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# CONSTRUCTION

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



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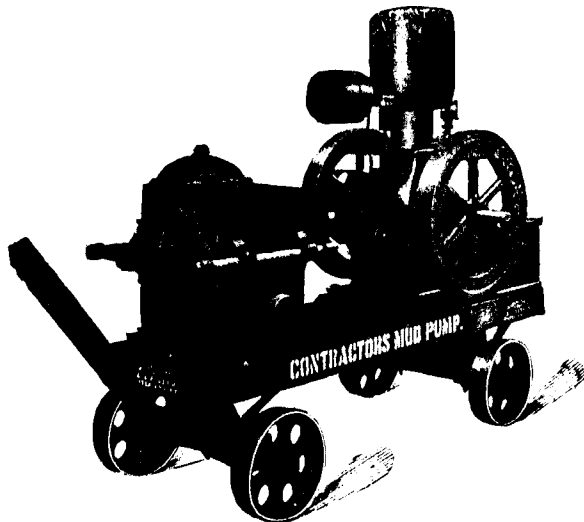
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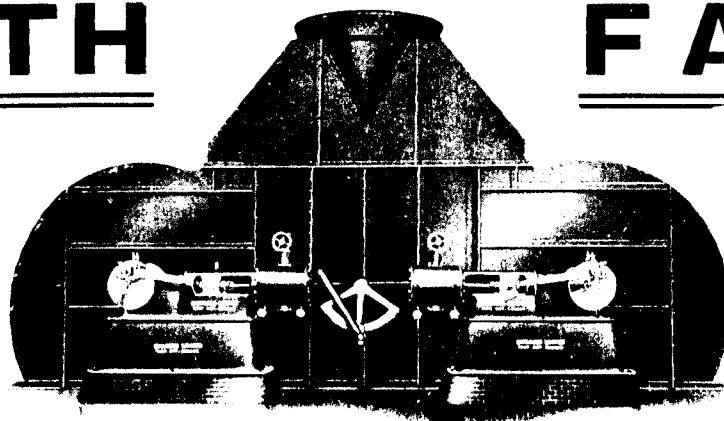
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"Portland Cement"—

But the man who does the  
best work insists upon get-  
ting "Canada" Portland  
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And he looks to  
see that every  
bag bears this  
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**T**O specify Canada Portland Cement, is to in-  
troduce an additional safety factor into your  
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know the value of "making assurance doubly sure."

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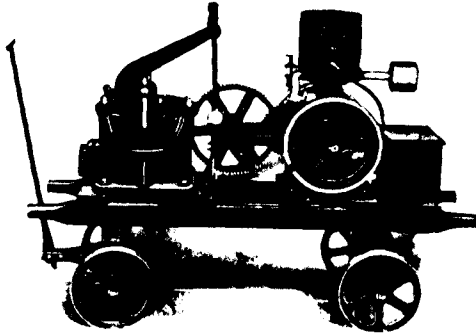
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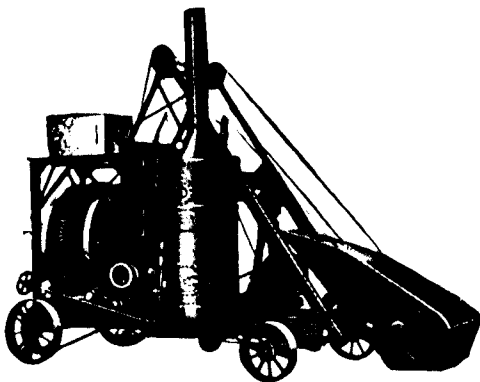
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**U**NDENIABLY, there is a decided grace to the roof lines. By the very nature of its shape, it seems to lend itself to a dignity and grace of treatment much appreciated by the architect.

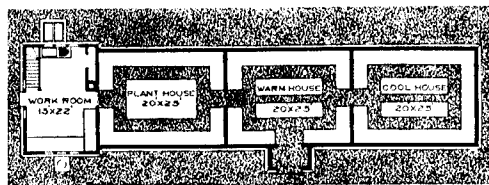
Further than this, it has distinct growing advantages, as the spring of the curve is so gradual the head room along the side benches is much greater, giving more room for the taller growing plants than in straight roofed houses.

For graperies, they give an opportunity for longer vines,—an advantage which every owner and gardener appreciates.

Our Catalog, "Some Greenhouses We Have Built," goes thoroughly into the various types of houses and tells plainly and pointedly just why our Sectional Iron Frame Construction is the superior construction it is.

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The "KINGDON-NON-SOIL" Syphon Jet is absolute perfection in Closet Construction, inasmuch as it combines *all* sanitary features.

The "KINGDON" is 14½ inches high. The advantages of a bowl of this height are conceded by physicians and experts.

The Flushing Rim is extended both front and back, making it a most Sanitary Fixture.

The Area of Water Surface is 14 x 11 inches, with large waterway through Trap, while in the

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The "KINGDON" Closet is supplied with the "Robertson" Low Down Tank, fitted with "Monarch" Gravity Flushing Valve, the only perfect mechanism for the purpose ever invented.

It is absolutely noiseless so far as a Closet can be. This feature completes the perfection of its parts.

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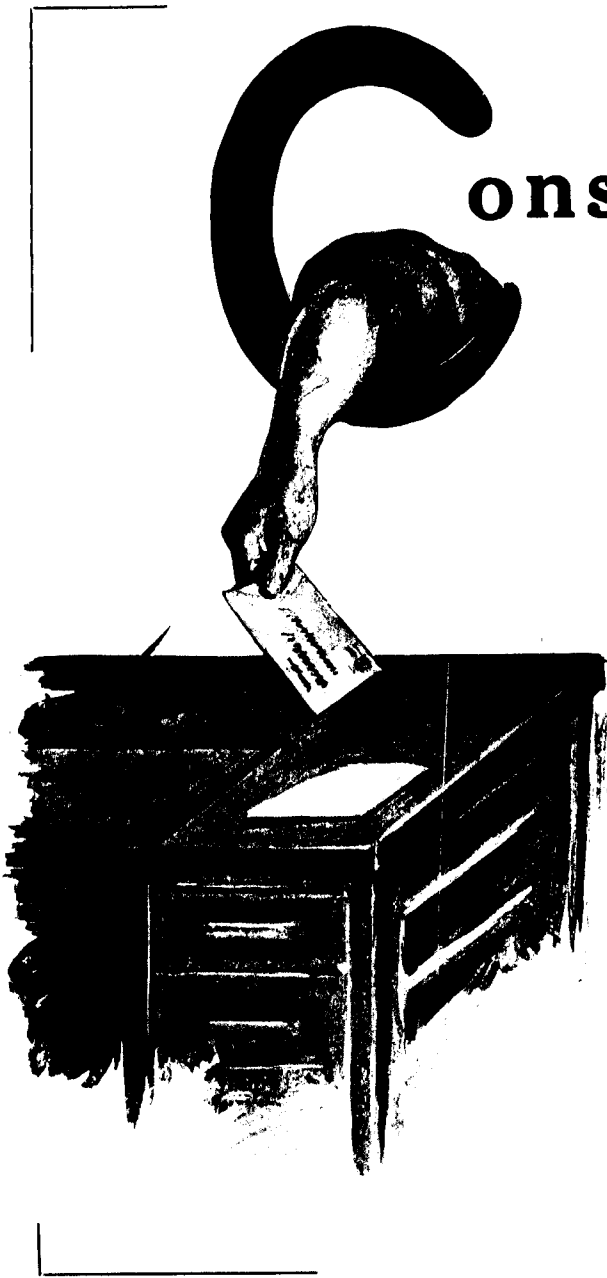
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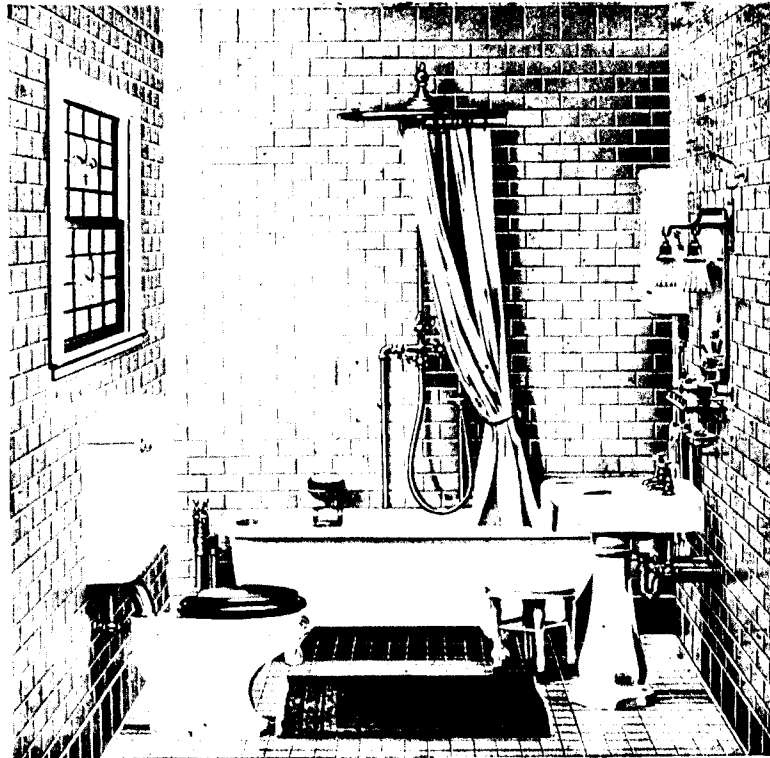


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## MODERN BATHROOM



Design P 60

The bathroom illustrated above is an extremely well planned interior for a moderate sized house. The entire equipment, while inexpensive, is most satisfactory and practical.

The Closet Bowl is of the “Standard Sanitary” “Vitrite” porcelain, the surface of which is hard, smooth, and non-absorbent, therefore highly sanitary, while the Tank is porcelain enameled.

Our long experience has particularly demonstrated the special fitness of porcelain enamel as the ideal material for Closet Tanks.

Enameled Tanks will not sweat, crack, need no lead, copper or other lining, and will not rust. There is no wear out to the porcelain enameled Tank.

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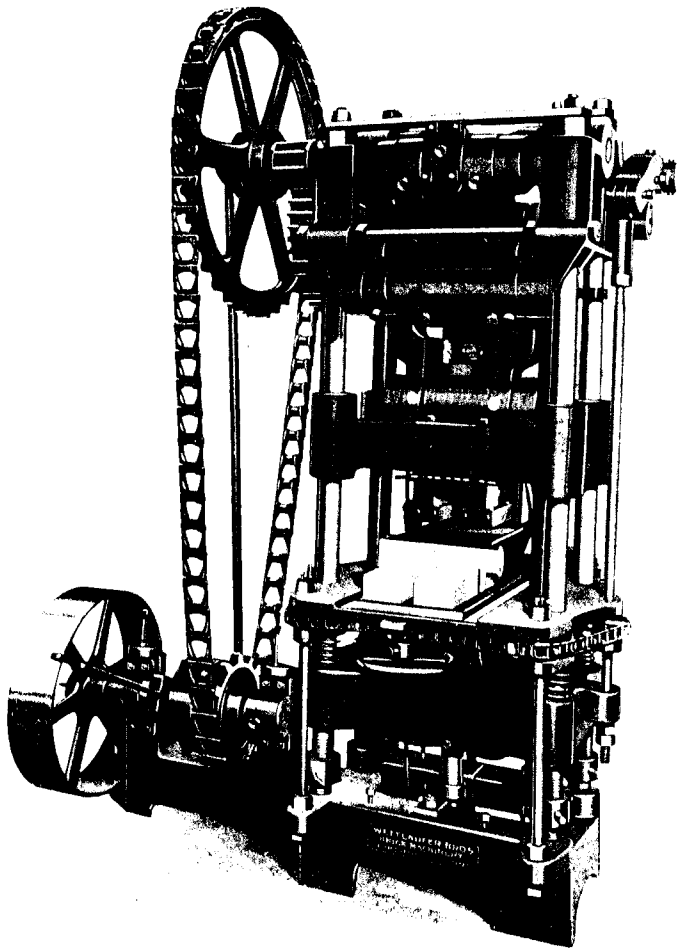
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Also Lime and Clay Bricks, on 24 hours' notice. Brickmakers and Contractors should investigate this

## New Wettlaufer Brick Press



*Have us send you our Catalogue on Hoists, Pumps, Stone Crushers, and Tile, Block and Brick Machines.*

It will turn out 15,000 bricks per 10 hours, with a power of only 4 or 5 horse power. Will adjust instantly to make brick of any thickness between 1 inch and 3½ inches, with or without frogs.

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It pays to install good Elevators—“Turnbull Elevators”—then you are sure to get satisfactory service year in and year out.

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Royal Bank's  
New  
Twenty Storey  
Building  
Toronto

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DON VALLEY  
BRICK  
and  
POROUS TERRA  
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FIREPROOFING  
will enter  
extensively into  
the construction of  
this important  
building.  
(See opposite page)

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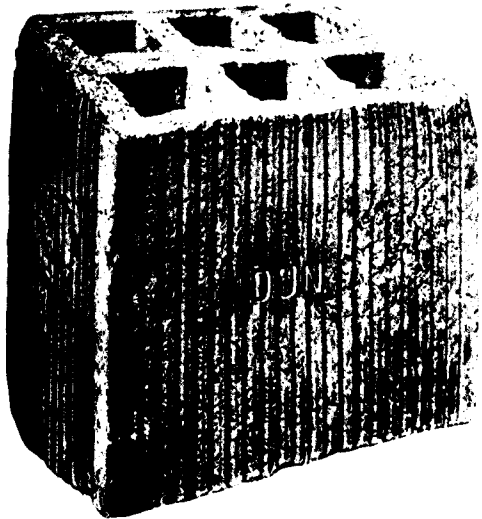
**The Largest Clay  
Product Contract  
for a Single Building  
ever placed in the  
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**Royal Bank's  
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*(Illustration on opposite page.)*



**3,000,000  
DON VALLEY BRICK**

**1,400,000 Sq. Ft.  
DON VALLEY POROUS  
TERRA COTTA  
FIREPROOFING**

**Q**UANTITY may be termed the *requisite factors* which place a commodity in big demand—and *quantity*, an evidence of capabilities for meeting that demand. Here is an illustration:

Can you picture 3,000 teams laboring along the road with as many loads of brick, and another caravan of 1,600 teams immediately behind, each drawing a load of porous terra cotta? Or a train load comprised of these two materials extending along the track for a distance of  $3\frac{4}{5}$  miles, and containing 535 cars? Or again can you conceive of two immense piles, one a pyramid of porous terra cotta 106 ft. square at the base and recessing one foot to every foot rise to a height of 106 feet; the other a solid cube of bricks 36x36 ft., rising perpendicular on all four sides to a height of 124 feet? If you can, then you have some idea of the clay products alone that will enter into the construction of what will be the highest building in the British Empire.

There is enough porous terra cotta to cover a pavement 60 ft. wide for a distance of  $1\frac{1}{4}$  miles, and a sufficient number of brick to construct a sidewalk 10 ft. wide for a distance of approximately  $8\frac{3}{5}$  miles. Laid end to end these blocks of terra cotta would reach  $75\frac{4}{5}$  miles, or over twice the distance from Toronto to Hamilton. The bricks arranged in a similar manner would extend over a distance of 441 miles, or approximately one-third again the distance between Toronto and Montreal.

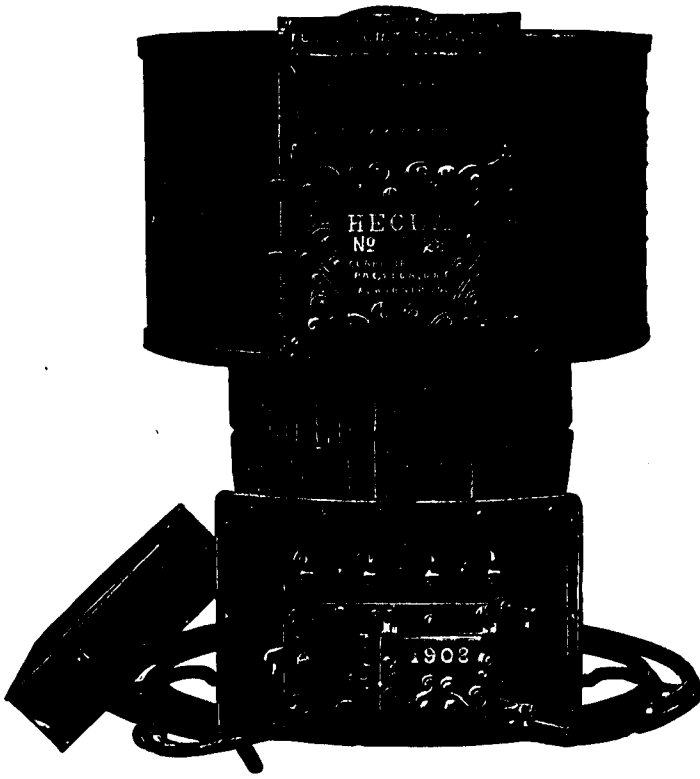
All this represents *quantity*, yet such a contract means decidedly more. It tells of recognized value, modern plant equipment, progressive business methods, and large industrial resources. The acceptance of an order by us is in itself *an assurance of prompt deliveries.*

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## FOR COAL OR WOOD




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The requisite for a successful Warm-Air Heating System is a good furnace; one that will not only supply an abundant quantity of pure warm air; but will, in addition, be economical in the consumption of fuel, easy to operate, safe from dust and smoke, and that will give the greatest length of service. Some cheap furnaces fulfil one or more of these conditions, but the furnace you want must fulfil all. That is what the HECLA does.

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### "HECLA" FEATURES

- Automatic Gas Damper prevents gas puffs.
- Gravity Catch locks door every time you shut it.
- Double Feed Door for convenience when burning wood.
- Damper Regulator enables you to operate the dampers without going to the basement.
- Dust Flue carries all the dust up the chimney.
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- Double Tin and Asbestos Lined Case to prevent the loss of heat in the cellar.

**STEEL RIBBED FIRE POTS**  
**INDIVIDUAL GRATE BARS**

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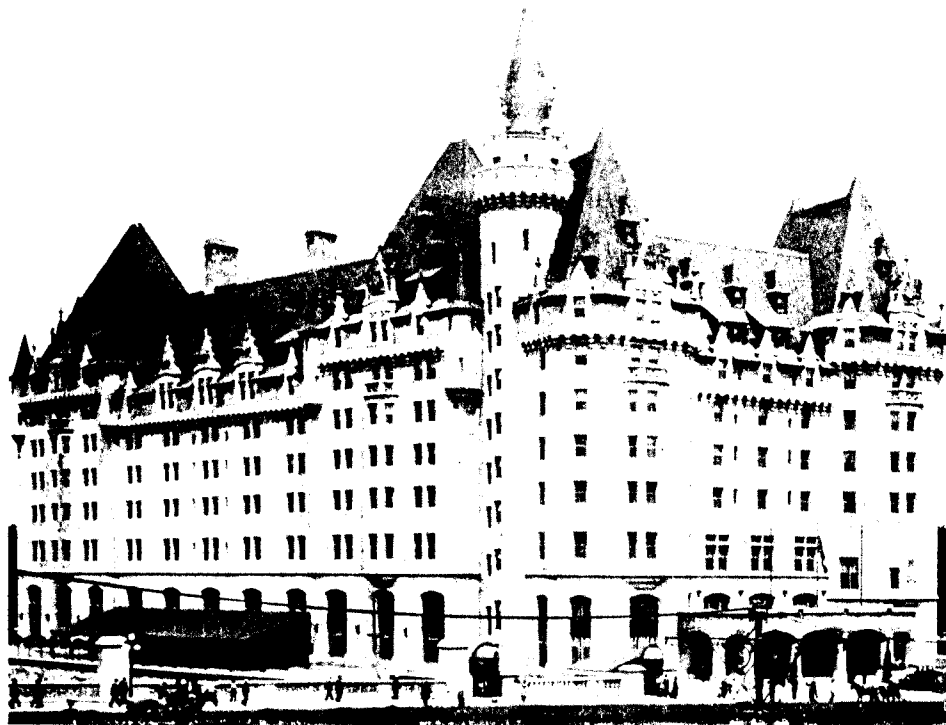
# Clare Bros. & Co., Limited

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**CHATEAU LAURIER, OTTAWA.**

This is an example of typical high-class construction, where the exclusive specification is

## PEDLAR'S METAL LATH

as a base for the plasterwork. About 30,000 sq. yds. of the galvanized 24-gauge Pedlar Lath was applied for the walls and suspended ceilings.

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*Stocks carried at Important Building Centres. Every facility for Prompt Field Deliveries. Specifications, Literature and Sample Construction at Nearest Branch.*

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# To Make Concrete Waterproof

The only permanently satisfactory method is to use

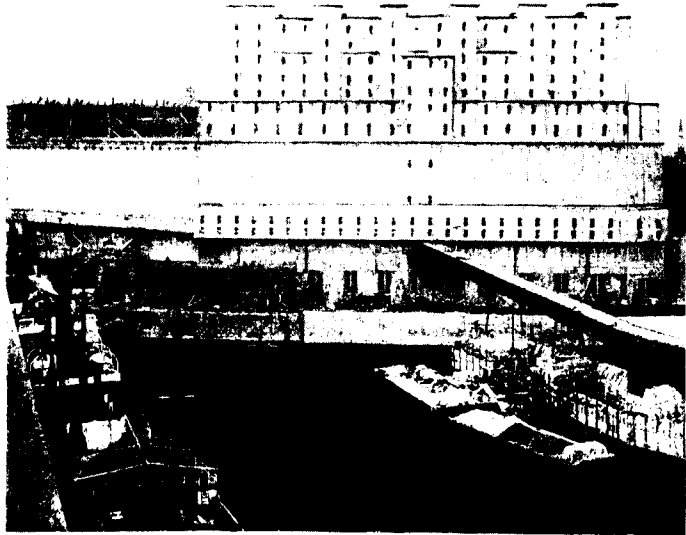
## "MEDUSA" WATERPROOFING

The original dry white powder waterproofing. Infinitely superior to other powders and to all liquids, pastes, etc.

The proportion of actual waterproofing substance in Medusa is very large, and results are both certain and permanent. It is absolutely insoluble and unaffected by water even after years of contact.

Specified by the most eminent Architects and Engineers. Used on such important structures as

**Harbor Commissioners' Elevator No. 2, Montreal.**



Harbor Commissioners' Elevator, Montreal.  
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Tenth Floor, Eastern Townships Bank Bldg., Montreal, Que.

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An office requires a clear, soft light, evenly distributed to every part of the room, and free from shadows.

In the head office of the Canada Life Assurance Company, and in many other large offices, the light problem has been satisfactorily solved by installing

## Alexalite

It does not cast a shadow and there is no glare. The lamps are concealed, giving an indirect reflected light, very grateful to the eyes. By insuring more comfortable working conditions, it increases the efficiency of all employees.

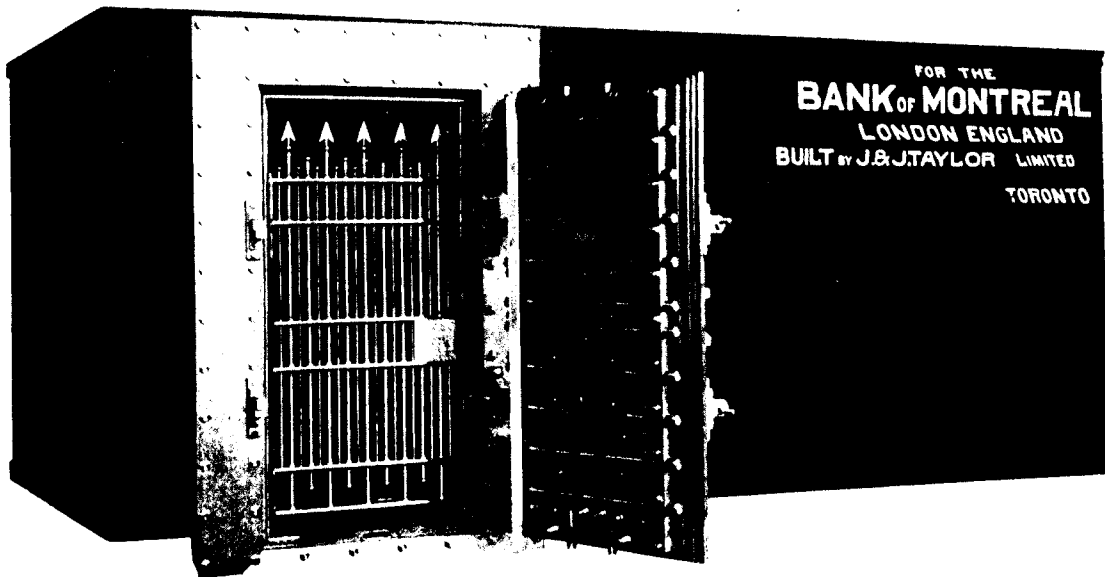
Alexalite is not expensive to operate. In fact it usually effects a saving of from 25 to 40 per cent. over other systems.

It is the ideal light, not only for offices, but for stores, warehouses and in every place where "more light and better light" is required.

## Canadian Alexalite

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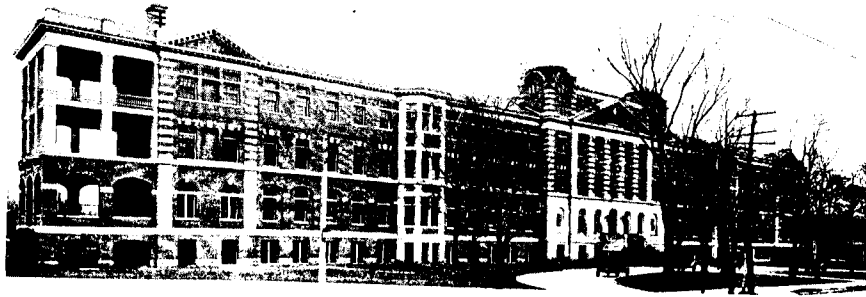
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### The Western Hospital

Construction made use of Port Credit Brick. This brick is full size, stands high compression tests, and has a notably low absorption. This makes Port Credit Brick highly desirable for facades and elaborate structures, subject to the grime of city conditions. The Port Credit Pressed Brick is graded No. 1, No. 2, and No. 3.

This Brick is made from Canada's best bed of shale. The output is 1,000,000 a week. Prompt deliveries may always be had at building centres.

For Specifications or Deliveries, telephone, call or write

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(12)

**"Made of Canada's Finest Shale."**



### The Constructor Says —

**"WHEN I order a yard of metal lath I want it to cover a yard on the wall. That's why I always order HERRINGBONE LATH. A yard on the wagon is a yard on the wall. Those selvage edges eliminate the lap and the extra length is not counted in the measurement."**

**"HERRINGBONE USERS ARE HAPPY LATHERS"**

**CLARENCE W. NOBLE**

GENERAL SALES AGENT

TORONTO

MONTREAL

WINNIPEG

Metal Shingle & Siding Co., Manufacturers

The family upstairs is never  
unpopular in apartments  
where

## NEPONSET

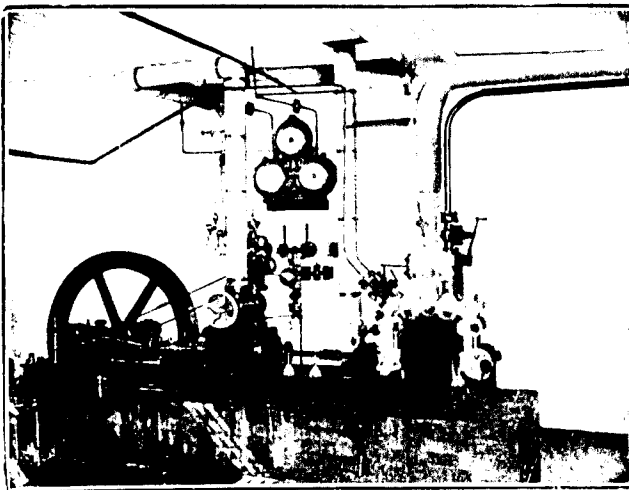
FLORIAN SOUND DEADENING FELT

is used between floors



Bird & Son, Est. 1795, Hamilton, Ontario; Montreal, Winnipeg, Vancouver, St. John,  
E. W. Bird & Son U. S. Plant, East Walpole, Mass.

