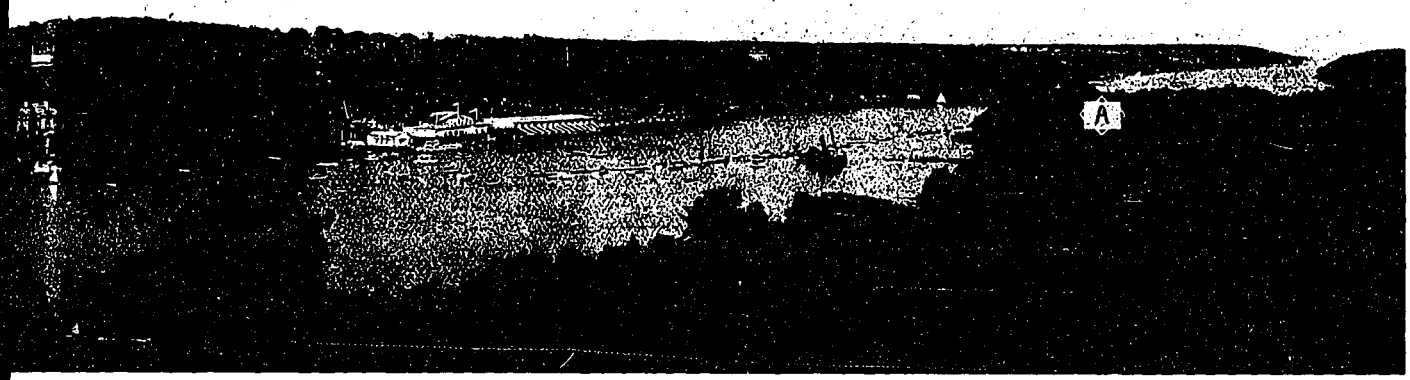
The Secretary of the whole competition is

MR. JOHN A. PEARSON,
Darling & Pearson,
Imperial Bank Building,
Toronto.

HISTORICAL SIGNIFICANCE.

The establishment of self government in the Dominion in 1758, which this Memorial Tower is to commemorate, cannot be regarded as merely an incident in history. We must consider it in association with a great policy—a policy which has increased the power and broadened the influence of the British people. The importance of this occurrence must be judged by the results, and we find results in every country over which floats that flag which is the emblem of liberty and justice, of peace and of patriotism—that flag which for so many generations has given us freedom to flourish in the highest degree.

With an event so important in the history of Canada, as well as to the British world, associated as it was with a period so glorious in British history and which was followed by occurrences in later years brought about by so many of our great men, the Canadian architect is given



rovince of Nova Scotia, as a site for the proposed National Memorial Tower, in the foreground. "A" marks the proposed location of the Tower. It a level places it within view of a vast sweep of both land and sea.

a subject which for inspiration and incentive, should bring forth his best efforts.

While Quebec has undoubted claims to be regarded as the "birthplace of Canada," the great Motherland has placed Nova Scotia in a position regarded as the "cradle of the Empire," and Halifax its constitutional birthplace. The architects of Canada have been asked to design a Tower that will befittingly mark this birthplace.

While every designer will be permitted to plan his tower in accordance with his individual conception, the Canadian Club of Halifax, which has assumed the responsibility of carrying out the project, in a recent pamphlet made some suggestions that may serve to give some idea as to just how this historical edifice might be carried out to properly commemorate the various events connected with the history of Nova Scotia as a province, in which responsible Government was first established in Canada. It, however, is not necessary, nor would it be advisable for designers to follow in every particular these suggestions. The tower shown in the suggestion referred to, is designed to be of noble proportions, and the first course of masonry, laid on the bed rock of native Nova Scotia granite, would typify the beginning of representative Government in the year 1758, associated so closely with the foundation of the Empire. In this particular conception, each course of massive masonry upwards, would have its meaning, and would be adorned by reference to the names and deeds of distinguished men who have served their country. Before going further with the description of this suggestion, we wish to make it very clearly understood that no designer is especially requested to follow out the ideas contained in this suggested design. We give it here purely for the purpose of denoting the historical events as they occurred, and how they could be carried out in accordance with one man's idea.

The historical purpose of the edifice must always be held in view. It was many years before representative Government developed into responsible Government, not indeed until 1841-48. Accordingly, for a space above the foundation of over eighty years, this suggested design would be characterized by massive simplicity of outline. Again in 1867, Nova Scotia federated with other provinces to form the Canadian Dominion, and from the natal day (July 1), from that year onwards, the pioneer province by the sea has done its full share in promoting the general progress.

It should be the aim of the design to denote all such matters in the architectural features of the tower, so that it would strike the beholder as, even in external appearance, appropriately fulfilling the purpose of its erection. The structure itself should be able to tell its tale to the spectator in after years, when present actors may be forgotten. It should practically and unmistakably proclaim the spirit of these words: "This is a birthday tower, erected by a grateful people to inform the world that a new nation was born, and with its birth the old mother became larger, nobler, more perfect than before."

One of the most important events in the formative days of the Empire was the opening of the doors of a legislative assembly in Halifax, by direction of the King, to receive the elected representatives of the early settlers of Nova Scotia. The exact date is almost identical with another event, which occurred in another part of the world. The Nova Scotia representatives had scarcely left their homes to pursue their journey through the woods to Halifax, to meet in assembly for the first time, when a child was born in a country parish in England; a child who lived to make his mark as a naval officer as no other has done since the world began. That child received the name of Horatio Nelson, and at his death some forty-seven years afterwards, no man could have done more to place our Empire on a broad and lasting basis than the great admiral. Trafalgar cleared the European atmosphere, and contributed in a marked degree to render our colonial empire possible. Up to the date of that glorious victory, as should be indicated on the proposed tower, the structure might be characterized by the greatest simplicity in its external outline.

Some nine months before Nelson passed to his reward, a great man—one of the greatest which Canada ever produced—was born in a little cottage on the shores of the North West Arm. The upper half of the tower might be enriched by a reference to the grateful services to his

country of Joseph Howe, a man who has done so much to render his name immortal in the hearts of his countrymen. That famous Nova Scotian has provided abundant opportunities for the architectural adornment of the tower.

There are many other distinguished names which should find places of honor at various stages—that of the Hon. J. W. Johnston would especially be one of them. The efforts of this statesman were greatly valued for a lengthened period, and on no occasion more so than in the complete development of responsible government, the only basis of colonial government upon which the empire of the future can be built up.

As all the world knows, Nova Scotia filled a large place in the first establishment of steam communication between Great Britain and North America, chiefly through the enterprise and foresight of a Halifax merchant, Sir Samuel Cunard.

The first steamship to cross the Atlantic wholly under steam sailed from Pictou, Nova Scotia, August, 1833.

Nova Scotia has done much to advance submarine telegraphy. It is now fifty years since the first Atlantic cable was laid.

The Prince of Wales, now King Edward, arrived in Halifax in 1860.

The confederation of the provinces of the Dominion was effected in 1867, of which one of the most powerful advocates was that distinguished and remarkable Nova Scotian, Sir Charles Tupper.

These events and much more of high interest might fittingly be denoted. There might be half a dozen or more galleries in the tower, and places might be provided for references to the names and good deeds of all who have specially served their country.

A striking feature of the general appearance of the edifice would be the modest massiveness of its base in contrast with the more elevated portions, gradually increasing in architectural beauty until crowned by the finale.

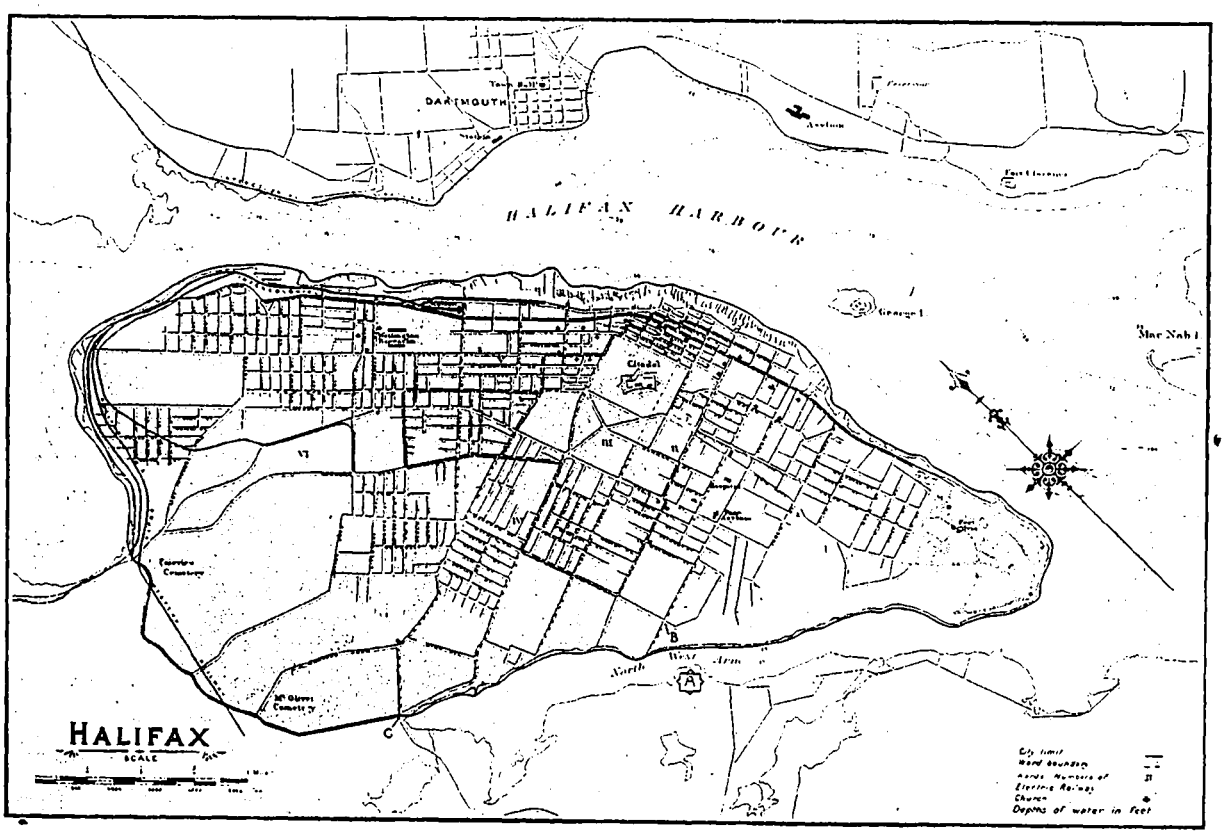
In this manner it will be seen that the purpose of the design is to raise a mural symbolic memorial of men distinguished in the public service, and of great events which have occurred at all stages of the history of Nova Scotia; the whole combining the spirit of colonial liberty with imperial stability.

A SITE FOR THE TOWER.

The selection of a proper place for the erection of the commemorative edifice is a matter that has been given careful consideration. Obviously the building should be erected on some conspicuous site, where it would be seen to the best advantage by the greatest number.

Every citizen and every visitor to the capital of Nova Scotia is familiar with the position and charms of that sheltered inlet of the Atlantic Ocean known as the North West Arm. "The Arm," as generally termed, is about three miles in length, situated in the immediate rear of the city, and as indicated on the map its greater portion is but little more than a mile and a half distant in an air line from the City Hall. For the most part the Arm is within easy reach of all the residential sections of the city. The water is of the purest description, being renewed twice daily from the Atlantic by tidal influence. There are no mud banks or reefs or shoals. The surface is generally unruffled, as it is sheltered from every quarter by foliage-clad, lofty banks; in consequence the Arm is unsurpassed in many respects for boating and canoeing, while it is navigable at all conditions of tide for vessels of any draft.

Midway between Point Pleasant at the entrance, and the head of the Arm, an elevated promontory from the western shore contracts the waterway and forms "the



Map of Halifax and environs. "A" marks the proposed location of the tower overlooking the city of Halifax and the entrance to Halifax Harbor. "B" denotes the corner of Oxford and South Streets, from which point the distance across the Arm to the proposed site of the tower will only be 1,500 feet. "C" marks the continuation of North Street around the head of the Arm, in which it is proposed to lay a street car line, so that the tower may be reached either by ferry across the Arm or by street car on North Street, around the head of the Arm.

narrows," where it is only 600 feet wide from shore to shore. At this point the Arm is divided into two lake-like expanses of great beauty, and on the elevated promontory mentioned it has been decided as the site for the historical tower. This is an ideal site, in full view of the eastern and western halves of the Arm, and regarded as a whole, there are few localities more attractive. The Mayor of Halifax, than whom there can be no better authority, in an official communication (April 11, 1908) respecting the portion of land desired for Park purposes, employs these words: "The North West Arm has of re-"cent years become probably the chief pleasure resort of "our citizens, and it is eminently desirable that a portion "of its shores should be kept open to the use of the public, "and for that purpose no portion is so well adapted as "that proposed to be dedicated."

A memorial tower, placed as suggested, would be seen from a long distance on every side, even from far out on the Atlantic. It would be conspicuous throughout the Arm. It would be in the midst of associations made memorable as the homes or haunts of the Howes, Hills, Thomsons, Cunards, Haliburtons, Tuppers, Jones', Stairs', Morrows, Kennys, Pryors, Ritchies, Duffus' and other sons of Nova Scotia, and thus in a neighborhood of old memories and on ground already historic.

In a few years great changes would be effected. Biological and other museums and buildings would probably be grouped around the tower for educational purposes. A simple cable ferry, spanning the narrows of the Arm, would bring the Tower and the Park within easy reach of the city electric railway. In an air-line, the actual distance from the proposed site of the Tower to the intersection of Oxford and South streets, the present end of the street railway is only 1,500 feet. By this means and by another extension of the street railway system around the head of the Arm, the proposed new Park and the Tower would readily be approached from both sides.

TECHNICAL EDUCATION.—Toronto's Chief Librarian on the Subject.

TORONTO'S NEW CHIEF LIBRARIAN, Dr. C. H. Locke, in a recent lecture, made some exceedingly pertinent remarks as to why we should take the question of trade schools more seriously at this time.

Dr. Locke is a man with ideas, and although we cannot say that we can agree with all the details of the several reforms he has proposed since he has been made chief librarian of the Toronto Public Library, his views on the question of technical education cannot but meet with the approval of every thinking man in Canada. The following is a resume of his remarks:

We need a revival in education that the people may see that education is the great end, making all things possible to those who have it. Much stress was laid upon the necessity for some means of education for those children who left the public schools at an early age without the training to fit them for the business of life. For them trade schools should be established wherein they could attain the knowledge to enable them to earn their livelihood. City children, in particular, were wanting in concentration, resourcefulness and the aptitude for business or the handicrafts.

The science of education is in much the same position as the tariff, in that it is ever changing, and as religion, in that every man has his own views on the subject.

The man who hopes for the return of the old methods and the professor who says that teachers are born not made, should be shut up in an educational museum. The most hopeful tendency for the present is the recognition of the fact that education was a process not a state or the possession of certain qualifications. Too long have we suffered from the terminology in education, which includes such terms as 'inculcate,' 'discipline,' which implies punishment, "broad and deep foundation" and "one stone upon another," In education, as in architecture ,there should be beauty and proportion, as well as strength. People complain of the lack of originality and ideas, yet we are turning out children, as has been said, like dollars with the stamp of nationality on one side and a mere difference of date on the other.

The student should be made to appreciate the end to be attained in his studies. The examination should be used only to reveal to the pupil what he knew or what he did not know, to organize his knowledge and to show the teacher wherein he had failed. Hence the examination should be conducted by the teacher and not by a stranger.

To-day children left the public school at the age of 12 or 14 years, and very few went to the high school. For these children training or industrial schools—trade schools in fact—were requird. City children are wanting in concentration and resourcefulness, and were handicapped in the world of action because of the lack of the training which used to be obtained about the home. These boys and girls are not helped by the evening schools, which were attended chiefly by adults and foreigners. The need of some form of education for young boys and girls who have shown by the popularity of the correspondence study courses. In Germany there are useful continuation classes, where the theory of trades is taught. Such schools may be established in Canada, in addition to the trade schools, where four-year courses should be given, the first two years devoted to general studies and the second two years to special studies.

BEAUTIFYING CITY HOMES.

SOME INTERESTING COMMENTS concerning the exterior decoration of house and apartments in Leipzic, Germany, are furnished in a recent report by S. P. Warner, U.S. Consul at that place.

The endeavor of the people there to add to the attractiveness of their individual homes, and thus to the general beauty of the city, has been greatly stimulated by the offering of prizes for the best and most artistically decorated houses. These prizes, which consist principally of objects of art and of valuable growing plants, are offered by the Der Verkehrsverein Association, while the Leipzic City Council contributes a considerable annual sum for prizes. Persons desiring to compete send in their addresses to the association, which furnishes free illustrated pamphlets containing valuable suggestions about growing plants and flowers, and using them most advantageously for exterior decoration.

The most practicable and popular method of decorating houses is by placing artistically painted wooden boxes containing collections of variegated flowers upon the window sills. The windows are frequently entirely framed in by climbing vines. Porches and balconies are better suited for floral decoration, as large pot plants and all sorts of vines can be used. In the residential sections of Leipzic nearly every house has some floral decoration. Small, unostentatious houses thus frequently attract much attention.

A SUSPENSION BRIDGE, the ropes of which are composed of pliable roots and vines, spans the River Apurimac, in Central Peru. The planks of the bridge are made of branches. In the moist climate of Peru it would not be extraordinary if this vegetable bridge were one day to start growing.

Home of J. Y. Reid, Winnipeg, a concrete residence in modern Colonial design, the stone, which is made of white Portland cement, ground stone, white sand and marble dust, being hollow, tool faced, and of the color and texture of natural stone. Herbert B. Rugh, Architect.

Sun Porch. Home of J. Y. Reid, Winnipeg, which affords a delightful outlook along the river. Note the treatment of the walls and the rich texture of the concrete stone. Herbert B. Rugh, Architect.

RESIDENTIAL WORK OF WESTERN ARCHITECT.—Four Attractive Winnipeg Homes Designed by Architect H. B. Rugh.—A Concrete Stone House in "Modern Colonial" Design—an Interesting Frame Dwelling—Two Examples of Red Brick and Cement Stucco. ∴

MANUFACTURED STONE is something seldom looked for and more rarely found in residences of the Georgian or Colonial type. Invariably one associates with this style of house, red brick and white mortar joints, or white painted brick or clapboard surfaces, and these elements have seemingly become accepted as the traditional "media" more particularly possessed of the quality of "eternal fitness" in designing work in this "period." The residence of Mr. J. Y. Reid, one of the four Winnipeg houses designed by Architect Herbert B. Rugh, which are illustrated in this instance, is however, a noteworthy exception. This house not only shows the former material to advantage, but the perfect co-relation which exists between the concrete stone and the design itself, strikingly demonstrates the adaptibility of the material and suggests its broader use in work of this character.

Two things which have greatly contributed to the success of the house have been the careful selection of the aggregates, and the intelligent execution of the workmanship. Quite frequently one finds examples of domestic work which leaves the merits of artificial stone for certain classes of residences, in serious doubt, but in this case the results clearly show that the material when properly handled, makes a most acceptable building product. The stone consists of tooled faced hollow blocks made from white Portland cement, ground stone, and marble dust. With the exception of the upper story, the blocks are laid with flush vertical joints and marked off with direct continuous depressed joints about an inch wide, producing effective horizontal lines and a treatment which most acceptably deviates from the harsh bevelling and other equally unsatisfactory results so often found where material of this nature is employed. A noteworthy feature is the free manner in which the material has met the requirements of the design, and also the texture and color of the concrete itself, a good idea of the latter being obtained from the view showing the spacious screened verandah which overlooks the grounds and the river at the rear.

In arrangement, the house follows the central hall plan, characteristic of this type of dwelling—a large living room with adjoining library at rear, occupying one side and the dining room, kitchen and pantry space the other. There is a pleasing degree of consonance in the decorative scheme and furnishings and a feeling of homelike comfort which makes the whole extremely inviting. The hall is finished in white enamel and mahogany woodwork, and this combination is further carried out in the dining room where the walls above the white wainscotting are covered with an imported paper having considerable color depth, and finished at the top with a heavy mahogany cornice. Both the living room, finished in mahogany and the library, which is trimmed with brown British Columbia fir, have beamed ceilings and fire-places, while all connecting doors throughout the floor are of mahogany, and either richly pnaelled or set in with plate glass divided into small panes.

Hallway, Home of J. Y. Reid, Winnipeg. Herbert B. Rugh, Architect.

Upstairs a similar sense of harmony prevails; delicate wall papers, white woodwork, mahogany doors, and appropriate furniture producing a most cheerful scheme. There are five good sized bed rooms with ample linen and wardrobe accommodations, two bathrooms, and a play room, the latter having a doorway leading onto a screened balcony which affords the same delightful view of the river and surroundings as is obtained from the spacious verandah over which it is placed.

The basement is occupied to large extent by a well appointed billiard room and a card parlor which are one of the features of the house, while the remaining portion of the space is taken up by the furnace and storage compartment and other offices of a household nature.

Another decidedly attractive Colonial home designed by Mr. Rugh, is the frame residence of E. H. Heath. This house stands on a large open site, and is sufficiently removed from the street line to have a proper setting; and with its deep porch spanning the entire front, its large enclosing columns, and interesting balcony arrangement, it is a structure which readily commands attention.

Although wood, owing to its inflamable nature, is becoming more generally debarred from external construction in the more thickly settled residential sections of our more progressive towns and cities, it would be difficult to conceive of this particular dwelling in any other garb than that which has been chosen for it, and still picture the same pleasing results. Here the white clad siding enhances the value of the design, and shows the author's rare discernment and proper appreciation of the adaptability of the material which is employed.

The interior of the house is compact and convenient in its layout, the woodwork and wall scheme consistent in treatment, and the appointments in general, well selected. There is a large reception hall, with a living room taking up the entire floor space one side, and the dining room and kitchen, the other. A richly panelled door connects with the rear passage leading to the kitchen and basement, and gives additional access to the den or library, which forms an alcove off the living room, at the back of the staircase.

The living room, which has a beamed ceiling and a

Living room, Home of J. Y. Reid, Winnipeg, looking towards the entrance hall. Herbert B. Rugh, Architect.

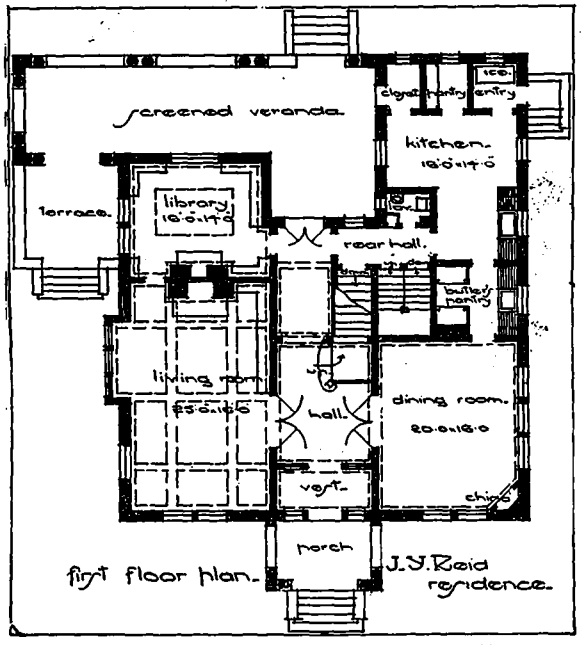
Dining room, Home of J. Y. Reid, Winnipeg, showing the white enamelled wainscotting and pleasing wall decorations. Herbert B. Rugh, Architect.

Library, Home of J. Y. Reid, Winnipeg, showing the fireplace and built-in bookcases. Note the simple and effective wall treatment. Herbert B. Rugh, Architect.

Bedroom, Home of J. Y. Reid, Winnipeg. Note the perfect harmony in the wall treatment, hangings and furniture. Herbert B. Rugh, Architect.

large brick fire-place, is finished in mahogany and white enamel, as is also the hall and all the other rooms in the house, with the exception of the dining room, which is trimmed in stained oak.

There are three large bedrooms on the second floor, together with a bath room, dressing room, and a large nook at the end of the hallway with door leading onto



First floor plan; Home of J. Y. Reid, Winnipeg. Herbert B. Rugh, Architect.

the balcony; while on the third floor are two additional bed rooms, a bath room and a spacious billiard room, all of which take up the space available in the most advantageous manner.

As with most Western cities, many of Winnipeg's recently erected residences are of the cement stucco type. In some cases, in conjunction with the use of metal lath and studs, this form of construction is carried out to a point which practically renders a house fireproof; but whether or not fireproofing is attempted, the plaster is at all times applied directly to metal lath, thus producing a far more stable and permanent building than the roughcast house of common plaster and wood lath of the early days, and still indeed permitted to be erected in some parts in the Eastern section of the Dominion.

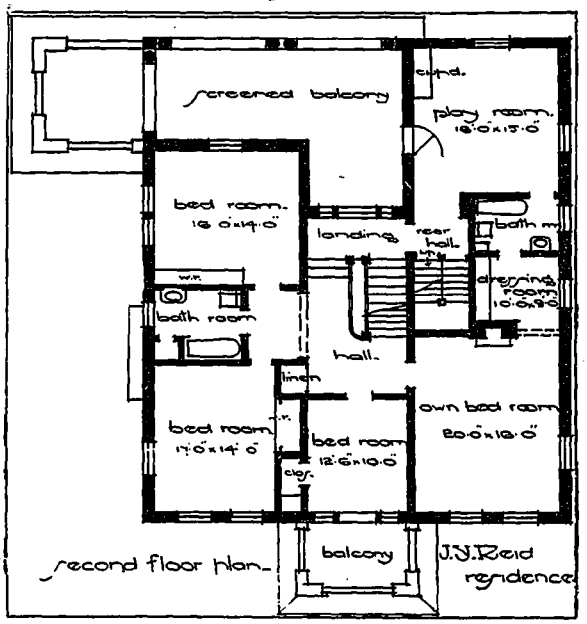
An interesting use of this material is seen in the residence of Mr. George Stephen, which has an attractive gable arrangement, unobstrusive bays, and hooded entrances of modest dimensions. With the exception of the red sand mould brick base course, which gives an effective touch to the color scheme, the entire body of the house is of rough cement stucco on metal lath. The entrance hall forms the key to a well laid out plan. There is a large living room, taking up the entire front portion of the floor. with the dining room adjoining it at the rear. Opening off the dining room is a large screened verandah with sloping balcony above. This latter feature is rather unusual, in that it is carried out to partake of the architectural composition of the body of the house proper.

The living room has a large brick fire-place, and built-in book cases, beamed ceiling and trim, all in mahogany stained birch; while the dining room is finished in a walnut stained birch, with panelled walls, plate rail and half beamed ceiling. The arrangement of the kitchen, pantry and rear hall, works out a splendid economy as regards space. The manner in which the outside kitchen door and basement entrance are combined, doing away with an extra door in kitchen and thereby giving more working space, is noteworthy.

On the second floor are two large bed-rooms, bath room, and a den having a brick fire-place; while on the third floor are two additional bed-rooms and ample linen and storage accommodations.

The house of Mr. C. D. Shepard is a residence that is well planned to meet the requirements of the average family. There is a large living room, dining room, hall, kitchen and pantry on the first floor, and four good sized bed rooms with wardrobe accommodations, and a bath room on the second.

The construction of the house is of frame, with red sand mould brick veneer for the first story and cement stucco on metal lath and half timbered gables above. There is a side terrace and porch which makes an interesting entrance. Both the living room and dining room, which have beamed ceilings, are finished in British Columbia fir. In the former room is a large open brick fireplace, while in the latter the walls have high panelled wainscotting with a plate rail at the top.

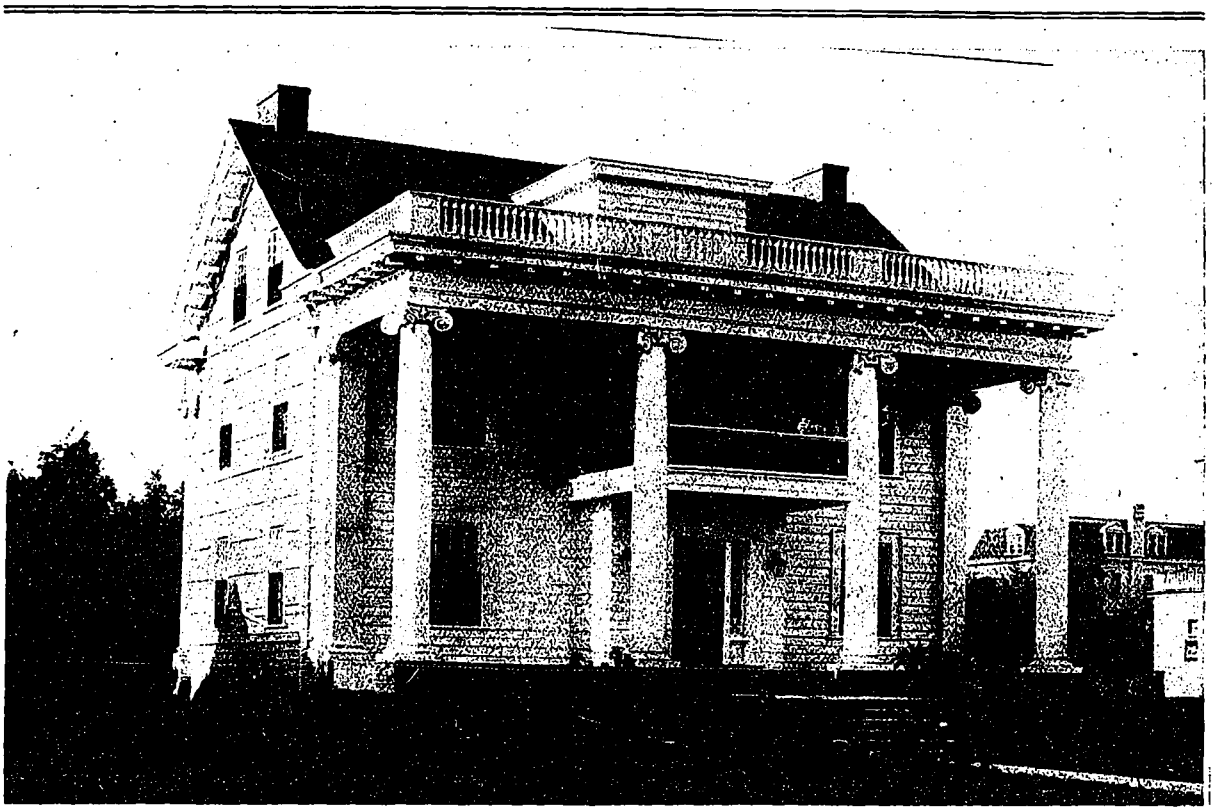


Second floor plan, Home of J. Y. Reid, Winnipeg. Herbert B. Rugh, Architect.