MAKERS OF NEPONSET BUILDING PAPERS, SOUND DEADENING FELT, WATERPROOFING FELT, ROOFINGS AND WALL BOARD.



Some of our recent installations:—

Montreal Dairy Co., Montreal.  
McDonagh & Shea, Winnipeg.  
Langley & Howland, Toronto.  
C.P.R. Calgary Hotel, Calgary.  
C.P.R. Banff Springs Hotel, Banff.  
University Club, Montreal.  
A. Bennett, Dauphin.  
Canadian Breweries, Vancouver.  
Canada Glue Co., Brantford.

And many others.

## THE LINDE CANADIAN REFRIGERATION COMPANY, Limited

37 St. Peter Street, MONTREAL

REFRIGERATING AND ICE-MAKING MACHINERY  
CORK INSULATION

WRITE FOR CATALOGUE

ALL FITTINGS KEPT IN STOCK

# BITUNAMEL

REGISTERED

An Enamel-like coating of a bituminous nature for the protection of all kinds of Iron or Steel surfaces, such as Pontoons, Bridges, Roofs, Girders, Tanks, Tubes, Car Trucks, Steel Cars, Ships' Bottoms, Foundations, etc.

*It will fulfil the following conditions:*

Moderate in price.

Great covering capacity.

Possesses great elasticity and tenacity.

Dries quickly and hard with a smooth surface.

Will not crack nor peel off.

Easily applied, does not require heating or melting.

Is sent out ready for use.

Is impervious to rust and moisture from within and without.

Is unaffected by 1 per cent. of boiling caustic water.

Absolutely waterproof, as a coating for foundations of buildings to render them waterproof it has no superior.

Walls coated inside before being plastered will be rendered perfectly damp-proof.

Steel plates coated fifteen years ago still perfectly protected and good.

Steel pontoons coated eighteen years ago still perfectly protected and good.

Fresh water tanks coated ten years ago still perfectly protected and good.

It is also a wonderful preservative of wood whether above or below ground, preventing decay.

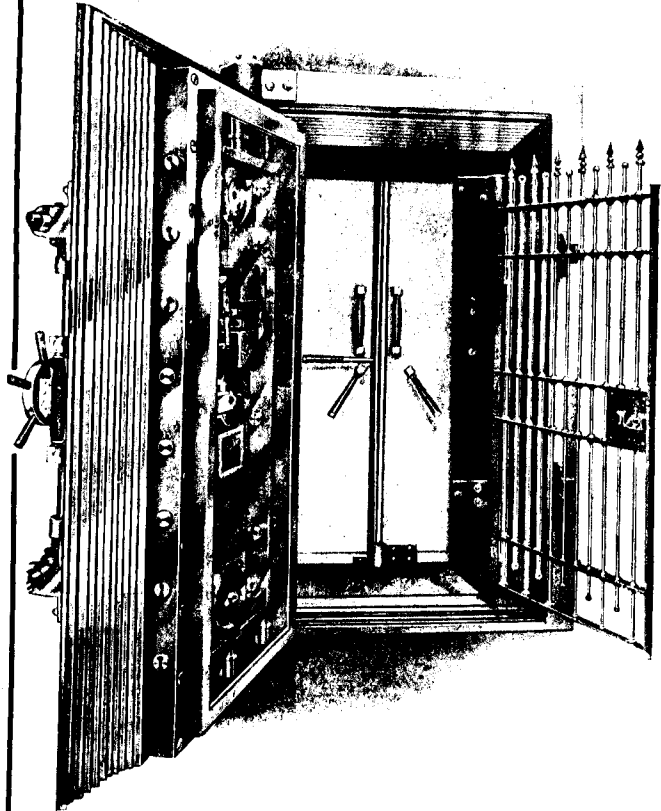
We guarantee it free from rosin and to have a flash point of not under 75° F.

Put up in packages from 1-gallon cans to barrels.

**The Ault & Wiborg  
Co., of Canada, Limited**



Varnish Works  
TORONTO  
MONTREAL WINNIPEG  
Cincinnati Philadelphia  
New York Buffalo  
Chicago Minneapolis  
San Francisco London Paris



Showing Extra Heavy Vault Door, Built and Installed by us for the Head Office of

THE NATIONAL TRUST CO., TORONTO

**Fire-Proof Safes  
Bankers' Safes  
Fire-Proof Vault Doors  
Bankers' Vaults and Vault Doors**

**PRISON CELLS**

**35 Years Experience  
35 Years Without a Loss**

Our Safes and Vaults have stood the severe tests of all of Canada's Great Fires. A record of which we have every reason to feel proud.

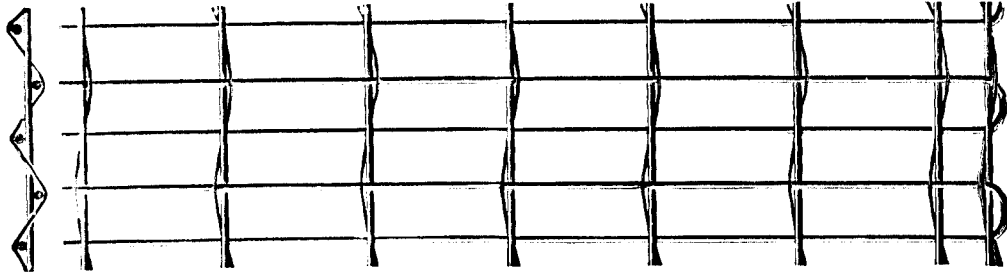
Nothing but the best grade material and expert mechanics are used in the construction of G. & McC. Co.  
**SAFES and VAULTS**

Ask for our Catalogue and Book—  
"Profitable Experience."

The  
**Goldie & McCulloch Co.**  
Limited

Head Office and Works - GALT, ONT., CANADA  
Branches or Agencies in TORONTO, MONTREAL, WINNIPEG,  
VANCOUVER and ST. JOHN, N. B.

# GREENING'S PATENT TRUSSED WIRE LATH



## EASILY APPLIED

The best, cheapest and most satisfactory on the market.

Write for Particulars and Price

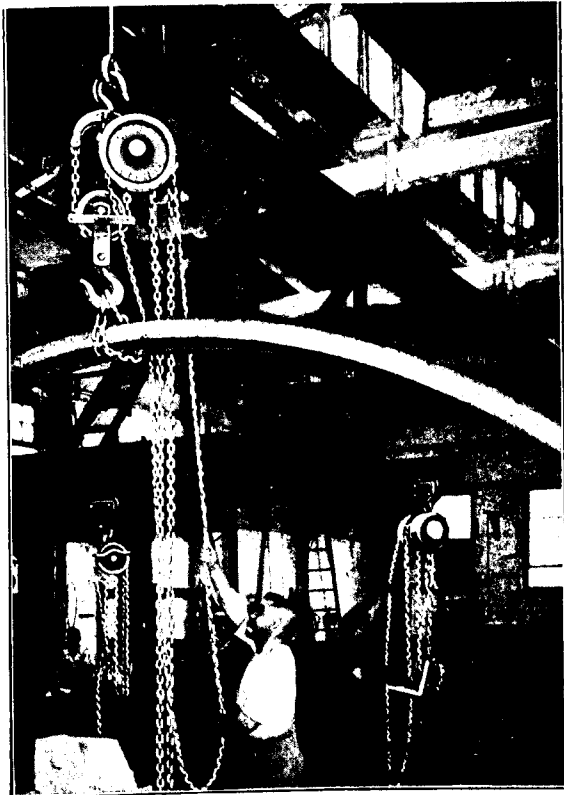
Wire Rope ————— Wire Reinforcing

Manufactured by

# The B. GREENING WIRE CO. Limited

Hamilton, Ont. - Montreal, Que.

## THE TRIPLEX BLOCK



A 4-ton Triplex Block used for handling girders in a steel structural shop in Brooklyn.

Why should weight of material *restrict* output?

WHY shouldn't a workman who handles metal do as much work per hour as a man who handles cork?

Hundreds of industries manufacturing heavy materials are using hoisting machines, and conveying apparatus in connection therewith so efficiently that workmen scarcely realize that the loads they are moving single handed, thousands of pounds every hour of the day, are any more than trifling loads of a few score pounds.

### THE NEW BOOK OF HOISTS

shows such plants in operation and gives tables of efficiency which will help to solve your manufacturing problems. Send for a copy to-day. To-morrow you may be too busy to think of it.

TRIPLEX BLOCKS. 16 sizes: One-fourth of a ton to forty tons. 300 active stocks all over the United States and Canada.

Every Block Tested to 50% Overload.

**The Canadian Fairbanks-Morse Co.**  
LIMITED

Montreal St. John Ottawa Toronto Winnipeg  
Saskatoon Calgary Vancouver Victoria



THE  
CAROLINE COURT  
APARTMENTS

THE "Caroline Court," Vancouver's new apartments, were erected at a cost of \$140,000.

J. P. Matheson & Sons designed this building, which is thoroughly modern in all its appointments.

### Northern Electric Inter-phones

were selected for the inter-communication system.

Write our nearest branch house for full information about Northern Electric Inter-Phones.

**THE Northern Electric**  
AND MANUFACTURING CO. LIMITED

Manufacturer and Distributor of Telephone and Fire Alarm Apparatus and Electrical Supplies for every possible need.

Montreal, Halifax, Toronto,  
Winnipeg, Regina, Calgary,  
Edmonton, Vancouver.

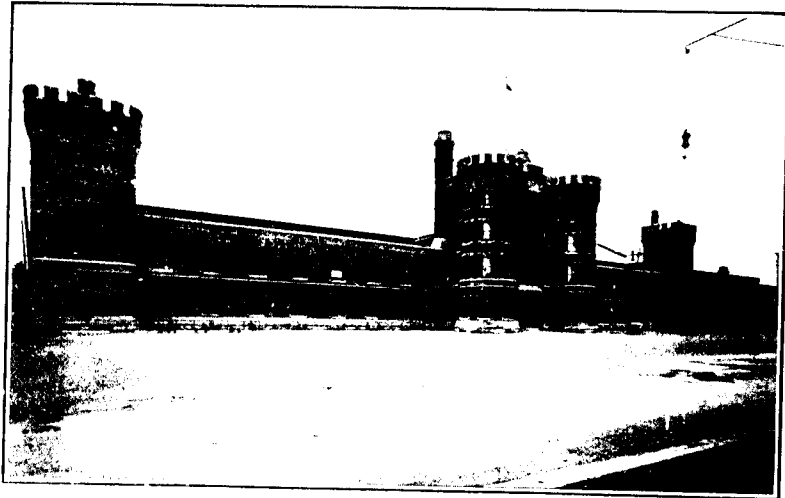
## The Roof that Never fails is the Roof of *ASBESTOSLATE*

Other roofings are sold on the understanding that they may last five, ten, fifteen or even twenty years—but that all this time they will be steadily deteriorating, until at last, reaching their limit, they fail.

Not so with ASBESTOSLATE.

Instead of deteriorating, it actually becomes harder, tougher and more enduring with age and exposure. An ASBESTOSLATE roof 25 years old has just as long an "expectation of life" as has one newly laid.

No building can be too good for a roof of ASBESTOSLATE, for besides being practically



Armory—University Avenue—Toronto. Roofed with Asbestoslate.

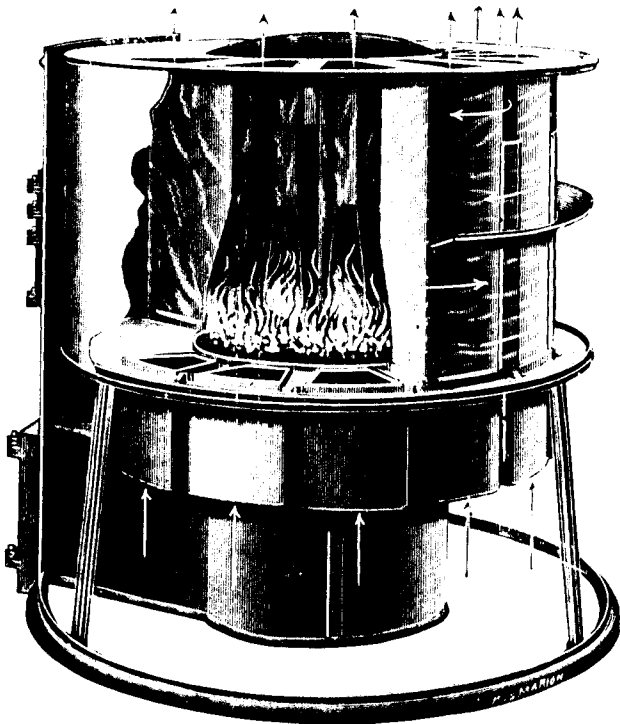
everlasting, it is absolutely fireproof and decidedly artistic. Yet it costs less than natural slate or tile, and but little more than those roofings which must be frequently renewed.

ASBESTOSLATE is made in "shingles" of various sizes and shapes, in Newport Grey, Indian Red and Blue Black. Write for Booklet C.N., giving full information, to

## Asbestos Manufacturing Co. Limited

Address: E. T. Bank Bldg., 263 St. James St., Montreal. Factory at Lachine, P.Q. (near Montreal)





Interior of combustion chamber showing arrangement of hot air columns which gives the Calorific the largest amount of heating surface to each square foot of grate surface ever produced in a warm air heater.

## The Owner Will Appreciate

and be thoroughly satisfied with his heating system if you specify the

# CALORIFIC Warm Air Furnace

Note the extent of fire surface on the hot air columns. Not an ounce of heat energy is wasted. The smoke, gases and direct action of the fire combine to heat the air in the air chambers, causing a constant flow of warm air, and producing an even heat at a small fuel expense.

The Calorific Furnace will save 50 per cent. in coal bills, and is extremely durable, making it an economical furnace to install.

## RECORD FOUNDRY AND MACHINE COMPANY

MONTREAL, P.Q.

MONCTON, N.B.

WINNIPEG, MAN.

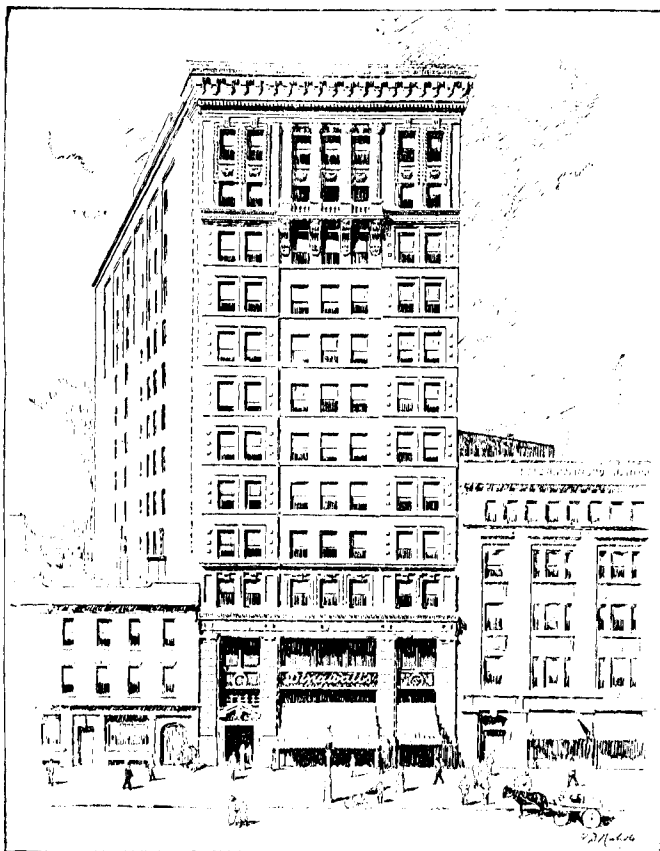


Wrought Iron Gates, Imperial Bank, Hamilton

Manufactured by

## ARCHITECTURAL BRONZE AND IRON WORKS

Canadian Allis-Chalmers, Limited, Head Office, Toronto.



# Across Canada

with the

## IMPERIAL WIRE and CABLE COMPANY, LIMITED

Toronto MONTREAL Winnipeg

Third of a series of advertisements showing buildings of National importance which have been wired with the Imperial Wire and Cable Co's Limited wires.

This picture shows,

### The McArthur Building, Winnipeg

This building was wired with "30% PARA" Rubber Insulated Wire.

Architect . . . . . J. H. G. Russell, Winnipeg  
 Engineer . . . . . Charles L. Pillsbury, Minneapolis, Minn.  
 Electrical Contractors . . . . . Mitchell-Gray Electric Co., Winnipeg.

Address enquiries to nearest office

**MONTREAL TORONTO WINNIPEG**

Enquiries from Alberta and British Columbia may be addressed to Northern Electric & Manufacturing Co., Limited, Calgary and Vancouver.

"ADANAC," "IMPERIAL HIGRADE" and "30% PARA."

# ALWAYS USE Hammer Brand Plaster of Paris

Manufactured for Half a Century

The Standard of Excellence



TRY IT  
 and compare its surface covering capacity with other Brands

Manufactured Solely By

## ALBERT MFG. COMPANY

HILLSBOROUGH, NEW BRUNSWICK, CANADA

Export Agents: THE IMPERIAL EXPORT CO., LIMITED

MELBOURNE:  
 17 Queen St.

SYDNEY:  
 Martin's Chambers, Moore St.

AUCKLAND:  
 34 Fort Street

CHRIST CHURCH:  
 \_\_\_\_\_ St.

# ***Ormsby-Lupton-Steel-Sash***

Rolled Steel—Low Carbon Members  
 All Sections—Solid—One Piece  
 Accuracy in Glass Sizes Guaranteed  
 Muntins Locked Making Joints Inseparable

## **Ormsby-Steel-Partitions Pond Continuous Sash**

MINIMUM COST—MAXIMUM STRENGTH AND LIGHT

# **The A. B. Ormsby Company, Ltd.**

TORONTO

Associated with

WINNIPEG

**THE METAL SHINGLE AND SIDING COMPANY, LIMITED**

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MONTREAL

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AGENTS:

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 Victoria " "  
 Winnipeg " "  
 Calgary " "  
 Saskatoon, Mackenzie & Thayer.

N. Battleford, Mackenzie & Thayer.  
 Edmonton, F. C. Coombs.  
 Regina, Robson Supply Co.  
 Moose Jaw, General Builders Supply Co.  
 Prince Albert, Bowman Supply Co.

Quebec, J. A. Bernard.  
 Ottawa, Canadian Agency & Supply Co.  
 Montreal, Stinson Reeb Builders Supply Co.  
 Halifax, Frank A. Gillis & Company.  
 St. John, J. C. Berrie.

# **24 GAUGE EXPANDED STEEL LATH**

"Galt" Lath is becoming more and more popular. Plasterers are finding out that it takes less mortar, has a better key and is more reasonable in price than any other kind.

WRITE FOR PARTICULARS.

**THE GALT ART METAL CO., Limited**

(DEPT. "A")

**GALT, - ONT.**

## DEFECTIVE ACOUSTICS CORRECTED BY THE J-M METHOD

The methods used by our Acoustical Department in correcting the defective Acoustics in this Parliament Building are based on practical experience gained in solving big acoustical problems throughout the Dominion.

In handling such contracts we are rarely compelled to change general architectural details. Where we have found it necessary to make slight modifications, it has been conceded that the general appearance of such interiors was improved as the result of

## **J-M** ACOUSTICAL TREATMENT

We are prepared to execute contracts for the correction of defective acoustics in all types of buildings by the same scientific method used in this Parliament Building, and guarantee satisfactory results.

No wires, sounding boards or other unsatisfactory makeshifts are used. We employ only the intelligent application of natural laws.

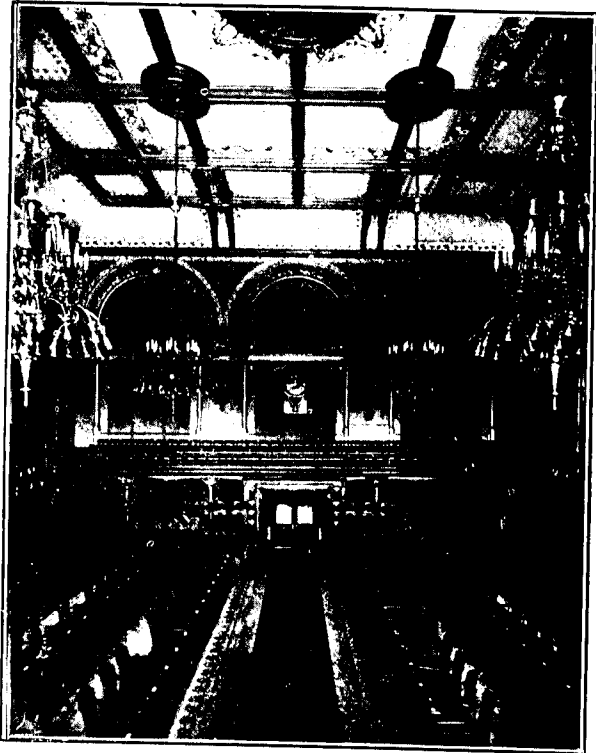
*Write our nearest House for full particulars.*

**THE CANADIAN**

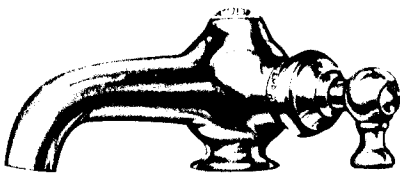
**H. W. JOHNS-MANVILLE CO., Limited**

Manufacturers of Asbestos and Magnesia Products **ASBESTOS** Asbestos Roofings, Packings, Electrical Supplies, Etc.

**TORONTO MONTREAL WINNIPEG VANCOUVER**  
1872



Parliament Building, Toronto, Ont., After J-M Acoustical Treatment.



This is our china base basin cock which harmonizes perfectly with the modern bath-room finished in porcelain tile and with porcelain fixtures.

It is massive in appearance and is the very thing for Pedestal lavatories.

We make plumbers' brass fixtures of all kinds and for all standard baths and lavatories. If you wish to insure a perfect fit specify

**EMPIRE BRASS GOODS**

## **Empire Manufacturing Co., Limited**

Head Office and Factory - - LONDON, ONTARIO

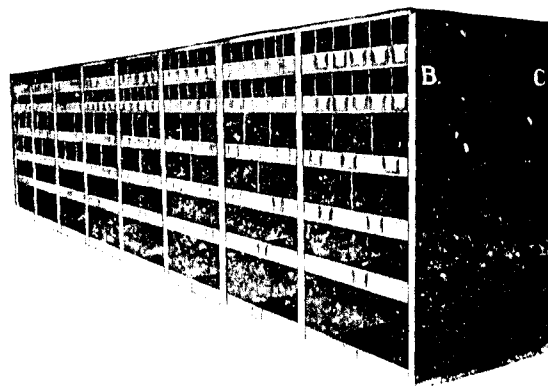
Montreal Office,  
Room 31 C.P.R. Telegraph Bldg.

Winnipeg Office,  
109 Carlton Block, Portage Ave.

# Specify "Dennisteel"

## Dennisteel Lockers

are sanitary---safe---economical in cost and space  
---convenient to install and to rearrange if so desired.



The partitions are solid steel sheets, a much more sanitary method of separating the clothing in adjoining lockers than the ordinary wire or expanded metal. It is also a more durable construction.

The doors may be had in either perforated sheet steel or expanded metal. Each one has three hinges and a *three-way locking device*, with key or combination locks.

## Dennisteel Shelving

Is much stronger, and takes much less room than wood. It is adjustable, and sections can be added as requirements expand. Shelves can be converted into bins by using steel bin shelf attachments. All compartments are furnished with label-holders.

**Dennis Wire & Iron Works Co., Limited**

General Office and Works :

120-130 DUNDAS ST. - - LONDON, ONTARIO



United States Home for Disabled Volunteer Soldiers, Hampton, Va.

250,000 White and Red Brown "American" Enameled Brick used for the interior lining of the various Departments of this Home.

The Ottawa Fireproof Supply Co.,  
514 Sussex St.,  
Ottawa, Canada.

Scott, Hammond & Pratt, Ltd.,  
65-67 Victoria Street,  
Toronto, Canada.

Stinson-Reeb Builders' Supply Company,  
10th Floor Eastern Townships Bank Bldg.  
Montreal, Que., Canada.

### Modern Brick Construction

For this Home the United States Government demanded the highest standard of brick perfection. Even the interior walls of the Hospital Ward (see cut) are built of

### "American" Enameled Brick

to afford a bright, clean and thoroughly sanitary finish.

Write for Fifth Edition Catalog, illustrating the standard sizes, colors and some of the special shapes.

SAMPLES — Miniature or full size, forwarded, all charges prepaid. Prompt attention given formal inquiries.

(See Sweet's Catalog, pages 122 to 131.)

Cadwell Sand & Gravel Co.  
Windsor, Ontario, Canada.

Sackville Hill,  
52 Elgin Street,  
Hamilton, Ont., Canada.

The Waite-Fullerton Co., Ltd.  
402 Builders' Exchange,  
Winnipeg, Man., Canada.

THE  
**LINDE BRITISH  
REFRIGERATION  
COMPANY LIMITED**

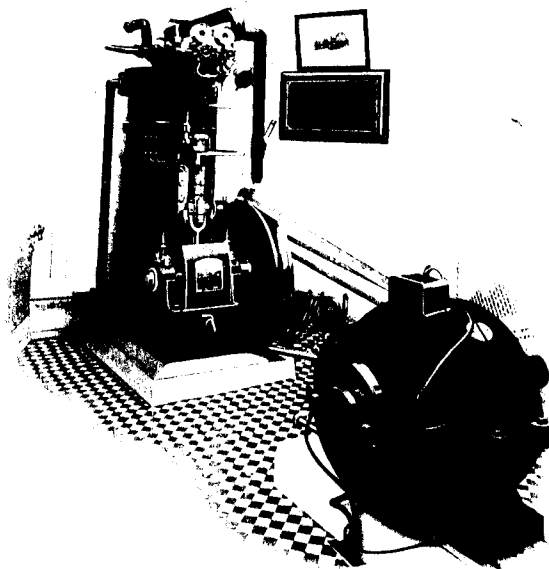
**Carbonic Acid Compression  
"The Modern Method"**

Temperatures as desired.  
Ice-making if required.  
Need only unskilled attention and  
small floor space.  
Clean and absolutely safe.  
Always available.  
Delivery of most sizes from Montreal stock.

The illustration shows the Linde British Carbonic  
Acid Refrigerating Plant as installed in

Hotels	Apartment Houses	Club Houses
Flats	Residences	Hospitals
Butcher Shops	Grocery Stores	
Fish Markets	Restaurants	Dairies

**ESTABLISHED**  
In Great Britain 27 years - In Canada 18 years  
*Has the largest output in the world  
of refrigerating machinery*



CANADIAN OFFICES:  
**CORISTINE BLDG  
MONTREAL**

**SEBCO**

**Expansion  
Bolts and  
Anchors**

They are TIME, LABOR and MONEY  
SAVERS. One can, in a very few minutes,  
fasten any kind of fixture to walls, floors and  
ceilings of brick, stone, concrete, tile or any  
hard substance in which a hole can be drilled.  
The fixture becomes part of the wall itself;  
never to come down unless purposely removed.

**The Bolt**



Sebeco Expansion Bolts are used for heavy work  
such as fastening machinery, metal doors, gratings,  
heavy pipes, etc. Made of malleable iron for use  
with either lag screws or machine bolts.

**The Anchor**



Sebeco Expansion Anchors for fastening light bath-  
room and electrical fixtures, elevator indicators,  
signal lights, chandeliers, mail boxes, sprinkler  
systems, and for work around marble or tile where  
it is imperative that no rust stains shall appear.  
Made of a non-rusting composition metal for use  
with any ordinary wood screw.

377 St. Paul St., Montreal  
28 Toronto St., Toronto  
425 Henry Av., Winnipeg

**STAR EXPANSION BOLTS** J. EDWARD OGDEN  
Canadian Distributor

## From Coast to Coast

**I**N every important centre of population, from Halifax to Vancouver, you will find most of the better class Office Buildings, Banks, Hotels, Apartment Houses, Factories, Printing Plants, Garages, Stores and Warehouses equipped with

# OTIS-FENSOM ELEVATORS

The name has come to be synonymous with efficiency and unfailing service. The sense of security experienced when riding in an Otis-Fensom Passenger elevator is its own best recommendation. The steady, even motion of the car, and the uniform rigidity of the framework, are features of Otis-Fensom engineering which commend themselves to the thoughtful builder and architect.

Otis-Fensom equipments include every type of elevator from the most elaborate of passenger cars to the simplest devices for handling freight.

Correspondence is invited from Architects and Engineers.

# OTIS-FENSOM ELEVATOR COMPANY LIMITED

Head Office:  
50 Bay St., TORONTO

Works:  
HAMILTON, ONT

# Ideal Drinking Fountains

are made in designs and sizes for every use. They are constructed to withstand the abuse that a public fixture usually encounters and their snowy enameled surfaces will last a lifetime. We manufacture the most complete line of Drinking Fountains ever offered to the trade and they are fully described and illustrated in a NEW CATALOG which will be sent upon request

MADE IN 167 DESIGNS AND SIZES

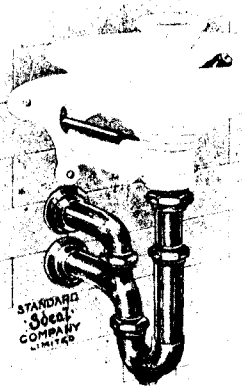


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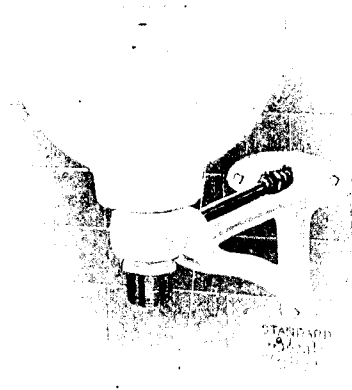


Plate F 3305



Plate F 3013



Plate F 3025



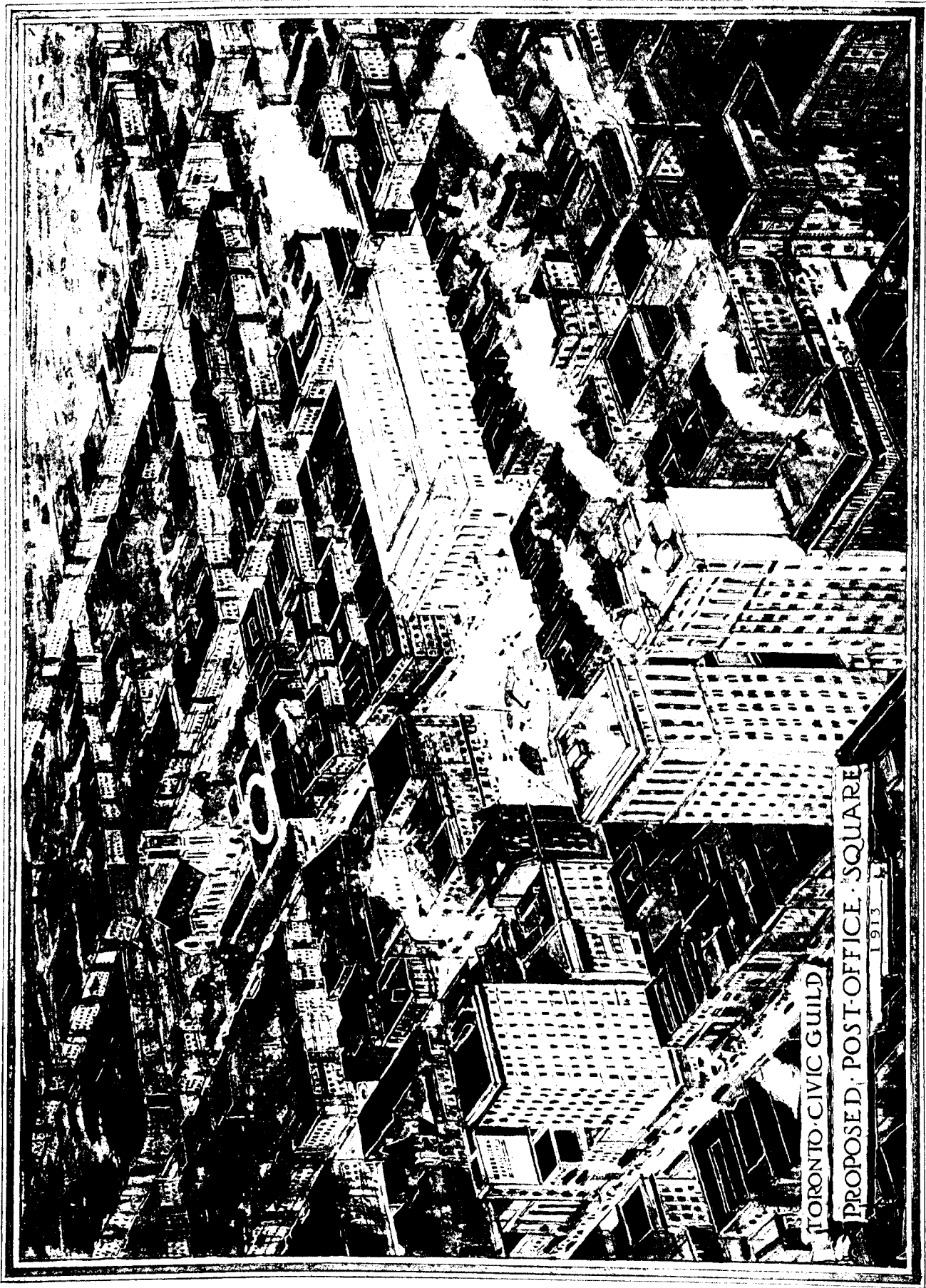
Plate F 3055

*The Standard Ideal Company Ltd*

General Offices and Factories:  
PORT HOPE, CANADA

Branch Offices and Showrooms: Montreal, Toronto, Winnipeg, Vancouver





DRAWN BY CHARLES S. COBB, ARCHITECT.



CHATEAU DE CHAUMONT, FRANCE.  
PHOTO BY F. R. MAJOR.

# CONSTRUCTION

VOL. VI

No. 12

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H. GAGNIER, Limited, Publishers  
GRAPHIC ARTS BUILDING, TORONTO, CANADA

BRANCH OFFICES :

MONTREAL

WINNIPEG

CHICAGO

NEW YORK



STREET SCENE IN LOCHES, FRANCE.  
PHOTO BY F. R. MAJOR.



**Q** The aim of "Construction" for the year 1914—An endeavor to present the best work in a wholesome and practical manner.

**Q** The commendable work of the Toronto Housing Company—Plans accomplished and general results from an esthetic and social standpoint.

IN REVIEWING the year of 1913 through all its varying successes and failures, one fact seems to stand forth—the lessons learned through over-investment will make the progress of the coming year greater and place it on a more secure foundation. Already indications point to a gradual return of our illustrious record during 1912. CONSTRUCTION aims to present in an artistic and practical manner the best architecture and engineering problems throughout the provinces, and naturally relies upon the cooperation of each individual interested in a sane and broad development of our various cities and towns. Beginning with the January issue, it will present a number of plate forms dealing with subjects which should prove helpful to every artisan. The policy of showing a building in its entirety will be adhered to, while the examples will cover each type of structure and at the same time depict the character of work being done in all parts of Canada. The best designs executed in other countries will be shown from time to time in order that we may keep in touch with the class of work as well as the men who are responsible for the future progress of art. Prominent men in the profession are preparing for CONSTRUCTION articles dealing with the living questions of the day, matters with which they are thoroughly acquainted and which are vital to the sane progress of our artistic ideals. The house will take a prominent place in CONSTRUCTION for 1914. This type of building has been sadly neglected during the past year, while so much excellent work has been done in that direction. The territory covered will represent the architects from Quebec to Vancouver. Government buildings, schools, commercial structures, hospitals, art galleries, churches, apartments, etc., will also be thoroughly illustrated. Civic planning will be seriously considered, and several schemes for Canadian cities are to be shown in connection with the author's description of same. Space will not permit of further detailed information, but with the hearty commendation and assistance of each person concerned we will endeavor to present all the best work, thoroughly and practically, and with a dignity, we trust, which will command the admiration of our readers as well as foreign contemporaries.

THE HOUSING of workingmen, who rely upon a moderate wage for the maintenance of their family, is a problem which confronts the authorities of every city. In Ontario the Government considered the question as a Provincial matter and passed a bill presented by the Hon. Mr. Hanna which was drafted in conjunction with others most prominent in the housing movement. This measure opened the way for each city, enabling them to act with the Government in the solution of providing comfortable and artistic homes for the poor. The city of Toronto felt the need and appointed a committee from which resulted the authorization of a company to whom the city council voted bonds to the amount of \$850,000 on the basis that \$150,000 be provided by said company. With a capitalization of \$1,000,000 the first step was to prepare plans for five acres of land fronting Logan avenue. The scheme involved an expenditure of \$400,000 and resulted in the housing of two hundred families. The second development of the Housing Company is located near Riverdale Park, comprising two thousand feet of street frontage. The buildings will accommodate one hundred and eighteen families; cost approximately \$500,000, and include a private plant for the ample provision of heat and hot water. One of the schemes has quite an English character, the homes surrounding a central court. These houses have a minimum rental of twelve dollars a month, which covers the cost of upkeep, taxes, insurance, interest on bonds, interest on shareholders' capital, and which provides a sinking fund to retire all bonds in forty years. The work of the company is highly commendable and will result in the betterment of localities wherein the homes are built. The children are provided with ample playgrounds, while gardens are arranged for flowers, vines and terraces. As stated at the laying of the corner stone of the second building development, it is not an undertaking of philanthropic motives but one of social justice. Times and conditions have forced us to provide for the needs of those who are alive to the real sense of living and who are unable to meet the exorbitant increase in rentals, etc. The object of the Housing Company is to make it possible for the working man to live comfortably and at

the same time give his family the opportunities for education and wholesome pleasures. It is a business proposition and will do considerable to eliminate the evolution of slums in our cities. Give the conscientious working man a chance to better his conditions and he will in time bring about a condition which in itself will enhance the esthetic appearance of the city as well as the moral status of the community wherein he lives.

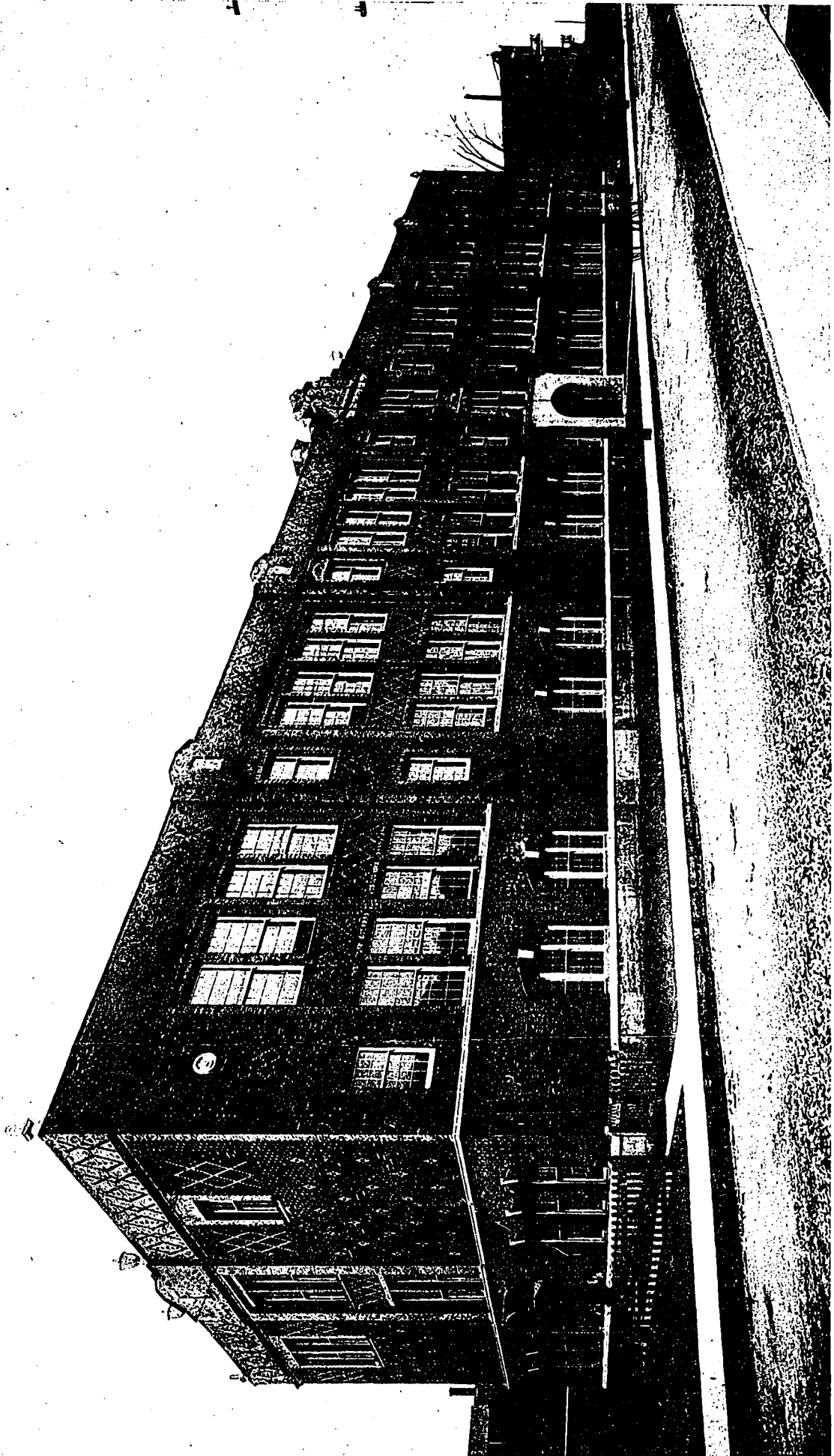
**Tremendous fire loss of forests through railways—Action already taken and need for more stringent laws—Value of re-forestation.**

DURING THE YEAR 1912 there were over two hundred fires started within three hundred feet of railway lines subject to the jurisdiction of the Board of Railway Commissioners for Canada in British Columbia, Alberta, Saskatchewan and Manitoba. Of this number one hundred and sixty-four were caused by trains. The loss resulting from eighty fires on the Canadian Pacific line alone was approximately \$65,000. Appreciating the urgent need of definite action the Board in May, 1912, ordered certain regulations for the prevention of fires. Among the various clauses is one which states that every railway subject to the legislative authority of the Parliament of Canada shall cause all locomotive engines to be fitted with an extension smoke-box having the aperture entirely covered with wire mesh. Another provides that capable inspectors shall be stationed at the different terminals, whose work will consist of a thorough examination of all fire-protective appliances and keep a record of each inspection. Still another states that the various companies shall maintain efficient patrol and fire-fighting service from April to November. These, together with numerous other conditions enacted, should assist materially in the preservation of the forests. But they alone have not, nor can they, prevent the big conflagrations until proper jurisdiction is passed which pertains to all railroads. The Government Forestry Branch reports that half of the original forest of Canada has been destroyed by fire; that for every foot of timber utilized seven has been burned, and that at the low estimated value of fifty cents per thousand feet b.m., the timber uselessly ruined by fire would have yielded a direct revenue of more than one billion dollars, to say nothing of the benefits resulting from its utilization. Such statements as these cannot help but awaken the people interested in the country's welfare to the pressing need of more stringent action. As soon as proper means have been employed to eliminate the fires, new forests will be planted. Considerable attention has been paid to the question of ensuring the perpetuation of the forest by old-style methods of lumbering on Government lands, but the phase of forest planting has been seriously neglected. It is quite imperative that the Government take even more stringent action towards the railways and at the same time anticipate the future's need by re-forestation.

**The skyscraper—The mistakes of New York should be a lesson to our Canadian cities in their haste to erect tall structures.**

THE SKYSCRAPER for Canadian cities is universally condemned, and still two are being erected on opposite corners to the C.P.R. building in Toronto. What congestion will occur at the narrow intersection of the two busy streets when the thousands pour from the three structures, is passed over lightly by the exponents of the commercial tower. The abundance of land within a stone's throw of this site, which is practically being wasted for want of thorough up-to-date buildings, is not even considered. To ape the skyward tendencies of New York City seems to rule the ambitions of some few who are powerful enough to force the will of the people's representatives. Toronto might well learn the experience of America's metropolis. In that city the majority of the older buildings remain unimproved at low levels on account of the skyscrapers enticing away their tenants. Such a condition exists in close proximity to many recent tall buildings where may be found abandoned residences, poor tenements, cheap lofts, etc. An example of note in this connection is the Tower building, eleven stories high, flanked on both sides by other structures—44 to 50 Broadway—all of which are to be torn down because they do not possess sufficient tenants to pay for the operating expenses. These buildings are serviceable, but doomed to destruction by the eagerness of people to occupy the more elaborate and self advertised structures. Why shouldn't the adjacent property owners have some rights, some protection not only as concerns the question of rentable values, but also the problem of light and air? The Borough President of New York appointed recently R. P. Bolton to make a scientific study of building construction and cost. Mr. Bolton, in commenting over his report, says: "I have suggested to the commission a limitation of nine times the gross plot area in gross interior floor area. Coupled with a restriction as to cornice heights and permission to build higher only by recession from all sides of the property lines, the access of light and air to street and neighbors would be secured. With the increased high cost of construction, it follows that rentals must be high if a proper return is to be secured, but it is a fact that the mere height of buildings does not bring in commensurate returns. There are actually instances in lower Manhattan where the lower floors of some skyscrapers are unrentable as office space and are rented for storage purposes on account of the insufficient light and air they afford. This is due to the building itself, which has not only robbed its neighboring properties of their share of light, but has robbed itself of its own share of reflected light. The same applies to access of air for ventilation. Had such buildings been constructed with regard to these features a much less height would have been found to produce equal results."

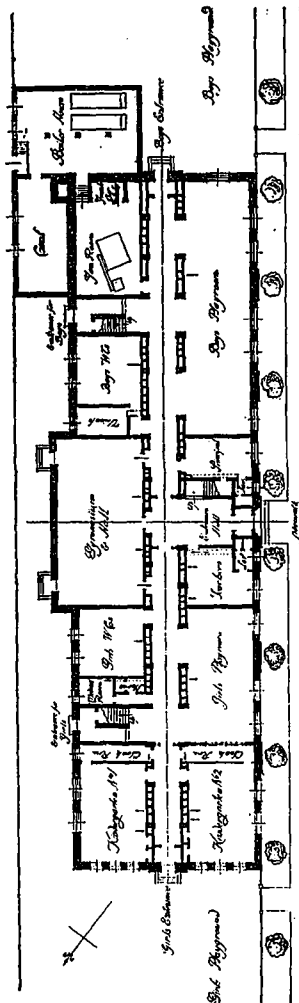
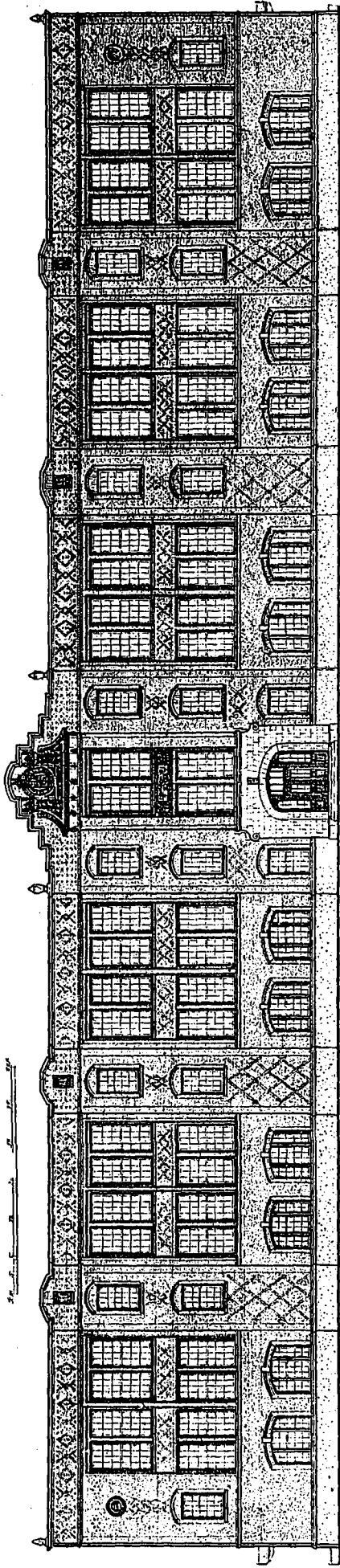
CONSTRUCTION



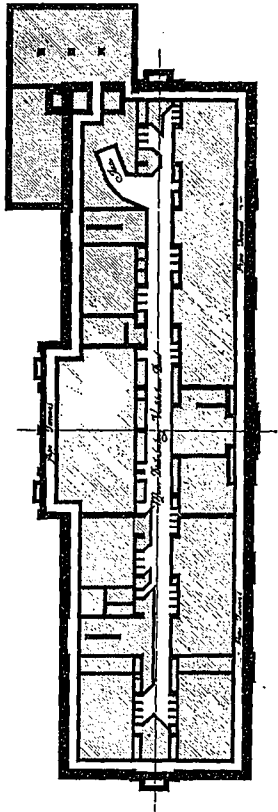
EDWARD VII. SCHOOL, MONTREAL.  
NOBBS & HYDE, ARCHITECTS.

# CONSTRUCTION

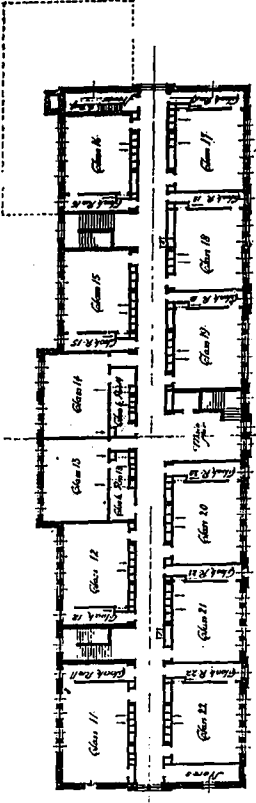
The Edward VII. School, Montreal



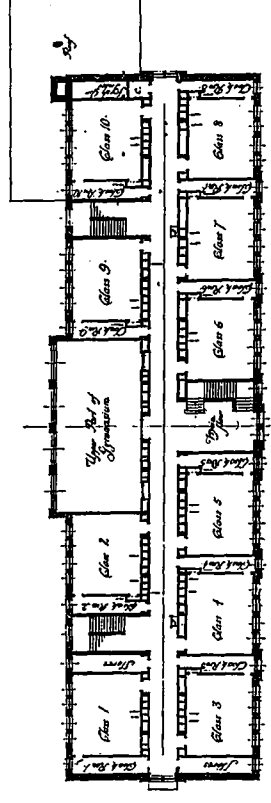
Ground Floor Plan



Main Floor Plan



Upper Part of Gymnasium



Lower Part of Gymnasium

EDWARD VII. SCHOOL, MONTREAL.  
NOBBS & HYDE, ARCHITECTS.



# Three Montreal School Buildings

NOBBS & HYDE, Architects.

THE PROTESTANT Board of School Commissioners of Montreal have been compelled to meet the rapidly increasing demand for school accommodation within their jurisdiction in recent years by enlarging such of the schools as were capable of enlargement and building at the rate of one new school a year besides. This activity in connection with primary education (quite apart from the Board's high school and technical school work) has naturally resulted in very clear and definite views as to accommodation requirements on the part of the experienced officials of the Board. Such matters as the sizes of ordinary class rooms, kindergarten rooms, sloyd rooms, cookery rooms, etc., may be said to have been reduced to an exact science. The cost of land and the cost of building in relation to the funds available impose a rigid, though not a gross, economy in school building in Montreal, and two very desirable elements in the ideal school plan have had to be dispensed with or only partially provided for of late years; firstly, playground accommodation, and secondly, assembly halls. In recent cases, however, the indoor playrooms have been greatly improved in type, while the gymnasium, so arranged as to be capable of use as assembly halls on occasion, provides what is essential in that respect.

When the officials have prepared their schedule of cut and dry accommodation, and the Board has provided the site and the funds and the admonition as to "cost per cubic foot," checked by the "cost per class room provided," the architect is called upon to invent a synthetic solution. In the case of the three schools illustrated the sites were the only variable factors of moment and the only element of accommodation susceptible of much variation was the "coat room."

In the case of the Edward VII. School, the usual and ideal coat room was possible owing to the extreme length of the site.

In the Strathearn School on a costly site which did not admit even of a playground (but happily

situated within a stone's throw of the Mount Royal Park), extra wide corridors flanked with a special sliding front locker device, take the place of the separate coat rooms, saving 20 p.c. of the cubic contents of the class room floors in the school building.

The Peace Centenary School, which is the next to be proceeded with, is fortunately on a very liberal site. The school is of such a size that the well-proved the most economical, the coat rooms in this case being placed on the inside across the corridor from the class rooms. The whole of the external walls are thus available to light class rooms.

Without quoting the standing orders of the Board as to detailed requirements for the various elements of the school plan, a note on the most important element,—the ordinary class room,—may be of interest.

The officials very rightly insist that there shall be no door in the wall behind the teacher, but a blackboard the whole width of the room. Another blackboard is placed on the inner wall (opposite the windows) between the entrance door and the cupboard, if on that wall. The back wall is provided with rails only for diagrams.

The dimensions of the class rooms are, maximum twenty-five by thirty feet, to minimum twenty-four by twenty-eight feet. The height in the cases illustrated is twelve feet ten inches, floor to ceiling. The window sills are three feet high and the glass area is one-sixth of the floor area—a rather excessive requirement.