The second floor is finished throughout with the exception of the bath room, in British Columbia fir, stained in lighter shades than the living rooms in the floor below.

A SUPER-HYGIENIC JAPANESE HOME.

A HOUSE HAS BEEN ERECTED at Yokohama, Japan, to fulfil the following requirements: 1. To embody all desirable conditions possible from a hygienic standpoint. 2. To protect the inhabitants against sharp changes of temperature. 3. To reduce to a minimum the consumption of fuel. 4. To provide the residence against the numerous earthquakes of the country. In general dimensions the house, according to the description in a French contemporary, is 44 ft. long, 23 ft. wide, 17 ft. high. In exterior appearance it has the form of a rectangular box well lighted, though it has no doors nor windows, and presents no joints or crevices through which air, moisture in the atmosphere, dust, insects or microbes can enter. It appears to be a veritable dream of the sanitarian. It is constructed of glass in the form of slabs

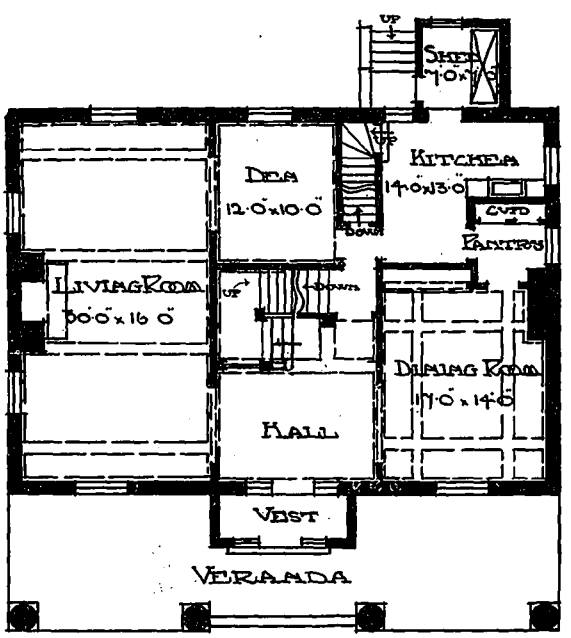


Residence of E. H. Heath, Winnipeg. An interesting frame house designed along lines in keeping with the Georgian period. Herbert B. Rugh, Architect.

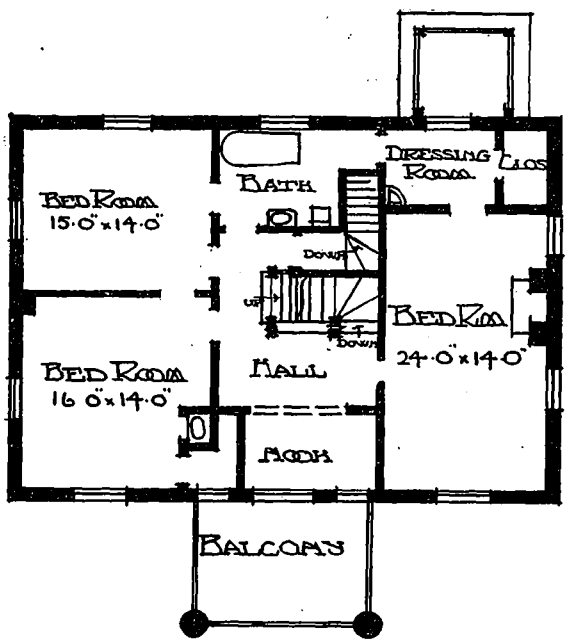
about 36 in. long, 24 in. wide and 5 in. thick. The wall contains an air space 4 in. thick filled with a saturated aqueous solution of alum or of a salt of sodium, like common salt.

The two glass surfaces forming the wall with its air space are fitted to a framework of cast iron. The roof is made with glass tiles, with the joints closed by means of rubber. On the tiles is laid a bed of cinders, and finally is laid a lattice work of wood covered with cement. The roof is thus translucent like the walls, but does not resist to so great an extent the penetration of heat from outside or the loss from the interior. The saline solution between the faces of the walls can be colored to suit the taste of the owner, and under the action of the intense rays of the sun the light, it is stated, enters diffused and softened. The main floor is formed of two layers of boards separated by a cushion of sawdust. The air to the building is admitted through grills.

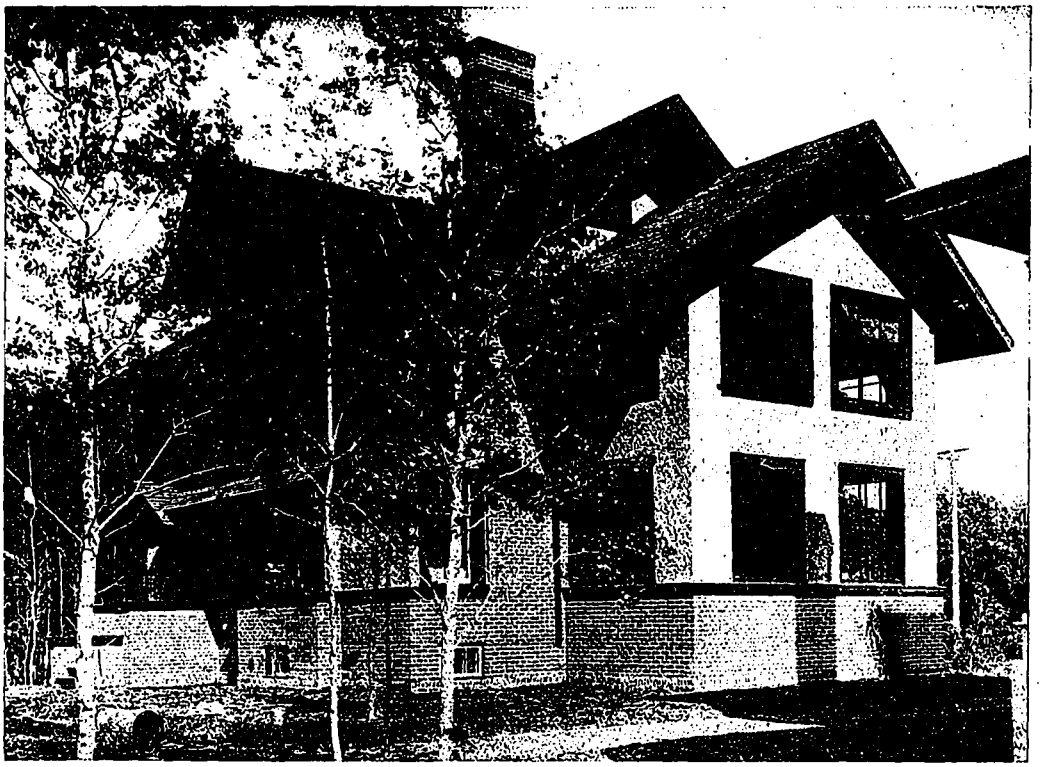
It is through the cellar that one enters the house, passing through a lobby leading to a stairway from the cellar.



First floor plan, Residence of E. H. Heath, Winnipeg. Herbert B. Rugh, Architect.



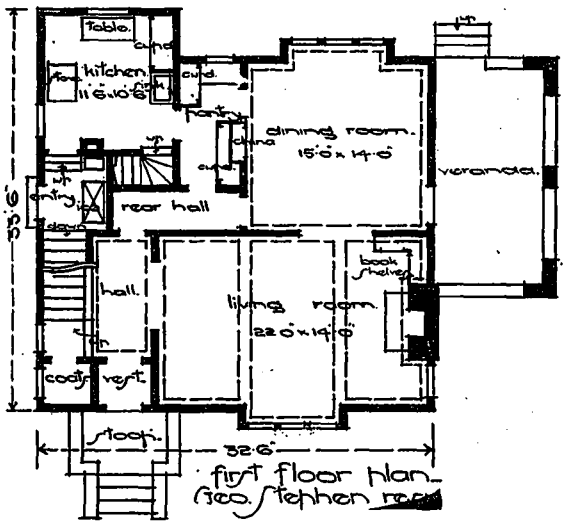
Second floor plan, Residence of E. H. Heath, Winnipeg. Herbert B. Rugh, Architect.



Residence of George Stephen, Winnipeg. A modern cement stucco house with straight lines and pleasing gables, and attractively set off by red sand mould brick up to the first floor window sills. Herbert B. Rugh, Architect.

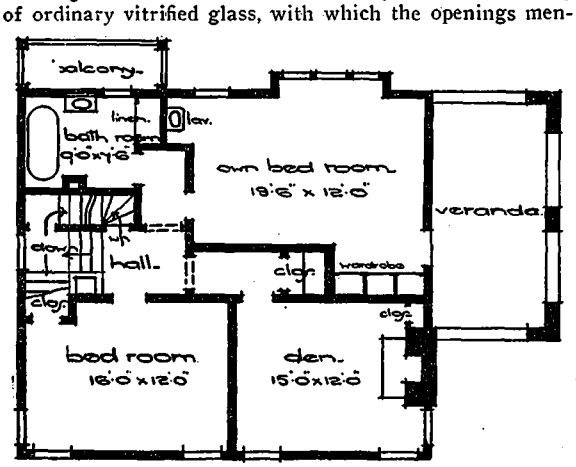
Home of C. D. Shepard, Winnipeg. A noteworthy moderate sized dwelling with red brick and cement stucco walls and half timbered gables. Herbert B. Rugh, Architect.

The doors of the lobby are arranged so that on going in or out a person moves a minimum quantity of air. The supply of air is obtained by means of pipes which rise vertically above the ground at a distance from the house,



First floor plan, Residence of George Stephen, Winnipeg. Herbert B. Rugh, Architect.

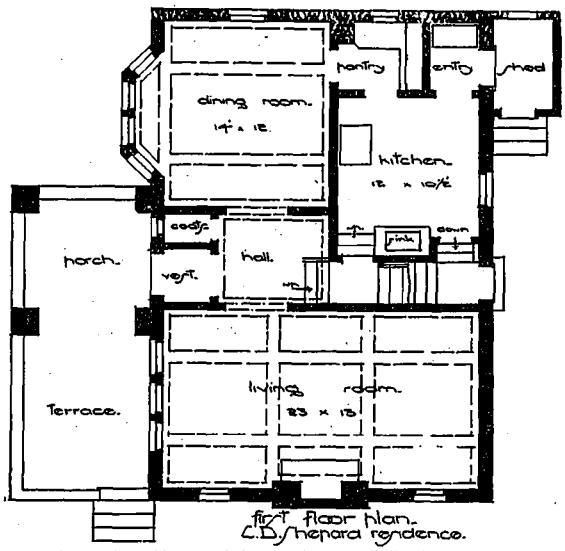
communicating with other pipes discharging into an air chamber. Before its admission into this space the air is filtered by passing through cotton and then on merging from the cotton flows over a large glass plate coated with glycerine to retain the microbes which the cotton has allowed to pass. Thus purified, the air enters the main part of the house through the grills mentioned, of which the openings can be regulated at will. The outflow of the air is effected through openings at points where in our houses a molding would be located. At this level the building is encircled on the outside by a sort of boxing of ordinary vitrified glass, with which the openings men-



Second floor plan, Residence of George Stephen, Winnipeg. Herbert B. Rugh, Architect.

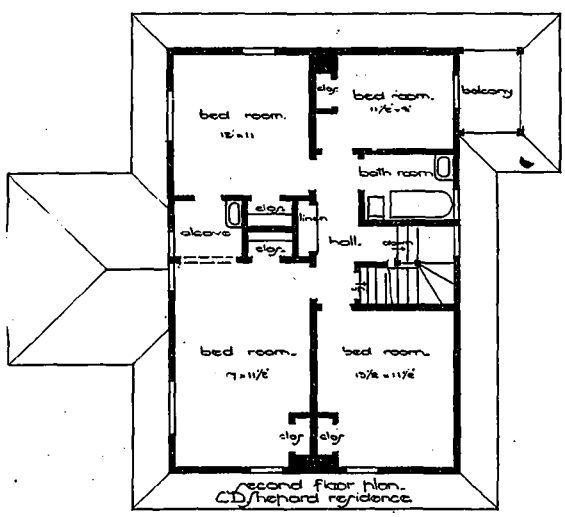
tioned communicate. The heat developed in this box by the sun's rays is generally sufficient to establish a draft and bring about a current of air toward an exhaust chimney, which is also constructed to take advantage of the sun's rays. An opening allows for discharging rain water at the base of this chimney in such a manner as to assist the draft. The result is that the greater the strength of the sun or the greater the quantity of the rainfall, the greater the degree of ventilation. If ,on the other hand, heat from the sun is deficient and it is not raining at the same time the draft necessary can be obtained by a small stove installed in the air chamber. To resist earthquakes the piers of the foundation of the building are on the lower part rounded so as to rest freely in hemispherical holes. Since the erection of the building, it has resisted more than 300 earthquakes of more or less intensity.

ODD AND INTERESTING BITS of architecture are continually being brought to light by journalists and travellers in their meanderings through various countries. The latest in this respect is an ancient church, built in the great rock which rises from the river in the quaint old German town of Oberstein. "The front of



First floor plan, Home of C. D. Shepard, Winnipeg. Herbert B. Rugh, Architect.

building," says a writer in the February Wide World Magazine, is "of stone, but the church itself is hollowed out of the rock and penetrates far into its heart. Tradition says that in the 14th century the Count of Oberstein, one of the old robber barons, fell deeply in love with a beautiful young lady, the daughter of a neighboring knight. His brother also sought the fair maiden's



Second floor plan, Home of C. D. Shepard, Winnipeg. Herbert B. Rugh, Architect.

hand and the two suitors had a violent quarrel. The upshot was that the Count flung his hapless brother from the top of his castle wall, high up the precipitous cliff. Repenting of his awful deed, the Count vowed that he would build a church where his brother's body first touched the ground. He did so, excavating the church in the rock; and tradition goes on to say a miraculous spring of clear water sprang from the crag as a token that heaven was appeased. This curious church is now the only Protestant place of worship in the town."

REGISTRATION OF ARCHITECTS IN THE TRANSVAAL.—Text of Law Recently Passed by South African Legislators.—Places Conduct of Profession in Hands of Newly Formed Transvaal Association.—Powers of Governor-in-Council.—Non-accepted Applicants Privileged to Appeal to Supreme Court.

Architectural Registration, or the Licensing of Architects, continues to be a live question with architectural organizations the world over. CONSTRUCTION *recently called attention to the fact that the Transvaal Institute of Architects had been successful in securing a legal status for the profession in South Africa. In addition to this, the architects in the state of Missouri, in the United States, have been successful in securing a Licensing Law, similar to that in the state of Illinois. The architects of New South Wales, Australia, are contending for legal recognition, and the architectural associations of Great Britain have joined hands in requesting such legislation in the British Isles. The architects in Quebec province have at present a Close Corporation Charter, as well as has the province of Alberta. The Ontario Association of Architects have for some time been clamoring for legislation that will place the practice of architecture within government control, and, with any degree of co-operation from members of the profession, who do not belong to the Ontario Association, and with such co-operation as they are entitled to have from the lay public in Ontario, they should be successful in securing such legislation. We publish below, in full, the Bill recently passed in Transvaal, which should prove of exceptional interest to both the exponents and opponents of the Registration of Architects in the Province of Ontario.*—EDITOR.

WHEREAS it is expedient to provide for the registration of persons publicly practising, or entitled to practice publicly, as architects in The Transvaal, so as to distinguish qualified from unqualified persons;

And whereas it is necessary to provide a qualification for admission to the Register of Architects;

BE IT ENACTED by the King's Most Excellent Majesty by and with the advice and consent of the Legislative Council and Legislative Assembly of The Transvaal as follows:—

Use of Title of Architect Restricted.

1. After the expiration of six months from the coming into operation of this Act no person shall describe or hold himself out as an architect or use any name, title, addition, or description, or letters indicating that he is an architect, whether by advertisement, by description in or at his place of business, or residence, by any document, or otherwise, unless he is registered as an architect in pursuance of this Act.

Penalty for Infringement.

2. Any person contravening any of the provisions of section one hereof shall be liable to a fine not exceeding one hundred pounds for each offence and in default of payment to imprisonment for a period not exceeding six months.

Association of Transvaal Architects.

3. Upon the coming into operation of this Act there shall come into existence a body corporate by the name of "The Association of Transvaal Architects" with perpetual succession and the right to use a common seal and to sue and be sued in its corporate capacity, and the said body corporate shall be capable in law of taking and holding any movable or immovable property for the benefits and purposes of the association with power to dispose thereof, but so that the association shall apply its funds and assets in promoting the objects of the association and shall not at any time pay any dividend to its members. Every person registered as an architect as hereinafter provided shall upon such registration ipso facto become a member of the said association.

Appointment of the Provisional Council.

4. Upon the coming into operation of this Act there shall come into existence a provisional council consisting of the following persons, namely:—

Walter Reid, F.R.I.B.A.	J. F. Beardwood, M.S.A.
Herbert Baker, F.R.I.B.A.	R. Howden, A.R.V.I.A., M.S.A.
G. A. H. Dickson, F.R.I.B.A.	G. H. Veale.
Frank Emley, F.R.I.B.A.	F. G. McIntosh.
Archer Hosking, A.R.I.B.A.	W. J. D. Swaan.
W. H. Stucke, A.R.I.B.A.	G. St. J. Cottrill.
Harry Clayton, M.S.A.	

who shall be the first members of the Association of Transvaal Architects and shall forthwith cause their names to be entered upon the register thereof. The provisional council shall, subject to the provisions of this Act, exercise all the powers of the association until the council hereinafter mentioned shall come into office.

Should any of the said persons die or become incapacitated, or refuse to become or remain members of the said provisional council, the Governor-in-Council may appoint other qualified persons in their place.

Proceedings of the Provisional Council.

5. Upon a day to be fixed by the President of the Transvaal Institute of Architects, but not later than one month from the coming into operation of this Act, the provisional council shall meet at Johannesburg and shall at such meeting elect a president. In the absence of the president at any meeting the members of the provisional council present shall elect one of their number to preside.

At any meeting of the provisional council five members personally present shall constitute a quorum, and a majority of the members present shall decide every question to be decided by such meeting, except admission to the register, on which a majority of the whole council shall vote, and fourteen days' notice shall be given of all meetings at which the admission of members is to be dealt with.

Subject to the provisions of this Act the provisional council are hereby empowered to regulate their meetings and the proceedings thereat and the mode of carrying on the business of the association and shall remain in office until six months after the date of the coming into operation of this Act.

The provisional council shall have power to appoint a clerk or registrar and such other officers as they may deem necessary for the purpose of the association.

Persons Entitled to be Registered by the Provisional Council.

6. The provisional council shall forthwith open a register in which any person shall be entitled to be registered as an architect in pursuance of this Act who proves to the satisfaction of the provisional council within six months next after the coming into operation of this Act that at the date of the coming into operation of this Act he was resident in British South Africa, and

(a) was a member of the Transvaal Institute of Architects or of any other institute or society of architects of equal standing; or

(b) was publicly and bona fide practising as an architect in The Transvaal; or

(c) was at such aforesaid time, or prior to the coming into operation of this Act, engaged as an assistant to an architect in The Transvaal and has had at least seven years' professional experience; or

(d) that he is possessed of qualifications and experience which may be declared by the Governor-in-Council by proclamation to be equal to those in one or other of the foregoing instances.

Persons Entitled to be Registered by the Council.

7. Upon the expiration of six months from the date of the coming into operation of this Act no person shall be entitled to be registered in the said register as an architect unless he shall prove to the satisfaction of the majority of the whole council hereinafter mentioned that at the date of his application for registration he is resident in British South Africa and has attained the age of twenty-one years; and

(a) has passed the examination for associateship of the Royal Institute of British Architects or the examination for membership of the Society of Architects of London or the examination or examinations conducted by the council and prescribed by the bye-laws of the association or some other examination which may be declared by the Governor-in-Council by proclamation to be equivalent to one or any of these examinations, and has in addition had at least four years' professional and practical experience as an assistant to an architect; or

(b) that prior to, or at any time of, the coming into operation of this Act he was registered as an associate or fellow of the Royal Institute of British Architects or as a member of the Society of Architects of London or the Transvaal Institute of Architects or of some society or institute of architects which the Governor-in-Council may by proclamation declare to be of a standing equal to that of one of the said institutions.

Applicant Refused by Council May Apply to Supreme Court.

8. Where the council has refused to register the name of a person applying to be registered under sections six and seven, such person may apply on notice of motion to the Supreme Court for a review of the decision of the council, and the said Court may thereupon make such order as it may deem fit.

Register.

9. The provisional council or the council, as the case may be, shall, within a week after the registration of any person under this Act, transmit to the Colonial Secretary a duplicate of the said entry and the Colonial Secretary shall cause a duplicate of the aforesaid register to be kept in his office. Every change affecting the Register shall be noted therein and notified to the Colonial Secretary.

Registration Fees.

10. No person shall be placed upon the register until he has paid such registration fee, not exceeding five guineas, as shall be fixed by the provisional council or the council, as the case may be.

Resignation by Members.

11. It shall be lawful for any person whose name has been placed on the said register and whose professional conduct is not then the subject of investigation at any time to resign by writing under his hand addressed and delivered to the council and thereupon his name shall be removed from the said register and he shall cease to be registered as an architect and to be a member of the association.

Annual Subscription.

12. Every member of the association shall pay an annual subscription at such time and of such amount as shall be fixed by the by-laws framed as hereinafter provided: provided, however, that members who have ceased to practice shall be entitled to remain on the register without being liable to pay such subscription, but shall not be entitled to be officers of the association or to be present or vote at any of the proceedings of the association, or to be reckoned in any quorum unless they shall have paid such subscription.

Recovery of Subscription.

13. All sums of money due by members to the association for registration fees or subscriptions may be recovered in the court of any resident magistrate within whose jurisdiction the debtor may reside. An affidavit by the secretary setting forth the necessary facts shall, in cases by default, be prima facie evidence upon which the court may grant an order or pronounce judgment by default in such suit and such judgment shall be enforceable in ordinary course of law.

Election of the Council.

14. On such day during the currency of the sixth month next after the date of the coming into operation of this Act as the provisional council shall appoint they shall convene a meeting in Johannesburg of all persons whose names appear upon the register at the date on which the notices convening such meeting are issued, such notices to be posted to the registered address of such persons at least fourteen days before the date fixed for the said meeting, and at such meeting the persons present or represented by proxy in writing shall proceed to elect in a manner to be provided by the provisional council a council of twelve members who shall come into office upon the expiration of six months from the date of the coming into operation of this Act and thereupon the provisional council shall cease to exist. The council shall hold office until the date of the first or next annual general meeting as the case may be when they shall retire from office.

Offences.

15. The following acts and practices, whether of commission or omission, upon the part of any architect, shall be offences under the provisions of this Act, and if found guilty by the Supreme Court of having committed or engaged in any one or more of such acts or practices, such architect shall be liable to be suspended from practice for any period that may be decided on by the said court, or to have his name removed from the register as hereinafter provided; that is to say—

(a) allowing any person except a registered architect in partnership with himself to practise in his name as an architect;

(b) directly or indirectly sharing his professional remuneration with any person, not being a registered architect in partnership with him, or directly or indirectly accepting any share of the professional remuneration of such person or any commission or bonus thereon;

(c) signing accounts, statements, reports, specifications, plans, or other documents purporting to represent any architectural work performed by himself which work shall not have been performed under his personal supervision or direction;

(d) directly or indirectly paying a person a commission for bringing him work, giving any person monetary or other consideration as a remuneration for bringing him work, or for inducing other persons to give him work;

(e) touting or otherwise improperly obtaining or attempting to obtain work;

(f) performing any architectural work in connection with any matter which is the subject of dispute or litigation upon condition that only in the event of the said dispute or litigation ending favorably for the party for whom the work is performed shall payment be made for such work;

(g) conducting himself unprofessionally or dishonorably in connection with any work performed by him as an architect;

(h) wilfully disobeying, refusing, or neglecting to carry out and perform any by-law or order lawfully adopted and established by the association regarding any point of professional practice;

(i) engaging in any practices or performing any acts similar to those acts and practices prohibited in the aforegoing sections.

Inquiries Into Conduct of Members.

16. If the conduct or behavior of a member of the association shall appear to the provisional council or the council to require investigation, they shall, before proceeding against such member in the Supreme Court as provided in the next succeeding section, hold an inquiry and, if required by such member, hear evidence on the matter. Eight days' written notice of the charges against him and of the date of such inquiry shall be given to the member concerned, who shall be entitled to appear at such inquiry to answer such charges and to produce evidence on his behalf, and his own evidence (if any) shall be admissible against him in any other proceedings, civil or criminal. If such member requires evidence to be heard, the provisional council or council may also hear evidence against such member. Where evidence is to be heard the president or vice-president may administer the oath to witnesses, and such witnesses shall be subject to the law relating to perjury,

Proceedings for Suspension and Removal of Members.

17. In the event of any member of the association being in the opinion of the provisional council or council guilty of any act or omission prohibited by this Act, or offending against any by-law or regulation framed thereunder, the provisional council or the council may call upon any such member to show cause to the Supreme Court of this Colony why he should not be prohibited from practising as an architect, and why his name should not be removed from the register. All such proceedings shall be taken in the name of the association. Upon the hearing of any such matter the court may suspend such member from practice, remove his name from the register, or make such other order as may seem fit, and may further make such order as to costs as may seem fit. In case of such suspension or removal, copies of the order of Court shall be lodged with the Colonial Secretary and the association and noted in the register.

Penalties.

18. In case any member of the association shall in consequence of an order of Court be suspended from practising as an architect in this Colony, such person shall during such time as he is suspended, cease to be a member of the association, but shall nevertheless be liable to pay all moneys due by him up to the date of such suspension.

Persons Having No Claim Against the Assets of the Association.

19. No claim against the assets of the association shall exist in the case of, or be made by, any person whose name has ceased to appear upon the register of the association.

Titles Allowed to Members of the Association.

20. Every person whose name appears on the register shall be entitled to style himself "Registered Architect, Transvaal."

Rules and Regulations for Examinations.

21. The council shall, upon being elected to office, forthwith frame rules and regulations for regulating the examinations or equivalents thereto, which shall be required of applicants for registration under section seven of this Act.

Powers of the Council.

22. The council shall have power to do each and all of the following acts:

(a) to manage and superintend the affairs of the association;
(b) to appoint and remove any servants of the association and to determine the duty, salary, and remuneration of the same;
(c) to accept or refuse for good cause any application for registration made in pursuance of this Act;
(d) to hold examinations for applicants for registration and to grant certificates to such persons as have satisfied the examiners in such examinations;
(e) generally to exercise all the powers of the association, except such powers as are expressly reserved by this Act to the association in general meeting.

Persons in Arrear With Subscription Not Qualified to Vote.

23. No person who is in arrear with his subscription shall be qualified to be present, or vote, or be reckoned in a quorum at any meeting of the provisional council, or council, or of members, while he is so in arrear.

General Meetings.

24. There shall be held once in each year a general meeting of the association whereat every architect upon the register who is not disqualified under section twelve hereof shall be entitled to vote personally or by proxy in writing. The quorum for such general meeting shall be fixed by the by-laws.

Any question to be decided at such meeting shall be decided by a majority of the members present or represented thereat.

The council shall prepare as at the thirty-first of December in each year a balance sheet of the affairs of the association and an account of all moneys received and expended by the association, and submit such account duly audited to the association at such general meeting for discussion and approval. The officers of the association who shall consist of the members of the council and of a president and two vice-presidents (who shall, however, be members of the council) shall be elected annually, at such meeting, and the said officer shall retire annually but shall be eligible for re-election.

It shall be lawful for any member or members of the association at such meeting to move any resolution which is not consistent with the purposes and provisions of this Act.

Chairman's Vote.

25. The person presiding over the provisional council or council or at any general meeting, shall have a deliberate as well as a casting vote.

Meeting to Pass By-laws.

26. The provisional council shall forthwith prepare draft by-laws for the association for the purposes enumerated in the next succeeding section, and shall convene a special general meeting of the association in Johannesburg to be held not later than six months from the date of the coming into operation of this Act for the purpose of considering and, if approved, of adopting the said by-laws. The notice convening such meeting shall be sent to the registered address of each member of the association not later than fourteen days before the day appointed for such meeting and shall be accompanied by a copy of the said by-laws.

A majority of the members personally present or represented by proxy in writing at such meeting shall be sufficient to determine all matters to be decided thereat and the non-receipt of the said notice or copy of the proposed by-laws by any member or members shall not invalidate the proceedings at the said meeting, provided that one-third of the number of members then on the register shall be present personally or be represented by proxy in writing.

Purposes For Which By-laws May be Made.

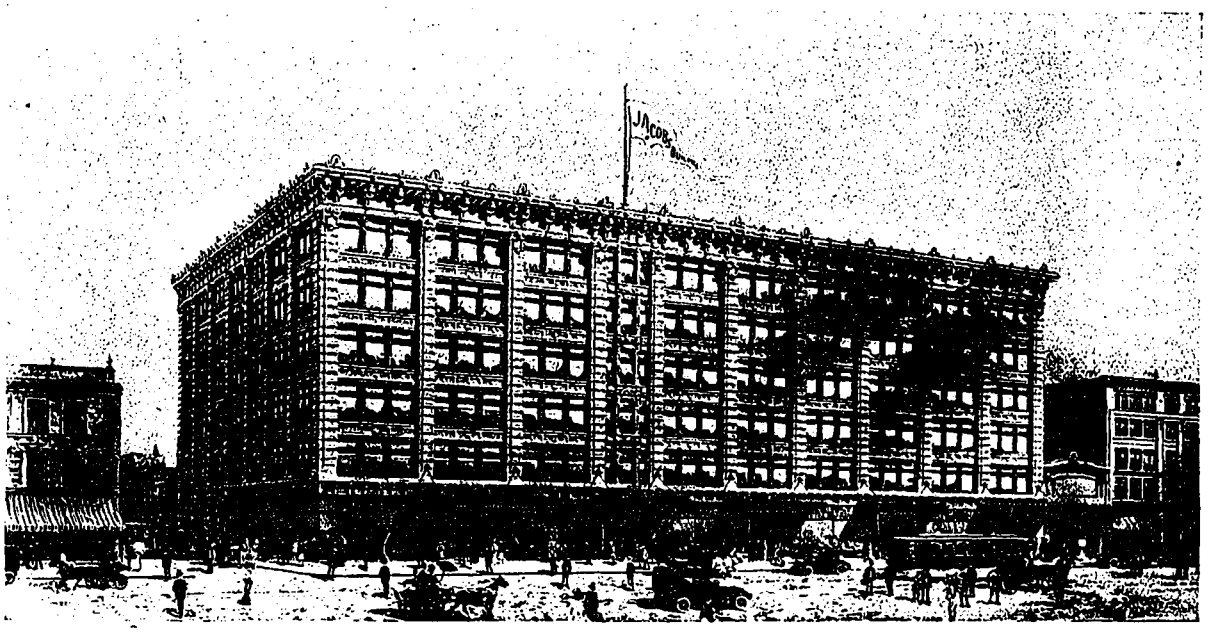
27. The council may, from time to time, subject to the approval of the association assembled in a special general meeting called for the purpose, make by-laws for any of the following purposes, provided that such by-laws be not inconsistent with the provisions of this Act, and may alter, amend, or repeal such by-laws including the by-laws framed under the last preceding section, that is to say:—

(a) for fixing the amount of the annual subscription payable by members and the time of payment of the same;
(b) for defining what shall be considered unprofessional or dishonorable conduct on the part of an architect;
(c) for regulating the time, mode, and place of summoning and holding ordinary and special general meetings and the quorum to be present thereat and the mode of voting and the conduct of proceedings at any such meetings and the regulations for the adjournment thereof;
(d) for regulating the meetings of the council and the quorum to be present thereat;
(e) for regulating the mode of nomination of members for election to the council and the mode of filling casual vacancies thereon;
(f) for regulating the times and places for holding examinations of applicants for registration and the subjects and the manner of conducting or holding any such examinations, and for fixing a reasonable fee to be paid by applicants and the conditions on which the examiners shall hold office and their remuneration;
(g) for regulating the mode of election of the officers of the association;
(h) for fixing a tariff prescribing the remuneration which architects shall be entitled to charge for their services;
(i) for determining the qualification and disqualification of councillors;
(j) and generally such by-laws as from time to time seem to the association requisite for giving effect to the provisions of this Act and for the furtherance of the objects of the association.

Alteration of By-laws.

28. No alteration in the by-laws as adopted at the special general meeting referred to in section twenty-six shall be made save by a majority of two-thirds of the members personally present or represented by proxy in writing at the special general meeting convened for the

(*Concluded on page* 65.)



The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander streets, Montreal. Mitchell and Creighton, Architects.

CANADA'S LARGEST CONCRETE BUILDING.—Splendid Modern Commercial Structure Now Nearing Completion at Montreal —Will House a Number of Diverse Business Interests.—Features of Its Design, and Power and Machinery Equipment.

THE NEW JACOBS' BUILDING, now nearing completion at Montreal, gives to that city what is claimed to be a structure which is as thoroughly fireproof as modern building science has made possible. Aside from this, it is notable as the largest reinforced concrete building in Canada, while still another interest is attached in the fact that, despite of the difficulties encountered in the early stages of the work, the remarkably short time in which the building was erected, demonstrates the rapidity of progress which working organizations and engineering skill have made possible in the method of construction adopted.

The building, which is seven stories high, and designed to carry three additional stories as the need for further accommodations might demand, has a frontage along St. Catherines street of 265 feet, and a depth on St. Alexander street of 136 feet. The main facades, designed in the French Renaissance style, are of glazed terra cotta, with ornamental cast iron store fronts, cornices and mullions; the entire space between the pilasters being devoted to windows, so as to provide an area in this respect, which will adequately serve to light all parts of the interior.

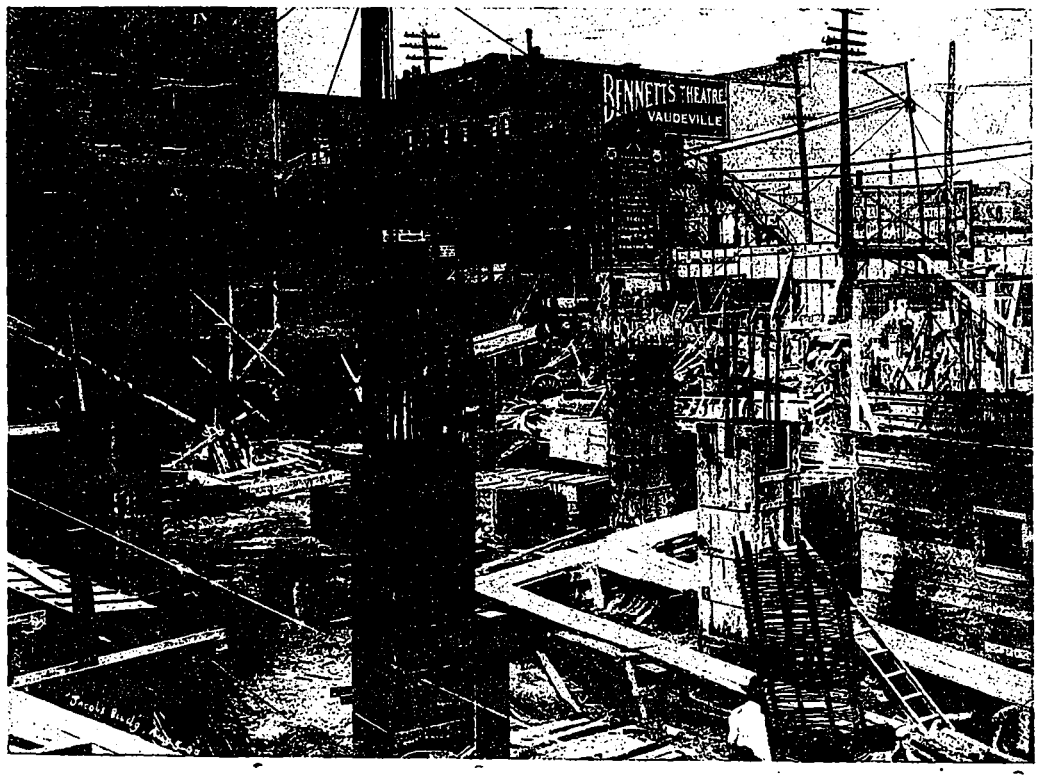
Built on a site which was originally an old river bed, the work on the foundations necessitated the most careful procedure, in that a modern theatre building adjoined one corner of the lot, and also because of the fact that the frontage of the site extends along a street where there is a continuous heavy traffic, including an uninterrupted trolley service.

Excavation for the structure was begun during the second week in April, 1909, and this work, together with the preparing of the foundations, was found to be a very difficult, tedious and costly proposition. Test holes, sunk on the site, disclosed the fact that the upper layer of soil consisted of a very soft form of wet blue clay, this clay becoming softer on the continued lower levels. At the 23-foot level the soil changed to a very wet sandy substance which might almost be termed a wet quicksand, being really a mixture of quicksand and slimy clay. It was necessary to go through about 12 feet of this formation before striking hard pan.

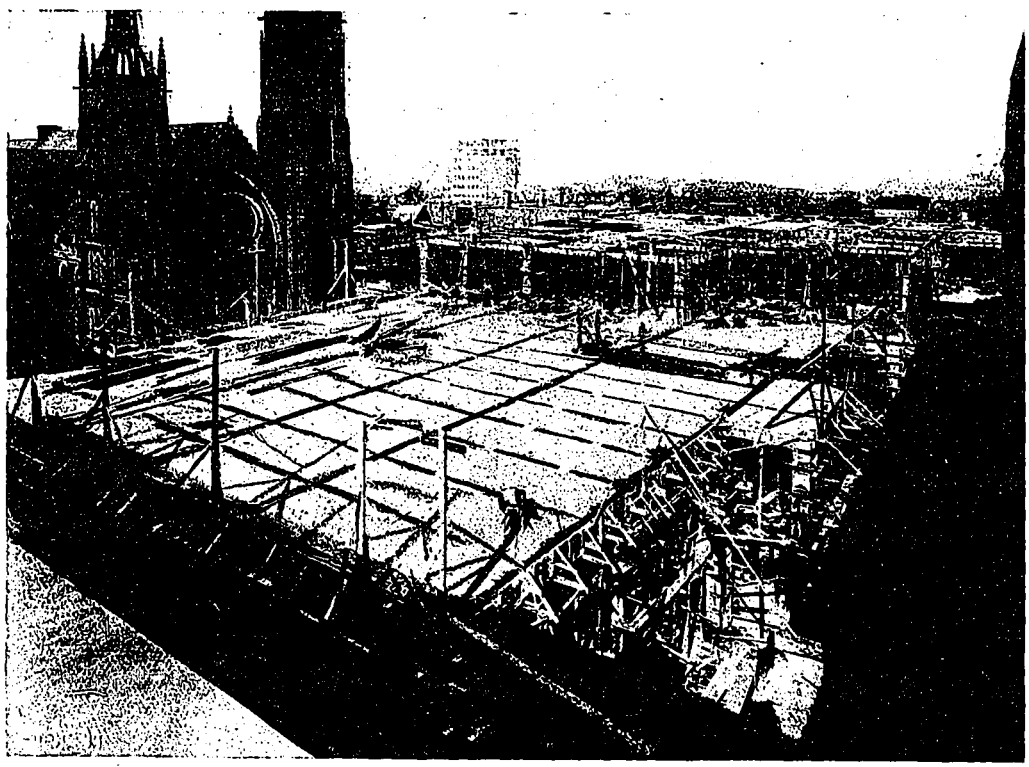
To reach hard pan, in carrying out the foundation work, it was necessary to sink caissons. These caissons were composed of 3-in. tongued and grooved planks, placed in circular form. They were driven down in two lengths by means of steam hammers, and excavation was then carried on inside thereof. The lower 10 feet, before reaching hard pan, had to be removed with tripods and buckets, the substance encountered being too thick to handle with pumps, and not stiff enough to permit of being dug. Besides this work, a general excavation to the depth of 11 feet and 6 inches, necessitating the removal of 12,000 cubic yards of earth, was carried out in order to provide for the machinery, etc., which occupies a large portion of the basement; the machinery room being 4 feet 6 inches below the general basement floor level. In all, there are eighty-five circular concrete foundation piers, distributed over an area of 30,000 square feet. These piers have an average diameter of 4 feet, the footing area being increased to a diameter of about eight feet in order to maintain a uniform distribution of the load figured.

Great care had to be exercised when the quicksand was reached to prevent the sheeting from collapsing on account of the pressure from the surrounding buildings. Another difficulty was met with in guarding against accident to the Princess Theatre building which adjoined the property on the west-end, and also extended part way along the south side. This, however, was finally overcome by using stout shores braced back to the piers which had already been installed. After this the piers on the property line were sunk and filled, and cantilever beams extending back to the inside row of columns and under the theatre walls, were built to carry the masonry underpinning

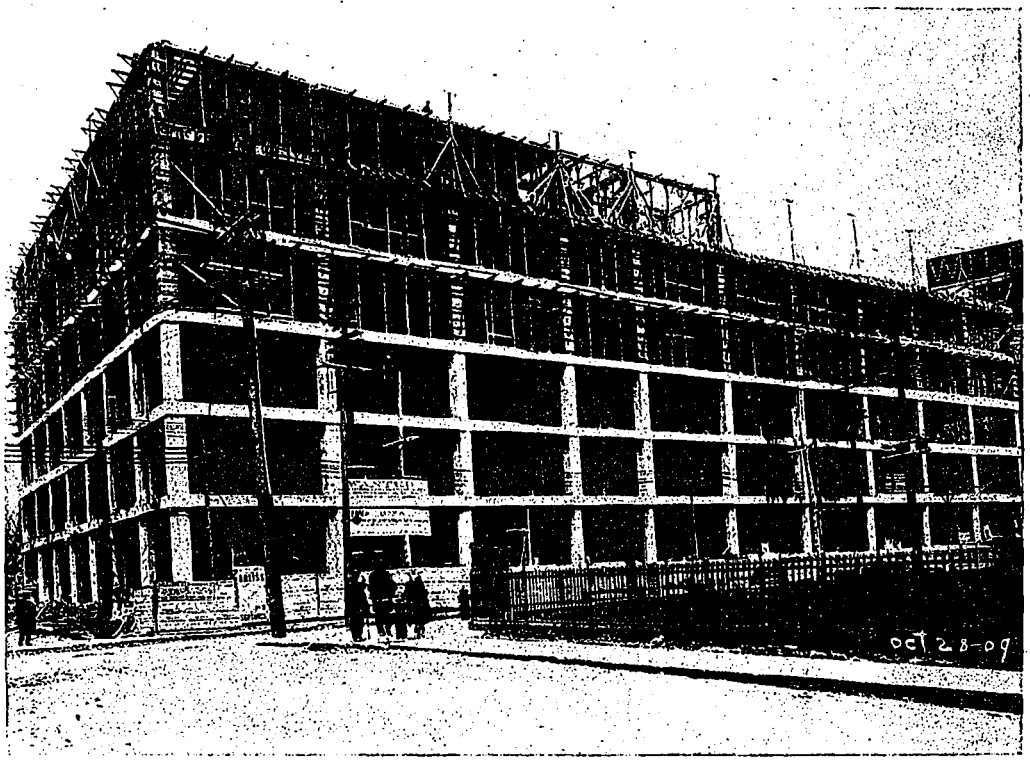
The structure, which is built according to the Kahn



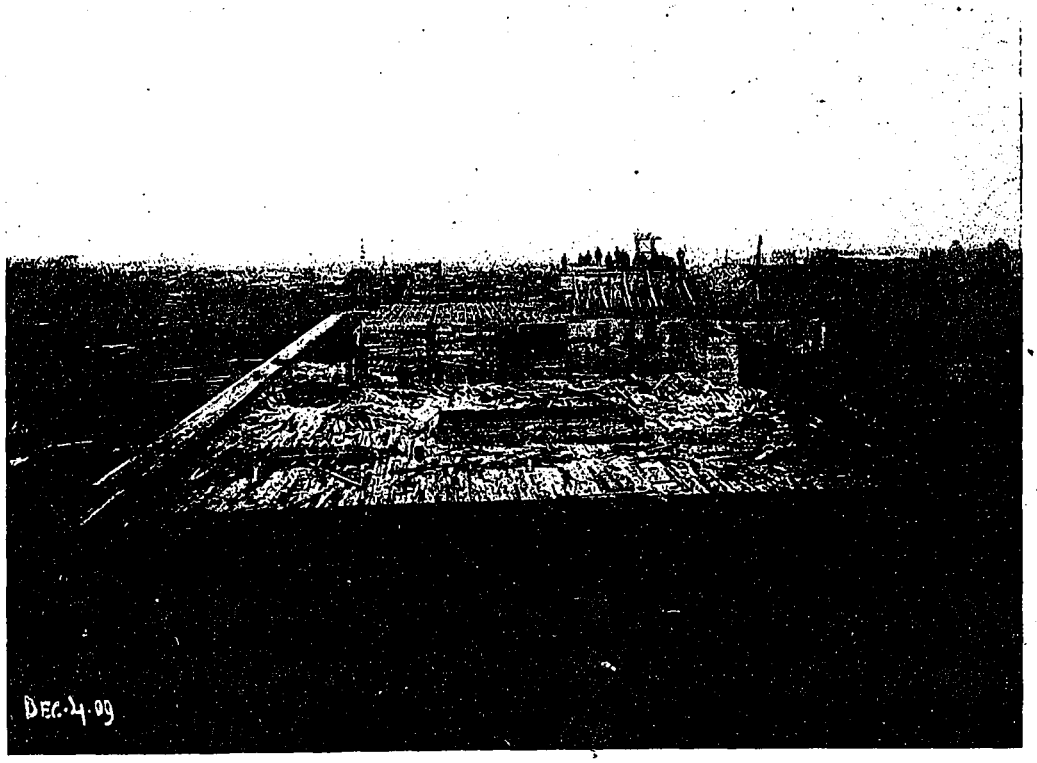
Foundation work on the new Jacobs Building, St. Catherine and St. Alexander streets, Montreal, showing the caissons and reinforcing for the concrete supporting piers. The site of the structure covers an area of 30,000 square feet and 85 piers in all were required. This view was taken on August 5th, 1909, thirteen days before the superstructure was started, and while excavation was still in progress. Mitchell and Creighton, Architects.



View of the new Jacobs Building, Montreal, taken on October 9th, showing the construction of superstructure. The foreground shows the finished centering ready for concreting, and the background the form work in course of erection for the next floor. The large building under course of erection in the distance, is another modern business structure which is being built according to the same system of construction. Mitchell and Creighton, Architects.



New Jacobs Building, Montreal, as it appeared on October 28th, seventy days after the foundation was completed. This view gives an excellent idea of the rapidity with which the work progressed. The time required for setting up the forms for the ground floor was ten days, and for the other floors, an average of eight days to the floor. Mitchell and Creighton, Architects.



View of new Jacobs Building, Montreal, taken on December 4th, showing the building practically enclosed, and also the superstructure or seventh floor, which will eventually cover the entire area of the building and form a portion of the future extension of four floors provided for in the design and construction of the building. Mitchell and Creighton, Architects.

System of reinforced concrete construction, will house a number of diverse interest.

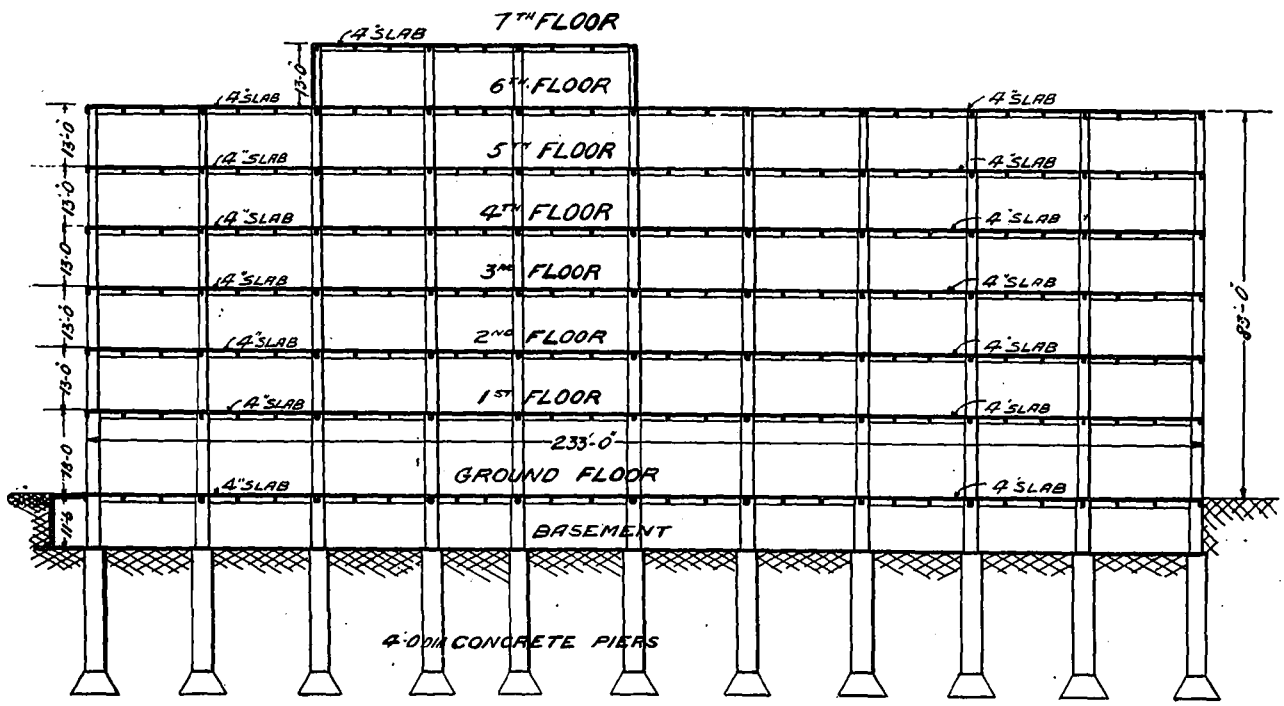
The lower portion of the west end of the building is to be occupied by the St. Regis Hotel Co., for hotel and cafe purposes. The hotel kitchen, serving rooms, etc., will be located in the basement. The cafe, dining room, office and bar will be located in the ground floor, a number of private dining rooms on the first floor and bed rooms on the second and third floors. Private bathrooms will adjoin each bed room. The interior finish of the hotel portion of the building is fully in keeping with the high class of the building in general. The balance of the ground floor is to be used for retail mercantile stores. The T. Eaton Co. will occupy three entire floors of the building for manufacturing purposes. The upper two floors will be arranged for offices. The entire seventh floor, which is really a superstructure over the building proper, not covering the entire ground area, is utilized for offices for the varied business interests with which the owner, Mr. Jacobs, is connected.

It is interesting to note the rapidity with which the concrete skeleton of the structure was carried up. The

The concrete for the entire structure was mixed in the proportion of 1, 2, 4, the stone for the columns being such as would pass through a half-inch ring, and for beams and slab of a size to pass through a ¾-in. ring. All concrete was mixed to a sloppy consistency, and great care was taken to have same well puddled and spaded in the forms, the work being subjected at all times to a rigid inspection.

As regards equipment, the contractors' plant consisted of a small circular saw, motor driven, a No. 2½ Ransom mixer discharging into a 20 cu. ft. Ransom bucket, which in turn dripped into a receiving hopper equipped with two gates. Steam for the mixer and two hoisting engines was supplied by a horizontal boiler, and two small stiffff leg derricks were used for hoisting the reinforcing steel and lumber.

The extra excavation work in the basement, which was decided on after the building was up several stories, was handled by using two half yard mining skips on narrow gauge tracks. These skips dumped automatically directly into carts driven in on the ground floor, and were



Longitudinal section, Jacobs Building, St. Catherine and St. Alexander streets, Montreal. Mitchell and Creighton, Architects.

foundation work and excavation was completed by August 18, but previous to this the erection of forms had been started, and the first concrete for the superstructure was poured on August 20. In order to expedite the work, the forms for the first three stories were made up at the contractors' planing mill, and delivered to the job ready for assembling and erecting. Ten days were required for the erection of the first floor forms, but the form work on the other floors was accomplished on the average of eight days to the floor. The forms in all cases were allowed to stand for three weeks before stripping was commenced, and were then carefully taken down and rebuilt if necessary before being hoisted for the floor above.

The lumber used for this purpose consisted mostly of 2-in. spruce, dressed on one side, and two edges for beams and columns, with 1-in. floor decking; a small chamfer strip being inserted in the angles of all beams and also at the intersection of beams and slab. The interior columns are all octagonal in shape, and the forms for the concrete were all clamped with specially made steel clamps.

run by cable off the drum of a hoisting engine, which also operated the wheelbarrow hoist for brick, etc.

STRUCTURAL FEATURES.

The building is designed to carry a live load of 150 lbs. per sq. ft. on the ground floor, 125 lbs. per sq. ft. on the upper floors. The columns throughout the building are octagonal in shape, and vary in size from 32 in. in cellar to 20 in. in upper story. When the additional stories are placed on the structure the size of the upper columns will be 12 in. The main girders, which span 17 ft. 9 in., are 12 in. x 24½ in., and are reinforced with two 1¾ in. x 2¾ in. Kahn bars and one 1 in. cup bar. The intermediate beams which run opposite to and frame into the main girders are 8 in. x 18 in. size, and are reinforced with 1 in. x 3 in. Kahn and one ⅝ in. cup bars. All columns are reinforced with steel rods, hooped with 5-16 in. and ⅜ in. round steel hooping varying in pitch from 1¼ in. to 2 in., according to loading; the concrete inside the hooping being figured for 750 lbs. per sq. in.

An interesting feature in the arrangement of the ground floor is the central portion around the elevators and stairways, which is raised two feet above the general floor level, and also the lowering of the floor back of the elevator, two feet, to allow the teams to drive in on the laneway level, and load directly onto the wagons. Another interesting feature of the design is the cantilever beams under the basement floor, carrying the columns in the outer west wall, as well as the wall itself. These cantilever beams were necessary on account of the building proper extending to the extreme western limits of the property; the caissons under these beams being fully a foot inside the property, and the columns above overhanging the outer edge of these caissons by this margin. The centres of these columns are actually 2 ft. 6 in. off the centres of the caissons. The beam over the driveway on the ground floor of building is also worthy of note. This beam is of 26 ft. 2½ in. span, and carries a concentrated load of 445,000 lbs. 9 ft. 6 in. from the point of support, and in addition thereto a load of 46,400 lbs. equally distributed over the entire span; this beam is 24 in. x 84 in., and is reinforced with five 2 in. x 3½ in. two freight elevators discharging to the loading platform which has already been described.

Wherever it was deemed likely that openings for stairways, elevators, etc., might be required in the future, lifting slabs were provided. In this case the main slab was left with a rebate, and tar paper was placed over the joint before the removable slab was concreted.

There were approximately 10,300 yards of concrete used to complete the structure. The structure is equipped with two Otis-Fensom electric passenger elevators and two high speed electric freight elevators. There are two sets of reinforced concrete stairs running from basement to roof, and also a set of iron stairs. All elevators are motor driven.

POWER AND MACHINERY EQUIPMENT.

The building is heated by steam, lighted by electricity and also by means of Blau gas. This latter, by the way, is a most interesting product, and though well known in Germany, is new in this country. The gas is manufactured in central plants and delivered under high pressure in cylinders, the cylinders being connected to the piping

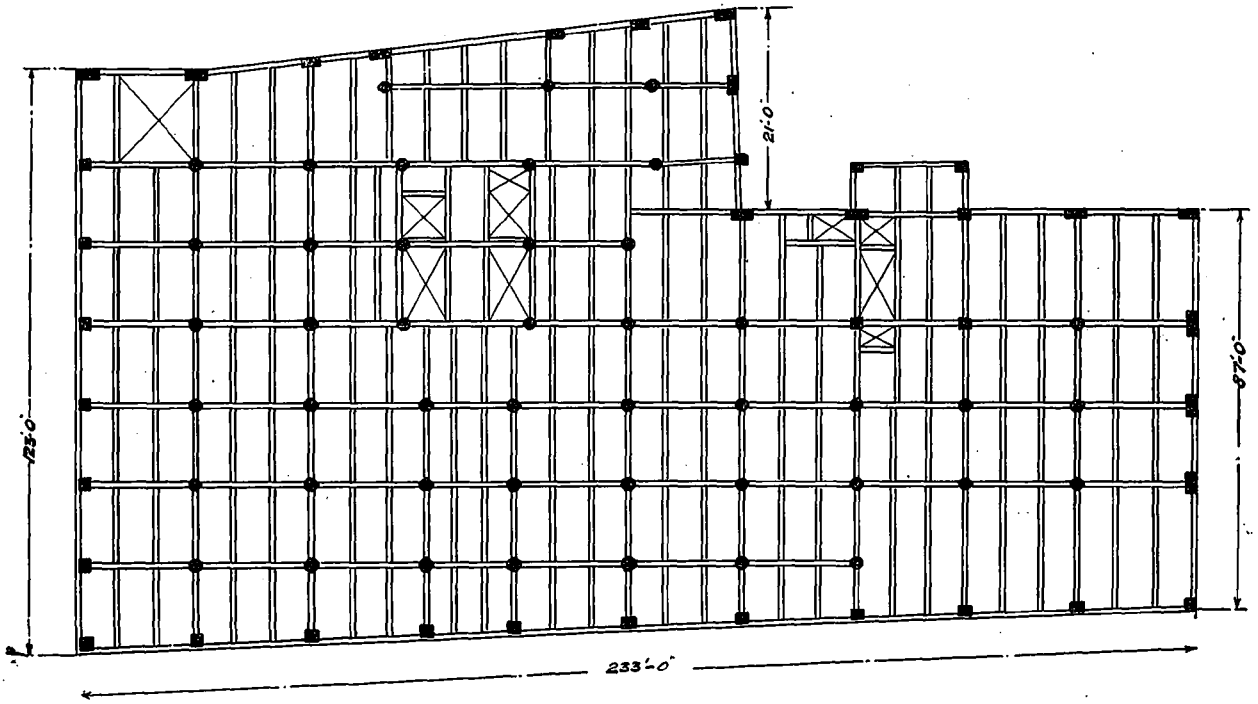


Diagram of typical floor, Jacobs Building, Montreal. Mitchell and Creighton, Architects.

Kahn and ten 1 in. cup bars. The floor slabs throughout are 4 in. thick, and are reinforced with No. 6 Kahn rib metal, this metal having a cross sectional area of .18 sq. in. of steel per foot.

The interior partitions are all constructed of hollow terra cotta tile, and the entire ground floor ceiling is of expanded metal suspended to cover the sprinkler pipes, plumbing and electric wiring, etc. The south and west curtain walls between the columns and beams are filled in with red ascot brick, and the concrete columns and beams are exposed and dressed with bush hammers, which gives a very pleasing effect.

All the exterior facing is carried on the concrete; the outside floor beams being offset beyond the face of the columns to give a bearing for same.