The school buildings under construction are thoroughly fireproof in their construction. The fuel and

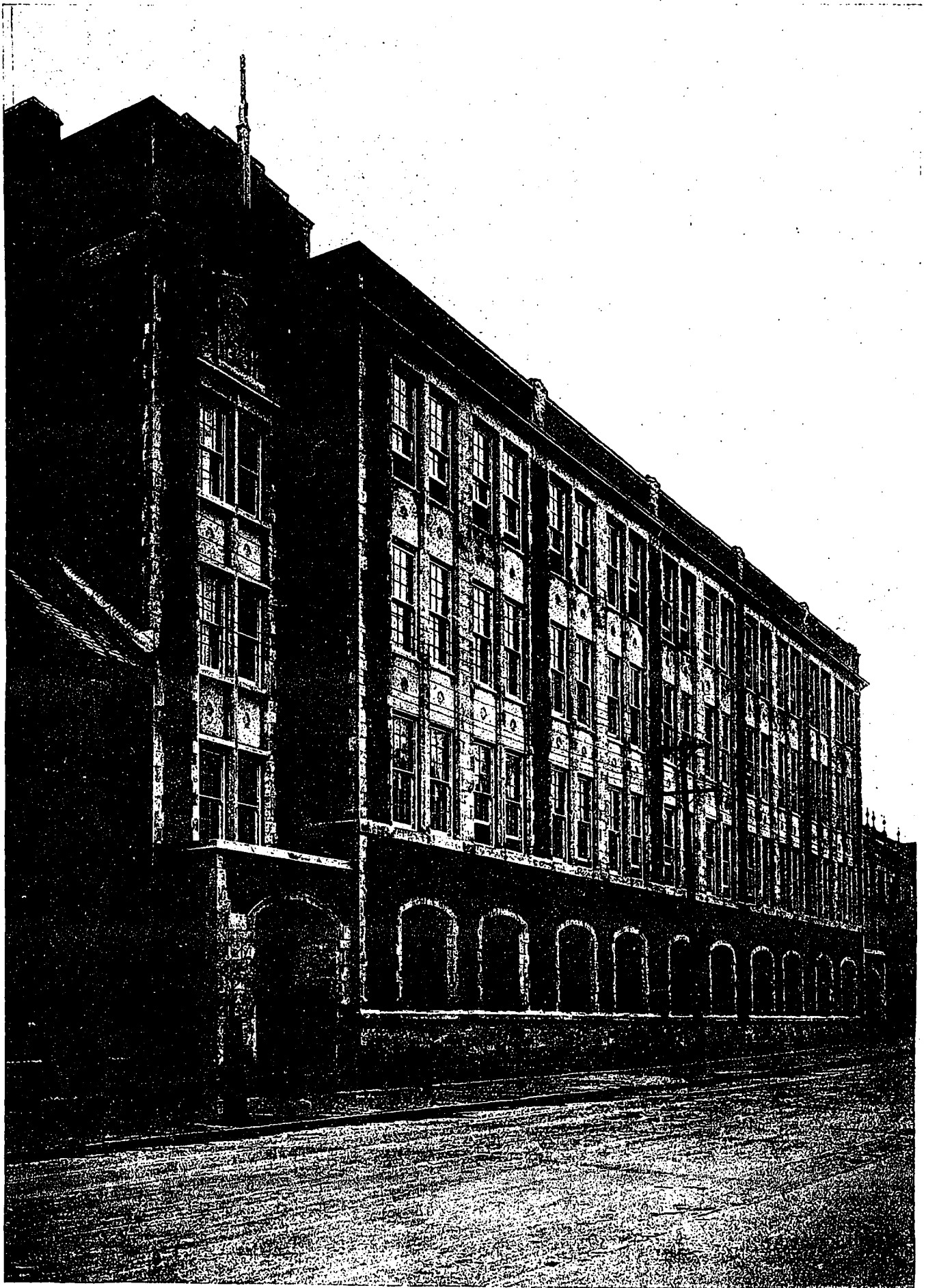
heating apparatus are disconnected as far as possible from the ground floor, from which the stairs lead up. There is no basement, the space below the ground floor being filled in, except for ventilating ducts and pipe tunnels. Where internal concrete staircases can be suitably distributed throughout the building external fire escapes are dispensed with.

The ventilation provided in class rooms is thirty-five cubic feet of air per child per minute, and as the class rooms are seated for from forty to fifty children,



MAIN ENTRANCE, EDWARD VII. SCHOOL.

CONSTRUCTION

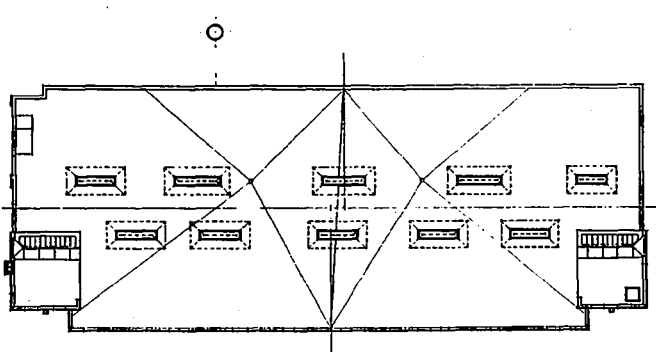
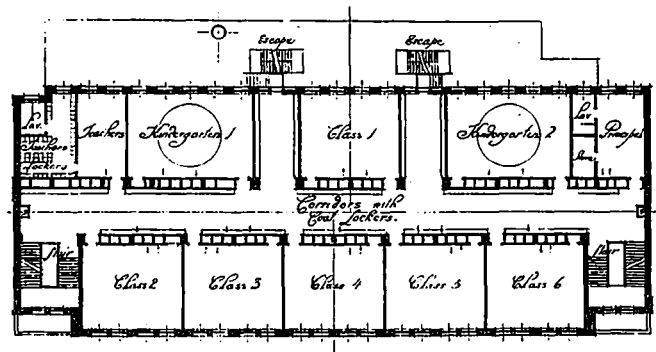
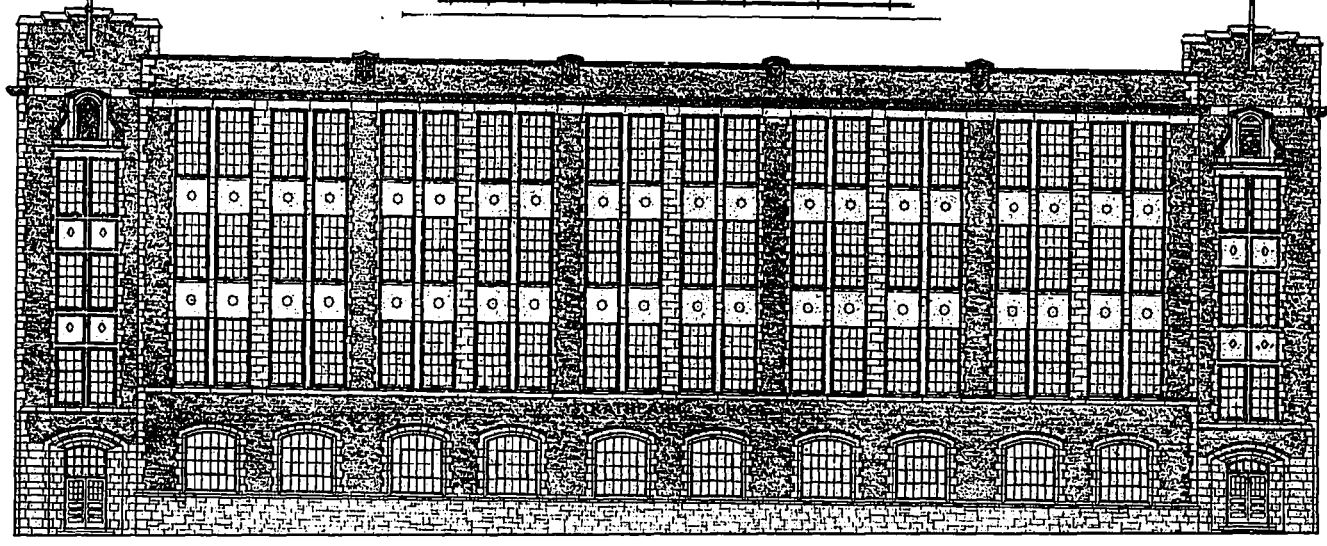
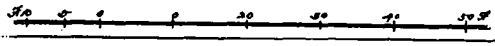


STRATHEARN SCHOOL, MONTREAL.

NOBBS & HYDE, ARCHITECTS.

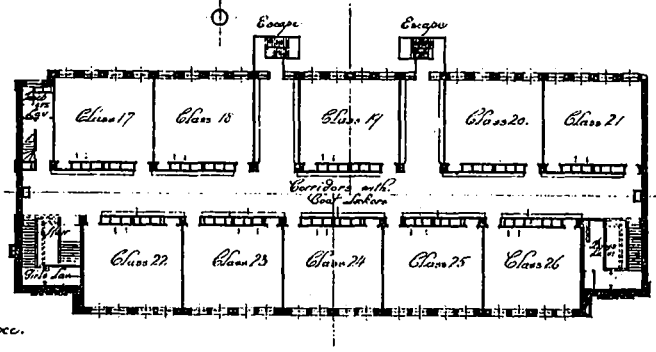
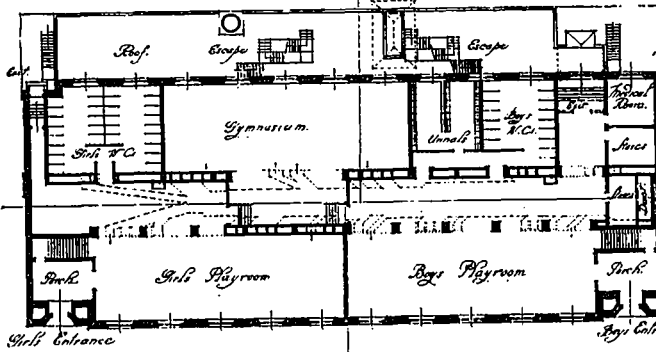
*Strathearn School Montreal*

*Albert Street to Duane Street*



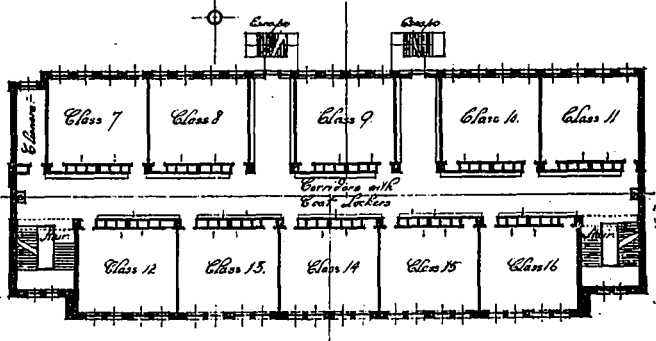
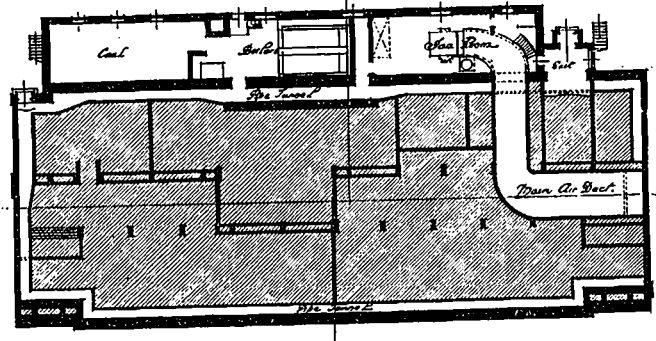
*First Floor Plan*

*Roof Plan*



*Second Floor Plan*

*Third Floor Plan*



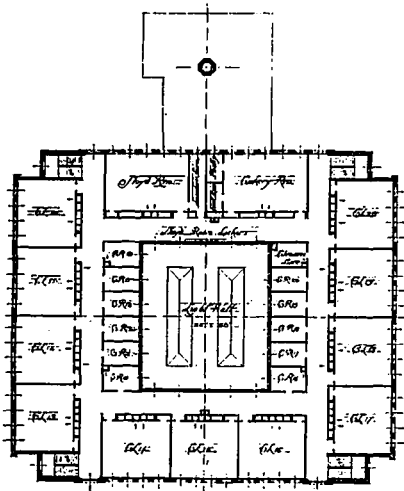
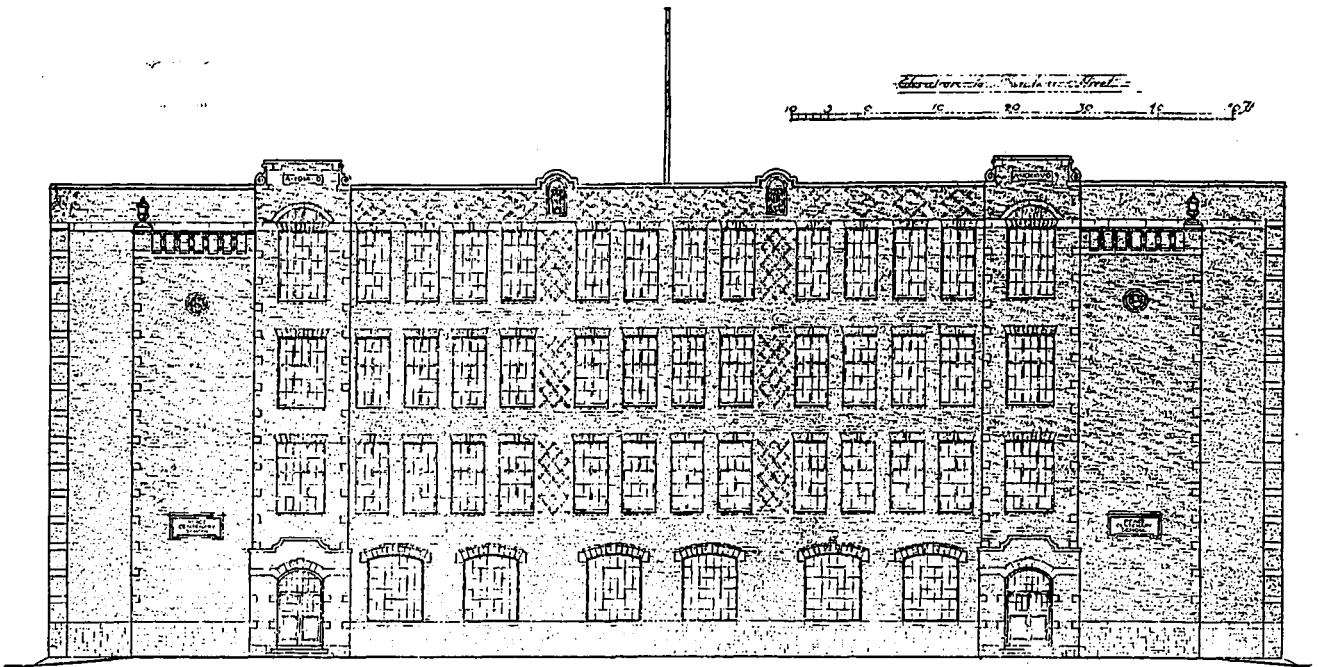
*Foundation Plan*

*Fourth Floor Plan*

STRATHEARN SCHOOL, MONTREAL.  
NOBBS & HYDE, ARCHITECTS.

# CONSTRUCTION

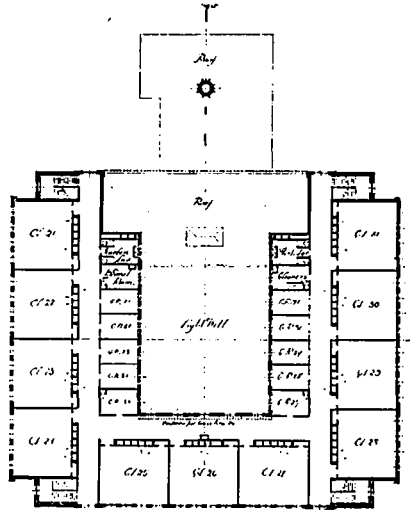
Scale: 1" = 20'-0"



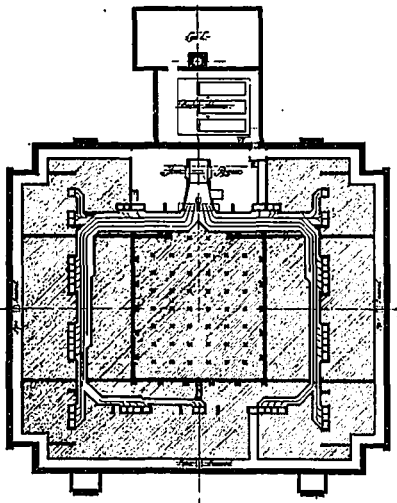
Second Floor Plan

## PEACE CENTENARY SCHOOL, MONTREAL.

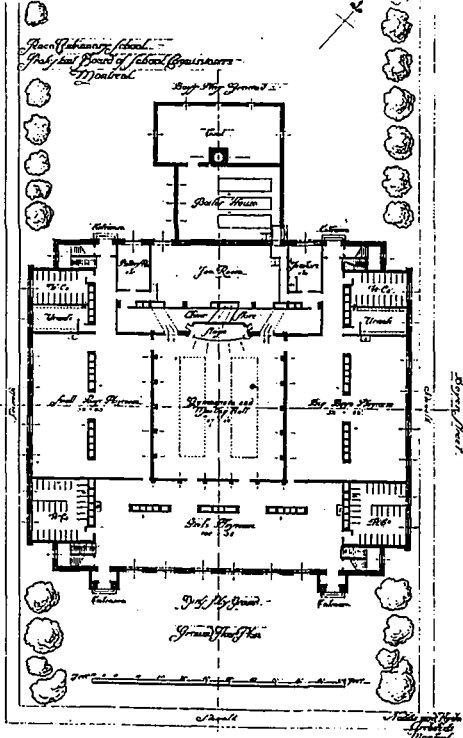
NOBBS & HYDE, ARCHITECTS.

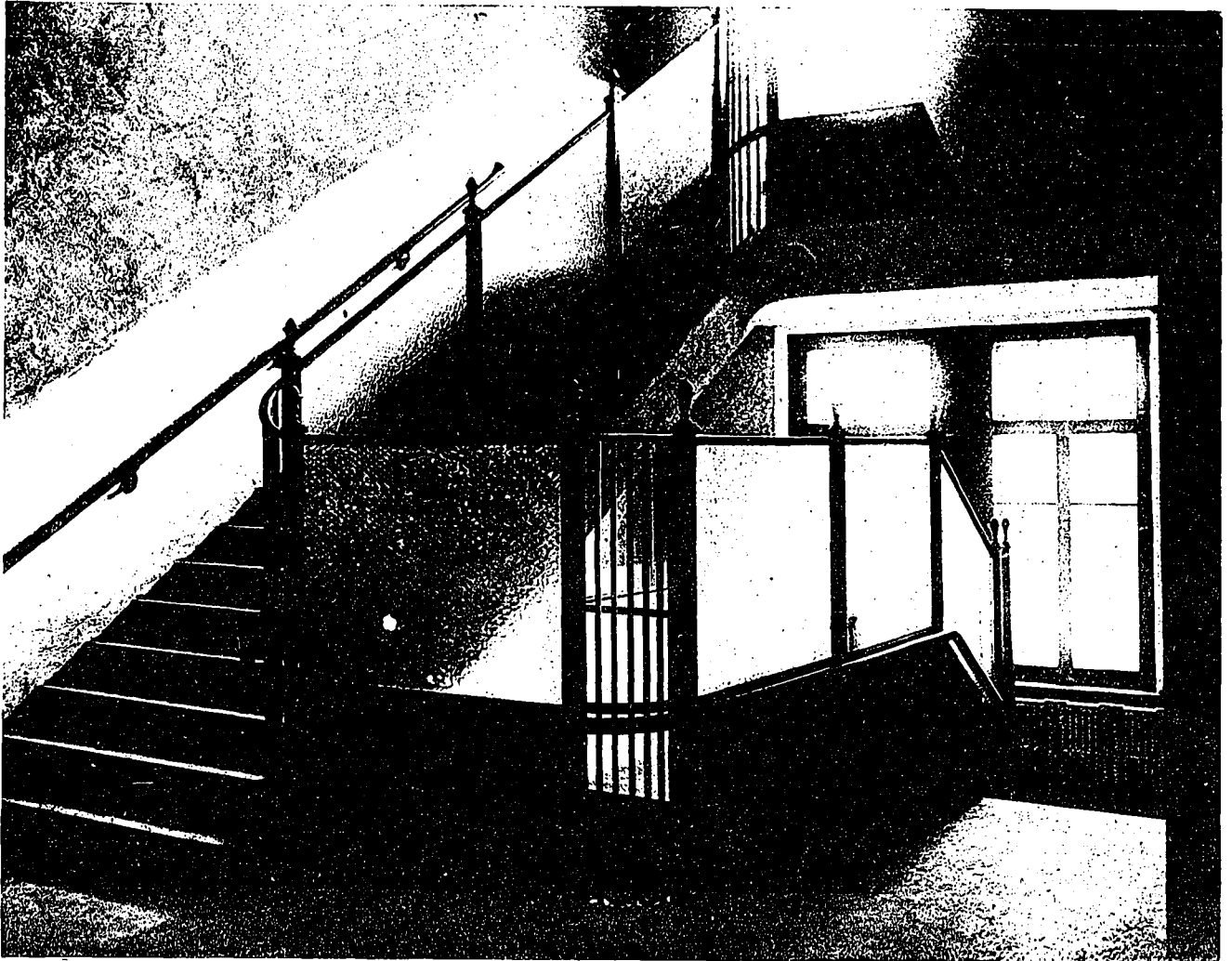


Third Floor Plan



Fourth Floor Plan





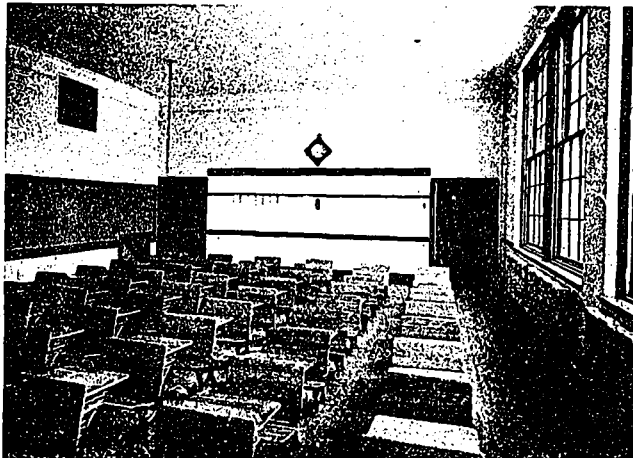
STAIRWAY, STRATHEARN SCHOOL.

that represents between ten and eleven changes per hour. The heating and ventilating of the three schools illustrated has been designed by the Canadian Domestic Engineering Company.

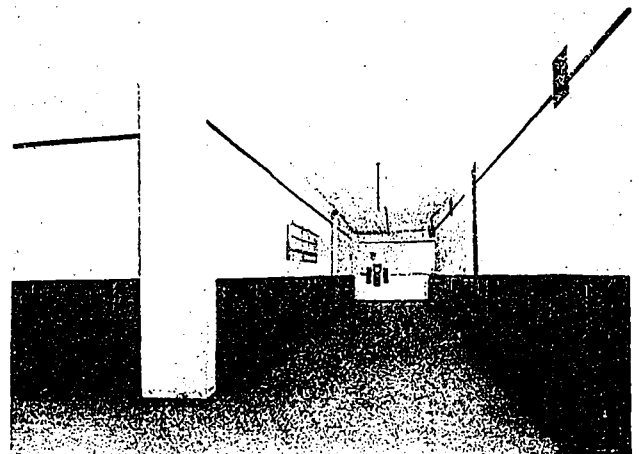
*Comparative Table.*

	Edward VII.	Strathearn.	Peace Cen.
Common classes .....	22	26	31
Kindergarten .....	2	2	2
Sloyd .....	0	0	1
Cookery .....	0	0	1
Total class rooms .....	24	28	35
Boys' playroom area, ft.	3,300	2,700	6,500

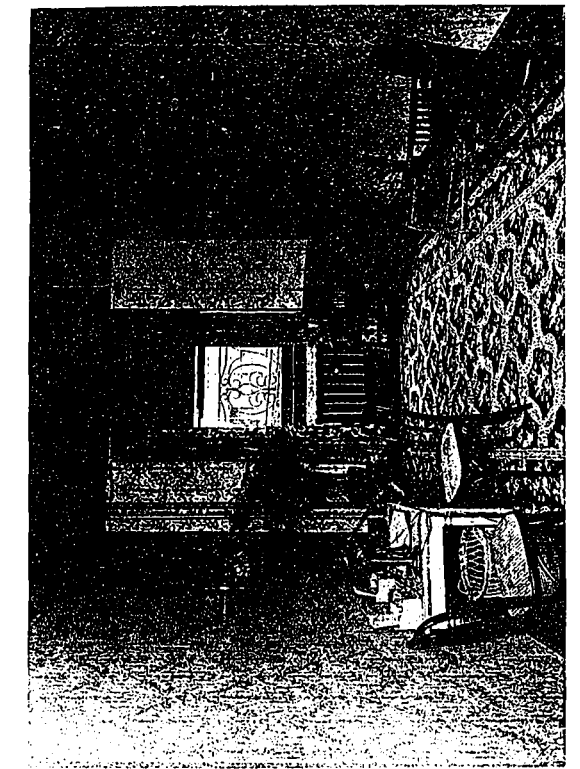
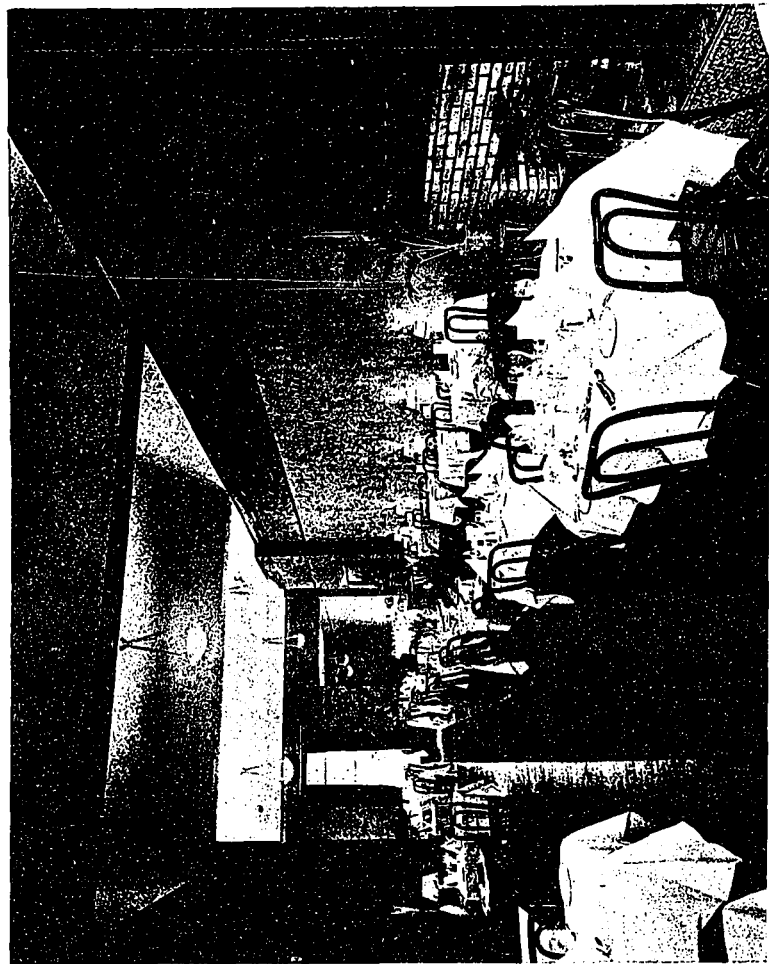
Girls' playroom area, ft.	1,900	2,400	4,000
Gymnasium area, ft. . . .	2,000	2,100	3,600
Boys' urinals .....	18	41	58
Boys' water closets . . .	16	17	36
Girls' water closets . . .	16	31	58
Cubic contents, ft. . . .	931,000	873,000	1,434,000
Cost, general contract . .	\$143,775	\$168,000	\$205,000
Cost, engineering .....	30,550	33,500	45,000
Total cost .....	174,325	201,500	250,000
Cost per cubic foot . . .	19c.	23c.	17½c.
Cost per class room . . .	\$7,280	\$7,150	\$7,143
Number of children . . .	1,000	1,200	1,500
Cost per child .....	\$174	\$167	\$167
Date of completion . . .	Sept., '12	Sept., '13	Sept., '14



CLASS ROOM, EDWARD VII. SCHOOL.



CORRIDOR, STRATHEARN SCHOOL.