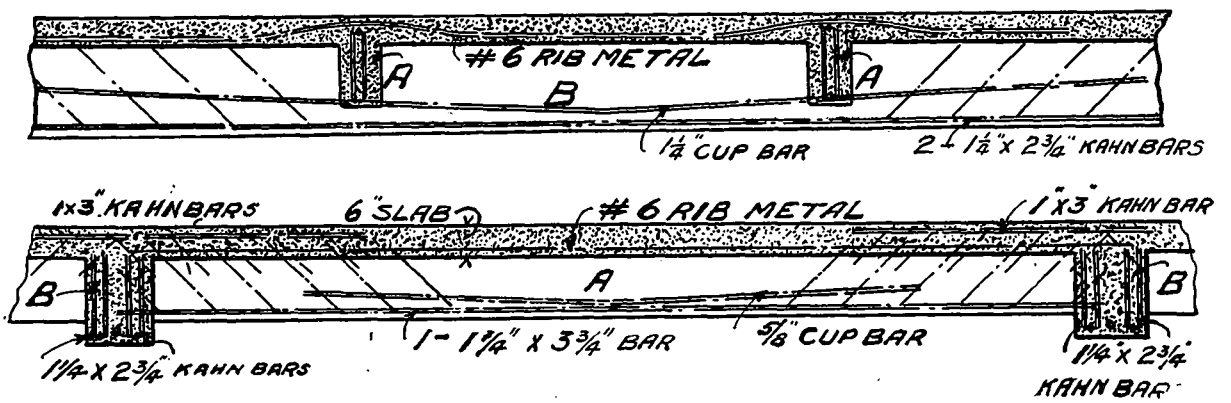
The interior plan and arrangement of the building has been very consistently worked out, ample shipping facilities being provided in the way of driveways, etc., with system in the basement of the building in which it is to be used. The company manufacturing this gas are at present completing a new factory building in Montreal.

In the basement of the building will be located an absolutely complete power plant, power being produced by steam and also by means of a gas suction plant. In addition to adequately meeting the requirements of the building itself, this plant will also supply heat and power to adjacent buildings. The power equipment will consist of one 150 h.p. Belliss & Morcom compound steam engine, four 150 h.p. Tubular steam boilers, and one 150 h.p. Hornsby-Stockport suction gas engine equipment, together with suction gas producer plant and the necessary switchboard for handling the above-named equipment, and any additional current that the building might require from the outside. The steam engine will be direct coupled to a 100 k.w. Allis-Chamers-Bullock 240 volts, direct current generator. These generators are of the 3-wire type, and will be operated either in parallel or separately. The wiring throughout the building is, therefore, a 3-wire system,

and the lighting will be done on a basis of 110 volts. The incandescent lamps (if metallic filament) will be hung in series, and the motor-elevators and light manufacturing which will be done in the building, will all be operated on 220 volt basis. There will also be provided a transformer room for receiving alternating current from the outside which will, as alternating current, be stepped down to the proper voltage and distributed through the lighting circuits, separating, in that case, the power from the lighting; a motor-generator set for conversion of alternating current into direct current will be installed should the equipment in the building be insufficient to take care of the total requirements.

The Belliss & Morcom steam engine and the Hornsby-Stockport gas engine are both of English manufacture. The gas engine set is the Otto cycle single cylinder type, with extra heavy flywheel, and governing on the "hit and miss" plan. The relation between the gas producer and the engine is automatic, it being necessary for the attendant merely to put coal in the hopper of the producer and see to the lubrication.

The plan of operation anticipates the running of the steam engine in the winter only, which will result practically in the use of the steam engine as a reducing valve, for the reason that the main object of the steam boiler plant is for heating and is of sufficient capacity to take



Detail of typical beam and floor construction, Jacobs Building, Montreal. Mitchell and Creighton, Architects.

care of several adjacent buildings. Economy, therefore, is obtainable by passing the steam through the 150 h.p. steam engine, utilizing the exhaust steam for heating. In the spring, after the heating season is over, operation of the steam engine will be discontinued, but the gas engine will be operated during the entire year, and the additional current for power or lighting which may be required will be brought in from the outside.

From a standpoint of power equipment and general flexibility, the entire property with its lighting and power equipment, comes up to a very high standard. There is no especially novel feature except that the power equipment combines gas and steam engines—operating, as stated, the steam engine in the winter only.

The plumbing and ventilation throughout the structure embody the most approved sanitary features. The building is equipped with a complete sprinkling system. The ground floor is finished with ceramic tile and the upper stories in maple, this maple super-flooring being practically the only unprotected wood in the building. The interior doors and trimmings are kalameined.

The architects for the building were Messrs. Mitchell & Creighton, of Montreal, and all the concrete work was done in accordance with the standard specifications for reinforced concrete as advocated by the Trussed Concrete Steel Company of Canada, Ltd., of which the following is an abstract:

CEMENT.

"All cement furnished for this work is subject to inpection and tests as hereinafter specified.

All inspections and sampling shall be made by In spectors, appointed by the architect, at the point of manufacture sending samples to their laboratory for tests and only cement that has been previously accepted will be allowed on the work.

In cases where special conditions make inspection at factory impracticable, inspection at the job may be substituted, subject to approval of the architect. When job inspection is permitted the cement shall be delivered at the job at least two weeks before required for use so as to allow ample time for necessary tests by the laboratory. During this interval the cement shall be stored in weather-tight building and proper care taken to so separate the individual cars that they can be easily identified if found unsatisfactory.

The cement will be accepted at the work packed in stout paper, cloth or canvas sacks. Each package shall be plainly labeled with the name of the brand and the manufacturer. Any package broken or containing damaged cement may be rejected as a fraction package at the option of the engineer in-charge of the work.

The acceptance or rejection of cement used under this specification shall be based on the following requirements.

Fineness of grinding, time of setting, specific gravity, constancy of volume, chemical composition, strength—cohesive and adhesive, microscopic test.

Fineness of Grinding.—After being gently shaken for five minutes, the cement must not leave more than eight per cent. residue on a sieve having between ninety-six and one hundred meshes per lineal inch, the size of the wire being 0.0045 inches; or after being gently shaken for ten minutes must not leave a residue of over 24 per cent. on a sieve having between 192 and 200 meshes to the linear inch; the size of wire being 0.00235 inches.

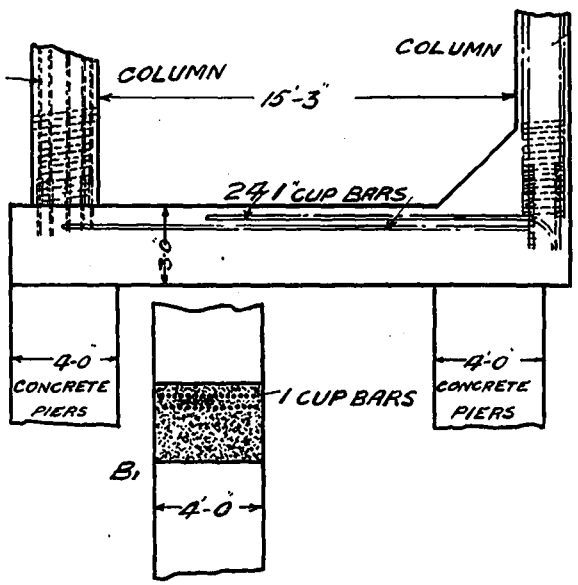
Time of Setting.—On being mixed for three minutes on a non-absorbent surface with the proper percentage of water to produce normal consistency, the paste shall not develop initial set under twenty-five minutes or final set under four hours, or even ten hours. The paste to be kept in a moist atmosphere at about sixty-five degrees Fahr. during the tests and results taken with Vicat apparatus.

Specific Gravity.—The specific gravity of fresh cement must not be less than 3.15 or more than 3.25. On seasoned material the specific gravity must not be less than 3.08.

Constancy of Volume.—A pat about three inches in

diameter, one quarter inch thick at centre and tapering to a thin edge made from paste mixed for three minutes on a non-absorbent surface with proper percentage of water to produce normal consistency, shall be placed on a glass plate and allowed to set in a moist closet at a temperature of 65 degrees Fahr. for twenty-four hours. It shall then be placed in cold water, which shall be raised to boiling point and kept boiling three hours. The pat after boiling shall show no signs of cracking, warping or similar indications of disintegration.

Strength—Cohesive.—The cement shall be mixed for not less than three minutes on a non-absorbent surface



Detail of basement cantilever, Jacobs Building, Montreal. Mitchell and Creighton, Architects.

with water to produce a paste of normal consistency; it shall then be pressed into oiled moulds with the fingers, but in no case rammed. The test specimens (briquettes) shall be placed in moist closet maintained at a temperature of 65 degrees F. for twenty-four hours, after which the moulds shall be removed and the briquettes placed in cold water until tested. The average of five briquettes broken at each period must exceed the following values:

2 days after gauging—275 pounds per sq. in.
4 days after gauging—400 pounds per sq. in.
7 days after gauging—500 pounds per sq. in.
28 days after gauging—600 pounds per sq. in

There must be a rise in strength of at least fifty pounds between each period; the stress to be applied at the rate of 100 pounds per ten seconds.

Strength—Adhesive.—The mortar shall be mixed for three minutes on a non-absorbent surface in the proportion by weight of one of cement to three standard "Ottawa" sand, which has passed the 20 x 20 sieve and been retained on a 30 x 30 sieve. Nine per cent. of water of the combined weight of sand and cement shall be used.

This mortar shall be reasonably rammed into moulds resting on a glass surface previously coated with a thin coat of mineral oil. The briquettes shall be placed in moist closet for twenty-four hours and then removed and placed under water until tested. The average five briquettes broken at each period must not exceed the following values:

7 days after moulding—200 pounds per sq. in.
28 days after moulding—290 pounds per sq. in.

There must be a rise in strength of at least fifty pounds per sq. in. between each period. The stress to be applied at the rate of 100 pounds per ten seconds.

SAND.

The sand shall consist of grains of any moderately hard rock that is perfectly sound. Any sand showing signs of disintegration shall be unconditionally rejected. The sand shall be well graded from coarse to fine. Any sand containing over 5 per cent. of loam or clay will be rejected.

BROKEN STONE OR GRAVEL.

The aggregate shall be composed of broken stone or screened gravel. The broken stone shall be of a hard, close-grained quality, free from dust and crushed so that its largest dimension shall pass through a ring one inch in diameter. Gravel shall be free from dirt and sand and shall range in size from that of a pea to an inch. Disintegrated stone or broken stone containing mica shall be rejected.

PROPORTIONS.

All concrete shall be proportioned of one part Portland cement, two parts sand and four parts broken stone or screened gravel.

RE-INFORCED STEEL.

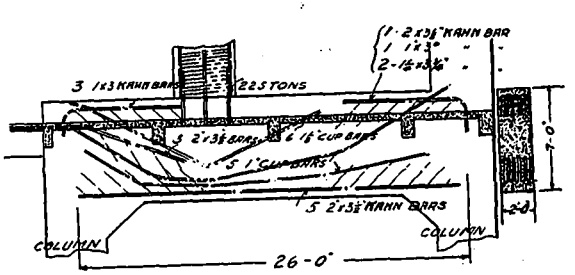
Steel used shall be medium open hearth steel to be rolled from new stock and to meet the manufacturer's standard specifications. Ultimate strength 60,000 to 70,000 lbs. per square inch. Elastic limit not less than half the ultimate strength. Minimum elongation twenty (20) per cent. Bending test 180 degrees to a diameter equal to thickness of piece tested without fracture on outside of bent portion. All steel shall be free from paint, oil or heavy rust or scale.

RE-INFORCEMENT FOR SOLID SLABS.

For solid concrete slabs the reinforcement shall be a steel fabric made of open hearth steel and provided in flat sheets. The main tension members shall be at right angles to the supports, have a maximum spacing of 8 inches and shall be accurately spaced by rigidly attached cross members preferably made from same sheet of steel. The cross members shall not be spaced farther apart than the spacing of the main tension members.

REINFORCEMENT FOR BEAMS.

For joists, beams, and girders no reinforcement shall be considered that does not provide for shearing stresses



Detail of heavy beam over driveway, Jacobs Building, Montreal. Mitchell and Creigton, Architects.

as well as direct tension. Shear members shall be inclined at an angle of 45 degrees, pointing up and towards the supports and shall be rigidly connected to the main tension member by shearing up its flanges. There shall be suffiicent shear reinforcement so that the concrete will be obliged to resist only diagonal tension and shear up to 50 lbs. per sq. in.

MINIMUM PROTECTION.

The minimum protection for reinforcing steel which shall be taken as the distance from the surface of the steel bar to the nearest concrete surface shall be: (a) For slabs ¾ inch. (b) For beams, girders and columns 1½ inches. Steel shall be placed in exact accordance with detail drawings.

BASIS OF CALCULATION.

In calculation of stresses the following assumptions shall be made:

Modulus of elasticity of steel Es= 30,000,000
Modulus of elasticity of concrete, Ec= 2,000,000
Whence $\frac{Es}{Ec} = M = 15$

The value of M given above remains constant at working stresses.

A plane section before bending remains a plane section after bending; that is, the stress in any fibre is directly proportional to its distance from the neutral axis. The tensile strength of concrete shall be neglected.

ALLOWABLE STRESSES.

The following maximum stresses based on figuring full live and dead loads shall be used in the design of reinforced concrete work. Steel in tension = 16,000 lbs. per square inch. Extreme fibre stress in concrete in compression in slabs, beams and girders = 750 lbs. per square inch. Concrete in shear = 50 lbs. per square inch.

The minimum longitudinal reinforcement in any column regardless of the load carried by same, shall be one per cent. of the cross sectional area. For columns reinforced with longitudinal bars tied at intervals of not less than the diameter of the column, the safe load shall be computed as follows: Safe load (in pounds) = 500 Ac + 7500 As. Ac net cross sectional area of column in square inches. As = cross sectional area of longitudinal reinforcement in square inches.

For columns reinforced with longitudinal steel and with spirally wound hoopwing the safe load shall be computed as follows: Safe load = Ac + 15 fc (As + 2. 4A $1\frac{1}{8}$). Where fc = allowable stress on concrete in compression, to be taken at 750 lbs. per square inch. Ac = net area of concrete enclosed in hooping. As = cross sectional area of longitudinal reinforcement. A $\frac{1}{8}$ = cross sectional area of imaginary vertical rods having same quantity of steel as the hooping per lineal foot of column. For all columns the above safe carrying capacities shall be reduced 20 per cent.; for corner columns reduced 30 per cent.

The stresses allowed above shall be used only in the case where the unsupported length of the column is not greater than 15 times the least diameter. Where the length exceeds this limit the allowable stress shall be reduced according to the standard formulas.

Where columns are subjected to loads of known eccentricity the combined stress in the extreme fibre due to direct compression and bending moment shall not exceed that allowed in slabs and beams.

CONTINUOUS ACTION.

The bending moment for slabs and beams which are not continuous over supports shall be taken at $\frac{1}{8}$WL. Where W = total dead and live load uniformly distriuted on the member. 1 = clear span of same. When slabs and beams are built continuous over both supports the bending moment shall be taken at not less than 1/10 WL. Where slabs and beams are continuous over one support only the bending moment shall be taken not less than 1/9 WL. In case of square panels reinforced in both directions and continuous over all supports the bending moment shall be taken not less than 1/20 WL.

When above reductions in bending moments are allowed, provide in the top of the slab or beam over the support at least one quarter of the maximum area of reinforcement in the bottom of the adjacent span.

T BEAMS.

If the slabs, beams and girders in the floor construction are poured in one continuous operation, the width of the adjacent floor slab on each side of beam or girder that may be figured in the compression flange, must not exceed twice the width of the beam or girder of four times the thickness of the slab.

In the case of a floor system consisting of slabs, beams and girders, where the slab reinforcement runs parallel to the girder, the portion of the slab as noted above cannot be figured as part of the compression flange unless reinforcement be placed in the slab at right angles to the girder to insure that the two act together.

COMPRESSION STEEL IN BEAMS.

When it is necessary to introduce steel to take compression in slabs, beams, or girders, the compressive stress allowed on such steel shall not exceed 15 times the computed compressive stress in the concrete at the same distance from the neutral axis.

MIXING CONCRETE.

All concrete must be machine mixed using a batch mixer of an approved design. Fresh clean water, free from acids or strong alkalies shall be used and in sufficient quantity so that the resulting mixture will flow readily around the reinforcing bars. All materials shall be thoroughly mixed dry, after which the proper amount of water shall be added, and the mixing continued until the concrete is uniform. A competent foreman must be in constant attendance at the mixer to give his approval of every batch which leaves the machine.

PLACING CONCRETE.

All forms must be absolutely clean and free from shavings or foreign matter before any concrete is placed. All concrete must be deposited in forms within ten minutes after leaving the mixer. All beams and slabs must be filled to the top surface in one continuous operation, that is from the bottom of the beam to the top of the floor construction, care being taken to see that the concrete flows around and under all reinforcing members.

During the operation of pouring, the sides of all beams and girders shall be well spaded so as to obtain a perfectly smooth surface when the forms are removed. All columns shall be poured six to eight hours ahead of the beams and slabs, and the concrete during the operation of filling shall be constantly puddled by means of a rod to expel all bubbles of air and give a smooth finish to the finished structure. The pouring of the column must be a continuous operation to the bottom of the beam or girder it supports. Concrete, after it has been poured, must not be disturbed by walking or wheeling over same till it has thoroughly set.

STOPPING WORK.

When concreting is once commenced it must be carried on vigorously to completion if possible. If concreting must be stopped before an entire floor is completed, the stop shall be made in the centre of beams and center of floor slabs. The plane where concrete work is stopped must be vertical and at right angles to the direction of the beam or slab. In no event shall work be terminated in beams or floor slabs where future shearing action becomes great, as at their ends or directly under a heavily concentrated load.

CENTERING.

The centering must be true and rigid, properly braced and of sufficient strength to carry the dead weight of the construction as a liquid without deflection. All joints must be tight so as to prevent the leakage of the liquid masses. Beam and girder forms should be crowned or cambered ¼ inch to every 10 feet. The centering must be so built that the various parts can be taken down in the following order:—Two sides of columns, floor forms,

sides of beams, sides of girders, remaining sides of columns, and the supports for beams and girders.

REMOVAL OF CENTERING.

Centering shall not be removed until the concrete is thoroughly set and is of sufficient strength to carry its own weight besides whatever live load is liable to come on the construction. No falsework shall be removed without the approval of the architect or engineer in charge. Beams and girders shall remain supported for at least two weeks after all other falsework has been removed. Columns shall not be given their full loading in less than five weeks.

After the forms are removed any small cavities or openings in the concrete shall be neatly filled with mortar.

FREEZING WEATHER.

Placing concrete in freezing weather shall be avoided whenever possible, and when necessary special precautions shall be taken to prevent the concrete freezing, such as heating the building with salamanders; covering the concrete with sawdust, straw or manure, heating the materials and adding calcium chloride (8 lbs. per barrel of cement) to the water used in mixing the concrete. All concrete which is frozen shall be removed. The centering shall not be removed until the concrete has thoroughly set and aged.

TESTS.

Floors where directed shall be tested after the centering has been removed one month, to a uniformly distributed load equal to twice the safe load. With this load there must be no deflection exceeding 1/400 part of the span, and the floor must return to its normal position after removal of the load.

The Trussed Concrete Steel Company of Canada, Limited, G. B. Reynolds, local representative, were the structural engineers; and the general contract was carried out by Messrs. D. G. Loomis & Sons. The superintendent of construction was Mr. Beck, assisted by H. McGill Allen, who had charge of the placing of the reinforcing steel and concrete work. All cement used on the job was supplied by the Lakefield Portland Cement Company, and the terra cotta, both for the exterior walls and the partitions, was furnished by the Eadie-Douglas Company, Limited.

REGISTRATION OF ARCHITECTS IN THE TRANSVAAL.—Continued from Page 54.

purpose of sanctioning such alteration. Notice of such meeting, and of the alteration or alterations to be proposed thereat, shall be sent by post to the registered address of each member of the association at least fourteen days before the date fixed for the meeting, but the non-receipt of such notice by any member or members shall not invalidate the proceedings thereat, provided that one-third of the members then on the register shall be personally present or be represented by proxy in writing.

By-laws—When to Take Effect.

29. No by-law framed and adopted under sections twenty-six and twenty-seven of this Act and no alteration, amendment or repeal of any such by-law shall have any force and effect until the same shall have been approved of by the Government-in-Council and published in the "Gazette" whereupon they shall have the force of the law and shall be binding upon all members of the association in so far as the same are not in conflict with the provisions of this Act.

Repeal of By-laws by Governor-in-Council.

30. The Governor-in-Council shall at all times have the power to repeal the existing by-laws of the association and may, from time to time alter, amend and add to such by-laws, provided that such alteration, amendment and addition be not in conflict with the provisions of this Act.

Costs of Promoting This Act.

31. The council may allocate such sum or sums of money as shall be proved to their satisfaction to have been expended in promoting this Act, and which sum or sums are, in the opinion of the council, reasonable, and may order the same to be paid through their treasurer to the body or bodies, person or persons, who may establish the claim or claims within twelve months of the coming into operation of this Act.

Title and Date of Operation of Act.

32. This Act may be cited for all purposes as the Architects' Private Act, 1909, and shall come into operation and have the force of law on the publication thereof in the "Gazette."

CODE OF ETHIC: to be included in the by-laws of the Transvaal Association of Architects. Incorporated under the Architects' Private Act, 1909. Promulgated in Government "Gazette" of 21st July, 1909.

1. Clause 15 of the Act is included in this code, and the following are given in further explanation of pars. *g*, *h* and *i* of Clause 15, also par. *b* of Clause 27.

2. No member shall have any financial interest in or otherwise combine any other business with that of architecture, such as building and contracting, house and estate agency, auctioneering, merchants or any such like as the council may from time to time decide.

3. A member shall not receive, directly or indirectly, any royalty, gratuity or commission on any patented or protected article used on work which he is carrying out for his clients without authority in writing from those clients.

4. A member shall not participate in or be the medium of payments of prime cost sums or other payments made on his clients' behalf to any builder, contractor or business firm, without authority in writing from those clients. He may issue certificates or recommendations for payment by his clients.

5. No member shall guarantee an estimate or contract by personal bond, nor be party to a building contract except as owner.

6. No member shall attempt to supplant another architect after definite steps have been taken towards his employment.

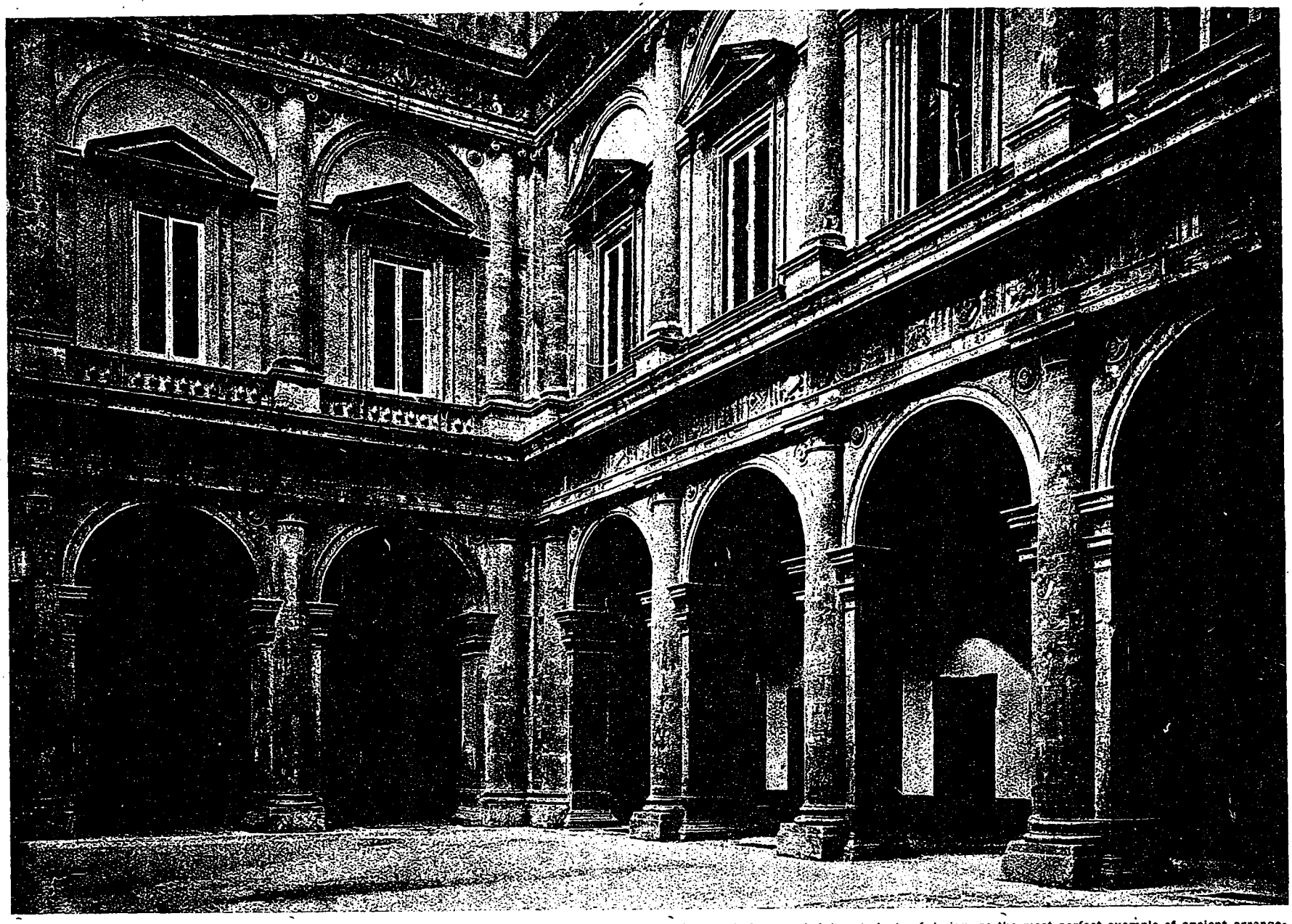
7. No member shall advertise in any publication or in any other way than by a card or plate, giving name, address and profession. It is undesirable to do so on boards or boardings in front of buildings in course of construction.

8. No member shall criticize in public print the professional conduct or work of another architect except over his own name.

9. No member shall furnish designs in competition in private work or public work except under conditions and assessors previously approved by the council of the association.

10. No member shall submit drawings in any competition not designed and prepared under his personal supervision; nor shall any member attempt to secure any work for which a competition remains undecided.

11. The schedule of charges as sanctioned under the Act shall be the minimum rates for the services rendered.



Court of Farnese Palace. The architecture of this palace, and more especially that of the arcades of its court, is regarded by students of design, as the most perfect example of ancient arrangement adapted to modern conditions and requirements.

THE FARNESE PALACE.—Beautiful Edifice Designed by San Gallo, and Finished by Michael Angelo.—Regarded by Students of Design as the Most Perfect Example of Ancient Architecture Adapted to Modern Conditions and Requirements. ∴ ∴ ∴

OF ALL THE BEAUTIFUL PALACES in Rome which are conceded to be the finest architectural works in Europe, none equals Farnese. This magnificent edifice was erected by Pope Paul III. before his accession to the Holy See, after the designs of Antonio Cordiani da San Gallo, and was completed by Michael Angelo. It obtained its name from the illustrious Italian family of which Cardinal Alessandro Farnese, who was raised to the Papal throne as Paul III. in 1534, was a member.

The Farnese Palace forms a quadrangle of 256 ft. by 185 ft. It is constructed of brick, with the exception of the dressings of the doors and windows, the quoins of the fronts, and the entablature and loggia in the Strada Giulia, which are of travertine stone. Of the same stone, beautifully wrought, is the interior of the court.

The building consists of three stories, including that on the ground, which, in the elevations or facades, are separated by impost cornices. The only break in its symmetry and simplicity occurs in the loggia, placed in the centre of the first story, which connects the windows on each side of it by four columns. On the ground story the windows are decorated with square-headed dressings of extremely simple design: in the next story they are flanked by columns, whose entablatures are crowned alternately with triangular and circular pediments; and in the third story are circular-headed windows, crowned throughout with triangular pediments. The taste in which these last is composed is not so good as the rest, though they were probably the work of Michael Angelo.

The facade towards the Strada Giulia is different from the other points in the centre only, wherein there are three stories of arcades to the loggia, each of whose piers are decorated with columns of the Doric, Ionic and Corinthian orders in the respective stories as they rise, and these in form and dimensions correspond with the three ranks of arcades towards the court. It appears probable that this central arrangement was not in the original design of San Gallo but introduced when the third story was completed.

Magnificent as is the exterior of this palace, it does not exceed the beauty of the interior. The quadrangle of the court is 88 ft. square between the columns of the arcades, and is composed with three stories, in which the central arrangement above mentioned towards the Strada Giulia is repeated on the two lower stories, over the upper whereof is a solid wall pierced in the windows.

The piers of the lower arcade are ornamented with Doric columns, whose entablature is charged with triglyphs in its frieze, and its metopae are sculptured with various symbols. The imposts of the piers are very finely profiled, so as to form the entablatures when continued over the columns of the entrance vestibule. In the Ionic arcade, over this, the frieze of the order is decorated with a series of festoons.

The distribution of the different apartments and passage is well contrived. All about the building is on a scale of great grandeur. Though long unoccupied, and a large portion of its internal ornaments has disappeared, it still commands admiration in the Carracci Gallery, which has continued to serve as a model for all subsequent works of the kind. The antique sculptures for which it was formerly renowned, are now in the museum in Naples; a few of the classic works, however, are still to be seen in the great hall.

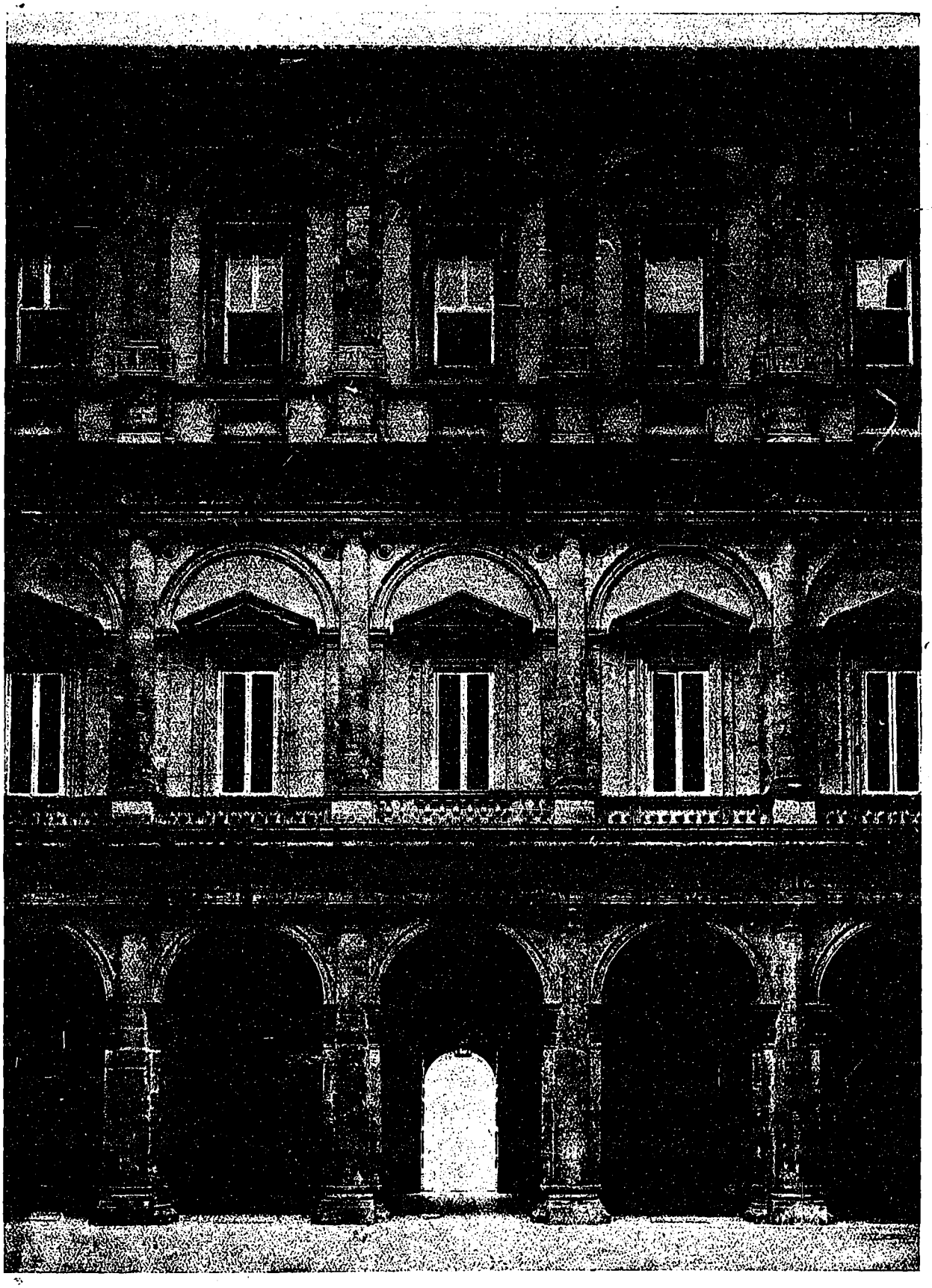
The architecture of the Farnese Palace, more especially as respects the arcades of its court, is the most perfect adaptation of ancient arrangement to more modern habits that has ever been designed. We here allude more particularly to the arcades, upon whose piers orders of columns are introduced. This species of composition, heavier, doubtless, less elegant, yet more solid than simple colonnades, is, on the last account, preferable to them, where several stories rise above one another. The idea was, certainly, conceived from the practice in the ancient theatres and amphitheatres; and its application at the Farnese Palace rivals in beauty all that antiquity makes one in its remains acquainted with.

Antonio Cordiani da San Gallo, (1485-1546), its architect, belonged to a celebrated family of architects of the Renaissance. His father, Giuliano (1445-1516), the first to be distinguished and most important member of the family was born in Florence, the oldest son of Francesco Giamberti, a woodworker. Although Giuliano, his father, was one of the most important architects of the Early Renaissance, his work as as architect was somewhat overshadowed by his prowess as a military engineer. Among some of his important work was the beautiful Church of Madonna delle Carceri at Prato; the Augustine convent at Florence; the Gondi Palace; the celebrated Strozze Palace for which Benedette da Majano has received the credit; the fortress at Ostia; the ceiling of Santa Maria Maggiore and the cloister of San Pietro in Vincoli. In 1503 he designed the first plans for Saint Peter's having been replaced by Bramante. Later he was associated with Raphael on Saint Peter's, serving in this capacity for two years.

Antonio Cordiani da San Gallo proved himself a worthy son of so illustrous a father. He went to Rome at eighteen years of age, studied with Bramnate, and did important work for forty-one years under Pope Leo X., Clement VII. and Paul III. He was employed on the Castle of Sant' Angelo and at Saint Peters, nearly finished the Farnese Palace, and completed the Santa Maria di Loreto at Loreto. With his brother, Ballista, he was engaged upon the Villa Madama in Rome, usually attributed to Raphael. In 1518 he was appointed to succeed Raphael as architect of Saint Peter's and of the Vatican Palace. His model for the church is still in existence. His work as a military engineer was very extensive, comprising more than a dozen fortifications. He died at Ferni, October 3, 1546.

It is questionable if there is in history any one family of architects that have so much exceptional work to their credit. Antonio Cordiani da San Gallo had an uncle known as Antonio da San Gallo "the elder" who had a career very similar to that of his brother Giuliano, excelling both as an architect and military engineer. He was employed by Pope Alexander VI. in fortification work at the Castle of Sant' Angelo, at Civita Castellana, and at Nepi. He re-constructed the church at Arezzo and built the fine Portico of the Annunziata, Florence, for Pope Leo X. His best work as an architect is the Church of the Madonna di San Biagio, at Monte Pulciano, where he also built the Cervini, Tarugi and Bellarmini Palaces. He took part in the defence of Florence when it was besieged in 1530, and died December 7th, 1534.

The Farnese Palace, the most magnificent of all the beautiful palaces for which Rome is renowned. It was erected by Pope Paul III., before his accession to the Holy See, after designs by Antonio Cordiana de San Gallo, and was completed by Michael Angelo.



Court of Farnese Palace, showing the Doric, Ionic and Corinthian Columns which decorate the piers in the respective stories as they rise, and the general treatment of window scheme and cornices.

CONSTRUCTION

A Journal for the Architectural, Engineering and Contracting Interests of Canada.

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

Vol. 3 Toronto, March, 1910 No. 4

Current Topics

A ROMAN TOMB of the second century B.C., containing a marble sarcophagus of exquisite workmanship, five feet long and admirably preserved, has been discovered at Grosseto.

* * *

THE VANCOUVER SCHOOL BOARD has decided to appoint a permanent architect to its staff at an annual salary of $2,500, instead of engaging one from year to year as has been the custom.

* * *

OFFICERS FOR 1910, as elected by the Quebec Association of Architects at the annual meeting recently held, are as follows: President, Thos. Raymond, Quebec; first vice-president, J. R. Gardiner, Montreal; second vice-president, L. Lemieux, Montreal; treasurer, W. Maxwell, Montreal; secretary, J. E. Vanier.

* * *

TORONTO'S CONTRIBUTION to the fire fiend in 1909 was $177,405, or over $300,000 less than in the preceding year. The total loss in this respect amounted to $740,931.78, and the insurance to $563,526.78. The total insurance on the properties affected was $2,531,741.35 of which amount $1,240,155.40 was on the buildings, and $1,291,586.35 on the contents.

* * *

PETROL DRIVEN STREET CARS are being put in service in Karachi, India, with a view of bringing about a more speedy service without the cost of changing the system to an electric line. The cars, which seat 46 people, are driven by a Lucas valveless engine of 25 horse-power capacity, and are capable of making about ten miles an hour. This departure is said to be the first application of petrol engines to street railway traffic.

REAL ESTATE IN MONTREAL is booming. An unusually large number of deals in the down-town district involving huge sums are now in course of negotiation, and land values in the suburbs are on the advance. Local contractors look forward to an extremely busy building year.

* * *

THE BUILDERS' ASSOCIATION of St. Thomas, Ont., have elected the following officers for 1910: Pres., Geo. Wilson; vice-pres., A. E. Hamilton; treas., Chas. Lee; sec., Geo. Tyler; auditors, L. Shaffer and W. J. Green; finance committee, John Scrace (chairman), A. E. Hamilton, Geo. W. Wilson; chairman of committee on games, Wm. Rose; chairman of grounds committee, John McCallum; chairman of printing, Dell Shafer; chairman of parade, John Scrace; chairman of entertainment, Clarence Lee. Arrangements for the annual outing will be made at a later date.

* * *

A NEW PROCESS for utilizing the waste slag of blast furnaces, with a view of converting it into glass, by adding sand and sulphate of soda, and in some cases a little lime, is now being tested in Liverpool. With or without enclosed wire, this glass may be cast or rolled into artificial slates, paving blocks, building blocks, bricks, slabs or tiles. Much is expected from the material as regards slag roofing slate, which, it is said, costs less than half as much as the natural slate of Wales, is translucent, can be made of any size or shape and in any one of several colors, and is absolutely rainproof.

* * *

NEW YORK'S NEW SUBWAY, it is estimated, will cost in big round figures, at least $240,000,000, making it the most costly railroad in the world. The present system cost $35,000,000 to build and lay down, and $45,000,000 more to equip, making $80,000,000 in all. The new system will cost $100,000,000 to bore and lay down, and when ready for operation, with all stations built and an adequate equipment of power houses and cars, will have necessitated an additional expenditure of $140,000,000. This huge outlay will be expended on a strip of tracks but little more than twenty-six miles long, so that the average cost per mile will approximate $923,765.

* * *

AT THE TWELFTH ANNUAL MEETING of the London Builders' Exchange held recently, the following officers were elected for the ensuing year: President, Geo. Everett; first vice-president, John Jones; second vice-president, William Nutkins; secretary-treasurer, George S. Gould, assistant secretary-treasurer, A C. Nobbs; Auditors, D. Ferguson and T. R. Wright; directors, J. Moran, E. Gerry, G. Belton, E. R. Dennis and W. T. Brown. Representatives on Western Fair board, Geo. Everett and Geo. Belton; delegates to the Canadian Builders' Convention, Messrs. Everett, Ferguson and Stevely; alternatives, J. Jones, Stratford and L. H. Martyn.

* * *

TAKING THE BUILDING RETURNS for 1909 on a per capita basis, Vancouver stands highest of any of the large cities of the Dominion. At least this is how it is figured by Building Inspector Jarrett of that place, who summarizes the year as follows: Toronto with 300,000 population, records building permits to the amount of $18,154,037. Winnipeg, standing second in building totals in the Dominion, reports an aggregate of $9,226,325; but this business is to be reckoned on a population stated to be nearly 200,000. Montreal comes third on the list with $7,783,531 as its total and a population of about 400,000. Vancouver, which is fourth with a total of $7,258,565 has as yet but a population of 100,000; and has therefore made a greater advance per capita than any other Canadian city in the metropolitan class.

TESTS ARE NOW BEING MADE in the United States with the Edison storage battery, which, according to the inventor, will supercede the trolley, and revolutionize the building of automobiles. Trial runs with a 26 foot experimental car carrying thirty passengers, which were made recently at Orange, N. J., before several street railway experts proved to be highly successful. The power was generated from 210 cell arranged under the seats, ten of which were used for lighting purposes. Mr. Edison is now at work on a patent electric heater, which he says, for cheapness and radiating power, will discount anything yet produced.

* * *

OFFICERS OF THE OTTAWA BUILDERS' EXCHANGE as elected at the recent annual meeting are as follows: President, George A. Crain, (re-elected); first vice-president, August Boehmer; second vice-president, J. Thorpe Blythe, (re-elected); treasurer, James Ritchie. The yearly report of the directors showed that the Exchange is making very substantial progress. A number of new names were added to the membership during the past twelve months, and the absence of strikes or labor trouble in the building trades had permitted operation to go uninterrupted. Reference was also made to the uniform form of contract, framed last season, which has just been put in printed form and is now receiving the attention of the builders and architects.

* * *

IN ORDER TO BETTER PROTECT THE PUBLIC the Home Secretary of England has made a series of regulations governing cinematrograph or moving picture entertainment in theatres and other buildings. These provide that the cinematograph apparatus shall be placed in an enclosure of sufficient dimensions to allow the operator to work freely, and except in the case of a movable building or structure the enclosure shall be of a permanent nature. Such enclosure must be placed outside of the building or auditorium, and, constructed of fire-resisting material, or lined internally with the same, and so ventilated as to prevent the escape of smoke into the auditorium. The entrance to the enclosure must be fitted with a self-closing smoke-proof door of fire-resisting material. Provision is also made for the protection of the openings for projection of the pictures, each opening to be fitted with an automatically-closing fireproof screen. The film boxes must also be made safe, and in the use of limelight gas bags are prohibited.

* * *

REPRESENTATIVES OF THE GOOD ROADS ASS'N of Ontario will gather in Toronto on March 2nd, 3rd and 4th, in what promises to be one of the most important and successful conventions in the history of the organization. The Association considers the time favorable for a concerted advance in the construction of new roads throughout the Province, and with this end in view efforts are being made to secure the attendance of members not only from county councils, but from the township bodies, and all other associations that are interested in improving the roads of the country, such as the Farmers' Institutes, agricultural societies, fair organizations, the various live stock associations, fruit-growers and others. The movement of the association is widespread in extent, and is now being taken up by the towns and cities. In addition to a valuable series of addresses from the superintendents of country road systems in which the cost, machinery and material used and method of construction employed will be explained, the programme provides for a number of interesting papers by experts from New York, Pennsylvania, Massachusetts and other States where the finest roads in America have been built.

BY THE PROVISIONS OF A NEW BY-LAW decided upon by the Winnipeg authorities all master plumbers will, hereafter, have to take out licenses, which will be renewable annually. They will also have to make and bear the cost of smoke testing. Taps and valves, however, will be tested by the city's plumbing inspector. The registration fee is to be ten dollars, and the annual fee one dollar.

* * *

A NEW YORK REPORT, regarding the cement production in the United States in the past year, says: Increased demand for cement during 1909 is attributable largely to activity in building. As construction work far surpassed 1908, consumption was considerably greater. The year's business was practically closed by November 1, and conditions since have shown an appreciable change. For the year mills operated between 60 and 65 per cent. of capacity, while total production was about 62 000,000 barrels, or an increase over 1908 of nearly 10,000,000. The high price for the year was $1.53 per barrel, and this declined to a low level of $1.33, rising again to $1.43, the present quotation to the dealer. A fair average price would be about $1.38. In general, prices have been rather unsatisfactory, manufacturers claiming that margin of profit has not been commensurate with cost of production. The cement production of 1908 was approximately 53,000,000 barrels, valued at $44,000 000; during preceding year production was about 49,000,000 barrels, valued at $54,000,000. This increase of about 2,000,000 barrels in production and decrease of about $10,000,000 in valuation was in the nature of a report from the industrial clearing house, such as the manufacturer had never encountered before. Nobody was quite certain as to how much cement the country could really consume. It served to show the present needs of the country and the extent to which competition had developed.

* * *

A TRACKLESS TROLLEY SYSTEM, the invention of Herr Ludwig Stoll, of Vienna, a leading official of the Austrian Daimler Motor Company, has for some time been working successfully near Vienna and elsewhere in Austria-Hungary. Current is taken from the overhead positive wire by flexible cables, and not by a pole or boom. Instead of an underrunning wheel or overrunning shoe, the head or actual current collector is a frame with two small grooved wheels on each side. One pair of wheels runs on the positive, the other on the negative wire, and the cable is suspended from the centre of the frame, from which point also is suspended a weighted pendulum, which keeps the wheels well pressed down on the wires. The wheels (or pulleys) run on ball bearings. The trolley runs without sparking. The pull of the cable acting on a very short lever arm, and the centre of gravity of the trolley being low, no deviation of the trolley is possible, even in strong transverse pulls. The conducting cable can be lengthened to follow the car by two appliances—an upper sliding knot tied upon the pendulum weight and stretched by a string in the latter, and a cable roller (on the left) with 10 to 12 yards of cable, which can be rolled up or let out by a spiral spring. Thus the car is allowed to run on any part of the road, to overtake other carriages, or to turn anywhere, accommodation itself to all kinds of traffic. When two cars running in opposite directions meet, the drivers interchange the trolley conduits by detachable contact boxes, an important advantage over a tram line with one track, on which the loss of time in waiting at passing places is sometimes considerable. The vehicle having this flexible means of taking the current can, it is stated, move as far as 20 meters (65 feet) away from the wire, and thus has powers of adaptability which would be rarely exercised to the full extent.

Lt.-Col. H. N. Ruttan, Winnipeg, the newly elected President of the Canadian Society of Civil Engineers.

CONVENTION OF CAN. SOC. OF C.E.—Twenty-Fourth Annual Meeting Brings Representative Gathering to "Capital" City.—Gist of Committee Reports and Business Sessions.—Status of Engineer Subject of Broad Discussion.—Officers for 1910.

ALTHOUGH THE 24th ANNUAL CONVENTION of the Canadian Society of Civil Engineers is now a thing of the past, the many vital subjects which occupied the three days time at Ottawa, and the important work which the Society has laid out for the promotion of the engineering fraternity in Canada, marks it as a cardinal event in the history of this organization, and one from which will eventually accrue such results as will be of immeasurable benefit to the engineer both individually and collectively.

If, perhaps, the meeting, in point of attendance, did not quite come up to the big convention held in Montreal two years ago, it certainly exceeded it in genuine enthusiasm, important business, and the promise of something in the way of actual accomplishment. In the latter respect, the Convention was particularly notable, not only as it concerns the interests of the engineer, but the interests of the entire country.

Possibly at no previous time has the status of the engineer been more broadly discussed and probably never before were more definite steps taken to bring about the advancement of the profession in the Dominion. The great interest awakened in this respect, was brought about by an address made by Mr. Dodwell, Halifax, at the annual smoker, in which he referred to the speech made in the House of Commons by Mr. Warburton, M.P., from Prince Edward Island, in behalf of the civil engineer, and which resulted in a committee of the Society being appointed to memorialize the Government on the subject of an improved engineering service, and a more deserved recognition for the members of the profession in its employ.

Mr. Dodwell's position as Resident Engineer of the Department of Public Works for Nova Scotia, made him particularly well qualified to go fully into the subject which he had chosen, and to call attention to the lack of success which has attended the efforts to improve the Department, that had been made in the past.

In the course of his remarks, Mr. Dodwell said that no more important subject has come before the Society since its organization—and this not because a good number of the members as in the Provincial or Federal Government, but because of the functions of the Society to guard the profession as a whole. There was urgent need for a higher professional standing in the Federal Service, together with an official status of enrolment and a system of pension and superannuation. No standard whatever, at the present, is required, and the engineers entering the Government service are not obliged to pass an examination or to produce testimonials. Any of them may be put into a position of responsibility when wise expenditures or extravagant waste will result, according to his ability and common sense or the absence of such qualities. In the report of the Department of Public Works could be found the names of caretakers, stationary engineers, and others, but not those of civil engineers. If proper organization existed the Department of Civil Engineering would be one of the most profitable institutions in the country, considering the capabilities of the engineer and the industrial advantages which his service makes possible. He believed that he voiced the sentiments of the Society in declaring that no civil engineer should be appointed by the civil service unless he was a member in good standing in their organization. In touching upon a recognized official status for the engineer with enrolment in the Civil Service, Mr. Dodwell said that no provision is made for a corps of engineers in the Federal Service, and that the Civil Service Act has always excluded civil engineers in a manner which looked very much like design or intent. There was no reason why engineers should not enjoy security of tenure and other privileges provided by the Civil Service Act. As it is, Mr. Dodwell intimated, there is a distinction between the inside and outside services. No engineer outside of Ottawa, notwithstanding the rank he holds, may have his name put on the Civil list as an engineer, and he believed that a man should be equally a servant of the Government, whether in Ottawa or Vancouver. As regards pensions and superannuations, under the existing conditions no provision was made for the engineer or for his family in case of death, and there were a number of engineers in the Public Works and Railway and Canal Department, whose period of office has been from fifteen to forty years. Other employees of the Government were taken care of in this respect, and this indifference to the engineer, in the opinion of the speaker, was a discrimination, unjust, ungenerous and remedial.

Reference was made to what has been accomplished by the Public Works Departments of India and Australia, and the measures adopted for the protection of the engineer's interest, or those of his family in case of his demise. The speaker wished to be understood that his arguments were not made for the purpose of increased salaries, but for an improved standard in the Federal Service, and a broader recognition from the Government, as he believed that it would serve to promote the interests of the engineer in general, and raise the status of the profession in Canada to a higher and more dignified plane.

Mr. Butler supplemented Mr. Dodwell's speech with an appropriate address in which he stated that the civil engineers are the most important factors in modern civilization, and that no other profession could lay claim to the all-absorbing quality possessed by the engineering profession. He laid stress on the importance of the civil engineer as being practical as well as scientific, and stated that the members of the profession in Canada should be among the best in the world. The transportation problem in the Dominion required a higher degree of skill on the part of the engineer, than in any other country, and any failure on his part would prove a menace to the political future of the country. It was essential that the transportation problem in Canada be worked out an east and west lines, and not north and south, if foreign territory is to be avoided. M. Butler hoped that the younger men would take some of his ideas home and think them over, and he wished to emphasize in particular the great disadvantage resulting from the lack of business acumen on the part of those engaged in engineering work.

President's Address

IN CLOSING MY YEAR as President of the Canadian Society of Civil Engineers, I desire to express my appreciation of the honour which has been conferred upon me and of the personal consideration of the members. My interest in the welfare and future of the Society will always continue, and I shall be ready to add my efforts to those of other members for its advancement.

I am pleased to be able to report the continued growth of the Society, in the ranks of which are now included practically all the engineers of the Dominion in every branch of engineering. During the past year we have added two hundred and forty members and students to our rolls; so that we now have a total membership of two thousand five hundred and sixty-nine, of which the Honorary Members, Members, Associate Members, and Associates number fourteen hundred and five, and Students eleven hundred and sixty-four. This must be very gratifying to the members of the Society, and is of interest to the country at large, in that it shows a marked advance in all branches of engineering which are so closely connected with the development of Canada.

The Canadian Society of Civil Engineers is an organization national in character, aim, and outlook, and is of recognized high standing. It must grow and increase in influence. The Society, as you are aware, some years ago formed itself into four sections: General, Electric, Mechanical, and Mining. The object in view was to centralize the interests of the different departments of engineering and enhance the attractiveness of the meetings to those especially concerned in only one branch of the profession. While the home of the Society is established in Montreal, where practically all the business is transacted, the occasional change of place for the annual meeting has, in my opinion, served to join the men of the far east and the far west with their brothers of the great middle country. The formation of our local branches, which extend from the Pacific Ocean to the tide-waters of the Atlantic Ocean, while preventing decentralization, has done much to reconcile diversified views. The prime reason for the organized existence of the Society is to afford an opportunity for interchange of views on matters of interest to the members, thereby facilitating the advancement of engineering knowledge and benefiting not only themselves but also the community at large.

In order to give effective assistance in the advancement of engineering practice, it is important that we contribute to the work of our committees, so that their reports may be exhaustive and conclusive. It is not expected that these reports shall be final, as this would leave no room for improvement and further development. The reports should express the combined judgment of the members of the committees with regard to the practice which it desires the Society to approve, keeping always in mind the fact that such approval is subject to revision as circumstances justify.

Canada's great problem to-day is transportation. While the possibilities and even the necessities of water transportation in Canada are great, the problem will, I think, be largely solved by the network of steel which is being rapidly spread over the country.

We have, without doubt, entered upon one of the greatest years, if not the greatest, of railway development in our country. This is noticeable not only in regard to additional mileage, but particularly in the tremendous increase of motive power now being applied in the operation of railroads. Locomotives have been designed and put into use of a size that a few years ago would not be thought of, and, in addition to this, railway gradients have been reduced at enormous expenditure. These grade reductions are such that they have more than doubled the haulage capacity for a given engine.

In the development of water power, Canada, from one end of the country to the other, has made phenomenal strides. We constantly read of new water power construction and the resulting increase in the industrial development of the country. There has also been great progress made in the electrical transmission of energy from the centres of water powers. Only a few years ago high tension transmission power lines were operating at a maximum of 30,000 volts, while this year the Hydro-Electric Commission of Ontario is constructing lines carrying 110,000 volts. In the application of electrical construction to railroads, the great improvement and added comfort in travelling is very noticeable, especially in tunnels, where trains are not now detained on account of gases generated by the coal-burning of the locomotives.

In the mining industries of the Dominion great strides have been made by the mining engineer, particularly in the construction and installation of machinery designed to handle in the most economical manner the riches beneath the soil. These new appliances have made it possible to develop properties which, in the days when only the pick and shovel were used, were without value, owing to the great cost of these old methods. Civil engineers engaged in municipal works have shown great advancement in the construction of waterworks, the proper disposal of sewage, and notably in the construction of roadbeds and pavements of all descriptions of highways.

In bridge engineering the problems which now face us are stupendous. Members of the Society are engaged in the building and construction of bridges with spans of 1,800 feet, in which also occur some most complex problems in substructure. The strength of bridges has been largely increased; in my own experience, almost threefold. It was said some two years ago that nearly everything had been discovered or invented except the flying machine and the North Pole. Since that statement was made the North Pole has been explored and flying machine construction rapidly advanced. I venture to predict that the progress of scientific engineering will in the next fifty years exceed that of the past fifty, great as that has been. Problems in engineering at which we now stand aghast will come to be matters of everyday practice. The members of the Canadian Society of Civil Engineers have undoubtedly lived up to the motto of the Society, whereby the great sources of power in Nature are converted, adapted, and applied to the use and convenience of man. The world owes more to the profession of engineering than to all the other professions combined.

I now wish to say a few words on the subject which, at the present time, is most interesting to me in my professional work. I refer to my connection with the Engineering Department of the Board of Railway Commissioners for Canada, of which I have the honor to be chief. You are, no doubt, aware that the Board of Railway Commissioners was formed for the purpose of dealing with matters relating to railway construction and maintenance, operation and traffic. The Engineering Department of the Board has to deal with construction and maintenance, and it is in regard thereto that I wish to speak specially. After a great deal of care and research, rules and regulations of the Board, specifying the proper method of presenting and filing plans, profiles, and details of all works in connection with railway matters, were drafted and approved. Plans of location of railways are now coming to the Board in great and apparently increasing volume from all parts of the Dominion. The Engineering Department, in examining these plans, has in view the following: That no infringement on other locations are allowed; that the proper location of railways over all streams has been observed; and that there is no interference with adequate drainage of the country. In connection with bridge work, the strain sheets are checked to see that they are in accordance with the standard specifications. After the plans of the bridges have been approved, the completed structures are inspected on the ground to see that the plans have been carried out.

All plans, which are forwarded to the Board with applications of railways for the crossing of highways,

are examined to see if the crossing is a proper one, and to endeavor to obtain grade separation in order to carry the railway over or under the highway, as the case may be. In addition to the above, many cases are also submitted, both by railway companies and municipalities, for the purpose of safeguarding the public by the application of grade separation to these thoroughfares. Scores of highway crossings are examined monthly by the engineers of this Department, and voluminous reports are made on the subject of eliminating grade crossings. In the older parts of the country, railway development in some places has reached a stage at which, on account of the great number of intersecting lines, care must be exercised in order to make these railway crossings separate by means of overhead or subway construction. Such construction is, of course, not yet possible in the prairie country of the West, where the ground does not lend itself to these conditions.

Great care is taken in the crossing of railways by high power electric transmission lines, in order to protect the public from dangers that might arise by breakage of these power lines. Such accidents are minimized by the construction of cables of reduced spans and greater tensile strength. The construction of all classes of conduits under the railway roadbeds for the conveyance of water, gas, and drainage is also a matter which demands close inspection. All plans of these are carefully looked into, so as not to impair the efficiency of the roadbed in the interests of the safety of the travelling public and trainmen.

The rules and regulations, after several minor amendments, have been thoroughly tested, and have apparently worked with equity to all whose cases have come before the Board for adjustment.

In closing my year of service in your cause, I desire to express my appreciation of the cordial assistance rendered by my colleagues on the Council and by your indefatigable Secretary. To this combined force I attribute whatever success in advancement your interests has fallen to the year of my administration.

Reports of the Various Committees

The report of the council showed the affairs of the Society to be in a most satisfactory condition. The treasurer's statement gave the year's receipts as $16,578, as against an expenditure of $12,421; and the annual enrollment had increased the membership to 2,659.

Government Testing Laboratory.

One of the most important reports considered, was that of the committee appointed at the previous convention to approach the Dominion Government regarding the desirability of establishing Federal testing laboratories for the investigation of structural and other materials. The committee had waited upon the Minister of Public Works, and had subsequently prepared a memorandum at his request in which attention was called to the work which has been done and is still being accomplished by the United States Government through its splendidly equipped testing laboratories at St. Louis and Pittsburg. The taking of a similar step on the part of the Dominion Government as the largest consumer of structural materials in Canada, would prove to be a wise and economical undertaking, besides being of great benefit to the public at large, through the printed reports of the results of the investigations. There is, it was pointed out, a great variety of structural materials in Canada, about the physical properties of which very little is definitely known, and whose relative values could be ascertained and exploited to the advantage of the country, if proper testing facilities were provided.

However, nothing as yet has been done by the Government regarding the project. It was the opinion of the convention that the Government should be furnished with more detailed data as regards the expenditure that the cost of erection, equipment and maintenance of such a laboratory would involve. With this object in view, a resolution was passed authorizing that the committee on the establishment of testing laboratories be continued, and that they be instructed to urge upon the Government, through the council, the desirability of appointing a commission to visit the United States testing laboratories at St. Louis and Pittsburg, and also the government laboratories in other places, for the purpose of gaining the necessary information to the establishment of a Canadian laboratory.