BILLIARD PARLOR. DINING ROOM.

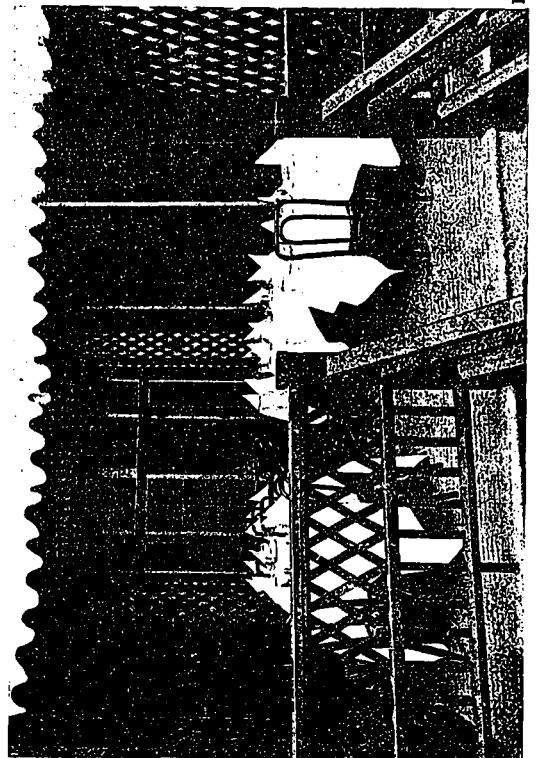
LADIES LOUNGE.



BILLIARD PARLOR.

THE  
 AMERICAN CLUB,  
 TORONTO.

JULES F. WEGMAN,  
 ARCHITECT.



ROOF GARDEN.

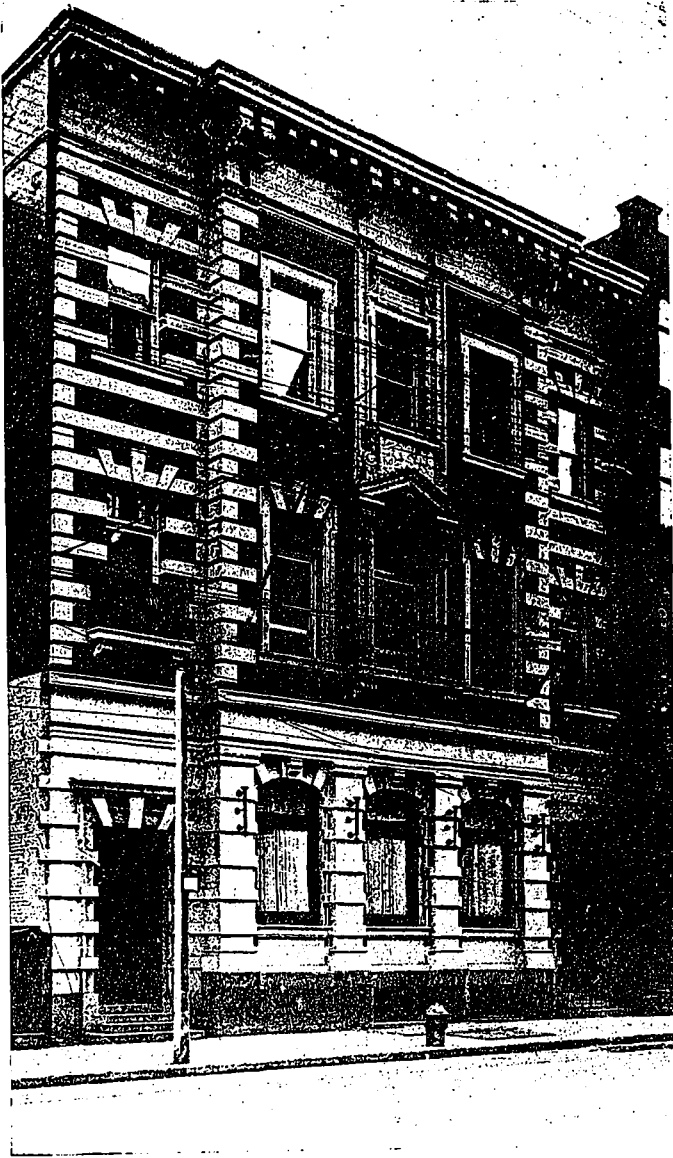
# The American Club, Toronto

JULES F. WEGMAN, Architect.

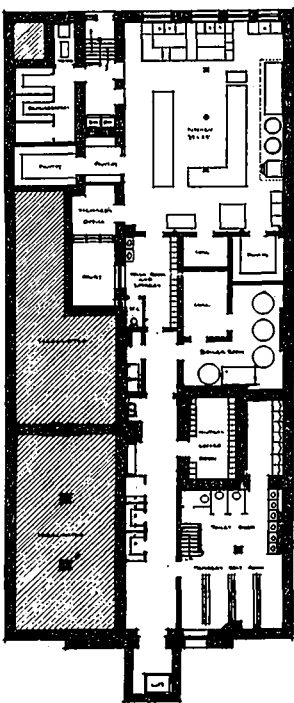
**T**HE AMERICAN CLUB, organized in the fall of 1912, purchased recently the Union Bank building, which is located at nineteen Wellington street. Facing the Ontario Club, it marks the site of another historical spot which has gradually grown into the active commercial life of that vicinity. The original structure was erected in 1858 by Cumberland & Storm, architects, for the Edinburgh Life Assurance Company. From 1874 to 1888 the Federal Bank occupied the premises and were succeeded by the Union Bank. The legal firm of Saunders, Torrance & Kingsmill held offices in the building from the date of occupancy up to last spring. The exterior of the structure was enlarged in 1899 to its present condition.

The building has a frontage of fifty-two feet and a depth of one hundred and twenty feet. It afforded quite an architectural and engineering problem in changing the needs of a banking institution to that of a social club, and its present state reflects considerable credit on the designer, J. F. Wegman, associated with the architectural firm of Darling & Pearson, and Norman A. Hill, the consulting engineer.

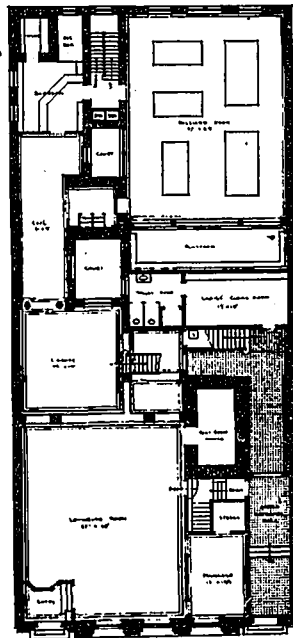
Two entrances furnish access to the ground floor, one leading to the men's lounging room, the other providing a means whereby the ladies can enter their own quarters privately. The lounging room, thirty by fifty-eight feet, takes the place of the old banking room with its decorative ceiling and saucer-shaped dome equipped with innumerable hidden lights. The room is seventeen feet high with walls finished in a brown shade to harmonize with the oak woodwork. In addition to the invisible ceiling lights are brass electric brackets on the walls.



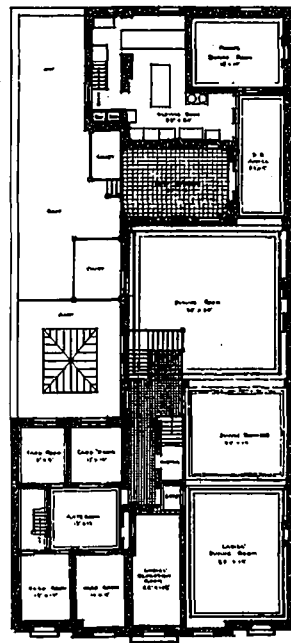
MAIN FACADE OF AMERICAN CLUB.



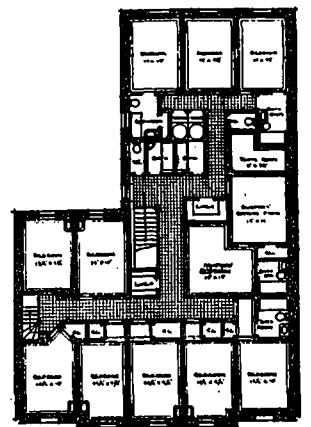
BASEMENT PLAN.



GROUND FLOOR PLAN.

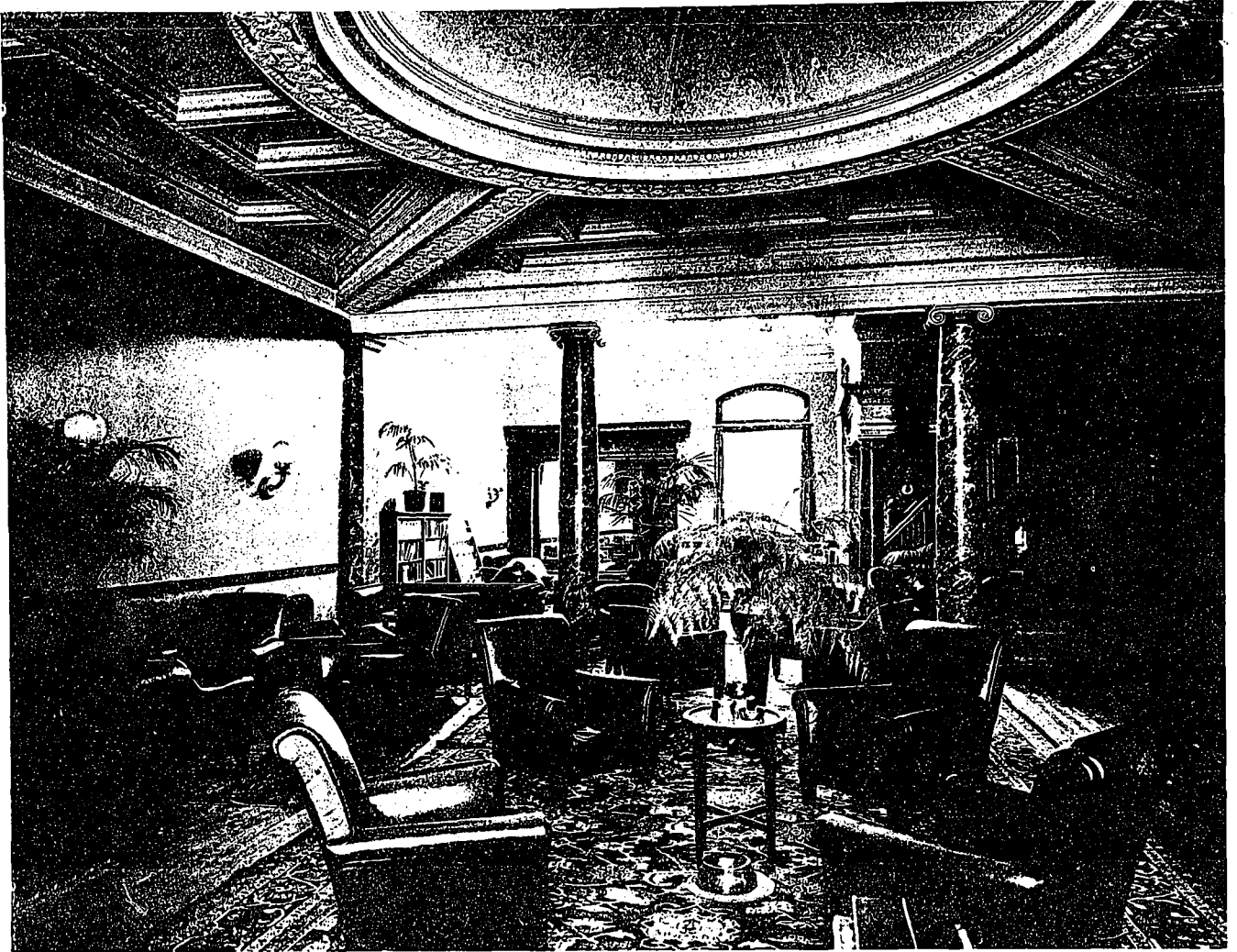


SECOND FLOOR PLAN.

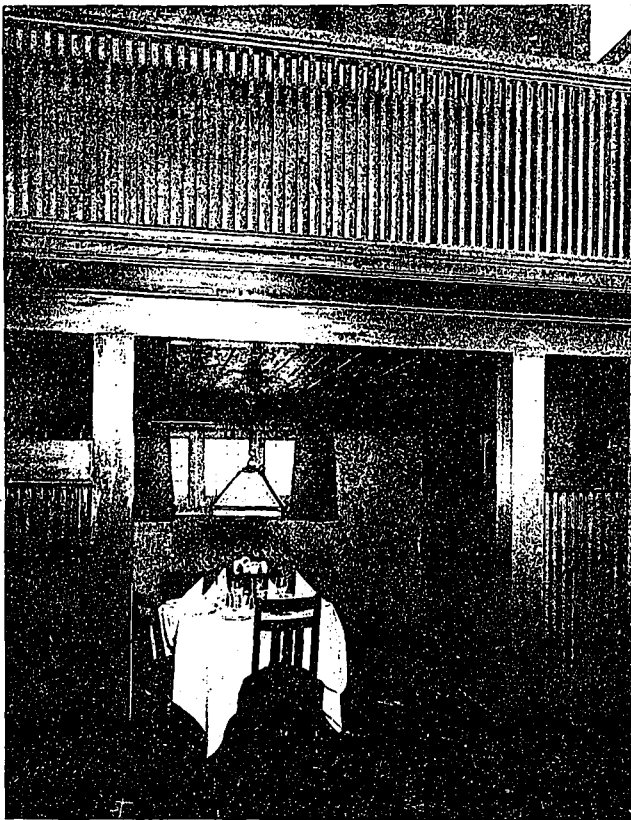


THIRD FLOOR PLAN.

PRESENT LAY-OUT OF AMERICAN CLUB.



LOUNGING ROOM.



PRIVATE DINING BOOTH.

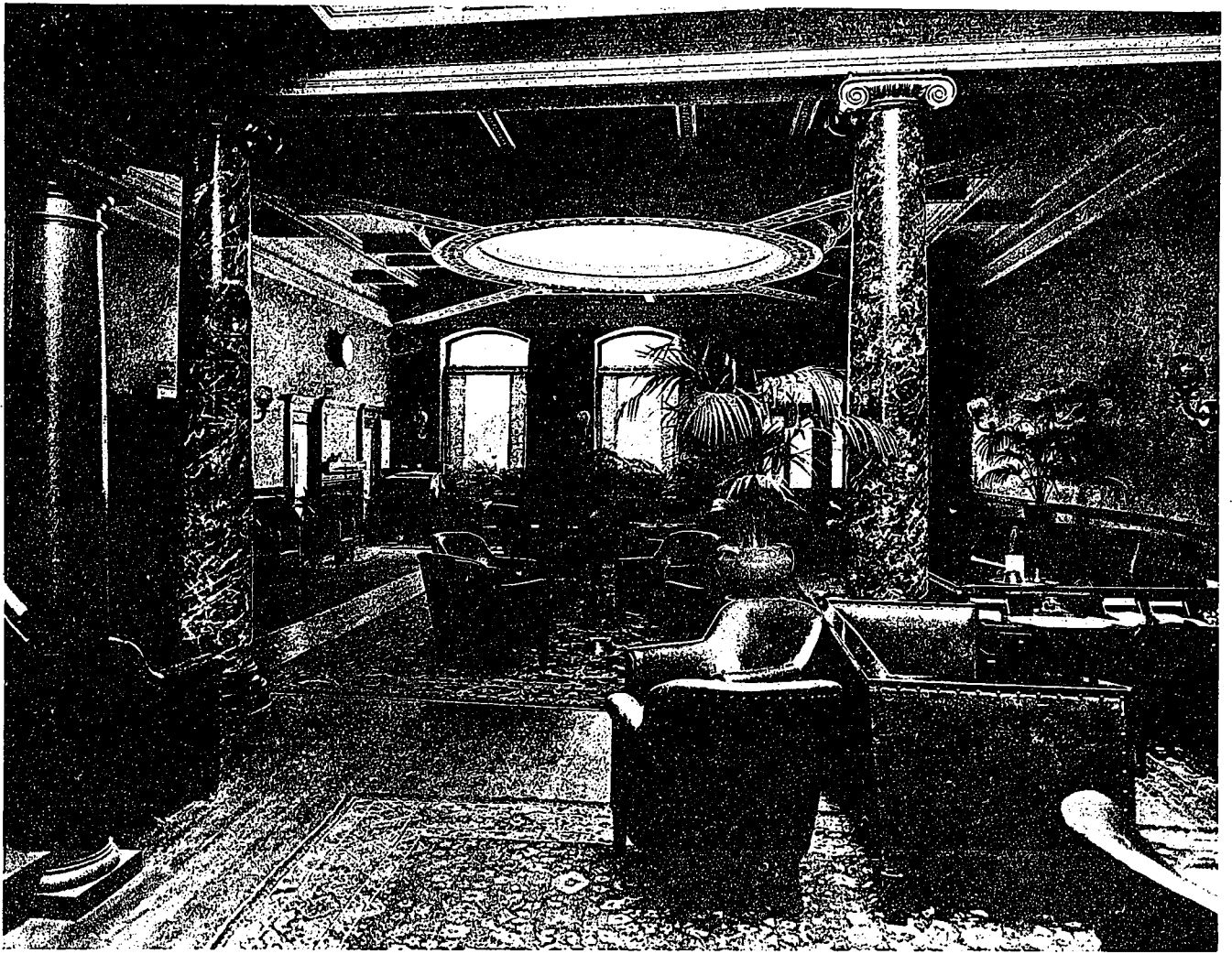
The oak flooring is covered with large Oriental rugs, setting off the big mahogany chairs and davenports upholstered in leather. Palms, tables and heavy raw silk curtains with fish-net lace at the windows lend a welcome atmosphere to the room.

Leading from the lounge is the smoking room, equipped with velveteen portieres, oak tables and chairs, which in turn opens into the billiard room, thirty by fifty feet. This room accommodates five billiard tables and has a raised platform with oak benches for spectators. Nine semi-indirect lighting fixtures of alba glassware finished in brush brass and black are suspended from the ceiling by chains. The walls are covered with painted canvas nine feet high with oak moulding above, while the flooring is of cork matting. Directly off from the billiard parlor is the wine and refrigerator room, containing the oak service bar and compartments extending from the floor to the ceiling.

The ladies' entrance has a floor of red square tiling covered with a runner of rich red carpet; walls of Pompeian red burlap nine feet high surmounted by oak moulding; hanging lights and oak settees. Stairs lead to the main dining-room on the second floor from the ladies' entrance lobby as well as from the lounging room.

The dining-room consists of two divisions thrown into one, seventy-five by thirty feet, with height of





LOUNGING ROOM.

seventeen feet and a seating capacity of one hundred and thirty. By raising the lower portion the floor presents a level surface throughout. The walls are covered with a brown paper of striking texture, nine feet in width, hung horizontally so as to eliminate all need of jointing, above which is a decorative frieze with designs of fruit, etc. This room is made especially attractive by nine electric fixtures of moonstone glassware finished in Roman gold; side draperies of gold Turkanum cloth; lace curtains in point Arab and Oriental rugs. A striking feature is the opening of the stairway originally closed.

Accessible from the main dining-room by French windows is the roof garden, thirteen by twenty feet, built in the old interior court. The floor is of slate, the walls of trellis work painted green. A small flight of stairs leads to the roof of the lounging room, which will permit of future extension to the present roof garden.

The ladies' reception room is finished with Austrian bentwood of art nouveau design finished in satin gray; walls of printed linen in bright floral designs; rug of Queen Anne period with black ground and varied in tones of yellow. Adjoining this room is a suite of four private dining-rooms, ten feet square, with copper colored velveteen draperies and point Arab lace curtains. These rooms surround an ante-room, twelve by thirteen feet, from which a private



SMOKING ROOM.

stair leads to the board room located on a mezzanine floor.

At the rear of the second floor is a private dining-room adjacent to the serving quarters, fully equipped with modern fixtures and possessing two electric dumb waiters running to the basement. Stairs also connect this serving space to the basement, where is planned a thirty by forty foot kitchen whose walls are lined with expanded metal and plaster painted. The flooring consists of concrete covered with rough and finished maple. In addition to the kitchen, equipped with combination coal and gas range, accommodations have been made for the help, locker rooms, toilet rooms, steward's office, bakery equipped with portable oven, store rooms, and boiler rooms.

The third floor has ten bedrooms, private bathrooms, showers, janitor's suite, linen closets, etc. The curtains of these rooms represent the hand block English tinted effect.

The success of club institutions is amazingly rapid and demonstrates clearly the tendency of our Canadian life. Started less than one year ago, the American Club has an active membership of five hundred and a large waiting list. Its aims are purely social and all matters of a political nature are rigidly barred. The majority of the members are citizens of the United States, while a large number of Canadian born are allied to the organization as associate members, which tends to eliminate all unnecessary sectional demonstrations and at the same time foster harmonious relations between the members which cannot help in time to eradicate any bitterness that may exist at present. With the present accommodations and the completion of other features already planned for such as bowling alleys, swimming pool, etc., the club will be thoroughly equipped to provide a suitable home for all members and friends who sympathize with the club spirit.



ORIGINAL FACADE OF PRESENT AMERICAN CLUB.

**I** THINK we all understand the term "Ideal"—an aim or inspiration of the mind—a dream which we may hope to realize. It is probable, however, we are not all so equally agreed as to what is understood by building. In these days building has become a science, rather than an art, and it is of the art of building, rather than of the science of building, I wish to speak. And so it becomes necessary to define art in some way. Well, as you know, a great philosopher—Tolstoi—has written a whole book in answer to the query, What is art? It will be enough for me here to roughly define art as an occupation in which man seeks to satisfy, not only the need of his body, but the desire of his heart.

Nothing is so essential to a building as the quality of truthfulness and reality. Why do we admire so much those fine old structures of half-timber work in old English villages? It is not merely because of their superficial charm, but mainly because we recognize their inherent truth. The whole arrangement of their timbers represents the actual structure of building, and we shall find throughout the same principle.

Everywhere we find function expressing itself in form naturally and inevitably. The creators of these dwellings had not, it is true, our modern advantages of education and research. They knew nothing of Classic temples, or of buildings designed in other lands. They worked out their own local problems in their own way unencumbered by unnecessary knowledge, and so could bring the whole of their unbiassed intelligence to bear on what they had to do. And the essential fact about their work is its unpretentious reality.

It must also never be forgotten that all the old work we admire so much was new once, and when it first appeared it must have been as startling in its novelty as any of the products of the "New Art" of our day. What a marvellous innovation must have seemed that first creation of the delicate beauty of Early Gothic art, when compared with the clumsy, rude, barbaric Norman work! And art, if it is alive, must always so change and develop; for in the continual flux of human affairs, to stand still is to fossilize and decay.—*Scott.*

# Proposed Registry Office, Toronto

THREE PREMIATED DESIGNS

THE ACCOMPANYING illustrations show the three premiated designs accepted in the competition for a Registry Office, Toronto. Held under the promotion of the municipal corporation and open to Canadian architects, a large number of schemes were presented, representing the skill of prominent firms located in all parts of the Dominion. The Board of Assessors consisted of Arthur R. Demison, Professor Wright of Toronto University, and R. H. Bowes. The first prize was awarded to Charles S. Cobb; second prize to Chapman & McGiffin; third prize to Symons & Rae, all of whom are located in Toronto. A brief description is given by each contestant, stating the main ideas they kept in mind while evolving their final solution to the problem.

## *First Prize, by C. S. Cobb.*

The requirements of this building are peculiar in that there is to be housed under one roof duplicate organizations similar in every respect, one for the registry division east of Spadina avenue and the other for that west of Spadina avenue. As stipulated in the program, it was thought desirable to face the building toward the south, so that the conditions required a structure symmetrical about a centre axis running north and south, and the design placed first

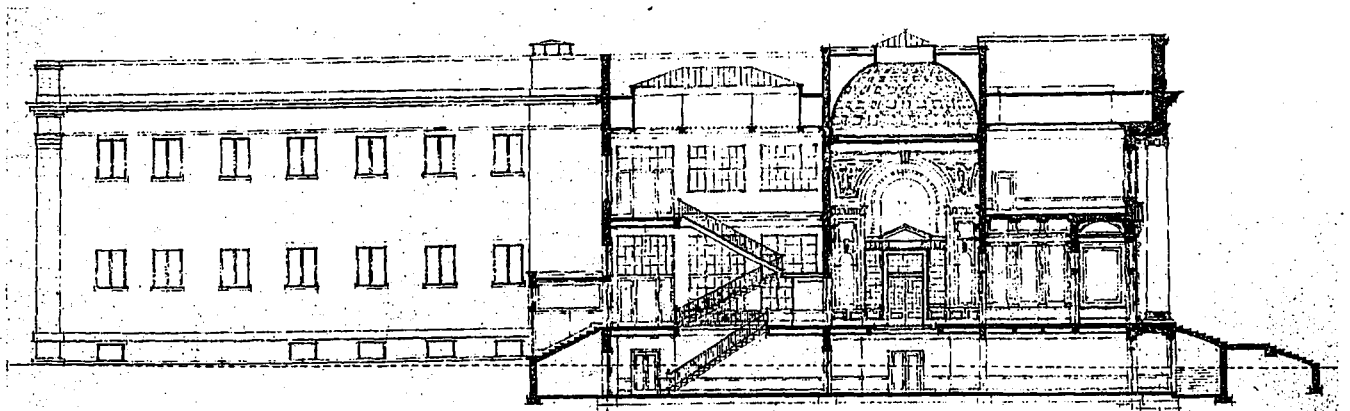
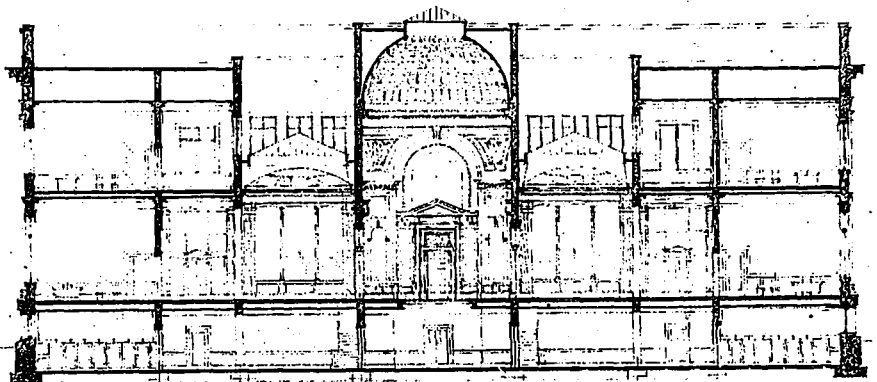
is a direct solution of these requirements of plan. The design, however, has one major feature which peculiarly enough was overlooked by most of the competitors in the competition, and that is a well marked separate entrance for the clerical staff, which allows them access to the building during hours when it is closed to the public; and thus obviates troublesome interference. The searching office has light and natural ventilation on all three sides.