Rail, Fastenings and Tie Plates.

The report on transportation, which was presented by the various sub-committees appointed to consider this comprehensive question, dealt with what had been accomplished in this respect during the past year.

Mr. Kelly, chairman of the sub-committee of Rails, Fastenings and Tie Plates, stated that in considering the work assigned to them, his committee had deemed it advisable not to attempt to cover the whole field in one year, but to take up one subject at a time, and to deal with it as fully as possible, so that the report would afford useful information for the members. The report of the committee was as follows:—

"In the report of your Sub-committee on Rails, Fastenings, and Tie-Plates, at the last annual meeting, consideration was given to a comparison of the various standard and proposed sections in use by the railways of North America.

"It was hoped that, during the year, sufficient information would have been obtained from the reports of the various railways to enable the sub-committee to present at least a study of the comparative results from the use of the various sections, but it has been impossible to do so up to this time.

"Naturally, there was much diversity of opinion among the users of rails with respect to the typical sections which might promise the best results, and there was some hesitancy upon the part of the majority of railways to abandon their past standards and experiment with any of the proposed types.

"Some of the railways, however, have made use of new types. The Canadian Pacific Railway have a new section embodying features of both the sections 'A' and 'B' proposed by the American Railway Association; and some of the railways in the United States have made experimental rollings with both sections 'A' and 'B,' drawings of which were shown in the last report of your committee.

"One difficulty in making a comparison of the tests of the different sections was apparent at the start, and consisted in the variety of designs for the different drop testing machines in use at the various mills. To overcome this variation of conditions, some of the mills voluntarily offered to construct a machine upon uniform and scientific principles, with the result that most of the mills have now installed such a machine, from which the tests made at one mill become comparable with those made at any other mill.

"The description or specification and a drawing of this machine accompany this report.

"It has been found, from a series of tests with the new machine, that the deflections obtained upon the test rails at different heights of drop are greater and more uniform than the deflections obtained upon the old machine under the same conditions, and therefore, give more accurate information upon which to base a study of the properties of the rails.

"It is the opinion of your sub-committee, therefore, that new specifications for rails should embody a requirement to use the Standard Drop Testing Machine.

"It is to be hoped that within the next year the records of use of the various new sections will have been

sufficiently far advanced and tabulated to enable an opinion to be formed as to the merits of the suggestions and principles embodied in their designs."

The report of the Committee on Ties, was substantially the same as the preceding year. It was pointed out that the Government had created a conservation committee which had taken some of the steps recommended in the report, although the report of the committee had not been brought to the attention of the Government.

Roadbeds and Ballasting.

As regards roadbeds and ballasting, the committee on this subject reported that a committee composed of practical railway men were at present reviewing a specification covering these points, which was already in use in the United States. This review would be published this spring, but not until it had received a thorough overhauling at the hands of three or four hundred practical engineers. As the men engaged in this undertaking were connected with railways in every portion of the North American Continent, the committee felt that it could safely wait until they got the specification, and if there was anything different in it required by the conditions in Canada, they could supplement it to suit the needs of this country. The Society could rest assured that at the next annual meeting there would be something definite to present in reference to specifications for roadbeds and ballasting, as applicable in Canada.

Transportation.

In the absence of Mr. Tye, President Mountain presented the report of the sub-committee on Transportation. He explained that the committee had gone into the question of economical routes from east to west both as regards rail and water transportation, and had gathered a large amount of information on the subject. In carrying out their duties, the committee had asked to confer with them the big men in railway and steamship lines in other branches than pure engineering, believing that more correct conclusions could be arrived at in this way. Attention was called to a suggestion embodied in the report to the effect that the committee, owing to the specific nature of its work, should constitute an independent unit in itself, and not be a sub-committee of a largeer committee on transportation. Mr. Mountain was of the opinion that this suggestion should be carried out in regard to each of the sub-committees on transportation, as each, in fact, have had to do their work independently, and he believed they should be continued that way. Further remarks on the report were made by Mr. Coultee, who stated that the idea of the committee had been to investigate the subject of transportation in Canada on rather new lines and to go into the physical features of the railway and water routes and their combinations, with a view to ascertaining the actual cost of haulage from two or three different standpoints. Perheps the best known system was that of train mileage and not the cost per ton mile. The latter, it was pointed out was very deceptive when the distance is long, and the committee had therefore, laid this phase of the question somewhat to one side, although it was also to be fully investigated. As far as the railways were concerned, they were trying to estimate the transportation on the basis of cost per train mile. In working on this basis, it was necessary to have full data on the physical features of railways and other systems, and the committee, therefore, wish to appeal to the members of the Society of their co-operation in this respect.

On motion of Mr. Sing, who paid a tribute to the profession by stating that he felt that the engineers were in every way qualified to give an expression of the opinion on the transportation of any country, the report was adopted.

Standard Specifications for Cement.

Considerable discussion was brought about by the report of the committee on Standard Methods of Testing and Specifications for Portland Cement. Following the presentation of the report, Chairman Jamieson explained that the committee had thought it advisable to formulate a specification for the use of members of the Society, and that he hoped it would be adopted and officially sanctioned with this end in view. During the year, considerable correspondence had been received from different members calling attention to various points, but the committee did not consider that it could make any material change from what was presented last year, although with further knowledge gained as regards chemistry of cement, it will be necessary to change and improve the specifications and rules for testing from time to time. The matter of a standard package for Portland cement was again brought to the attention of the Society and it was pointed out that the merger of the cement companies made the present time opportune for following up the question. In reply to a question regarding the quality of sand necessary in the mixing of cement for mortar, Mr. Jamieson stated that the committee had not gone into the question in detail and had therefore prepared no report on the subject. This question, he said, was next in importance to the question of cement itself, and it really formed another large subject that should be dealt with as a whole.

As regards the suitability of concrete for structures in sea water, the committee, it was said, had accumulated a large amount of data relative to this subject, but as yet no recommendation had been made. There was a large amount of evidence, Mr. Jamieson declared, to show that there is no material difficulty in using well made concrete in sea water. He thought that the greater amount of disintegration was due to porosity and freezing. It was, however, difficult to give anything definite in the present state of investigation, because of certain chemical re-actions that experts are scarcely capable of giving an opinion on as yet. It would seem that what was needed was a cement as low in magnesia and containing as little free lime as possible, and it was preferable to have the cement set in the way of blocks, instead of despositing it in a semi-fluid state, and allowing it to harden. A query as to whether the committee had gathered any data on the use of cement slag in this respect, brought forth the statement that there is a cement manufactured in Germany for which large claims have been made in the way of superiority in sea work and in which they use oxide of iron and reduce the aluminum, that is using the silica containing less alumina and using the iron as a flux. After further discussion dealing with the question of sand, the report of the committee was adopted.

New Committees.

Other business of the convention consisted of the appointment of a committee to investigate and report on the question of "Sewage Disposal with reference to the pollution of lakes and streams in Canada"; the nomination of members for the proposed Canadian National Committee of the International Electro-Technical Commission; and the appointment of a standing committee, as suggested by the Hon. Mr. Sifton, to co-operate with the Dominion Government regarding the conservation of national resources. This last named committee will have twenty members distributed through the entire country, whose duty will be to call the Conservation Commission's attention to waste of lands, forests, minerals or water power, and to the lack of development of natural resources.

The annual banquet of the Society, which was held in the Russell House, proved to be a most enjoyable affair in every particular. Over two hundred members and guests were present, including Hon. G. P. Graham, Minister of Railways and Canals; Hon. William Pugsley, Minister of Public Works; Hon. Clifford Sifton, Chairman of Conservation Commission; Professor Mc-

Lean, of the Railway Commission; Dr. W. F. King, Chief of Boundary survey; Professor Adam Shortt, Senator Edwards, Mayor Hopewell and Controller Champagne.

Officers for 1910.

The election of officers for 1910, resulted as follows:

President: Col. H. N. Ruttan, Winnipeg.

Vice-presidents: W. F. Tye, Montreal; C. H. Rust, Toronto; R. W. Leonard, St. Catharines.

Members of Council: C. R. Coultee, Ottawa; J. A. Bell, St. Thomas; J. M. R. Fairbairn, Montreal; A. W. Campbell, Toronto; F. L. Wanklyn, Montreal; C. E. W. Dodwell, Halifax; Phelps Johnston, Montreal; Duncan Macpherson, Ottawa; C. N. Monsarrat, Montreal; W. J. Francis, Montreal; A. E. Doucet, Quebec; H. J. Cambie, Vancouver.

General Section: H. G. Kelley and J. G. Sullivan, Montreal.

Electrical Section: L. A. Herdt and R. S. Kelsch, Montreal.

Mechanical Section: R. J. Durley and H. H. Vaughan, Montreal.

Mining Section: J. E. Hardman, Montreal; H. E. T. Haultain, Toronto.

The New President.

Lieut.-Col. H. N. Ruttan, the newly elected President for the Canadian Society of Civil Engineers, has been the City Engineer of Winnipeg for the past twenty-five years, and is one of the best known and most highly respected engineers in Canada. Col. Ruttan began his engineering work in the railway service, his first position being under Mr. E. P. Hannaford, Chief Engineer of the Grand Trunk Railway. When the construction of the Intercolonial Railway began, Mr. Ruttan was employed upon it as a junior in the staff of Sir Sandford Fleming, the Chief Engineer. He remained on this work, first as assistant engineer and later as division engineer, until the construction was practically completed. It was here that he obtained his first experience in the management of construction work. On section 6 of the road, the original contractors gave up their contract and the work was finished by the Government, with Mr. Ruttan as the manager of construction.

When the Canadian Pacific Railway was first projected, Mr. Ruttan was placed in charge of a party which made the first surveys in 1875 along the shore of Lake Superior between the Pic and Nepigon rivers. In the following year, 1876, he was sent to the Far Northwest and placed in charge of a party which made first the preliminary and later the location survey between Edmonton and the Yellow Head Pass. On this work he spent nearly two years. In 1877, while the construction work on the Canadian Pacific was going on, Mr. Ruttan was employed as contractors' engineer by Mr. Joseph Whitehead on contract 15, between Cross Lake and Rat Portage. Here he had charge of both the engineering and the construction cost departments. In 1880, Col. Ruttan took up his residence in Winnipeg and went into business on his own account as an engineer and contractor. Between 1880 and 1883 he constructed the present Canadian Pacific Railway line between Portage la Prairie and Gladstone. He also built the Canadian Pacific Railway Southwestern between Winnipeg and Carman.

In 1883 Col. Ruttan took up the study of municipal engineering problems, and spent the next two years in close examination of engineering work in various cities of the United States. Following this, in 1885, he was appointed City Engineer of Winnipeg, which was then a straggling frontier town with a population of about 16,000 The present population, twenty-five years after, is estimated at 150,000. The municipal works of the city are in keeping with the best engineering practice, and they are all practically the creation of Col. Ruttan. Particularly noteworthy is his work in the creation of the water supply system. The domestic supply of the city is obtained from seven artesian wells, each of which has an output of three-quarters of a million to five million gallons per day. There is also a special fire protection system supplied by pumps with a capacity of 9,000 gallons per minute, delivering water at a pressure of 300 pounds per square inch. The cast-iron mains for this high-pressure fire service have a total extent of eight miles through the business district of the city. The city is now constructing a hydro-electric plant for the supply of light and power on the Winnipeg River. The chief engineer of this work is Mr. C. B. Smith, and Col. Ruttan is a member of the Consulting Board of Engineers in connection with the work, the other members being Mr. William Kennedy, Jr., and Prof. L. A. Herdt, of Montreal.

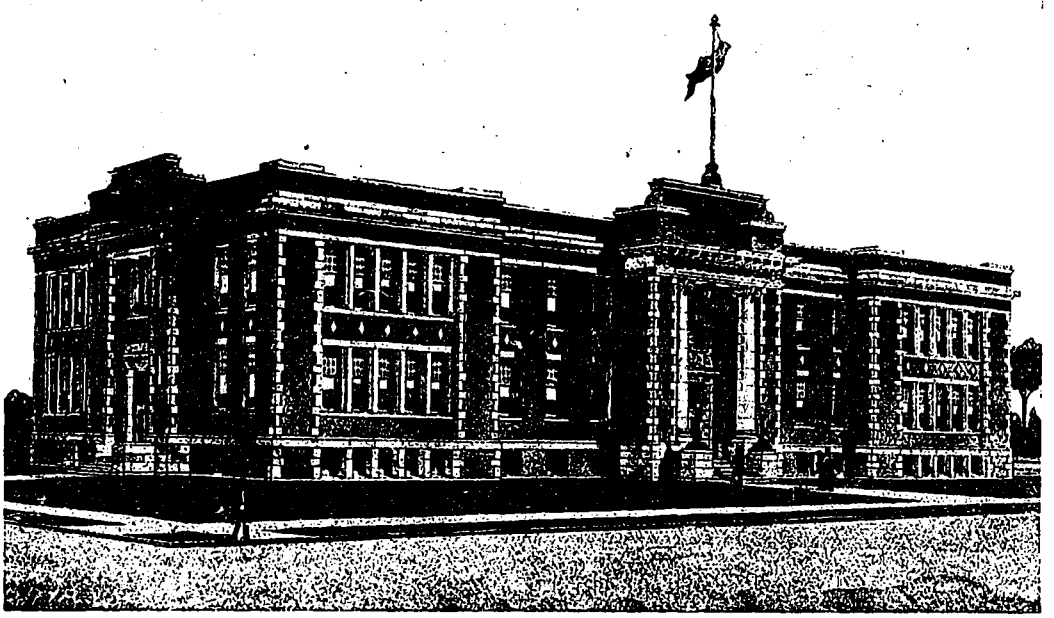
Col. Ruttan was prominent in the movement which led to the organization of the Canadian Society of Civil Engineers in 1887, and is a charter member of the Society. He also holds membership in the Institution of Civil Engineers of Great Britain, the American Society of Civil Engineers, the American Water Works Association, the American Society of Municipal Improvements, and the Concrete Institute of Great Britain.

THE CONSTANT GROWTH in population and the real necessity for increased business accommodation, in certain communities, is apparently overcoming the prejudices which has existed against tall office building construction. Those who have opposed high buildings for æsthetic reasons, are now yielding the point that where the ground area of a municipality is limited by certain natural conditions, and where trade conditions are continually expanding, there is no other choice but to build upwards. A United States contemporary in touching upon this change in sentiment, comments as follows: Art is now coming to the rescue of the skyscraper. We have nothing against the skyscraper while the artists always have been embittered by its presence and therefore it appears to be a far cry for art to approve of it, but in the recent discussion of the questions in New York City, the artists came out in a letter in which they put themselves on record in a very sensible way—almost too sensible for an artist—and that is what makes one wonder all the more. It appears that the Municipal Art Society, through Chairman John De Witt Warner of the municipal charter revision committee, has sent the board of aldermen a protest against the proposition to limit the height of skyscrapers. The society comes out for the skyscraper on the ground that New York's business and rapidly growing population admit no alternative. The committee's report says:

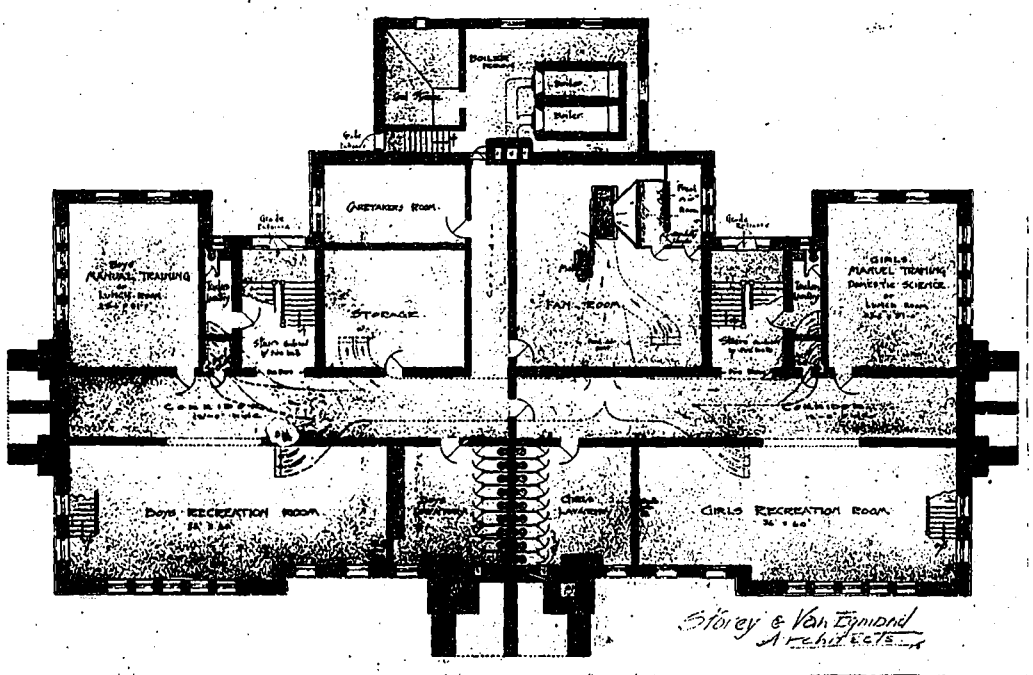
The real questions involved are how our air can be kept pure for our people, natural light most liberally provided for a great number consistent with their business convenience, and free access and communication.

Protection of light and aid and access are, therefore, the aim. Regulation of plans rather than restriction of heights of buildings are the simple means by which this can be promoted. A 5,000,000 city is upon us; a 10,000,000 one is in sight. Every transportation improvement that promotes residence at a greater distance from business adds correspondingly to the tendency of business toward a center where the most facilities can be provided for it.

Tall buildings, taller buildings, tallest buildings that are at once practical and tolerable are the most obvious recourse. Our aim, therefore, must be to encourage them to work out conditions under which they may be built highest with least curtailment of other essentials—safety, air, light and access.



Regina's new Collegiate Institute, built at a cost of $110,000. An evidence of the safe and substantial manner in which the West provides for the housing of her school children. The building is practically fireproof, the walls being of buff brick and Tyndall stone, the floors of reinforced concrete and the partitions of the metal stud and metal lath type.



Basement plan, Regina Collegiate Institute, showing the location of the manual training, domestic science and recreation rooms. Note the location of the boilers which are placed outside of the building proper, in the extension at the rear. Storey & Van Egmond, Architects.

REGINA'S NEW COLLEGIATE INSTITUTE.—A Modernly Planned School Building in Which "Merit of Investment" is Well Exemplified.—Floor System, Walls and Partitions of Fireproof Construction.—Designed with a View to Future Extensions. ∴ ∴

FROM A STANDPOINT of constructive economy and as a building which fulfils its usefulness in the most direct manner, the new Regina Collegiate can well commend itself to all municipalities which are at the present time concerned with the necessity of providing school buildings to more adequately meet their growing requirements.

A writer in a recent magazine article says, that "when a man looks over his yearly tax assessment, he is apt to take an interest in the matter of school buildings and their equipment, and to begin to realize the permanent investment he has helped to make in the cause of education." Foresight as to "merit of investment," and the element of safe construction, however, should come first and self-satisfaction and reflection afterwards. The former must obtain if the later is to prevail, and it is with this conviction and with the knowledge that "a thing half done is never done," that the more thoughtful communities are really beginning to take an advanced step along this line.

The new Regina Institute was erected at a cost of $110,000; but it is in the initial cost and not in subsequent improvements, where the burden of the expense falls. Its construction gives the city a permanent investment, and a building of good appearance, in which every reasonable provision has been made for the safety of the pupils, and in which the cost of insurance and upkeep has been reduced to a minimum. The exterior, which is carried out in buff pressed brick and Tyndall stone, shows no evidence of extravagant detail or unnecessary elaboration in its architectural treatment. The lines are simple and dignified; the entrance distinctly, but not unduly accentuated; and the structure in general of excellent proportions.

As regards construction, the building is about as thoroughly fireproof as the modern application of the term implies. There is little or nothing in its entire physical make-up of a combustible or inflammable nature. Reinforced concrete floors and solid brick bearing walls are employed throughout; the partitions are all of metal stud and lath construction; and the outside walls are lined with hollow tile to which the plaster is directly applied. Further than this, the main staircases are entirely cut off by fire walls and automatic rolling fire doors. The stairs have cast iron newels and risers, wrought iron hand rails, and slate treads, and are so arranged as to preclude any possibility of the scholars being entrapped in case of emergency.

A feature of the ground floor is a central rotunda finished in keeping with the corridors to which it connects, with terrazo flooring in three colors and enamel brick wainscotting in tones of green and brown.

This floor provides for a principal's room, a reception room, two rooms for the teaching staff, and six large class rooms. In addition to the central and end entrances, there are two grade entrances at the rear, giving access to the stair landings, thus providing ample means of ingress or egress to and from the building.

On the upper floor are four class rooms, two thoroughly equipped laboratories for chemical and physical research, and an assembly hall equipped with stage and dressing rooms and capable of comfortably seating 500 people. All class rooms have spacious wardrobes, and each room is provided with a self-winding electric clock, regulated from a master clock in the principal's room, by an automatic ringing device.

In the construction of the building, the essentials of school hygiene have been carefully considered as regards the lighting, heating and ventilating of class rooms, cloak rooms and corridors, and also as regards class room decoration, and the sanitary equipment in general.

The basement of the building is reached by four staircases, two at the rear and one at either end of the structure, off the corridor. This part contains the manual training and domestic science rooms, two large recreation halls with laboratories adjoining, together with storage and caretaker's compartments and fan room. These rooms are so arranged as to bring about a complete division between the boys' and girls' space. The boilers and storage for coal occupy an addition outside of the building proper.

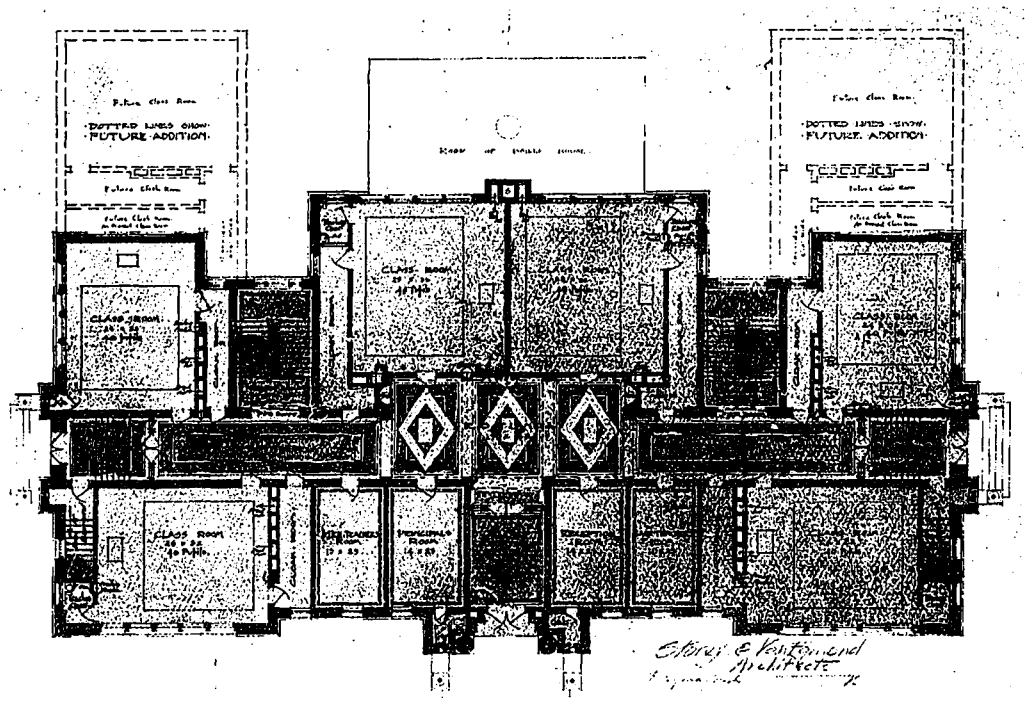
The heating and ventilating features of the building have been carefully designed to ensure a uniform temperature of 68 degrees at all times and at least six changes of air per hour in all class rooms and assembly hall. Low pressure, direct and indirect plenum system of heating and ventilation is used with automatic temperature regulation by thermostats, governing both the direct radiators and fresh air flues. The fresh air enters the building at the intake windows in basement, and into the fresh air room where it is heated by passing over steam coils provided with an automatic regulating damper, and thence through water spray which cleanses the air of all dust and brings it to the proper humidity. The air is then drawn into the fan and forced through the fresh air ducts, from which it passes into the various rooms at a height of eight feet above the floor. The vitiated air is in turn forced into foul air flues at the floor line, and carried off above the roof. The boiler installation consists of two return tubular units twinned together in order that one may be operated independent of the other during mild weather, which is more economical than where one boiler only is employed.

The thoroughness with which the building has been constructed and the consummate manner in which every detail has been considered as regards protection from fire, is such as to relieve the citizens of Regina of any apprehension in this respect, and to give to them a satisfying knowledge of having left no stone unturned in the fulfilment of their obligation.

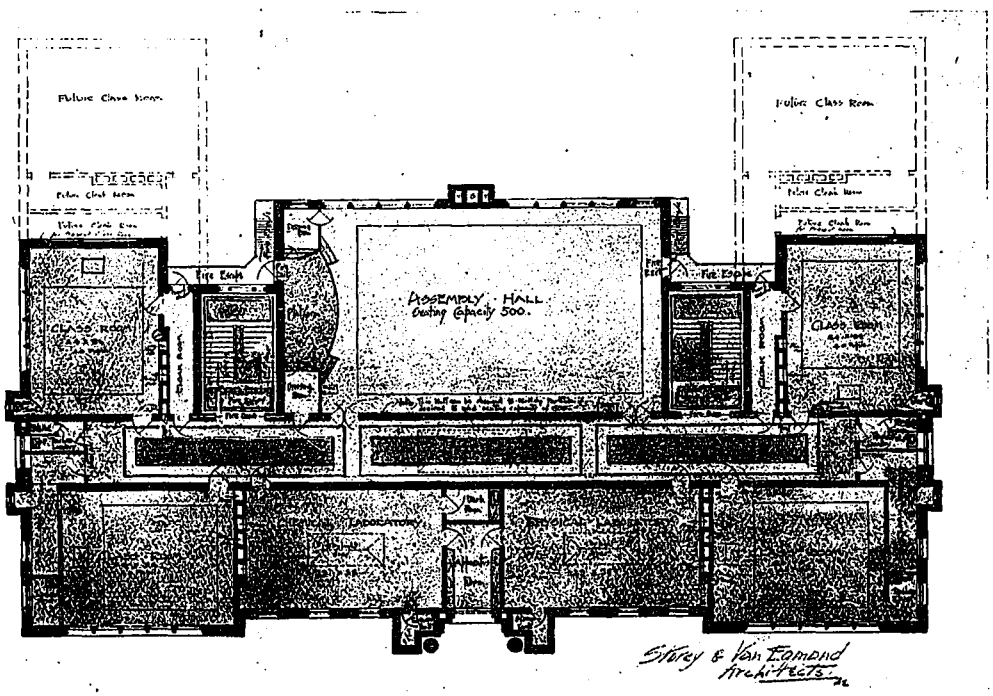
Although the structure is only two stories high, practically non-combustible, and provided with enclosed staircase, wide corridors and well placed entrances, extra means for safety have been provided in the way of two large iron balconies and fire escapes at the rear of the building, onto which four exits open.

The building, it might be remarked, is designed to permit of further extensions as the occasion for additional accommodations should demand. These additions will be carried out at the rear of either end of the structure in shape of projecting wings, and will form a natural development of the plan, instead of any added excrescence, as is too often the case in rapidly growing communities. Four extra class rooms will be provided for in this manner, making the school in all an eighteen-room structure, apart from the assembly hall, various offices, and recreation rooms.

The building was designed and erected under the supervision of Architects Storey and Van Egmond, Regina, the general contract being executed by Messrs. Wilson & Wilson, a firm of local contractors.



Ground floor plan, Regina Collegiate Institute, showing the location of stairways which are enclosed by fire-walls, and the arrangement of the class rooms. Storey & Van Egmond, Architects.



Second floor plan, Regina Collegiate Institute, showing the location of emergency exits and fire escapes. Storey & Van Egmond, Architects.

THE ARCHITECT AND THE HEATING AND VENTILATING ENGINEER.—Problems of Modern Heating Installations Require the Attention of the Expert Engineer.—Various Methods Employed and the Conditions Responsible for the Heating and Ventilating Troubles of the Architect.

PROFESSOR WARE, in a recent letter to one of our American contemporaries, said—"The old notion that an architect owes it to himself to keep everything in his own hands, passing as a past-master of all arts and crafts, was never a tenable one, even for a man born with the gift of universal genius. Few men have ever entered into this birthright, and the notion that every architect should pretend to it has fostered an untenable and preposterous attitude which has brought deserved discredit upon the profession.

"All that the ordinary practitioner can honestly undertake is to understand these matters well enough to discuss them intelligently with his advisers, reserving to himself the freedom to follow the advice given or not, according as it does or does not promote further practical or artistic ends he has in view."

These views of Professor Ware, are widely shared by the foremost members of the architectural profession on this continent. It is foolish for an architect to believe that he should be a civil engineer, a heating engineer, a plumbing engineer, and an authority on every branch of modern building construction. He certainly should have a knowledge of the basic principles, and the proper requirements in the various branches of building construction, but he cannot give to his client the best service unless he is prepared to accept the assistance and advice of the best authorities in the various lines connected with the construction of a building.

In Canada, there is one factor in building design, in which architects do not only show a gross lack of knowledge, but in many cases are seemingly unprepared to solicit or accept expert advice. This factor we speak of, is heating and ventilating, which in the modern day building, has become a science, and to have the knowledge and practical experience to properly and adequately heat a given building, to suit modern requiremtns according to our best known methods, is to-day not the work of an architect, but the work of an engineering expert.

The science, if such it may be called, of heating and ventilating engineering, is one that is founded almost completely upon the laws of thermodynamics. It is not what one might call an exact science, but in its rational design and application, the engineer may work with a reasonable degree of exactness. Most of the points of interest in the subject, may be theoretically developed; yet, as in all branches of engineering design, some parts require theory modified by good judgment and practical experience.