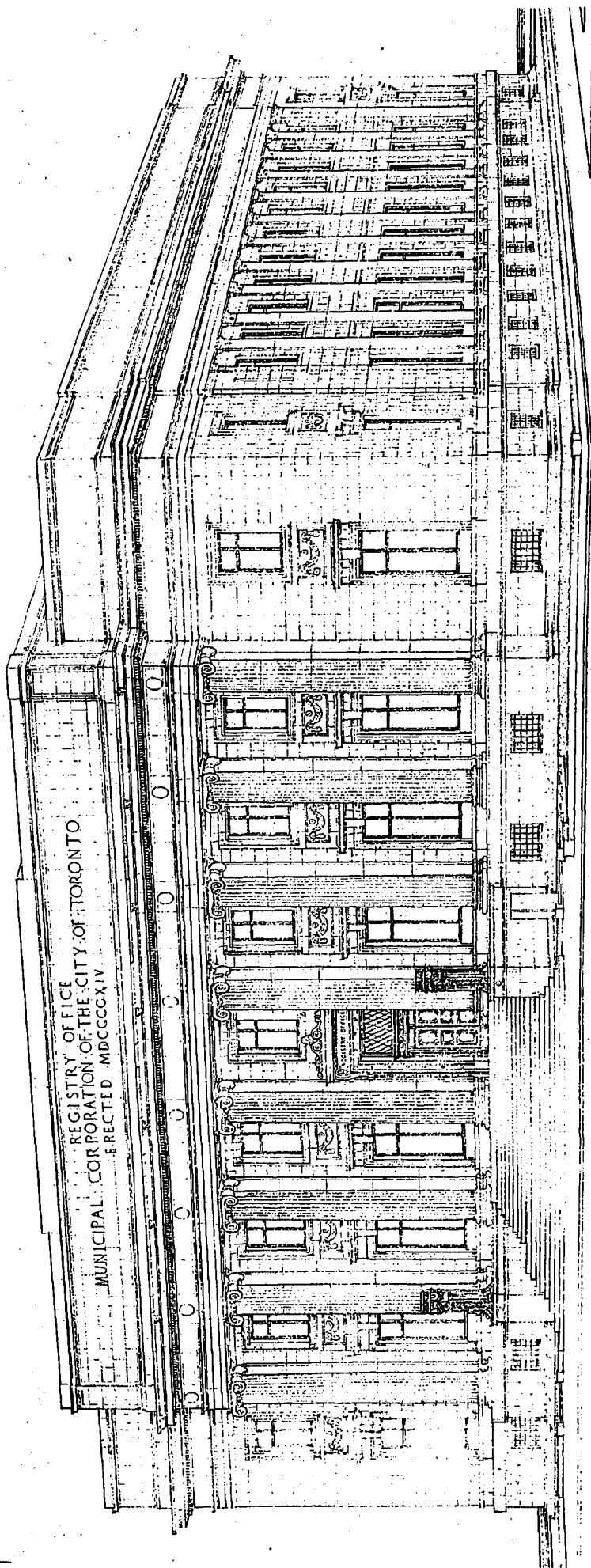
The elevation on Albert street is a Roman octo-style portico, while the lateral façades on Elizabeth and Chestnut streets are treated in a simple way with ten pilasters, embracing with their corner piers the entire length of these elevations.

## *Second Prize, by Chapman & McGiffin.*

In studying the plans it will be observed that an effort was made to arrange the two registry divisions in order that each in itself would form a complete unit and at the same time be most accessible to each other for purposes of administration as well as to the general public. Two main entrances lead to the large public space, extending up two stories in height, around which are grouped the two tiers of minor registry offices. Directly opposite the entrances is the administrative counter, the extension of which divides the searching divisions and permits of ample

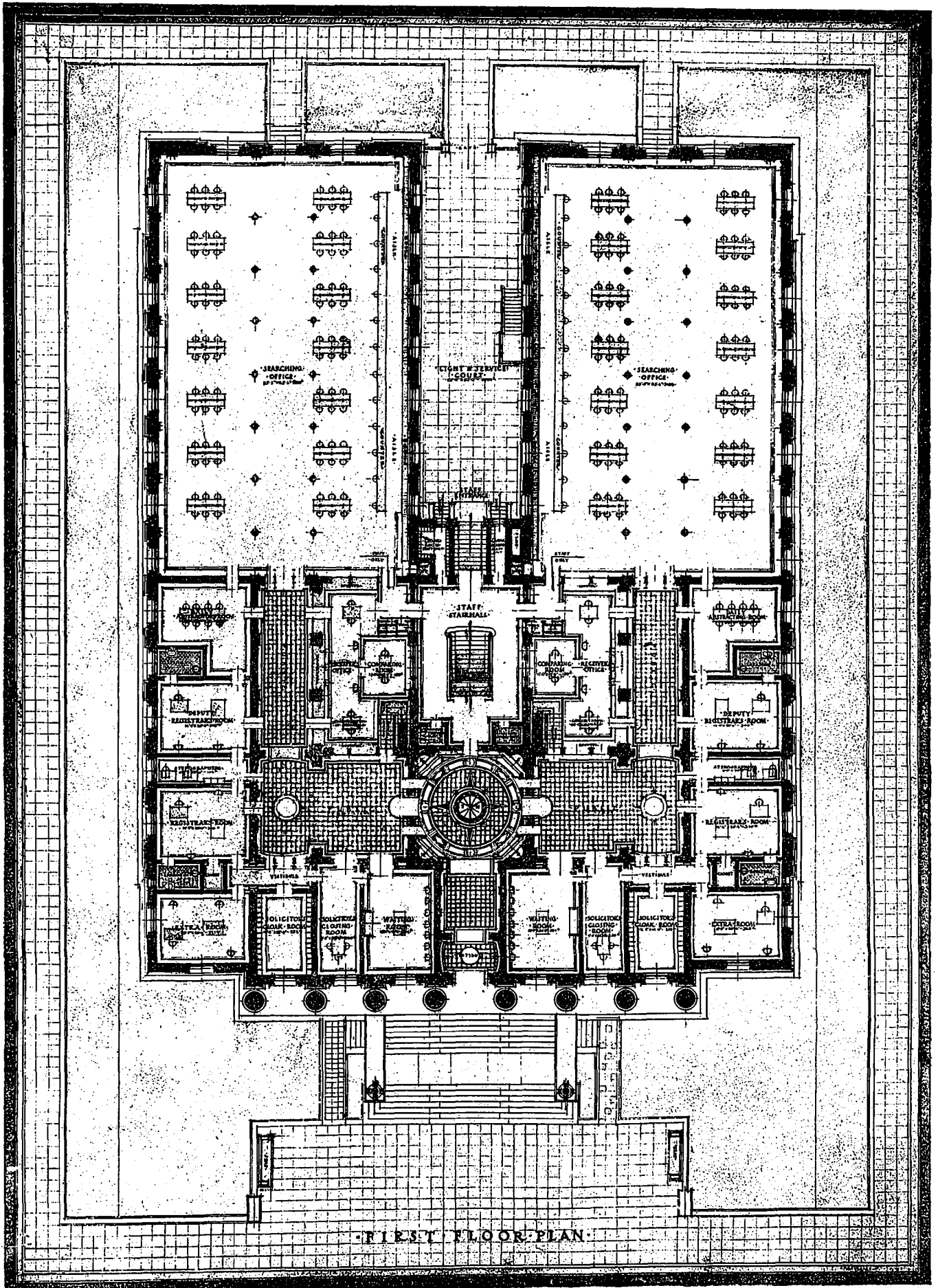
TRANSVERSE AND  
LONGITUDINAL  
SECTIONS,  
FIRST PRIZE  
DESIGN.



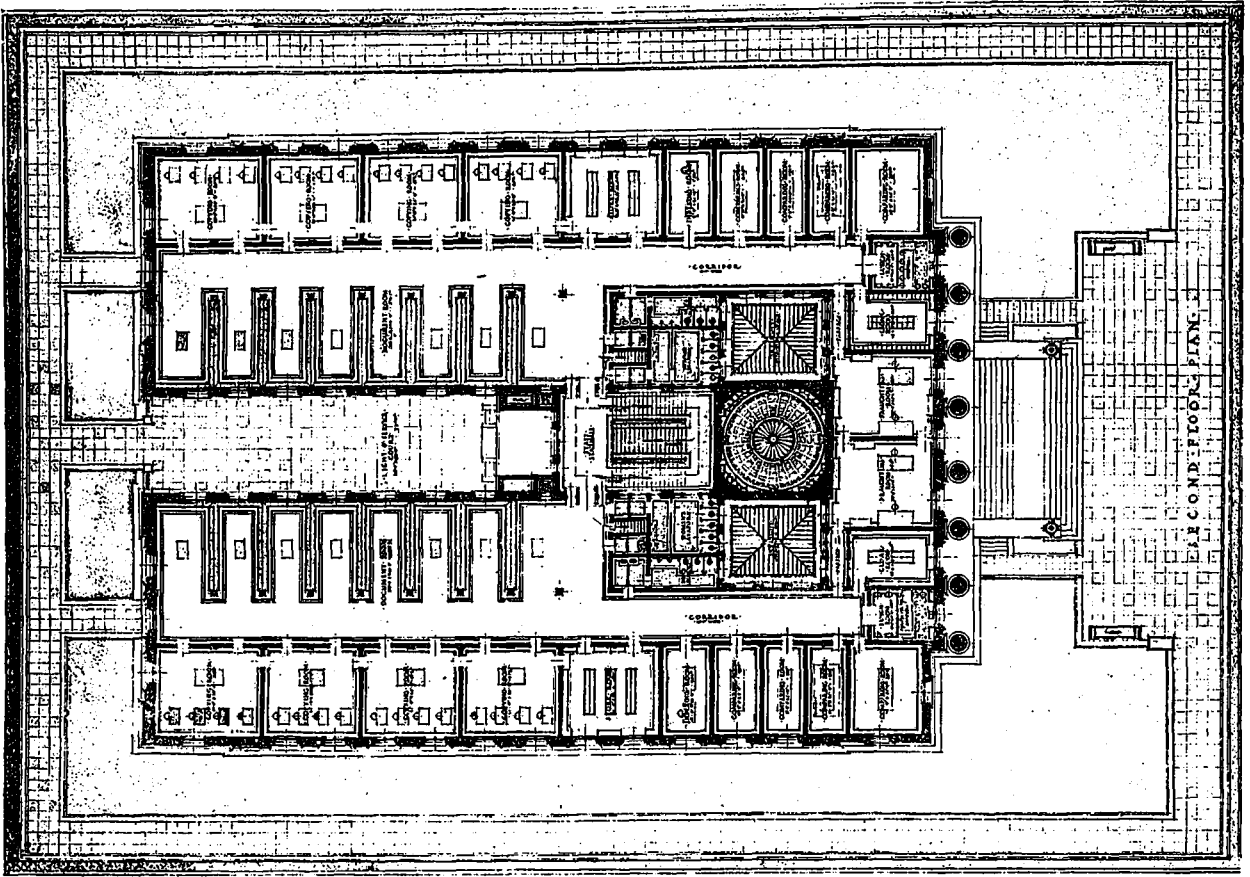


PROPOSED REGISTRY OFFICE, TORONTO, ONT.

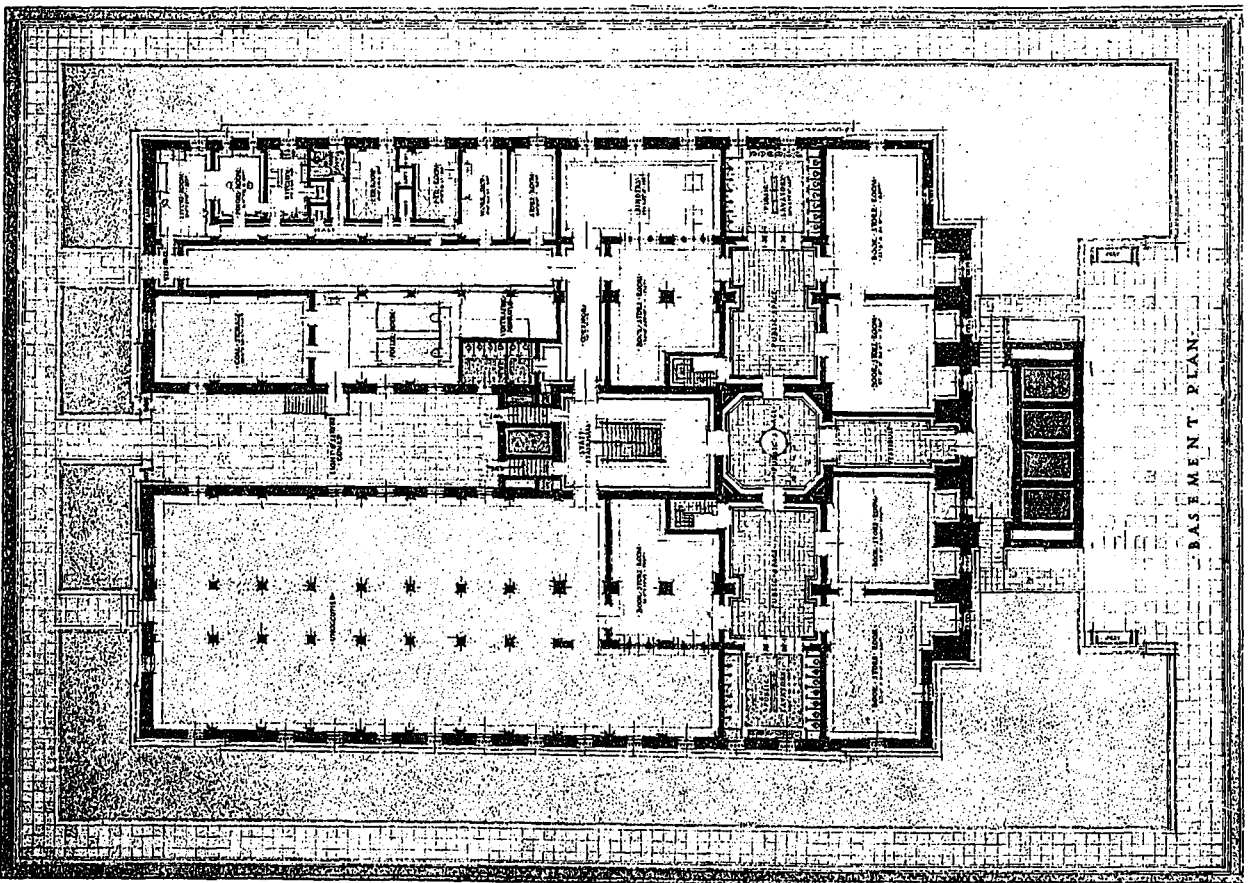
FIRST PRIZE DESIGN,  
CHAS. S. COBB, ARCHITECT.



PROPOSED REGISTRY OFFICE, TORONTO, ONT.  
CHARLES S. COBB, ARCHITECT.



SECOND FLOOR.



PROPOSED REGISTRY OFFICE, TORONTO, ONT.

CHARLES S. COBB, ARCHITECT.

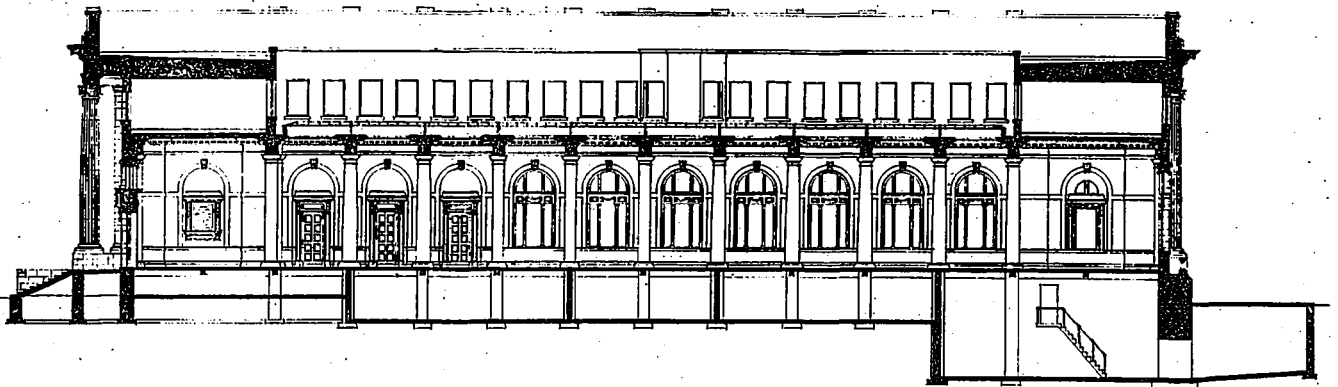
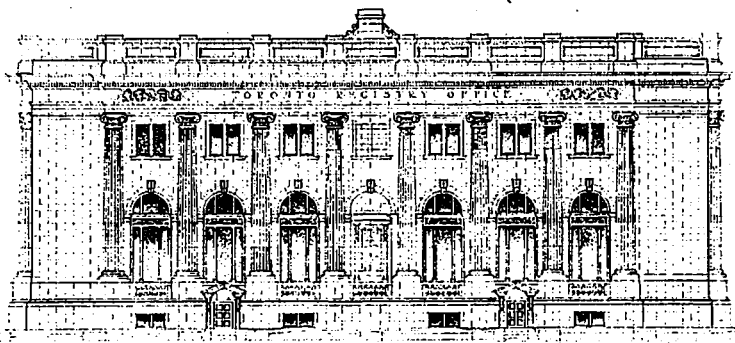
BASEMENT PLAN.

provision for book stacks. At the rear of this central feature space is allowed for clerical communication between the two divisions and a telephone booth for each division. The offices surrounding the public space have a private corridor for the staff in addition to the stairway which leads to the original document stacks on the third floor as well as the toilets for the clerical force located in the basement.

A feature of the scheme is the lighting.

Besides the windows on either side of the building there is a large skylight extending from the front portion of the public space back over the searching rooms, providing ample working light in all parts of the interior. The basement also secures an abundance of light from the outside windows and the large area covered with floor lights.

LONGITUDINAL  
SECTION AND  
REAR ELEVATION,  
SECOND PRIZE  
DESIGN.



### *Third Prize, by Symons & Rae.*

It has been the endeavor in this plan to emphasize that portion of the building which would be used by the public. The one chance of architectural effect would be the entrance, and taking advantage of this, the plan shows a rotunda running the full height of the building roofed with a cupola, thus giving expression to the plan on the exterior of the building. It was the intention to make the south front as imposing as the means at hand would permit.

The plan in other respects resolved itself into carrying out the instructions of the competition and fulfilling the requirements of the various departments.

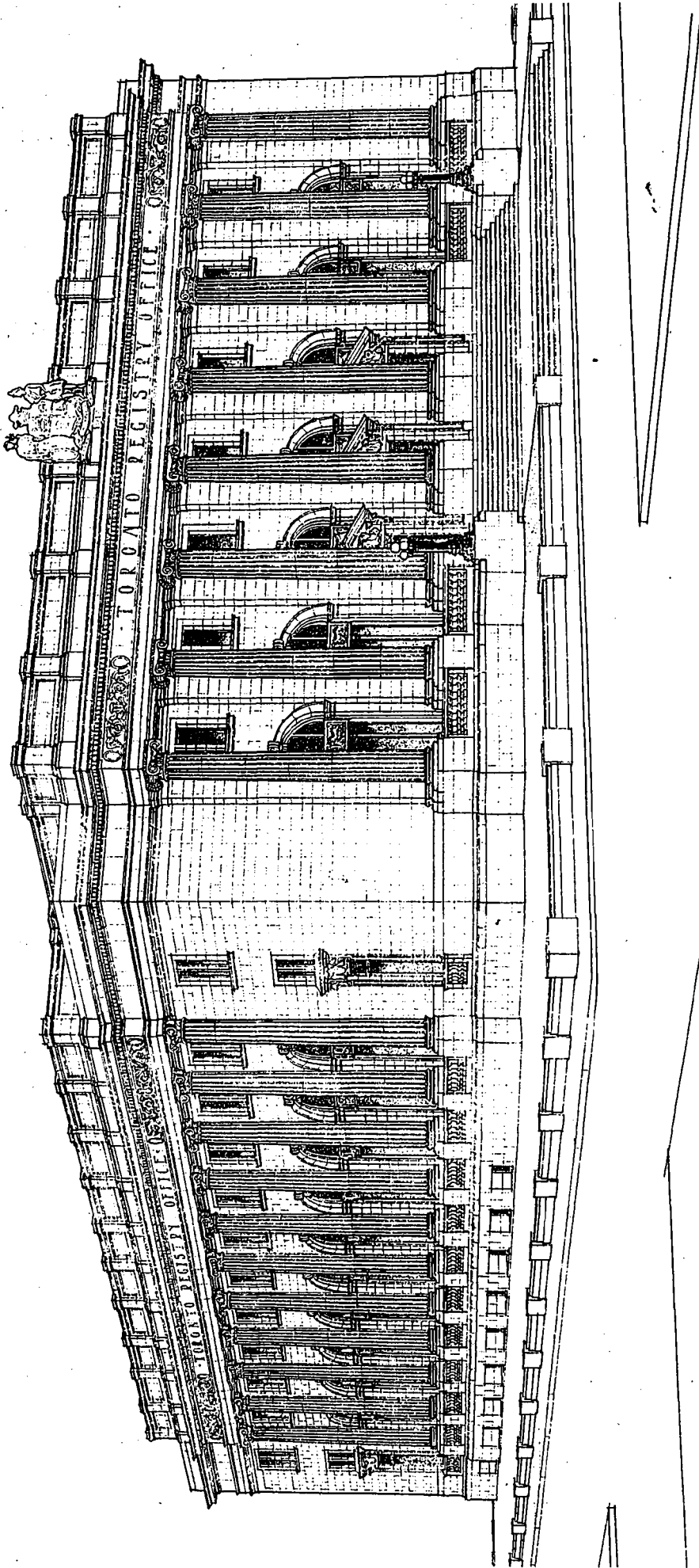
In order that the reader may consider more carefully the schemes presented, the conditions of the competition are given.

**Plan and Construction.**—In considering the designs, particular importance will be attached to simple and convenient planning, and it is essential that all parts of the building be amply lighted. The construction of the building shall be fireproof throughout as described under heading of "First Class Buildings" in the building by-laws, and all fixtures and fittings are to be fireproof as far as possible.

**Drawings Required.**—The following are the drawings required and no others are to be submitted: (a) Block plan, scale = 16 feet to an inch; (b) Floor plans for each storey and a roof plan, scale = 8 feet to an inch; (c) Sufficient sections to clearly illustrate the scheme proposed, scale = 8 feet to an inch; (d) Elevations to illustrate the façades, not shown on perspective drawing, scale = 8 feet to an

inch; (e) A perspective drawing showing a view of the proposed building set out to scale of 8 feet to an inch at the nearest corner, with the horizon line taken eight feet above the ground level.

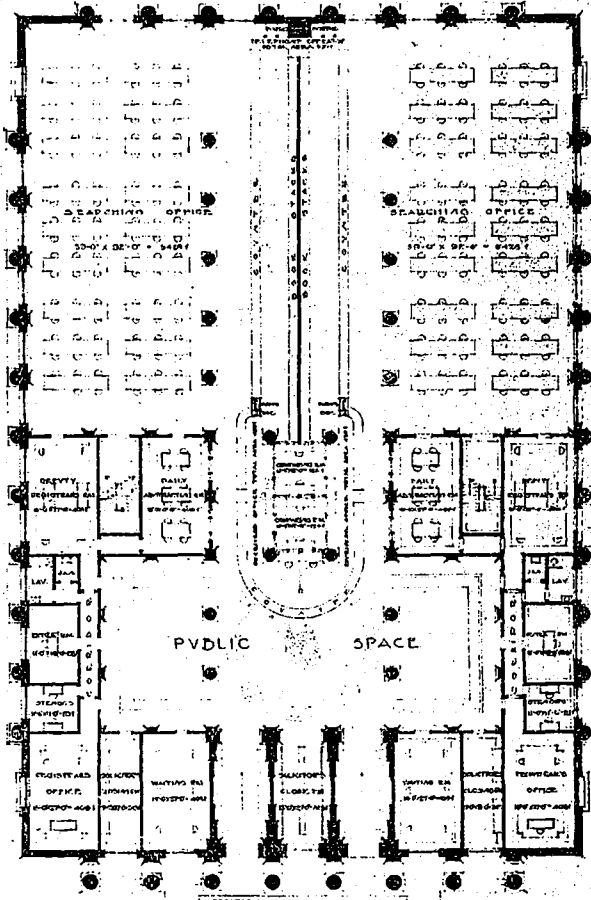
**Accommodation to be Provided.**—There are two registry offices, known as the Registry Division of East Toronto and the Registry Division of West Toronto, referring to city property east and west of Spadina avenue respectively. Each division is to be planned as a collection of units practically complete in itself, with such exceptions as will be stated in the following conditions. The floor areas given for the various rooms are to be followed as closely as possible, but it is not intended that they be rigidly adhered to, as variations within reasonable limits are permissible. The arrangement of the various rooms in relation to each other, as defined in the conditions,



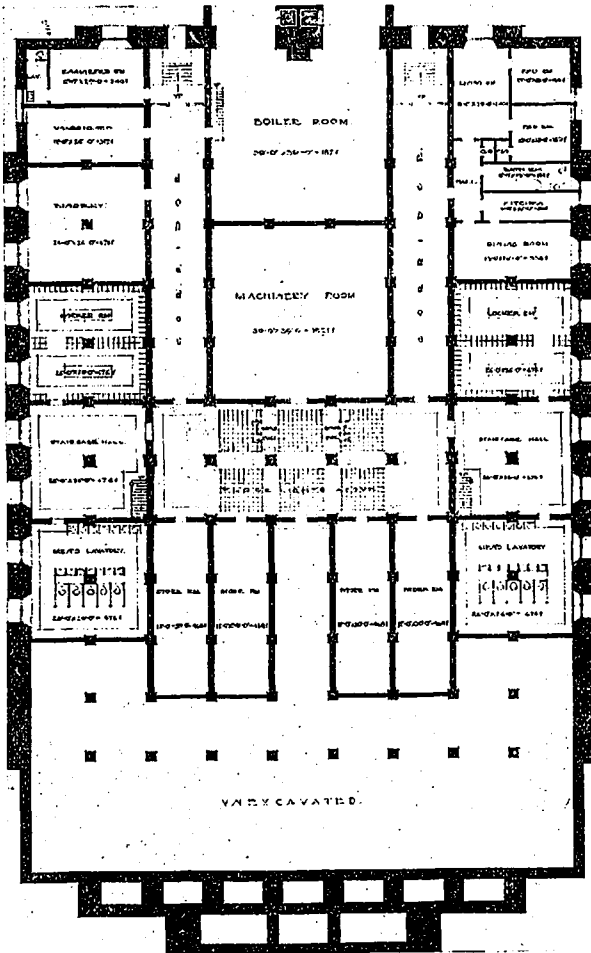
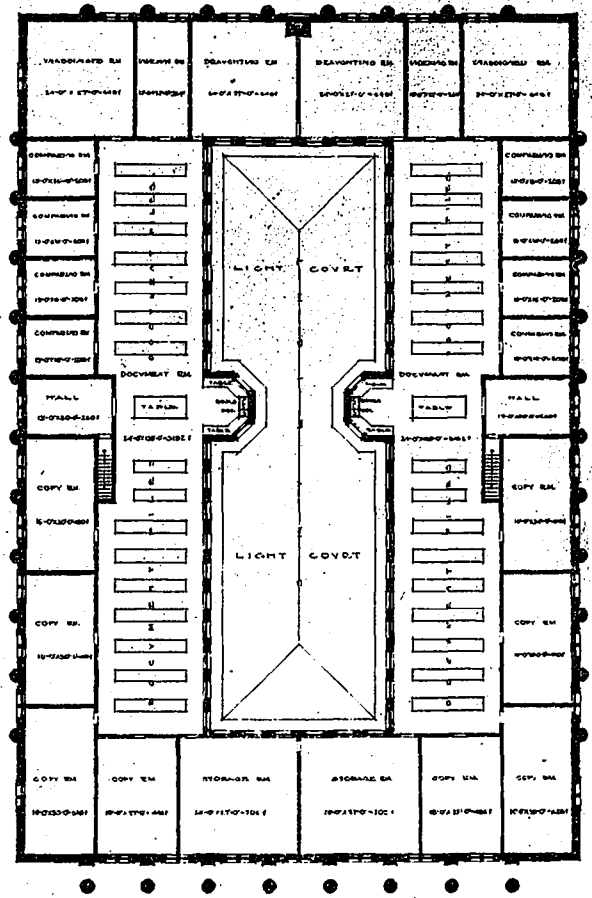
PROPOSED REGISTRY OFFICE, TORONTO, ONT.