Despite the fact that some features of heating engineering are as yet experimental and not as definitely understood as they might be, there is no reason why the installation of heating and ventilating apparatus should be undertaken by those who are not thoroughly trained in both theory and practice, and neither a heating contractor, nor an engineer has a right to nor is he justified in installing a job that scarcely shows any of the ear marks of theoretical investigation.

The time has come when it may be demanded of every architect who undertakes to design a modern building, to employ men to install the heating and ventilating apparatus for that building, who are capable of following closely the fundamental branches, and be prepared to furnish proof for every and any step taken in their work.

Contracts for heating and ventilating apparatus usually are let in one of the four following ways: (a) Some person, called for convenience, the dealer contractor, draws up a rough layout of the work, guarantees to install satisfactory apparatus for a stated sum of money, buys his apparatus from the manufacturer, installs it according to his own personal ideas, or according to the plans laid down by the manufacturers, and in a general way guarantees it to give good service; (b) a manufacturing firm draws up a plan and contracts to install, for a stated amount of money, satisfactory apparatus, usually made by the same company, guaranteeing its successful operation; (c) a responsible engineer is retained, who draws up plans and specifications for the work, and, upon competitive bids, the successful contractor installs the apparatus in accordance with these plans and specifications, the engineer being the judge of the quality of the work and material; (d) a responsible engineer designs the system and assumes all the responsibility in its erection, looking toward a certain required output or result. Materials are purchased in the open market and installed to his satisfaction, and after completion, if the final tests are acceptable, the purchaser pays the bills and takes charge of the completed plant.

The last method is looked upon as being possibly the safest and most practical, and is one that guarantees the architect that his owner's building will be properly, adequately and safely heated, and that the responsibility for all mistakes and errors is lifted from his shoulders. It safeguards the owner, in that the engineering contracting firm that so undertakes to heat a building assumes all responsibility for any mistakes made through lack of knowledge or lack of training, or unsuccessful experiments. He has thus obviated the unfortunate uncertainty, as to whether his building, when completed, will be one that for all time will be unhealthy and uncomfortable and expensive to heat.

A further great mistake made by many architects in the design of their buildings, is that their plans are often made without a proper consideration for the heating. In other words, an architect proceeds to plan his building without having consulted a competent heating engineer, and expects that the heating plans are to be made to fit the plans of his building. It is only fair to say that the average architect knows little or nothing of either the theory or practice of heating and ventilating engineering, but it is too often the case that his own private opinion of his own work in such matters, is highly satisfactory, and, consequently there is set up a different view point from the designer of the building and the designer of the heating apparatus, much to the detriment of the efficiency of the plan, very much at the expense of the interests of the client. A condition that causes the architect needless annoyances after his building is supposed to have been completed.

To get the best possible results, the system of heating should be selected first. A competent heating engineer should be called in to consult the architect before his plans are completed, so that proper and adequate allowance should be made in both the building and heating plans, to provide in the finished building, one which will give satisfaction to both the architect and his client.

This is no hardship to the architect, since many slight changes, any one of which would possibly be in favor

of the heating engineer, may be made in his plans, without causing any trouble.

In a simple building, such as a residence, to be heated by a furnace, we might say some of these points that could be mentioned, would be as follows: size and location of the chimney; the running of the cellar partition walls to accommodate the location of the furnace and the coal bin; the height of the basement ceiling to allow sufficient inclination of the leader pipes; the construction of the partition walls between the rooms to allow for riser pipes of sufficient size to heat large upstair rooms; the planning of the walls to avoid horizontal runs of heat ducts in the second floor to reach a room otherwise inaccessible, and many other points. All heating engineers know that the range of locations for a furnace, relative to the house plans, is very limited, and that in many cases it is an absolute necessity, after a house is completed, to set the furnace out of its desired location, thus compromising the efficiency of the system; also that the basement ceiling in many cases is so low that the leaders are required to be run nearly horizontal, thus reducing the draught in them; also that a six inch studded wall in many cases could easily have been substituted for the four inch wall, with little additional cost, and have improved the system immensely; also that certain walls absolutely prohibit all running of stacks to the desired spot in the room, and that with a slight change, this could have been arranged without in any way injuring the architect's plans.

We mention these few details in connection with the simplest type of heating, to show how necessary it is that the architect should consult a competent engineer in preparing plans for a building of any size. These difficulties that arise in the heating of small houses, with a hot air furnace, only go to prove how inconsistent it is for the average architect to assume the position that the matter of heating and ventilating his building is one of the simplest he has to contend with, and that any "rule of thumb" contractor can install a system after plans drawn up on a piece of note paper.

Another difficulty that arises in the selection of the heating contractor, is that most architects cannot see, (so long as a certain boiler or a certain radiator is specified), that he is paying for an adequate, efficient heating system, and that the brand of boilers or radiators is a matter of minor importance in the problem of properly heating any building. The result is that the contract is awarded to the lowest bidder and, insofar as the architect cannot be termed a heating engineer, it is impossible for him to properly superintend the work of an incompetent contractor, so that he may rectify mistakes as they are made and as the installation progresses but all he can judge from is the efficiency of the installation in the finished building. If for some reason, which he cannot understand, or which the contractor cannot explain, certain parts of the building are uncomfortable because they are too warm, while other portions are uncomfortable because they are too cool, and some parts of the building may be ventilated to the extent that a draught is created, while it may be impossible to ventilate other parts the whole job is a failure, the owner dissatisfied and the architect given no end of annoyance.

The architect in advising his client as to which tender to accept for carpenter work, interior woodwork, or masonry work, would never think of recommending a contractor unknown to him, even though his tender were the lowest. He invariably would say to his client: "This man I do not believe to be competent, and, although he has the lowest tender, I would not suggest its acceptance; this man I know—he knows his business; he does good work, and when the work is completed, it will be satisfactory, I believe that he will be the cheapest man in the long run although his tender is a little higher."

But it so often occurs in the selection of the heating contractor that after the architect has specified the apparatus to be used, he believes he is safe in awarding the contract to the lowest bidder. This is a great mistake, as has been learned by many architects, after some very dear experience. It seems to us that in the awarding of heating contracts, the architect should, in the first place, know that the man who has drawn his plans and who undertakes the installation of the apparatus, is responsible; in the second place, he should know that this man through training and experience, is capable of preparing the plans and installing an efficient system; in the third place, he should demand that this engineering contractor should assume all responsibility in providing a successful and satisfactory result in his finished job. It is true that engineers who accept such responsibility and are prepared to give such a service, will not be the lowest tenderers, but their work, after it has been completed, as has been the experience of our foremost architects, will prove the cheapest and most satisfactory in the end.

We have called these matters to the attention of our readers, for the reason that we find that one of the greatest complaints found by tenants and by owners of some of our best buildings, is the fact that they can never get their heating and ventilating apparatus to render the required serivice. Nine times out of ten, when the difficulty has been followed down, it develops that some "rule of thumb" heating contractor had installed the apparatus according to the specifications of the architect and in compliance with the heating plans that were made after the building plans had been completed, or from heating plans that did not show any of the ear marks of either theory or good practice. We believe that the heating problem is one which our Canadian architects could well afford to give a great amount of attention.

BOOK NOTICE.

MODERN LETTERING—ARTISTIC AND PRACTICAL.—A course for artists, architects, sign writers and decorators. The Construction of Pen and Ink Designs for Commercial Uses,, Advertisements, Letter Heads, Business Cards, Memorials, Resolutions, etc. By William Heyny. With 35 Plates, Drawings by the Author. New York: Wm. T. Comstock. Oblong volume, cloth; 136 pages, 7x10 inches. Price, $2.

A book of instruction primarily, valuable in the hands of the beginner and of assistance to the experienced workman, "Modern Lettering" essays the subject from the practical standpoint from cover to cover. The author, a man of experience and of artistic temperament, boldly sets forth his ideas and propounds his methods in concise language. Directions even to minute details are given, all of which are valuable to the student.

The Roman letters taken as the fountain head of all present systems, are exhaustively dealt with. Their construction is treated in the text, letter by letter, and the author's methods of drawing the "Modern Roman" alphabet are delineated in six full-page plates.

The alphabets treated and shown in the plates are Modern Roman, Classic Roman, French Roman, Antique Roman, Ornamental Roman and Century Roman, Roman Italics, Plain Round, Square and Spurred, Block and Ornamental Block Letters, Architects' Single Stroke Alphabets, Modern Script, German Gothic, Old English and Modern Unicals.

Much valuable information, the fruit of the author's long experience, is given on the choice of alphabets, the arrangement of words, and the spacing of letters, with good criticism of faults of modern letterers.

From the practical standpoint of use, the book is excellent. Treated in four parts, each heading in the contents is emphasized in italics in the text which facilitates reference. There is also an index.

CONVENTION AND EXHIBITION OF C.C.C.A.—London Selected for Second Annual Event.—Splendid Accommodations and Facilities Provided for Visitors and Exhibitors.—Present Indication Promises Big Attendance.

THE SECOND ANNUAL CONVENTION and exhibition of the Canadian Cement and Concrete Association bids fair to far outclass the initial meeting and show of this Association, held in Toronto in 1909. The show held at St. Lawrence Arena last year attracted hundreds of visitors from all parts of the Eastern Provinces, and the convention was well attended by those who appreciated the importance this new industry bears upon the future upbuilding of Canada.

The exhibits last year included almost every conceivable type of machinery employed in connection with the use of cement, as well as cement and concrete products of a scope and variety that surpassed the expectations of even those connected with the promotion of the Association. This first exhibition proved beyond all question that the cement industry is of such importance in Canada that the future of the organization was thoroughly assured.

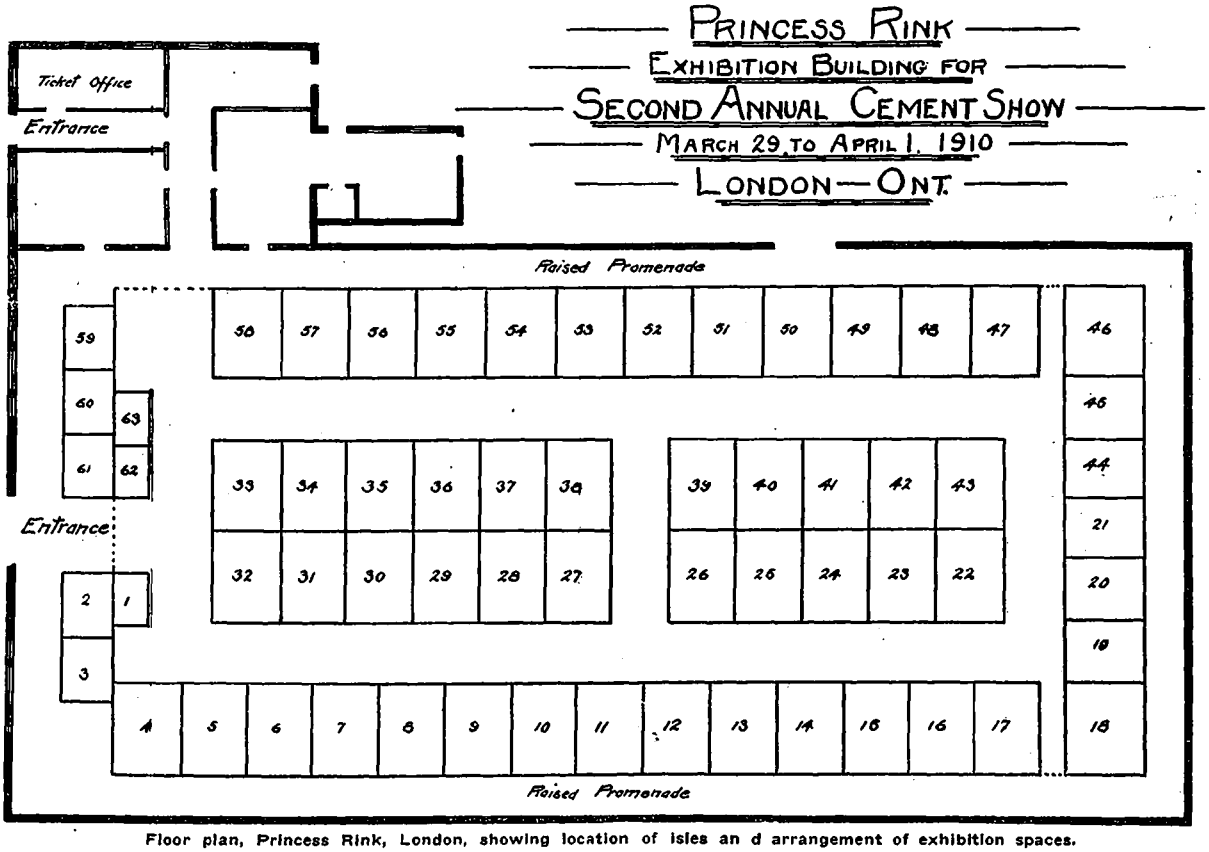
The National Association of Cement Users of the United States, which was started under much less auspicious circumstances a few years ago, is to-day the largest association of its kind in the world, as well as one of the strongest and most influential organizations connected with the structural and engineering industries in the United States. Therefore, if, as is predicted, the second convention and exhibition of the C. C. C. A. will surpass the initial one, both in the matter of exhibits and in interest in the convention proceedings, we feel that we are justified in assuming that this next meeting at London will be the greatest of its kind ever held in Canada.

The officers and council have worked diligently during the past year, and, although many difficulties have had to be encountered, they have been successful in establishing in material form an organization that last year was, to say the best, in an embryonic state.

The association has much to thank the City Fathers

Princess Rink, London, where the Second Annual Exhibition of the Canadian Cement and Concrete Association will be held March 29 to April 1st, inclusive.

of London for. This progressive Western Ontario city, realizing the importance of such a meeting being held in their midst, authorized Mr. C. F. Pulfer to offer the



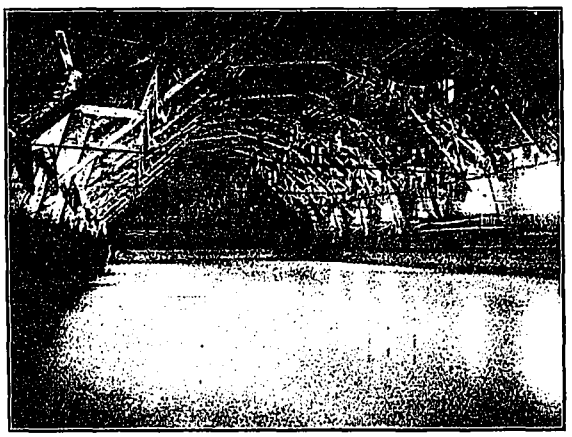
Floor plan, Princess Rink, London, showing location of isles an d arrangement of exhibition spaces.

association at a recent meeting of the executive in Toronto free use of the Princess Rink for the exhibition, together with a hall suitable for holding the meetings of the association. Offers were received from several other cities, but the executive committee finally decided in favor of the city of London.

The Princess Rink, as will be seen by the accompanying plan, will serve as a large, well appointed exhibition hall. The floors are of concrete, and large wide entrances are provided, through which machinery of amost any dimensions can be passed without difficulty.

The association was furthermore particularly fortunate in securing Mr. R. M. Hunt as manager for their exhibition. Mr. Hunt is Secretary of the Western Fair of London, in connection with which position he is well known throughout the Province of Ontario. He has had long experience in matters of this character, and is well qualified, possibly better than any other available man in Canada, to look after the interests of the association in this respect.

Mr. R. E. W. Hagarty was appointed as permanent secretary. Mr. Hagarty is a graduate of the School of Practical Science, and is at present employed in university work at this college. The association was again particularly fortunate in having been able to procure



Interior view, Princess Rink, London, showing the great unobstructed floor area. This floor is of concrete.

the services of a man of Mr. Hagarty's ability and qualifications, and it can be assured that under his secretaryship the growth of the organization will continue to be more rapid and substantial in the future than it has even been in the past.

Mr. C. F. Pulfer, Mr. Martin and Mr. Pocock constitute the local committee at London. These gentlemen were particularly active in bringing the convention to that city. Already this local committee has started a very active advertising and organization campaign, and we learn that, even at this early date, a large number of spaces have been sold.

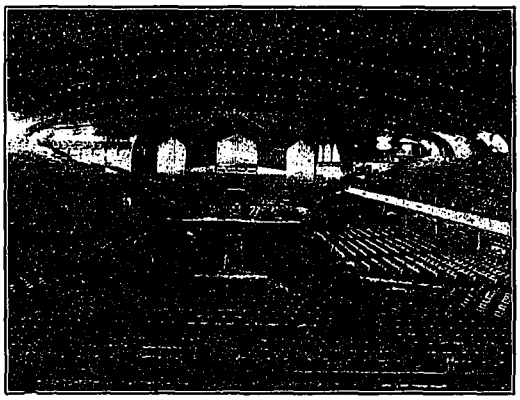
The program of the convention has not as yet reached us, but we understand that a number of the best authorities on the various branches connected with the cement and concrete industry will be present to give papers and take part in the discussion.

The Officers and Executive Committee for 1910 are as follows:—

President, Peter Gillespie; Vice-President, Gustave Kahn; Chairman of Finance, C. F. Pulfer; Secretary, R. E. W. Hagarty; Councillors, T. L. Dates, J. G. Murphy, Kennedy Stinson, C. H. Thompson, D. C. Raymond, C. M. Canniff, James Pearson, A. E. Uren, Ivan S. Macdonald.

A REINFORCED CONCRETE ORGAN.—Unique Orchestral Unit Installed at Ocean Grove, N.J.—Introduces a Number of New Features in Organ Construction.

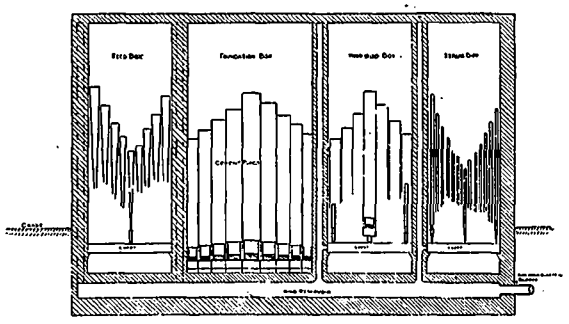
ANOTHER use has been discovered for cement, says CEMENT AGE. An organ builder of Elmira, N.Y., has set the musical age in a flutter of excitement over the wonderful musical effect produced by his Orchestral Unit Organ—largely constructed of reinforced concrete.



Interior view of Auditorium, Ocean Grove, N.J., showing the organ that is largely constructed of reinforced concrete.

A specimen of his work at the great Auditorium, Ocean Grove, N.J., has been attracting much attention. Madam Schuman-Heink describes it as "the most wonderful organ in the world," while Nordica and other great singers, are equally loud in their praise. Composers, such as Hadley and Homer-Bardtlet, declare that it marks the dawn of a new era in orchestral music. The National Association of Organists held a great convention at Ocean Grove, N.J., attended by hundreds of organists drawn from practically every state in the union. The Association unanimously passed a resolution acknowledging "the epoch-making advance" achieved and saying that if the inventor's genious has free scope a marked uplift to the musical life of the world will result.

The new form of organ has, therefore, evidently come to stay and we present a few of the details of construction.



Sectional elevation of Reinforced Concrete Organ at Ocean Grove, N.J., Auditorium.

The instrument at Ocean Grove is not a perfect and complete example of the builder's wonderful invention, yet it has attracted such general attention that over 100,000 people have paid for the privilege of hearing it during the summer and more than half of the cost of the instrument has thus been recovered in less than three months.

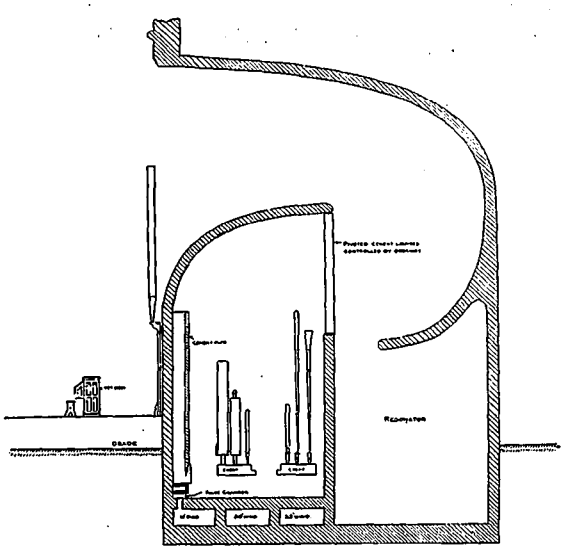
The Orchestral Unit Organ is like the church and

concert organ in but one particular, namely, that in each, the tone is produced by wind blown through pipes. Even here the resemblance is not great, for in the church organ a great quantity of air at a low pressure is used to blow many thousands of pipes, whereas in the Orchestral Unit Organ there are but few pipes and the wind used is of high pressure.

Apart from the metal pipes, the church or concert organ is a delicate machine constructed mostly of wood, leather and glue—affected by every change of temperature and readily damaged by moisture. On the other hand, the Orchestral Unit Organ is constructed largely of reinforced concrete, has practically neither leather nor glue and is absolutely impervious to weather changes.

The Orchestral Unit Organ is smaller and less complex than its older rival. It is also less costly, though it produces much louder and more expressive musical tones

Hitherto it has been considered for reasons having to do with acoustics, that wood should be employed in the construction or lining of organ chambers. Architects will be interested to learn that Robert Hope-Jones, the inventor of the Orchestral Unit Organ, judges wood to be about the worst possible material for employment in this capacity, and considers concrete or stone to be the best. In all organs the tone originates in the air and contact with anything calculated to absorb this tone is to be avoided. That is why he prefers concrete to wood.



Sectional end elevation of Reinforced Concrete Organ at Ocean Grove, N.J., Auditorium.

It is stated that the effects he obtains border on the marvelous. The Ocean Grove organ has but 14 ranks of pipes—as compared with 100 or even 140 in other organs—yet the Ocean Grove is easily the most powerful organ in the world. All its tones are reinforced and reflected by cement.

In the Orchestral Unit Organ monolithic construction is, where possible, employed. There are chambers and passages for compressed air, including four or five chambers for the pipes. The larger of these pipes are themselves of concrete, being formed in the walls of said chambers. Other features are, parabolic tone reflectors, resonance chambers, supporting corbels, and cylinders for shutter motors, etc.

There are no bellows, regulators or moving wind reservoirs. Electric motors compress the air at definite pressure into the concrete chambers and the wind chests and pipes are in direct and ample communication with these chambers. By this means a perfectly steady supply of wind is at all times available. This plan of relying upon the compressibility of air itself instead of upon the varying capacity of a collapsible reservoir is absolutely revolutionary in organ work, though it was tentatively tried by Mr. Hope-Jones in the organ he built for Worcester Cathedral, England, in 1895.

Each of the four or five chambers named above for containing pipes will measure perhaps 8 or 10 feet in each dimension (dependent, of course, on the size of the instrument). The top of each chamber is closed by a set of Venetian shutters with patent sound trap joints. These shutters can be opened or closed at the will of the organist—thus enabling him to govern the amount of tone emitted from each chamber. One chamber contains the foundation tones of the organ (Diaphones, Tibias and Diapasons)—one, the "wood wind,"—another the orchestral "string" tones—another the "brass" and a fifth the "percussion." By this means each department of the orchestra is properly represented and each is under separate control. The performer can control any of the pipes at any pitch and power, from any keyboard he may be playing upon.

The reeds used in the Orchestral Unit Organ have no tuning wires. They stand in tune of themselves and do not require the constant tuning and attention demanded in the case of church, concert and house organs as hitherto constructed.

The Orchestral Unit Organ being independent of climatic conditions is suited for out-of-door use in public parks, recreation grounds, etc. At the moment of writing one is being arranged to go below high water level, under a sea shore pavilion, the tone being reflected in parallel lines over the entire floor of the pavilion and from thence to the end of the pier. The parabolic concrete reflectors direct the tone wherever desired and prevent its dissipation into the surrounding air—just as is done with light waves in the case of a search light.

EARTHQUAKE-PROOF DOMICILES

AS A PROTECTION from earthquakes, many of the natives in the territory around Chilpancingo and other towns in the State of Guerrero, Mexico, build their homes in trees, says the Kansas City Star. Some of these tree homes are of large size and are ingeniously constructed. Reeds and grasses are interwoven with the twigs and branches of the trees, much in the manner that a bird builds its nest.

The strongest wind seldom loosens these houses from the tree. Where the trees are large and stand closely together, houses of two and three rooms are frequently built in their branches. These houses also afford protection from the "tigers" and other wild animals found in that region in large numbers. It is claimed that "tiger" will not attack its prey unless it is upon the ground. The prime object of elevating these houses into the trees, however, is to keep them from being shaken down by the severe earthquakes which visit the Guerrero territory at frequent intervals.

The rocking of the earth gives the trees a swaying motion that does no damages to the houses. In some localities whole villages of these tree homes are to be seen. None of them suffered damage from the recent earthquakes which wrought such ruin to the buildings on the ground.

FIVE MILLION DOLLARS is to be spent by the Canadian Northern for the construction of a modern station and terminal facilities at Montral. An announcement to this effect was recently made by W. D. Barclay, manager of the Quebec division, who stated that plans for he project have been completed and that the work, in all probability, would be started in the near future.

A PROMINENT PERSONALITY IN THE CEMENT INDUSTRY.

MR. W. H. FORD, Montreal, has recently been placed at the head of the Sales Department of the Canada Cement Company. It is interesting to note that this department controls the most extensive interests in cement, of any similar department in the world. The appointment of Mr. Ford, who is but thirty years of age, to this highly responsible position, is due to the manner in which he so successfully conducted the interests of the Wm. G. Hartranft Cement Co., Ltd., during the last three years, when he was one of the best known figures in the hotly contested battles that were waged between the various cement interests in this country, and now that they have all been shepherded into one fold, it is surely a mark of distinction that the youngest of the gladiators should be placed in supreme command of the output of the eleven mills forming the merger. Mr. Ford feels that he has his hands pretty full in his new position, but we are fairly certain that he will be equal to the demands upon him, for he is not a man who permits himself to be worn out with office drudgery, but it has been his custom to frequently go forth into the wilds of nature, and there, while

Mr. W. H. Ford, General Sales Manager for the Canada Cement Company, which controls the output of eleven mills.

stalking the moose, dream out the tactics of a future battle in the industrial field. For Mr. Ford is an ardent hunter, and some of our finest examples of Canadian big game, are his trophies, and he tracks down a hundred thousand barrel order with the same assuidity that he follows the lordly monarch of the woods, to his retreat.

In fact he is always looking for things that are big. That was what brought him up from the Southern States three years ago, to associate himself with Canadian development, and he found about as big possibilities in this field, as could be found anywhere. The cement business has been his life work. When he was quite a young man he took a four years' mechanical drafting course, and upon graduating, entered the office of W. B. W. Howe, Consulting Engineer, Spartanburg, S.C. Mr. Howe was one of the special committee appointed by the American Society of Civil Engineers, to draft a uniform set of specifications for Portland Cement. His associations with Mr. Howe, especially fitted him for a career in cement. On Jan. 1, 1903, at the age of twenty-four, he engaged with the Carolina Portland Cement Co., of Charlestown, S.C. Shortly after this he was transferred by this Company to the Atlanta (Ga.) Office, as Assistant Manager, where he spent two years, after which he went to Louisville, Kentucky, as Manager of the Sales Department for the Kosmos Portland Cement Co.

On the death of the Vice-President of the Wm. G. Hartranft Cement Co., of Philadelphia, Mr. Ford was appointed in his stead, and later came to Montreal as Vice-President and Manager of their Canadian Company. Before settling down in this new capacity, he spent six months in touring Canada, becoming familiar with conditions, and making himself known in every city and town in the Dominion. He still retains his position as Vice-President of the Hartranft Cement Co., is a member of the Sales Managers Section of the American Society of Portland Cement Manufacturers, is on the Executive Committee of the Canadian Cement and Concrete Association, and also a member of the Canadian Manufacturers Association. Wherever a Cement Convention is in session, there you will find Mr. Ford, active in the promotion of its interests. His one object in his new capacity is to make the Canada Cement Company a popular national institution, and he is satisfied that very shortly the public will know that its object is not to demand unreasonable prices, but rather to increase the consumption of cement, and it naturally follows that with the desire to increase the consumption, the prices necessarily will have to be of such a character as to induce people to use cement in preference to other building materials. The plants of the Canada Cement Co. are widely distributed, there being two in Montreal, one in Hull, one in Marlbank, one in Lakefield, two in Belleville, one in Owen Sound, one in Port Colborne, one in Calgary, and one in Point au Tremble, P.Q. Sales Offices—Halifax, Montreal, Toronto, Winnipeg, Calgary, and possibly Vancouver. Such wide spreading interests will provide Mr. Ford with about as big a task as has ever been undertaken in Canada, by so young a man.

A HANDSOME OFFICE CALENDAR.

THE HOIDGE MARBLE COMPANY, Toronto, as is their usual custom, are mailing to their patrons and friends, a handsome wall calendar, for one of which we herewith extend our thanks. The date pad is of sufficient size to make it especially useful in either a large or small office, while the subject of the calendar itself possesses an artistic merit that makes it highly acceptable to the recipient. The company has recently purchased a large interest in the marble quarries located south of Renfrew, Ont., in addition to making several important improvements to their Toronto plant.

ARCHITECTURAL FINISHES AND STAINS

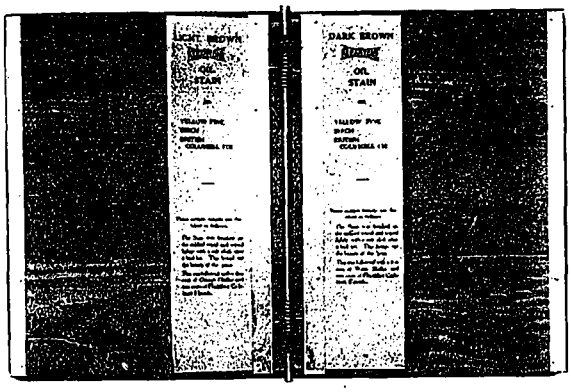
BY FAR one of the most ingenious and useful devices placed in the architects hands in some time, is the portfolio of "Architectural Finishes and Stains," which the International Varnish Company, Ltd., Toronto, is mailing to the profession. This portfolio or display book is intended by the donor to assist the architect to readily select any particular finish he may desire for the woodwork and also to enable him to make clear to his client

the exact scheme which he may have in mind. There are forty-eight sample boards in all, demonstrating in a practical way a variety of finishes (both in oil and acid stains), for woods which the architects are continually specifying, such as yellow pine, quartered oak, birch, British Columbia Fir, etc.