SECOND PRIZE DESIGN,  
CHAPMAN & MCGIFFIN, ARCHITECTS.

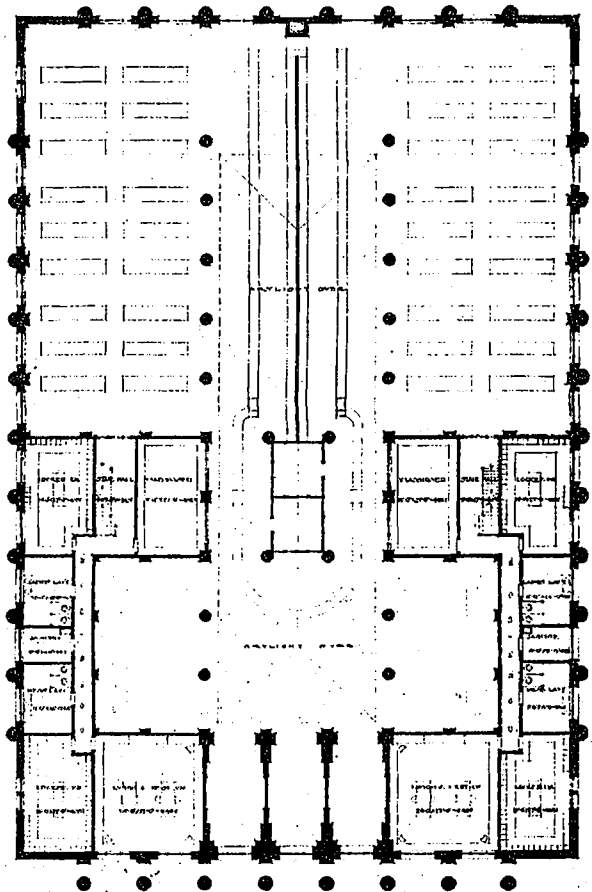


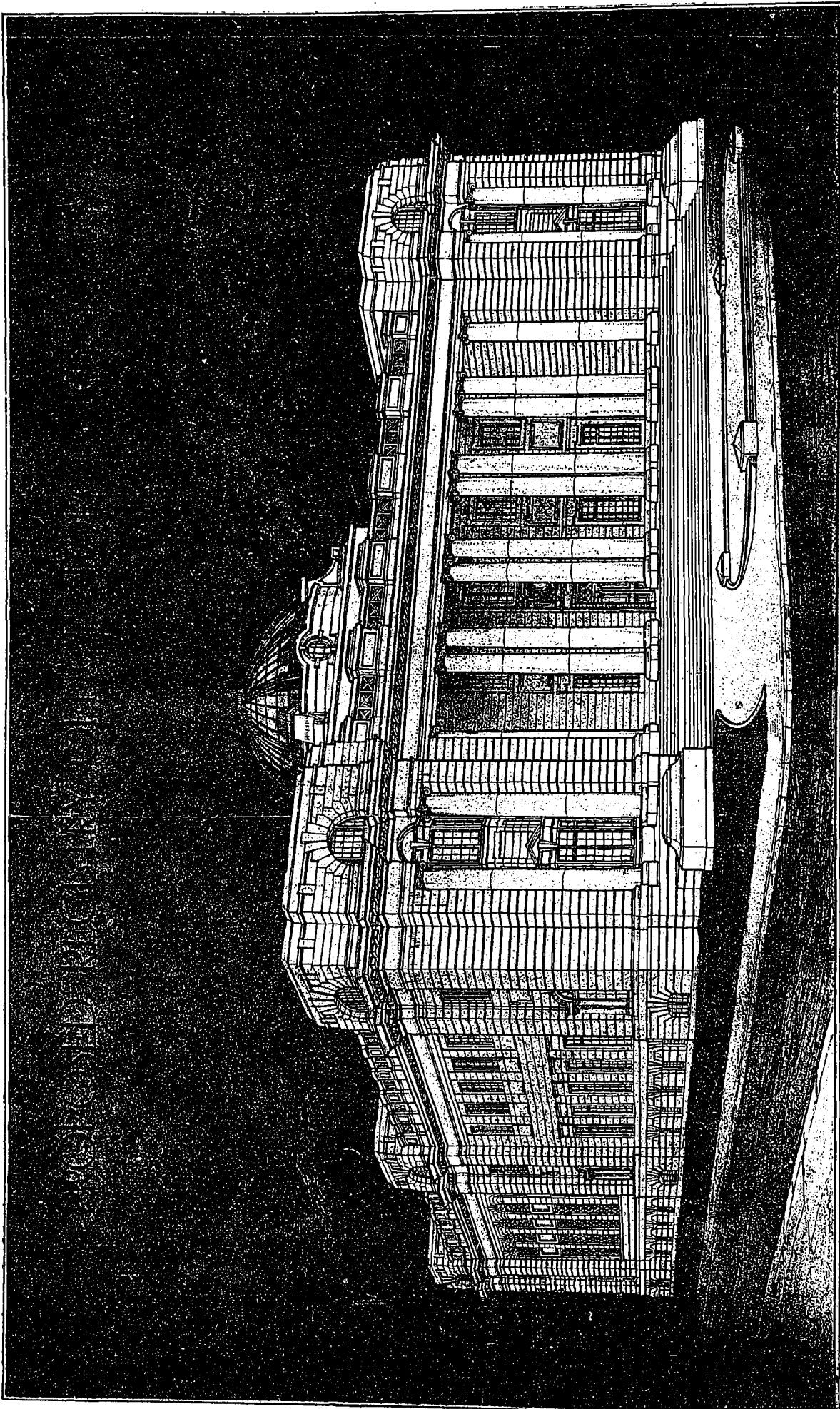


FIRST AND THIRD FLOORS.



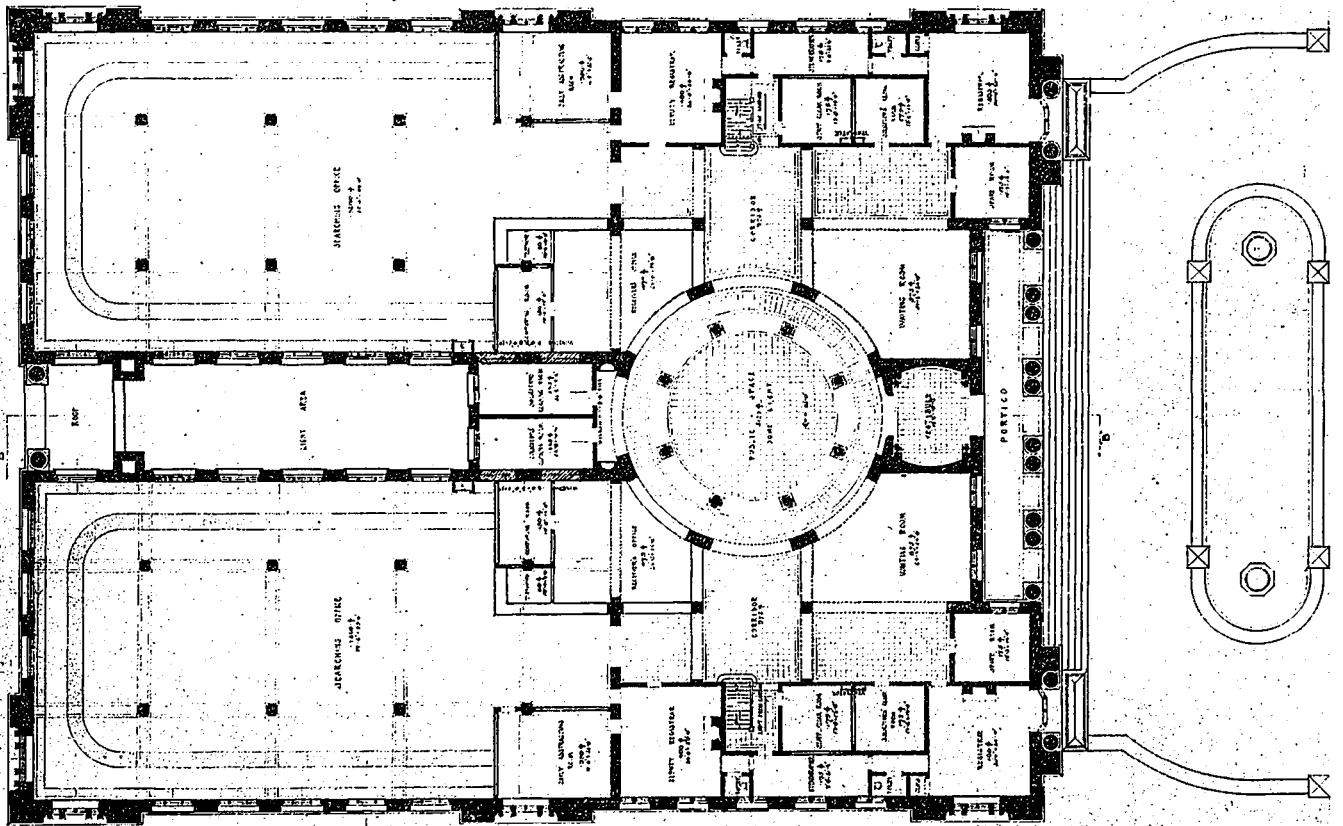
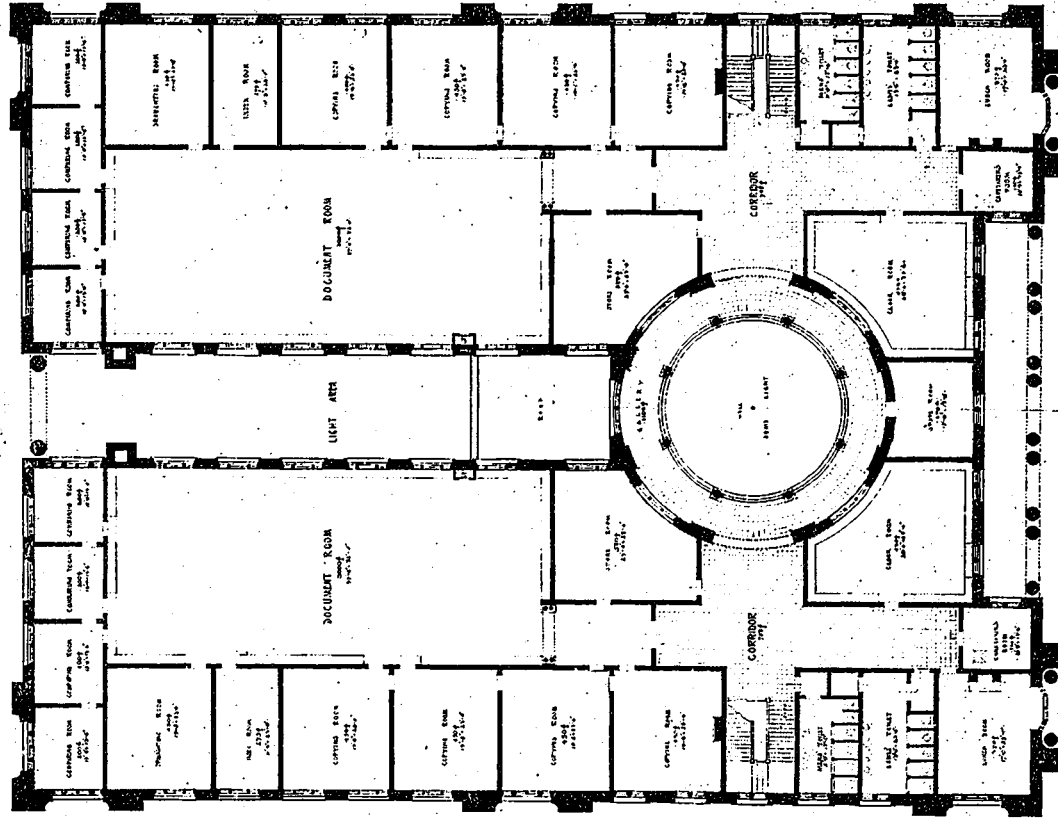
BASEMENT AND SECOND FLOOR.





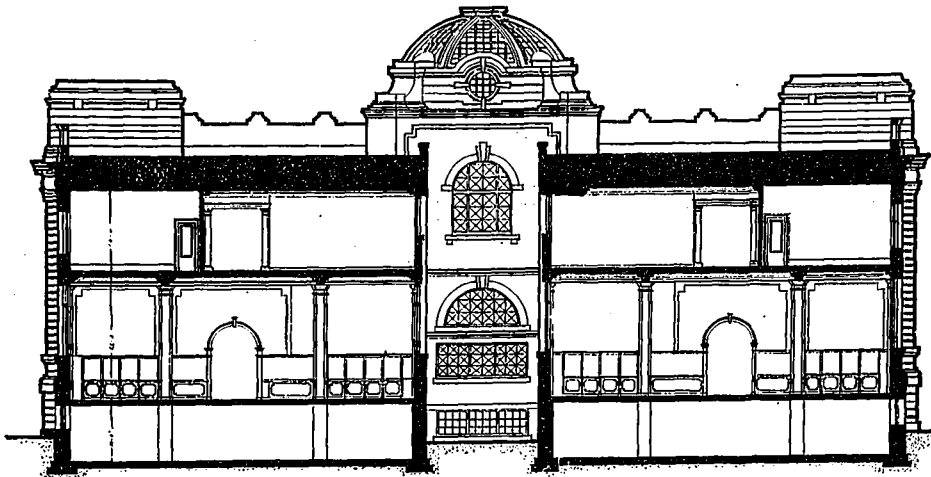
PROPOSED REGISTRY OFFICE, TORONTO, ONT.

THIRD PRIZE DESIGN,  
SYMONS & RAE, ARCHITECTS.



FIRST AND SECOND FLOOR PLANS,  
 THIRD PRIZE DESIGN.

PROPOSED REGISTRY OFFICE, TORONTO, ONT.



THIRD PRIZE DESIGN, TRANSVERSE SECTION.

is an important factor. A moderate amount of daylight will suffice for the basement rooms, but it is of absolute importance that a maximum amount of daylight be admitted to all other parts of the building. It is preferred that the main entrance faces the south.

**Basement Accommodation.**—Heating, and ventilating apparatus, including coal cellars, store-room, a small workshop and lavatory accommodation for engineer. Two storerooms for books of East division, total 1,000 sq. ft. Two storerooms for books of West division, total 1,000 sq. ft. Bindery, 400 sq. ft. Stair for staff, East division. Stair for staff, West division. Lavatories for public and male members of staff with access from first floor of both divisions. The public lavatory is to meet the requirements of an average of 100 persons in the building at the same time.

The janitor's quarters are to have a separate street entrance. The janitor will obtain access to first floor by the staff staircase. The engineer in charge of heating, etc., is to have a separate street entrance. The store-rooms in basement are to be convenient to the staff staircases of their respective division. The bindery will be common to both divisions.

Entrance vestibule and entrance hall, on first floor, will be common to both divisions.

**First Floor Accommodation, for East division.**—Waiting room, 525 sq. ft.; solicitors' cloak room,

200 sq. ft.; solicitors' closing room, 250 sq. ft.; receiver's office (including counter), 375 sq. ft.; comparing room, 150 sq. ft.; telephone switch-board operator, 80 sq. ft.; registrar's room, 400 sq. ft.; deputy registrar's room, 400 sq. ft.; stenographers, 120 sq. ft.; extra room, 200 sq. ft.; private lavatories for registrar and deputy; daily abstracting room, 400 sq. ft.; searching office, 5,200 sq. ft.; cloak room for staff, 200 sq. ft.; staircase for use of staff giving access to basement and

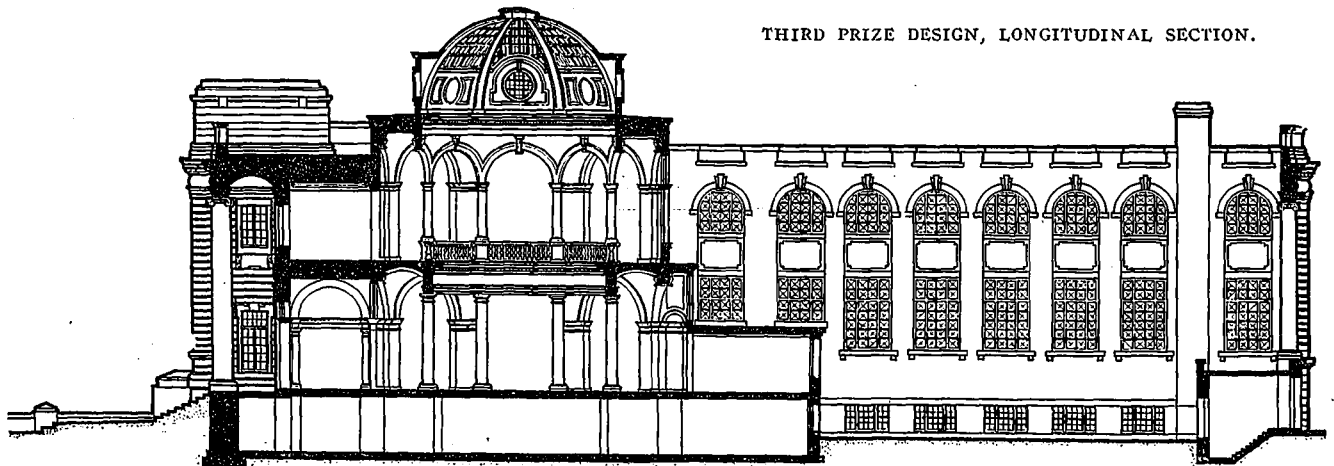
second floor; slop sink and storeroom convenience for janitor. The searching office is to be planned so as to allow of about 70 lineal feet of book stacks about 7 feet high against walls, and is to be cut off as much as possible from the public space, and there is to be only one entrance between them.

The accommodation required on first floor for the West division is to be the same as that for the East division.

**Second Floor Accommodation, for East Division.**—Document room, 3,000 sq. ft.; copying rooms (4), total, 1,800 sq. ft.; comparing rooms (4), total, 800 sq. ft.; draughting room, 400 sq. ft.; indexing room, 250 sq. ft.; lunch room, 300 sq. ft.; store-room, 600 sq. ft.; cloak room, 500 sq. ft.; women's lavatory (say 20 employees); men's lavatory (say 10 employees); slop sink and storeroom conveniences for janitor; stair hall, corridors, etc.

The accommodation required on the second floor for the West division is to be the same as that for the East division.

**Cost of Building.**—The proposed entire cost of the building, including heating, ventilation, plumbing, lighting, and architect's commission, is to be \$350,000. If it should be found on opening the tenders that the building cannot be completed within a margin of 20 per cent. above the proposed cost, the promoter may abandon the design tendered on.



THIRD PRIZE DESIGN, LONGITUDINAL SECTION.

# CONSTRUCTION

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ENGINEERING AND CONTRACTING  
INTERESTS OF CANADA



FREDERICK REED, Editor

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**CONTRIBUTIONS**—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and duly returned.

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**Vol. 6 Toronto, December, 1913 No. 12**

## CURRENT TOPICS

*TUESDAY EVENING*, November 18, C. T. Currelly addressed the Toronto Chapter of the O.A.A. on Egyptian architecture. The lecture was highly instructive from the standpoint of construction as well as design. A large number of views were shown revealing the ancient method of constructing the various temples.

\* \* \*

**ANNOUNCEMENT** has been made from Berlin that the coming year will see the erection of a railway bridge between Rugen and the mainland, which will be the longest in the world, exceeding even that over Ho-hang-ho, with its 3,580 yards. The cost of this great engineering work will not amount to more than \$5,000,000, or less than a third of that of the Forth bridge. When the bridge, which, it is said, is to include a track for pedestrians, though none for road traffic, is completed, it will substantially shorten the journeys between Berlin and Hamburg, on the one hand, and Stockholm and Christiania on the other.

*THE PLANS* of the Quebec bridge show a main span, eighteen hundred feet long, which is divided into three sections, two of which will be built out from the north and south main piers, measuring five hundred and eighty feet each in length, while the centre, or the section measuring six hundred and forty feet and weighing six thousand tons, will be built on as many as five floating barges and when completed will be carried to the middle of the river and placed in position. From the top of the stonework which constitutes each main pier to the top of the steel superstructure the height is no less than three hundred and twenty-five feet. From each main pier the supporting work will be carried out to where the two ends of the centre section begin, the whole presenting a very solid structure.

\* \* \*

*CALGARY* is the first city in Canada to undertake as a municipal department the construction and operation of an industrial service building. For the \$250,000 appropriated by the large favorable vote of the ratepayers, a six-story concrete structure will be erected and leased to incoming manufacturers. It is anticipated that by getting a start in this way, small industries will be encouraged, soon outgrow their temporary quarters, and go out to build more extensive accommodation for themselves. The advantage primarily to the newcomer is that he retains his capital in the form in which he can most profitably use it. To the people at large this plan offers an inducement to small manufacturers which, instead of being a tax, as is the bonus idea, is a revenue producer from the beginning.

\* \* \*

*IT IS BENEFICIAL* at times to hear the expressed opinion of foreign critics as they receive various opinions from our existing architecture. Johann Koller, a prominent architect of Vienna, Austria, who visited recently the various provinces of Canada and the States, says: "Your architecture, both Canadian and American, is an eyesore. The greatness of the building does not count, the decorations of a building will not stand alone; here you have, in fact, your whole idea seems to be the loftiness of your buildings, and then in these towers of straight lines and angles you attempt fancy decorations. Your taste is wonderfully insipid. In Austria, in Germany, France, England, all over Europe, you find buildings, large and small, but always a restful sight to the eyes and a pleasing picture to the mind. America and Canada in particular has a lot to learn yet in the designing and erecting of her buildings. Explain the cause of the number of buildings I have seen to be toppling over—nothing more than your Jack and the Beanstalk methods." In speaking of Montreal, Mr. Koller said: "You may think that in the few days I have been here I have not had time to judge. I have visited your East End and I have been through Westmount. I am amazed at your tastes and cannot help but feel that your outlook and ideas are still a trifle barbarous and stunted."

*OCCASIONALLY* the unusual in architecture strikes us very forcibly. A band of Ruthenian immigrants have erected a village in the Province of Alberta where no hardware, not even nails, enter into the construction. The buildings have pitched roofs composed of logs and thatch, with wide overhanging eaves. An artistic entrance is made of slender twigs woven and laced together, with hinges and latches of like material. Floors are laid in hewn logs, while the roof consists of poles and cross-woven wheat straw ten inches thick, packed solid and laid with extreme care, capable of withstanding the climatic changes for some twenty years.

\* \* \*

*JAMES & DAVIDSON*, architects, of Vancouver, are plaintiffs in an action against the city of Winnipeg, arising out of the recent competition for the plans of the new city hall at Winnipeg. The city of Winnipeg invited competition, promising to return the plans of all unsuccessful competitors. James & Davidson, who were among the unsuccessful competitors, claim that they have never received the return of the plans they submitted, and have issued a writ for damages for breach of contract. The contract sued on is the contract for return of the plans. Chief Justice Hunter this morning gave his consent to allowing service on the defendant corporation out of the jurisdiction.

\* \* \*

*SOME INTERESTING* comments were made by J. J. Shallcross, president of Victoria's Board of Trade, who has just returned from a trip abroad. In speaking of "Town Planning Schemes," Mr. Shallcross said: "They have been generally adopted throughout Great Britain and the urban and rural councils control them. These schemes are produced under the powers of the Town Planning Acts of the last three years, enabling municipalities to control the development of building areas both in respect to roads and the character and number of houses to be erected on any given area. In one district under my notice the municipality limited the number of houses per acre to twelve, whereas under the previous conditions the builders may have erected thirty or forty houses on the same ground." Mr. Shallcross thinks Canadian cities could take lessons from the legislation which has been perfected in this respect in the old country, where the land question has been for years such a vexed one, and where the present Chancellor of the Exchequer has under way one of the most far reaching and revolutionary land schemes ever projected by any State. In conclusion he says: "The time has certainly come when the people should seriously consider the character of the city itself and set out definitely to prevent over construction, congestion, false methods of construction—all of which could be regulated by laws controlling every phase of the work."

\* \* \*

*IN THE EARLY HISTORY* of San Francisco, the area to be occupied by the main exhibit

palaces of the Panama-Pacific International Exposition in 1915 was a tide flat, some portions of which had been dredged to accommodate shipping. In recent years, however, private interests had built a sea wall across the north basin in an easterly and westerly direction and filled a portion of the area inclosed. This work was not completed and it remained for the exposition company to fill the inland basin by means of suction dredgers. After the exposition's fill was completed, a number of tests were conducted to determine the supporting power of the soil at the depth of what probably would be the spread footing bottom. The result of these tests indicated that the supporting power of the dredger sand was very low, namely, about 400 pounds per square foot, which prohibited the use of this type of footing. Pile tests were made also, and it was found that the fill, in settling, gripped the piles in such a manner as to act as a load upon them. This caused the piles to penetrate into the original bottom and the conclusion was reached that unless the piles were sufficiently long they would settle with, and more rapidly than, the fill when the superimposed load would be brought upon them. Therefore, after a careful investigation, the engineers were forced to the conclusion that it would be inadvisable to carry any given load by skin friction alone. The general character of the soil under the dredger fill was clay, mixed with blue mud and water, underlaid with a layer of green sand and clay, and, finally, hardpan, the hardpan being located all the way from thirty to one hundred and twenty feet below the surface. In view of the great number of piles required, economy of length was an important factor, and it was decided finally to drive all the piles into the layer of green sand and clay overlying the hardpan, to a one-inch penetration at the last blow. In general, the character of the soil underlying the sites not covered with the dredger fill was yellow beach sand, soft clay and sand, hard green sand and clay, and, finally, yellow hardpan except in areas that had been filled prior to the commencement of exposition activities. It was decided to use, in general, piles for the support of all buildings, walls and special loads in these areas, as well as in the recently filled area. The reason for this was three-fold: (1) Uniformity of construction; (2) greater safety in case of earthquake, as portions of the site were originally submerged and past experience in San Francisco indicated that structures were most affected when they were supported on spread or raft footings, and (3) in giving a value of three thousand pounds to the square foot to the sand it was found that a spread would cost as much if not more than a pile footing. The actual length of pile driven through the site will vary from sixty to seventy-five feet, and in all cases an assumed load of twenty tons was taken as the value of one pile. The oddity of this constant unit, inasmuch as the value of the pile usually depends upon skin friction and length, is explained by the fact that, in the case in point, tests were conducted that confirmed the selection of the amount named.

# Erection of Viaduct at Trenton

R. K. PALMER

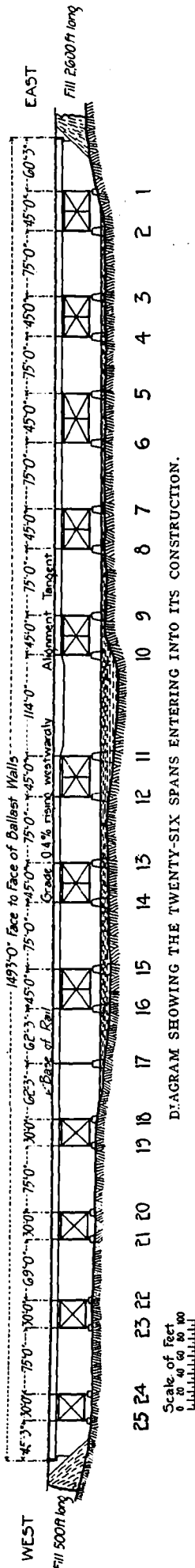


DIAGRAM SHOWING THE TWENTY-SIX SPANS ENTERING INTO ITS CONSTRUCTION.