These sample boards are arranged in nickel bound leaves, having three specimens on either side; the leaves being adjusted by a patented fastening device in such a manner as to permit the book to be opened flat at any part. Each stain or finish is accompanied by a description of the treatment employed to obtain the particular effect or polish procured, thus enabling the architect to readily specify what is required in this respect.

Another feature which greatly enhances the value of this book, is the complete specifications for finishing different varieties of wood, and also the splendid treatise on varnish, both of which in themselves are of inestimable value.

The portfolio is cleverly conceived, and splendidly gotten up. It has a usefulness that makes it a desirable asset, in that it is in the form of a book, handsomely bound in leather, and of a size that will conveniently fit any library shelf. The International Company makes a



Display Book of International Varnish Company, showing the manner in which the book opens, and how the sample boards are arranged and described.

number of special claims for its wood stains over other makes, particularly as regards British Columbia Fir and other native woods, and judging from the specimens shown, these claims are certainly well founded.

The Company's "Elastica Finishes" are used extensively in residences, office buildings, hotels, etc., where quality is the dominating essential. These were the first proprietory varnishes introduced to and specified by architects in Canada and the United States, and the increasing number of prominent architects who are regularly endorsing these finishes, is perhaps the best proof of their superior quality, uniformity, durability and elegance.

SANITOR TANKS AND CLOSET TANKS.

SOMETHING IN THE WAY of sanitary equipment which will interest architects and builders, is the new "Sanitor" tanks and closet seats which the Canadian, H. W. Johns-Manville Company have just put on the market. These seats and tanks are moulded in one piece from indurated fibre, a material with which most of us have been familiar for some years back in connection with a very serviceable type of water parts, tubs, water tanks, etc. One of the advantages claimed for this material is that being non-porous and hence non-absorbant, it does not swell, shrink, warp, crack or sweat, and is, therefore, unusually meritorious from either a constructive or hygienic point of view. Another feature to which attention is called, is the fact that in the manufacture of "Sanitor" tanks, the very nature of the material obviates the necessity of any lining, and therefore does away with the dangers of corrosion.

By a clever mechanical process, the exact grain of mahogany and oak is transferred to these seats and tanks. This is done so perfectly that few would be able to distinguish them from wood. The manufacturers are sending a sample of this material and descriptive booklet to interested parties.

The company also announces that they are now prepared to receive enquiries and orders for fuses, fuse plugs, fuse blocks, fuse and service blocks and accessories for all voltages. They carry a large stock of N. E. C. S. fuse material in their Toronto warerooms, and are able to supply the requirements of their patrons immediately upon receipt of order.

THE ANNUAL CONVENTION of the Canadian National Builders' Association, held recently at London, Ont., proved to be one of the most successfull and representative gatherings ever held in the history of the organization. Delegates were present from all sections of the country, and a large number of subjects having a vital bearing on the interests of the organization, were presented and discussed. One of the more important topics before the convention, was the matter of trade schools, and a resolution was adopted authorizing the affiliated exchanges in each province to petition their respective governments, asking that when technical schools are established, a practical trade school department be included for the training and development of mechanics. The "eight-hour limit" on Government contracts was also broadly discussed, and a resolution was adopted voicing the sentiment of the convention, as being opposed to the measure on the ground that it would increase the cost of building operations, and interfere with the liberty of the individual. Other measures dealt with were the "calling for tenders," and "indenturing of apprentices." Winnipeg was chosen as the place for the 1910 convention.

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Otis-Fensom Elevator Co., Limited.
Parkin Elevator Company.

ELECTRIC FIXTURES
Toronto Electric Light Co.

ELECTRICAL CONTRACTORS.
Goold Electric Co.

ELEVATORS (Passenger and Freight).
Otis-Fensom Elevator Co., Limited.
Parkin Elevator Company.

ELEVATOR ENCLOSURES.
Dennis Wire and Iron Works Co.,
Otis-Fensom Elevator Co., Limited.

EXHAUST FANS.
Sheldons, Limited.

EXPANDED METAL.
Expanded Metal and Fireproofing Co.
Galt Art Metal Co.
Clarence W. Noble.
Metal Shingle & Siding Co.
The Pedlar People.
Trussed Concrete Steel Co.
Stinson Reeb Builders' Supply Co.

FIRE BRICK.
E. F. Dartnell.
David McGill.
Stinson Reeb Builders' Supply Co.

FIRE ESCAPES.
Dennis Wire and Iron Works Co., Limited.
Parkin Elevator Company.

FIRE-PLACE GOODS.
Canada Wire Goods Mfg. Co.
T. Eaton Co.
John Kay Co.

FIREPROOFING.
Don Valley Brick Works.
Clarence W. Noble.
E. F. Dartnell.
Eadie-Douglas Co.
Expanded Metal and Fireproofing Co
David McGill.
The Pedlar People.
Port Credit Brick Co.
Trussed Concrete Steel Co.

FIREPROOF STEEL DOORS.
A. B. Ormsby, Limited.
The Pedlar People.
Stinson Reeb Builders' Supply Co.

FIREPROOF WINDOWS.
Galt Art Metal Co.
Metal Shingle & Siding Co.
A. B. Ormsby, Limited.
The Pedlar People.
Pilkington Brothers, Ltd.
Stinson Reeb Builders' Supply Co.

FLOORING.
Eadie-Douglas Co.
Seaman Kent Co., Limited.
Chemical Floor & Tile Co.

FURNACES AND RANGES.
Cluff Bros.
Gurney Foundry Company, Ltd.
Warden King, Limited.
King Radiator Co., Ltd.
Dominion Radiator Co., Limited.
Taylor-Forbes Company, Limited.
Clare Brothers & Co.
Pease Foundry Co.

FURNITURE.
T. Eaton Co.
Canadian Office & School Furniture Company.
Globe Furniture Co.
John Kay Co.

GALVANIZED IRON WORKS.
Galt Art Metal Co.
A. B. Ormsby, Limited.
Metal Shingle & Siding Co.
The Pedlar People.
Sheldons, Limited.

GAS AND GASOLINE ENGINES.
Colonial Engineering Co., Ltd.

GRILLE WORK.
Canada Wire Goods Mfg. Co.
J. & J. Taylor.

HARDWARE.
Taylor-Forbes Co.
L. A. De Laplante.
Gurney, Tilden & Co., Ltd.

HARDWOOD FLOORING.
Seaman Kent Co., Limited.

HEATING APPARATUS.
Gurney Foundry Company, Ltd.
Warden King, Limited.
Dominion Radiator Co., Limited.
King Radiator Co., Limited.
Taylor-Forbes Co., Limited.
Sheldons, Limited.
Pease Foundry Co.
Clare Brothers.
Goldie & McCulloch Co., Limited.
Sheldons, Limited.

HYDRANTS.
Kerr Engine Co.

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

IRON STAIRS.
Dennis Wire & Iron Works Co.

IRON SUPPLIES.
Kerr Engine Co.

INSULATION.
Kent Company, Limited.

INTERIOR WOODWORK.
Canadian Office & School Furniture Co.
Seaman Kent & Co.

JAIL CELLS AND GATES.
Canada Wire Goods Mfg. Co.
Dennis Wire & Iron Works Co. ited.
J. & J. Taylor.

JOIST HANGERS.
Taylor-Forbes Co.

LAMP STANDARDS.
Dennis Wire & Iron Works Co., Limited.

SEE INDEX TO ADVERTISEMENTS FOR ADDRESSES OF FIRMS IN THE ABOVE DIRECTORY

LATH (Metal).
Canada Wire Goods Mfg. Co.
Expanded Metal and Fireproofing Co.
Clarence W. Noble.
Galt Art Metal Co.
B. Greening Wire Co., Limited.
Metal Shingle & Siding Co.
Metallic Roofing Co. of Canada.
The Pedlar People.
Stinson-Reeb Builders' Supply Co.
Trussed Concrete Steel Co.

LEADED GLASS.
David McGill.
Pilkington Brothers, Ltd.
Canada Glass, Mantels and Tiles, Limited.

LIGHTING AND POWER PLANTS.
Colonial Engineering Co., Ltd.

LODGE FURNITURE.
Canadian Office & School Furniture Co.

MANTELS.
T. Eaton Company.
John Kay Co.

MARBLE.
E. F. Dartnell.
Hoidge Marble Co.
Missisquoi Marble Company.
Smith Marble & Construction Co., Limited.

METAL SHINGLES.
Galt Art Metal Co.
Metal Shingle & Siding Co.
The Pedlar People.

METAL WALLS AND CEILINGS.
Galt Art Metal Co.
Metal Shingle & Siding Co.
C. W. Noble.
A. B. Ormsby, Limited.
The Pedlar People.

METAL WEATHER STRIPS.
Chamberlain Metal Weather Strip Co.

OPERA CHAIRS.
Canadian Office & School Furniture Co.

ORNAMENTAL IRON WORK.
Canada Wire Goods Mfg. Co.
Canada Foundry Co., Ltd.
Dennis Wire & Iron Co., Limited.

PACKING.
Dunlop Tire & Rubber Co., Limited.
Gutta Percha & Rubber Mfg. Co.

PAINTS
Vokes Hardware Co., Limited.

PIPE COVERING.
Kent Company, Limited.

PLASTERERS.
W. J. Hynes.

PLASTER CORNER BEADS.
The Pedlar People.

PLATE AND WINDOW GLASS.
Pilkington Brothers, Limited.

PLUMBERS' BRASS GOODS.
Standard Ideal Company, Limited.
General Brass Co.
Jas. Robertson Co., Limited.

PLUMBING FIXTURES.
Standard Ideal Co., Limited.
Jas. Robertson Co., Limited.

PNEUMATIC TOOLS.
Mussons, Limited.

PORCELAIN ENAMEL BATHS.
Standard Ideal Co., Limited.
Jas. Robertson Co., Limited.

RADIATORS.
General Brass Co.
King Radiator Co.
Gurney, Tilden Co., Ltd.
Dominion Radiator Co., Limited.
Warden King, Limited.
Taylor-Forbes Co., Limited.
Somerville, Limited.

RADIATOR VALVES.
Kerr Engine Co.

REFRIGERATING MACHINERY.
Kent Company, Limited.
Linde British Refrigeration Co., Ltd.

REFRIGERATOR INSULATION.
Kent Company, Limited.

REINFORCED CONCRETE.
Expanded Metal & Fireproofing Co.
David McGill.
Clarence W. Noble.
The Pedlar People.
W. D. Beath & Son.
Trussed Concrete Steel Co., Limited

RELIEF DECORATION.
W. J. Hynes.

ROOFING PAPER.
Alex McArthur & Co.
The Pedlar People.

ROOFING (Slate).
A. B. Ormsby, Limited.

ROOFING TILE.
E. F. Dartnell.
David McGill.
The Pedlar People.

RUBBER TILING.
Dunlop Tire & Rubber Co.
Gutta Percha & Rubber Mfg. Co., Limited.

SAFES, VAULTS AND VAULT DOORS.
J. & J. Taylor.
Goldie & McCulloch Co., Limited.

SANITARY PLUMBING APPLIANCES.
Standard Ideal Co., Limited.
Jas. Robertson Co.

SCHOOL FURNITURE.
Canadian Office & School Furniture Co.

SHEET METAL
A. C. Leslie & Co.

SHEET METAL WORKERS.
Galt Art Metal Co.
Metal Shingle & Siding Co.
A. B. Ormsby, Limited.
The Pedlar People.

SIDEWALKS, DOORS AND GRATES.
Dennis Wire & Iron Works Co.

SHINGLE STAINS
James Langmuir & Co., Ltd.

SIDEWALK LIFTS.
Otis-Fensom Elevator Co., Limited.
Parkin Elevator Company.

STABLE FITTINGS.
Canada Wire Goods Mfg. Co.
Dennis Wire & Iron Works Co., Ltd.

STAFF AND STUCCO WORK.
W. J. Hynes.

STEAM APPLIANCES.
Sheldons, Limited.
Kerr Engine Co.
Taylor-Forbes Co.

STEAM AND HOT WATER HEATING.
King Radiator Co., Ltd.
Warden King, Limited.
Gurney, Tilden & Co., Ltd.
Dominion Radiator Co., Limited.
Taylor-Forbes Co., Limited.

STEEL CASEMENTS.
David McGill.

STEEL CONCRETE CONSTRUCTION.
Expanded Metal & Fireproofing Co
Clarence W. Noble.
The Pedlar People.
W. D. Beath & Son.
Trussed Concrete Steel Co.

STEEL DOORS.
Canada Wire Goods Mfg. Co.
A. B. Ormsby, Limited.
The Pedlar People.

STRUCTURAL IRON CONTRACTORS.
Dominion Bridge Co.
Stratford Bridge & Iron Co.
Jenks-Dresser Co., Ltd.
Hamilton Bridge Co.
Reid & Brown.

STRUCTURAL STEEL.
Jenks Dresser Co., Limited.
Hamilton Bridge Co.
Dominion Bridge Co.
Reid & Brown.
Dennis Wire and Iron Works Co., Limited.
Stratford Bridge Co.

STORE FIXTURES.
Gold Medal Furniture Mfg. Co.
Canadian Office & School Furniture Co.

TERRA COTTA FIREPROOFING.
Eadie-Douglas Co.
Don Valley Brick Works.
E. F. Dartnell.
Francis Hyde & Co.
The Milton Pressed Brick Co.
David McGill.

TILE (Floor and Wall).
David McGill.
Smith Marble & Construction Co.
E. F. Dartnell.

VALVES.
Gurney Foundry Company, Ltd.
Kerr Engine Co.
Taylor-Forbes Co.
Dominion Radiator Company.

VENTILATORS.
Sheldons, Limited.

WALL HANGERS.
Taylor-Forbes Co.

WALL HANGINGS.
T. Eaton & Co.
John Kay Co.
W. A. Murray & Co., Ltd.

WINDOW GUARDS.
Canada Wire Goods Mfg. Co.
B. Greening Wire Co., Limited.

A DIRECTORY FOR CONTRACTORS' SUPPLIES & MACHINERY

ADAMANT PLASTER.
Francis Hyde and Co.
Stinson-Reeb Builders' Supply Co.

ARTIFICIAL STONE.
Canadian Art Stone Co.
Roman Stone Co.

ASBESTOS PRODUCTS.
A. B. Ormsby, Limited.

BELTING.
Dunlop Tire and Rubber Co., Limited.
Gutta Percha & Rubber Mfg. Co., Limited.

BLOWERS.
Sheldons, Limited.

BLOW AND VENT PIPING.
Metal Roofing Co., Limited.
Metal Shingle & Siding Co.
A. B. Ormsby, Limited.

BOILERS.
Gurney Foundry Company, Ltd.
Warden King, Limited.
Dominion Radiator Co., Limited.
Berg Machinery Mfg. Co., Limited.
Taylor-Forbes Co.
Goldie and McCulloch Co., Limited.

BRASS WORKS.
Standard Ideal Company, Limited.
James Robertson, Limited.
Kerr Engine Co.

BRICK AND TERRA COTTA.
E. F. Dartnell.
Don Valley Brick Works.
Eadie-Douglas Co.
David McGill.
The Terra Cotta Pressed Brick Co.
Port Credit Brick Co.
Stinson-Reeb Builders' Supply Co.

BUILDING SUPPLIES.
Christie, Henderson & Co., Ltd.
E. F. Dartnell.
Eadie-Douglas Co.
Gold Medal Furniture Mfg Co.
Francis Hyde & Co.
Lockerby & McCoomb.
David McGill.

SEE INDEX TO ADVERTISEMENTS FOR ADDRESSES OF FIRMS IN THE ABOVE DIRECTORY.

The Pedlar People.
Stinson-Reeb Building Supply Co., Limited.
Roger Supply Co.

BRICK MACHINERY.
Berg Machinery Mfg. Co., Limited.

CAST IRON COLUMNS.
Gaudry & Co., L. H.
The Pedlar People.

CAPS FOR COLUMNS AND PILASTERS.
W. J. Hynes.
The Pedlar People.

CARS (Factory and Dump).
Sheldons, Limited.

CEMENT.
Canadian Portland Cement Co., Limited.
E. F. Dartnell.
The Lakefield Portland Cement Co., Limited.
Owen Sound Portland Cement Co.
David McGill.
Vulcan Portland Cement Co., Limited.
Francis Hyde & Co.
Leigh Portland Cement Co.
Rogers Supply Co.
Stinson-Reeb Builders' Supply Co.
Western Canada Cement & Coal Co.

CEMENT BLOCK MACHINERY.
Ideal Concrete Machinery Co., Limited.
Mussons, Limited.

CEMENT BRICK MACHINERY.
Ideal Concrete Machinery Co.

CEMENT MACHINERY.
Berg Machinery Co., Limited.
Ideal Concrete Machinery Co.

CEMENT TILE MACHINERY.
Ideal Concrete Machinery Co.

CONCRETE MIXERS.
Canada Foundry Company, Ltd.
E. F. Dartnell.
Mussons, Limited.
Ideal Concrete Machinery Co.

CONCRETE STEEL.
Dennis Wire & Iron Co.
Expanded Metal & Fireproofing Co.
B. Greening Wire Co., Limited.
Clarence W. Noble.
The Pedlar People.
W. D. Beath & Son
Trussed Concrete Steel Co.

CONDUITS.
Conduits Co., Limited.
Francis Hyde & Co.
The Pedlar People.

CONTRACTORS' MACHINERY.
Mussons, Limited.

CONTRACTORS' SUPPLIES.
Canada Wire Goods Mfg. Co.
Eadie-Douglas Co.
E. F. Dartnell.
Francis Hyde & Co.
Kent Company, Limited.
David McGill.
Miller Bros. & Toms.
Mussons, Limited.
Stinson-Reeb Builders Supply Co.
Rogers Supply Co.

CRUSHED STONE.
Christie, Henderson & Co., Ltd.
Rogers Supply Co.
Stinson-Reeb Builders' Supply Co.

CUT STONE CONTRACTORS.
Roman Stone Co., Limited.
Canadian Art Stone Co., Limited.
Fred Holmes & Sons.
E. F. Dartnell.

DOORS.
Gold Medal Furniture Mfg. Co.
L. A. De La Plante.

DRILLS (Brick and Stone).
Mussons, Limited.

ELECTRICAL CONTRACTORS.
Goold Electric Co.

ELECTRO-PLATING.
Dennis Wire and Iron Works Co.

ELECTRIC WIRE AND CABLES.
B. Greening Wire Co., Limited.
Jas. Robertson Co., Limited.

ENGINES.
Berg Machinery Mfg. Co., Limited.
Goldie and McCulloch Co., Limited.
Sheldons, Limited.

ENGINEERS' SUPPLIES.
Kerr Engine Co.
Mussons, Limited.

ELECTRIC WIRE AND CABLES.
B. Greening Wire Co., Limited.
James Robertson Co., Limited.

EXHAUST FANS.
Sheldons, Limited.

EXPANDED METAL.
Expanded Metal and Fireproofing Co.
Galt Art Metal Co.
Clarence W. Noble.
Metal Shingle & Siding Co.
The Pedlar People.
Stinson-Reeb Builders' Supply Co.
Trussed Concrete Steel Co.

FIRE BRICK.
E. F. Dartnell.
David McGill.
Stinson-Reeb Builders' Supply Co.

FIREPROOFING.
Don Valley Brick Works.
E. F. Dartnell.
Eadie-Douglas Co.
Clarence W. Noble.
Expanded Metal and Fireproofing Co.
David McGill.
The Pedlar People.
Port Credit Brick Co.
Trussed Concrete Steel Co.

FIREPROOF STEEL DOORS.
A. B. Ormsby, Limited.
The Pedlar People.
Stinson-Reeb Builders' Supply Co.

FIREPROOF WINDOWS.
Pilkington Brothers, Ltd.
Galt Art Metal Co.
Metal Shingle & Siding Co.
A. B. Ormsby, Limited.
The Pedlar People.
Stinson-Reeb Builders' Supply Co.

FLOORING.
Eadie-Douglas Co.
The Seamen Kent Co., Limited.
Chemical Floor & Tile Co.

FURNACES AND RANGES.
Gurney Foundry Company, Ltd.
Gurney, Tilden Co., Ltd.
Warden King, Limited.
Pease Foundry Co.
Dominion Radiator Co., Limited.
Taylor-Forbes Co., Limited.

GALVANIZED IRON WORKS.
Galt Art Metal Co.
A. B. Ormsby, Limited.
The Pedlar People.
Metal Shingle & Siding Co.

HARDWARE.
Taylor-Forbes Co.
L. A. De Laplante, Limited.

HEATING APPARATUS.
Gurney Foundry Company, Ltd.
Gurney, Tilden Co., Limited
Warden King, Limited.
Pease Foundry Co.
Dominion Radiator Co., Limited.
Taylor-Forbes Co., Limited.
Sheldons, Limited.
Goldie and McCulloch Co., Limited.

HYDRANTS.
Kerr Engine Co.

HOISTING MACHINERY.
Otis-Fensom Elevator Co., Limited.
Mussons, Limited.

INSULATION.
Kent Company, Limited.

IRON STAIRS.
Canada Foundry Co.
Geo. B. Meadows Co., Limited.
Francis Hyde & Company

JOIST HANGERS.
David McGill.
Taylor-Forbes Co.
Francis Hyde & Co.

LATH (Metal).
Canada Wire Goods Mfg. Co.
Clarence W. Noble.
Expanded Metal & Fireproofing Co.
Galt Art Metal Co.
B. Greening Wire Co., Limited.
Metal Shingle & Siding Co.
The Pedlar People.
Trussed Concrete Steel Co.
Stinson-Reeb Builders' Supply Co.

LOCOMOTIVE SUPPLIES.
Mussons, Limited.

LUMBER.
Gold Medal Furniture Mfg. Co.
L. A. De Laplante, Limited.

MARBLE.
E. F. Dartnell.
Hoidge Marble Co.
Missisquoi Marble Co.
Smith Marble and Construction Co., Limited.

METAL SHINGLES.
Galt Art Metal Co.
Metallic Roofing Co. of Canada.

METAL WALLS AND CEILINGS.
Galt Art Metal Co.
Metal Shingle & Siding Co.
A. B. Ormsby, Limited.
The Pedlar People.

METAL WEATHER STRIPS.
Chamberlain Metal Weather Strip Co.

MUNICIPAL SUPPLIES.
Francis Hyde & Co.
Mussons, Limited.

ORNAMENTAL IRON.
Canada Foundry Company, Ltd.

PACKING.
Dunlop Tire & Rubber Co., Limited.
Gutta Percha & Rubber Mfg. Co., Limited.

PIPE.
Francis Hyde & Co.

PLATE AND WINDOW GLASS.
Pilkington Brothers, Ltd.
Canada Glass, Mantel and Tile Co., Limited.

PLASTER BOARD.
Francis Hyde & Co.
Stinson-Reeb Builders' Supply Co.

PLUMBERS' BRASS GOODS.
Standard Ideal Company, Limited.
James Robertson Co., Limited.

PLUMBING FIXTURES.
Standard Ideal Co., Limited.

PLUMBER AND STEAM FITTER SUPPLIES.
General Brass Co., Limited.
Standard Ideal Co., Limited.
Taylor-Forbes Co.
Dominion Radiator Company.

PORCELAIN ENAMEL BATHS.
Standard Ideal Co., Limited.

PUMPING MACHINERY.
Mussons, Limited.
Otis-Fensom Elevator Co., Limited.

RADIATORS.
King Radiator Co.
Dominion Radiator Co., Limited.
Gurney, Tilden Co., Limited.
Warden King, Limited.
Taylor-Forbes Co., Limited.

RADIATOR VALVES.
Kerr Engine Co.

REFRIGERATING MACHINERY.
Kent Co., Limited.
Linde British Refrigeration Co., Limited.

ROOFING (Slate).
A. B. Ormsby, Limited.

ROOFING PAPER.
The Pedlar People.

ROOFING TILE.
E. F. Dartnell.
David McGill.
The Pedlar People.

RUBBER TILING.
Dunlop Tire & Rubber Co.
Gutta Percha & Rubber Mfg. Co., Limited.

SAND.
Sand and Dredging Company.

SAND AND GRAVEL SCREENS.
Canada Wire Goods Mfg. Co.
B. Greening Wire Co., Limited.

SHAFTING PULLEYS AND HANGERS.
Goldie & McCulloch Co., Limited.

SANITARY PLUMBING APPLIANCES.
Standard Ideal Co., Limited.

STEEL CASEMENTS.
David McGill.

STRUCTURAL STEEL.
Dominion Bridge Co.
Hamilton Bridge Co.
Jenks-Dresser Co., Limited.
Dennis Wire & Iron Works Co., Limited.
Reid & Brown.
Stratford Bridge Co.

SEE INDEX TO ADVERTISEMENTS FOR ADDRESSES OF FIRMS IN THE ABOVE DIRECTORY

TERRA COTTA FIREPROOFING.

Eadie-Douglas Co.
Don Valley Brick Works.
E. F. Dartnell.
Francis Hyde & Co.
David McGill.

VALVES.

Gurney Foundry Company, Ltd.
Kerr Engine Co.
Taylor-Forbes Co.
Dominion Radiator Co.

VENTILATORS.

Sheldons, Limited.

WALL HANGERS.

Taylor-Forbes Co.

WATER HEATERS.

Somerville, Limited.

WATERWORKS SUPPLIES.

Standard Ideal Company, Limited.
Kerr Engine Co.
Mussons, Limited.
Dominion Radiator Co.

WHEELBARROWS.

Mussons, Limited.

IRE ROPE AND FITTINGS.

B. Greening Wire Co., Limited.
Otis-Fensom Elevator Co., Limite
Mussons, Limited.

An Index to the Advertisements

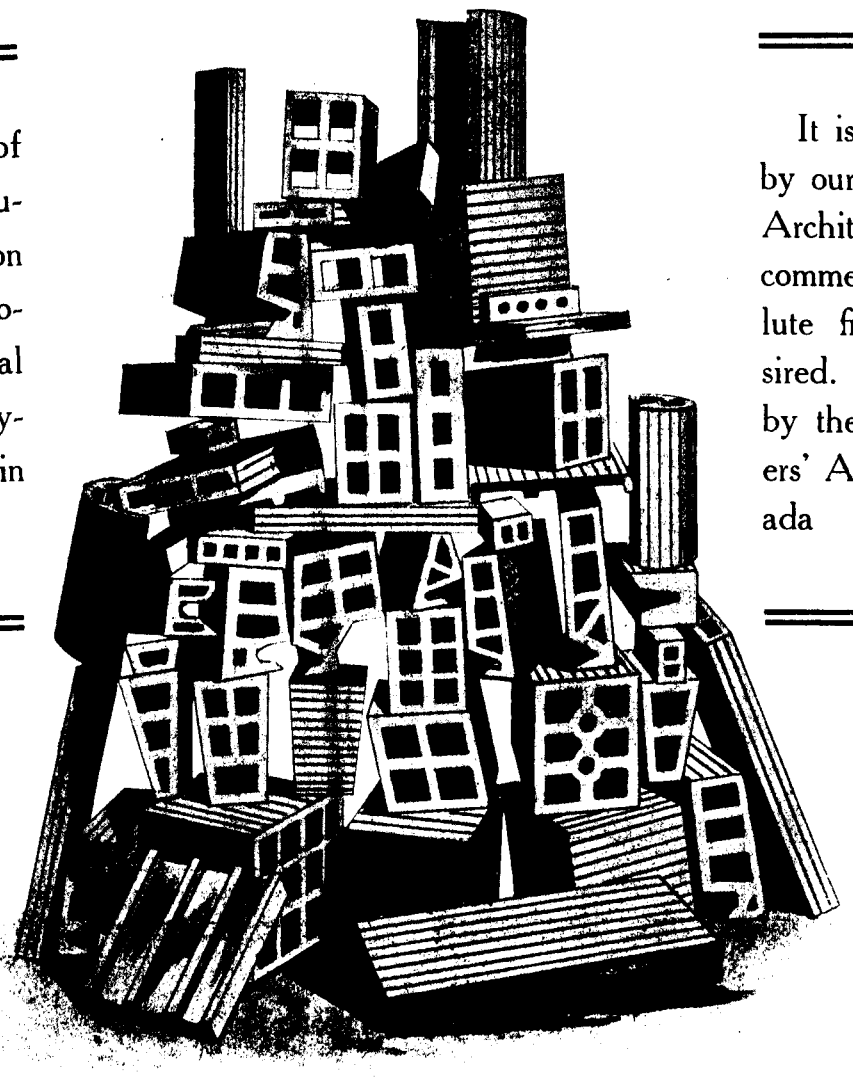
DON VALLEY

POROUS TERRA COTTA FIREPROOFING

IS THE HIGHEST TYPE OF FIREPROOFING USED TO-DAY

It is pronounced by authorities from both sides of the border to be the most uniform and the most thoroughly burnt terra cotta on the Canadian market.

Mr. C. E. Palmer, of Norcross Bros., who superintended the erection of the Royal Bank, Toronto, says: "It is equal if not superior to anything of its kind in America."



It is being used daily by our own well-known Architects, and is recommended where absolute fireproofing is desired. Highly endorsed by the Fire Underwriters' Association of Canada

Let us have some idea of the character of building you are contemplating and we will be able to give you information that will be of value to you. Terra Cotta Fireproofing is used in all kinds of buildings from the cottage to the highest class business block.

DON VALLEY BRICK WORKS

Head Office:
36 Toronto St., TORONTO

Montreal Agent:
DAVID McGILL,
Merchants Bank Chambers