**D**URING the past year a large amount of bridge building has been going on in the construction of the new Campbellford, Lake Ontario and Western Railway, connecting Agincourt, just east of Toronto on the C.P.R., with Glentay on the same line. This new line will serve the towns along the North Shore of Lake Ontario.

This line is a subdivision of the C.P.R. and serves to double-track that railway between Agincourt and Glentay. In all, there are sixty-five crossings, and each of these consists of one or more spans. Several crossings require a large number of spans, as, for instance, the crossing at Port Hope, where twenty-nine spans varying in length from forty to one hundred feet were required.

With the exception of the bridge at Mud Lake, all the spans on this line are of the plate girder type, and these plate girders rest either directly on the masonry or are supported on towers which rest on concrete piers.

The bridge at Trenton is a viaduct of the latter type, and this article is mainly a description of its erection, as its building comprises most of the operations involved in the erecting of plate girder bridges. This bridge has twenty-six spans and is made up as follows:—Nine 45 ft. spans; four 30 ft. spans; one 60 ft. span; two 62 ft. spans; one 69 ft. span; eight 75 ft. spans; one 114 ft. span; four 30 ft. towers; eight 45 ft. towers; one single bent.

The approach at the west end of the bridge consisted of a deep fill for about five hundred feet, after which the line passed through a hill, necessitating a deep cut and allowing very little room in the cut to

handle erection equipment or to pile bridge material, and on the fill there was, of course, no room at all. In the erection of this bridge it was decided to operate from the west end, as the approach from the east was over about two thousand feet of high temporary wooden trestle and the conditions were generally undesirable to an erector.

All erection equipment and material for the bridge was brought in over the C. L. O. & W. Railway track from Smithfield, a station on the Grand Trunk Railway about seven miles west of the bridge, and as this track was newly laid, unballasted, crooked, soft, uneven and ungraded for a part of the way, the difficulties may well be imagined and appreciated.

The transporting of material and equipment from Smithfield to the bridge site was done by the general contractors, and although the cars were loaded with pieces that were very heavy and awkward to handle, all parts arrived at the site in good condition. The material was brought in from the yard at Smithfield in the order wanted, and as much as possible was stored in the cut. All unloading and handling was done by two double boom derrick cars that were used for this erection and the type of which can be seen by referring to the illustrations.

The weights of various pieces were as follows:—One single girder, 30 ft., about 9,000 lbs.; one single girder, 45 ft., about 16,800 lbs.; one single girder, 62 ft., about 27,500 lbs.; one single girder, 69 ft., about 34,500 lbs.; one single girder, 75 ft., about 40,000 lbs.; one single girder, 114 ft., about 102,000 lbs.; one single tower bent, about 31,000 lbs.

There were two tracks in the cut, one of which was a through line to the bridge and the other a siding on which the material cars were placed. The derrick worked from the main line. The small spans could be picked off with one boom at a single lift by booming far out with the second boom to balance up the car.

It must be borne in mind that the very greatest care must be exercised in lifting loads at one side of a derrick car, as a standard gauge track makes a very narrow foundation and a small amount of bad judgment will upset a car and load, particularly if the track is new and the ground soft.

After a girder is lifted from the flat cars the two booms are gradually brought in, always maintaining the balance until the load is centred over the track in front of the derrick car, when it is carried along the line to some desired spot where the load can be boomed out and lowered out of the way. The longer girders are unloaded in a similar manner, with the exception that they are handled one end at a time. One boom of the derrick car is hooked to the forward end of the girder and this end is swung over



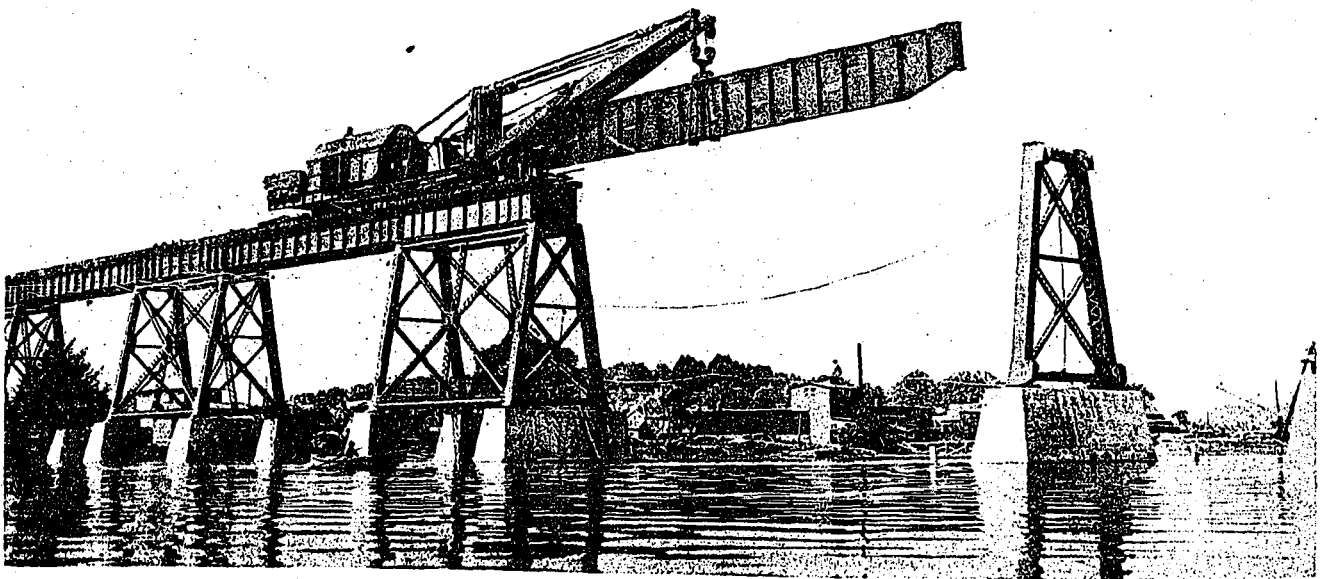
NO. I.—FASTENING THE TACKLE TO LIFT THE 114-FOOT GIRDER.

until it is centred over the track in front of the derrick. Then the derrick is backed up and the rear end of the girder swung over, after which the derrick is brought forward and both booms hooked to the centre of the girder by means of a balance beam to be described later. The load is now balanced over the centre of the track in front of the derrick and can be carried to the blocking prepared for storing it and the girder swung out to one side by the reverse process of unloading.

By referring to the general elevation it will be seen that the first piece to erect was bent No. 25. As noted on the diagram, there was a grade on the bridge rising westwardly, but the average distance from base of rail to top of pier was forty-four feet and the distance from the base of rail to the water was about fifty-three feet.

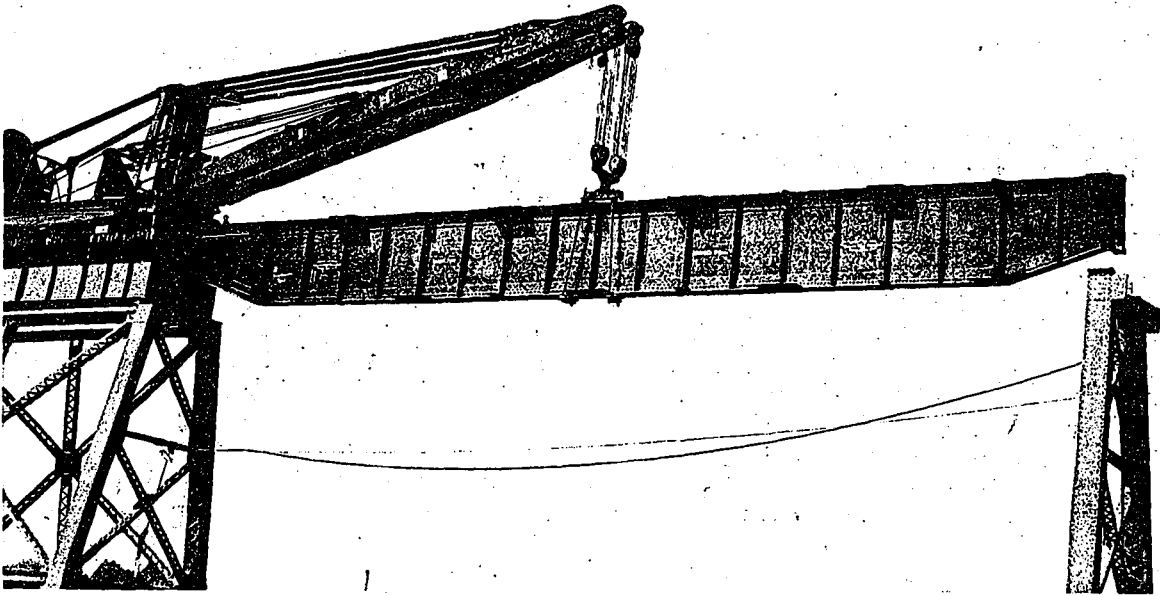
Bents of this height are easily handled by a derrick car. All the pieces forming a bent were assembled and bolted up in the cut and the bent carried out with the derrick. As span No. 26 was only 45 feet long, bent No. 25 could be set in place directly with the derrick and guyed until span No. 26 was dropped into place, after which the remainder of the pieces in tower Nos. 24 and 25 were erected in place and the thirty-foot span erected.

Short spans may be bolted and even riveted up complete before erecting, but this is not usually done, owing to the likelihood of getting a twist in the span and the girder shoes not sitting evenly on the bridge seats. Moreover, it is about as easy to put the bracing in place and rivet up after the girders are erected as to do it beforehand, and in this way any give and take in the connections is used to advantage.



NO. II.—THE 114-FOOT GIRDER CARRIED OUT BY DERRICK CAR.





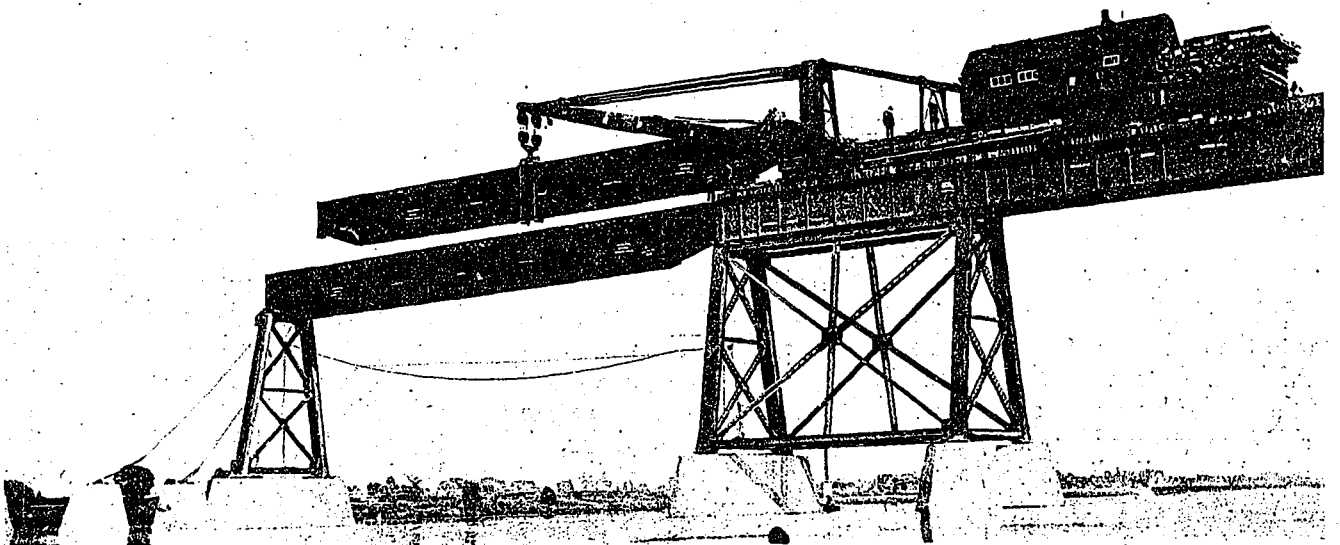
NO. III.—THE 114-FOOT GIRDER BEING LOWERED INTO POSITION.

Span No. 24 is seventy-five feet over all, and as the extreme length of the booms on the derrick is only sixty feet, it may be seen that bent No. 23 could not be placed directly with the car. Consequently a more roundabout method of erection had to be used. In this case the bent was assembled and bolted up complete as in the previous case and the main fall lines were attached just above the centre of gravity of the bent so that it was slightly heavy on the bottom end. Extra lines and tackle were led from the booms to the lower end of the bent to maintain it in a horizontal position until the car was brought forward and the bent swung clear of the trestle, after which the lower end of the bent was allowed to drop down, and as the car came forward this lower end of the bent was swung out until it sat at the proper place on the pier.

The bent was then tilted up as far as possible by

raising the load line. This probably brought the bent to within fifteen or twenty degrees from the vertical. In the meantime, guy lines were attached to the top of the bent and brought to the tower under the derrick and left in charge of men stationed where the lines could be properly snubbed. A winch was also anchored on one of the piers from two to four hundred feet forward of the bent and a cable passed through a block at the top of the bent, had one end fastened to the pier beside the winch, and the other end attached to the winch. Two men quickly pulled the bent to a vertical position, when it was held by the guy lines. The bent was then centred on the pier by means of bars and jacks and the anchor bolts dropped in place in holes left in the concrete when building the piers.

As a practical measure it is better to leave holes in the piers and grout the bolts in because of the great



NO. IV.—PLACING OF SECOND 114-FOOT GIRDER.

difficulty of properly locating the bolts if they are built in place when building the piers, although if they are built in and properly located it is a great help to the erector when erecting a bent, as the bent is centred as soon as the bolts are entered in the holes at the foot of the columns, and when the nuts are tightened the bent will stand regardless of guying.

It should be noted that as soon as an inclined bent is held by the guy lines and the cable from the winch, the load lines from the derrick are cast off, so that if anything gives way the load will not fall suddenly and upset or otherwise damage the derrick and hurt the workmen.

The bent being placed, the next operation was to erect the span. This was done by erecting one girder at a time and filling in the bracing after the girders were in position. The derrick was run back to the material yard and one of the girders was loaded on

lift is not taken in anything heavier than a light breeze, otherwise the girder could not be controlled and might easily upset the car.

By referring to the illustration it will be seen that two balance beams are used. These are made to be interchangeable for convenience in assembling. The upper one is at right angles to the track and its ends are connected by shackles to the blocks on the load lines. This beam serves to distribute the load equally between the booms.

The lower beam is just above the girder and parallel to it. At each end is a shackle which carries two double hooks which, in turn, catch the under side of the top flange of the girder. In all, the girder is lifted at eight different points over a length of about four feet, and by so lifting no undue strain comes on any of the rivets in the flange. A pin at the centre of each beam connects to an intermediate toggle, and



NO. V.—UP-ENDING A BENT BY MEANS OF DERRICK CAR.

a pair of buggies after the manner of handling girders when unloading:

The loading frames used in shipping girders, and each consisting of a timber sill and a timber brace on each side of the girder leading from the outer end of the sill to the under side of the top flange of the girder and all properly bolted, are used to steady the girders on the buggies. As soon as the girder is loaded on the buggies it is pushed out by the derrick car to the end of the track and the load lines of the derrick car fastened to the centre of the top flange of the girder by means of heavy grab hooks. The tackle is so arranged by means of balance beams that the load is equally distributed between the two booms and its position is readily controlled. Care must always be used to see that the load is in line with the centres of the two trucks under the car and that a

as these pins are in different planes and at right angles to each other, a universal joint is formed which allows the girder free play. A bridge tie is chained or clamped to the track at the extreme end of the trestle to act as a stop and prevent the car accidentally going over the end when carrying out a girder.

By referring to illustration No. I. it will be seen that the girder had been pushed out as far as it would go on the buggies. In this particular case the buggies were taken out one at a time and the buggy at the end next the car had already been removed and the men were connecting the tackle at the centre of the girder. The buggy and braces were still in position at the outer end. As soon as the girder was lifted the buggy and bracing at the outer end were removed and the girder was free to be carried out over the opening with the car.

The buggies mentioned above are so made that they are readily taken apart and the pieces placed along the outer ends of the ties out of the way of the car as it advances with the girder. After the car has been run forward to its final position, blocking is placed under each forward corner of the car frame and brought to a firm bearing by means of wedges and the help of jacks.

The girder was then lowered to nearly the level of the column cap, and when in this position it was rotated until the outer end was directly above the column cap, when the girder was lowered to take a bearing on the column at one end and the cross strut between the columns at other end. The girder was then braced in this position, the load line disconnected and the car backed up until the load line from the boom on the side that the girder was to be placed could be attached and the inner end of the girder swung out to its final position and the girder permanently bolted to the column caps at each end.

Girders up to seventy-five feet in length can be handled and set in place with one boom and time saved, but the risks due to greater strains in the car and the greater chance of upsetting lead the prudent erector to proceed as outlined above for all girders over fifty feet in length.

If brace frames are shipped in one piece they are carried out and lowered to place with the car, but if all bracing is shipped loose the various pieces are carried out over the girder by the men and bolted to place, after which the deck is laid temporarily and all is ready for the derrick to bring out the second bent and complete the tower.

The erection of Trenton viaduct from the west end up to and including bent No. 11 was accomplished by methods and equipment commonly used in modern bridge building. There was one feature in the erection of this viaduct, however, that is of more than passing interest, i.e., the erection of bent No. 10 and the 114 ft. span.

For the erection of bent No. 10 a large scow was provided and bridge ties were used to build a crib-work blocking to carry the bent and of such a height as to bring the base of the columns at just the right elevation to clear the top of the pier and to raise the top of the bent so the latter would rest at as great an incline as possible after the scow was loaded. The scow was then shifted to the east of pier No. 10 and the projecting bases of the columns were brought to the proper position over the pier and the scow anchored. The derrick was placed as near the end of the trestle as possible and securely anchored and the forward corners of the car frame blocked from the bridge deck. The load lines were carried out, fastened to the top of bent No. 10 and the bent up-ended and anchored with east and west guy lines.

The erection of the 114 ft. girder was done in a manner very similar to the erection of the 75 ft. girders with the exception of the equipment used. Owing to the great length of these girders and the fact that each girder weighed fifty-one tons, it was necessary to handle them with equipment that is quite

out of the ordinary. For the erection of such girders a derrick car had been built by the bridge company which is unique and single of its kind. It is so principally because of its great size, weight and capacity and because of the speed and ease with which it can be handled.

To handle girders of this size required the sixty-four foot booms, giving a clear distance from the end of the car to the load lines of sixty feet when the booms are in their normal position for handling girders, as indicated in the illustrations. The load to be lifted was about fifty-three tons, two tons of which was due to special tackle, and to take care of this load a counterweight of thirty tons were required and used at the back of the car. When supporting this load on the booms there was a reaction of 440,000 lbs. under the front truck. As this front truck is a three-axle truck, each axle load was about 147,000 lbs., or about three times that of the heaviest locomotive. To take care of this load the ties on the last spans were spaced close together, making a solid timber floor fourteen inches deep. The axles are only 3 ft. 9 in. centre to centre, and hence there was an extremely heavy concentrated load for the girders to carry, but as the derrick moves very slowly under load, there was no impact to consider, and although the unit stresses in the steel work and timber flooring were high, they were not excessive. Special tackle was built to carry the girders from the blocks so that the load would be carried from the bottom of the girder, thus saving the top flange from undue strain and saving the risk of hooks slipping or straightening.

Illustration No. I. shows the actual work of fastening this tackle and making ready for the lift, all other preparations having been made as was done for the seventy-five foot girders. The day was quiet, hardly any air stirring. The order was given to raise the girder and cast off the outer brace, and immediately this immense girder went up with the same ease as had all the smaller ones. The brace and the buggy were laid at one side and the car began to move out and finally lowered the girder onto greased rails that had been fastened on blocking which rested on special struts between the columns and on a level with the column caps. From here it was jacked over to its final position, the booms following and taking sufficient load to keep the girder right side up until it was firmly bolted to the column caps and the load lines disconnected for the car to go back after the second girder. It is probable that few onlookers realized they had just seen the erection of the largest girder that had ever been placed with a derrick car working on a standard 4 ft. 8½ in. rail base.

The entire span was erected and bolted up in one working day, the second girder being erected in about half the time required for the first one, probably because of greater confidence and the experience gained in erecting the first one.

The Trenton viaduct was designed and erected under the direction of P. B. Motley, Bridge Engineer, and C. W. P. Ramsay, Engineer of Construction of the Canadian Pacific Railway.

## SCHOLARSHIPS AWARDED FOR THE YEAR 1913.

THE FOLLOWING announcement of scholarships is taken from the recent journal of the R.I.B.A., and should stimulate the draftsmen with a keen desire to take advantage of such unusual opportunities:

**British School at Rome: The Henry Jarvis Studentship**—The Council of the Royal Institute of British Architects have awarded the Henry Jarvis Travelling Studentship in Architecture to Louis de Soissons, student of the Royal Institute, on the recommendation of the Faculty of Architecture of the British School at Rome. Mr. de Soissons is the first winner of this studentship, which is open to associates and students of the R.I.B.A. under thirty years of age and is of the value of two hundred pounds per annum, tenable for two years at the British School at Rome. Louis de Soissons won the Tite prize of the Royal Institute in 1912.

**The Rome Scholarship in Architecture**—The Royal Commissioners for the Exhibition of 1851 have awarded the Rome Scholarship in Architecture to Harold Chalton Bradshaw, on the recommendation of the Faculty of Architecture of the British School at Rome. Mr. Bradshaw is the first winner of the Rome Scholarship, which is open to British subjects under thirty years of age, valued at two hundred pounds per annum, and tenable for three years at the British School at Rome. Mr. Bradshaw, who is in his twenty-first year, is a student of the School of Architecture, Liverpool University. In July last he was awarded the University Certificate in Architecture, which exempts from the R.I.B.A. intermediate examination, while he also received at that time the Holt Travelling Studentship of fifty pounds. Mr. Bradshaw was placed second and was awarded a certificate of honorable mention in the competition for the Soane medallion last January. He was the winner of the first of Sir William Lever's prizes in the Liverpool School design for a new river front at Liverpool.

**The Herbert Baker Scholarship, 1913**—The trustees of the Herbert Baker Scholarship announce that, having considered the report of the assessors on the work sent in by the two competitors and the work, they have decided not to award the scholarship for the present year. The scholarship is in value two hundred and fifty pounds, and is open to any British subject who has spent seven years in the study and practice of architecture, under thirty-five years of age, and who has spent at least two-thirds of his architectural career in South Africa. The holder is required to spend eight or nine months in Rome as his principal headquarters, acting under the direction of the British School at Rome, this period to include a visit to Athens with the British School there as headquarters. The trustees express their regret that the offer of the scholarship has not met with a better response, both as regards the number of candidates and the standard of work sent in. The scholarship was intended to

benefit the young architect who has passed the elementary stage of his profession and is by his own experience learning to understand the difficulty of scholarly design and to feel the need and desire of direct study of the great masterpieces of art. The subject and the conditions prescribed were set with the object of testing the candidates not merely in regard to their technical capacity and power of expression, but also whether they have reached that stage in their architectural education at which a period of study in Italy and Greece would be of benefit to them as architects, and not merely as students of art or archaeology. The trustees state that the work of the two candidates comes short of the required standard in both respects, while it contains elements of promise which encourage the hope that they will come forward again. It is to be hoped also that other young architects who are ambitious of taking a high place in their profession in the future, may seek to profit by the opportunity which this scholarship gives of enlarging their artistic education, even if it may involve some present sacrifice of professional work. The scholarship will be offered again next year, and due notice will be given of the work required of candidates.

\* \* \*

**THE CONSENSUS** of opinion of the largest party of American medical men that ever visited Europe is that Paris is one of the most healthful cities in the world. The party comprised seventy physicians, who started on a study tour of the chief towns of the Continent before attending the recent International Congress of Medicine in London. They visited all the leading medical establishments, including the Salpêtrière Medical Training School, the Central Pharmacy, the Paris School of Medicine, the Hygienic Museum, the Tarnier Clinic, and the principal hospitals. "What we admired most about Paris," said the vice-chairman, Dr. S. Breitenfeld, "was the marvelous purity of the air and the best and cheapest medicine in the world. The city is extraordinarily free from dust. As far as installation, service, etc., of French hospitals are concerned, the authorities certainly have nothing to learn from America. Only one thing overlooked here is ventilation. In all the hospitals, including even the new hospital of La Pitié, the patients have the choice between a pronounced draught or going without air altogether. This is probably due to the hinged windows used here instead of the sliding windows employed by us. Another defect is the absence of screens to keep off flies, which are always carriers of bacteria."

\* \* \*

**RECONSTRUCTION** of the Canadian Pacific Railway hotel at Vancouver is progressing. It was first intended to build the central portion twelve stories at a cost of \$800,000, but it will now be made sixteen stories. This addition and construction of east wing to eleven stories will add \$1,200,000 to total cost, making \$2,000,000 expenditure. The present seven-story west wing will later be raised to eleven stories.

## AN IMPORTANT FACTOR IN DEVELOPING THE CEMENT INDUSTRY IN CANADA TO ITS PRESENT IMMENSE PROPORTIONS.

**A**LTHOUGH unheard of in the world of cement and concrete prior to his debut into this field only eleven years ago, the man who has played an important part in the development of cement for almost universal use is none other than W. H. Ford, Montreal, the general sales manager of the Canada Cement Company, Limited.

The progressiveness and ability of Mr. Ford are evidenced by his rapid rise in so short a time, and the decision with which he handles the matters connected with so important a position as he now holds.

The best evidence of Mr. Ford's ability is contained in the fact that only a comparatively short time ago he was selling cement in less than carload lots, while to-day his department controls the sales of one of the largest (if not the largest) cement com-

panies in the world, owning and operating thirteen mills scattered the length and breadth of Canada.



W. H. FORD.

panies in the world, owning and operating thirteen mills scattered the length and breadth of Canada. That the public owes much to Mr. Ford's foresightedness cannot be gainsaid, for it was he who first suggested a campaign of education for Canadians that has enabled them to know the wonderful possibilities of concrete, and to build with it structures that

are not only better and more permanent, but cheaper in the long run.

Charleston, South Carolina, is Mr. Ford's "home town," and although born in the South, he has since coming to Canada five years ago, been in and studied the conditions obtaining in every section of the Dominion and is now one of her most enthusiastic and energetic adopted sons. He believes that no country in the world offers as great possibilities to progressive, capable young men as does the great expanse of land, rich in resources, lying north of the United States and reaching from the Atlantic to the Pacific—Canada.

The rapid rise of W. H. Ford to the prominence he has attained, is an interesting example of what brains and enthusiasm can accomplish when combined with determination and hard work.

Mr. Ford has always maintained that to be a really successful sales manager, personal contact and acquaintanceship with customers is necessary, as well as a complete knowledge of conditions throughout the sales territory. At the end of each year's shipping season, which arrives about November 15th, Mr. Ford "takes to the road" and is gone until spring, a matter of about five months, during which time he covers approximately twenty thousand miles, about four-fifths of the distance round the world, and often arrives at a small hamlet when the thermometer is many degrees below zero. These trips are largely accountable for the vast and pleasant acquaintanceship (for he seems to know almost everyone) that he has made in the short space of time he has been in Canada. However, Mr. Ford's knowledge of the people, territory and conditions, is not limited to Canada, for he has travelled over practically the whole of the United States, and takes considerable pride in being able to discuss with the same degree of intelligence, cement conditions in both countries. The success of Mr. Ford's efforts as a sales manager is unquestioned, and it would seem that his career has only just begun, and that there are surely bigger things yet in store for him.

Mr. Ford's personality is second only in importance to his business ability. He has keen perception and far-sightedness. He is considerate and generous to a fault; broad in his views, but simple in his tastes, and welcomes one with a smile. He carries with him a genial and democratic "good-fellowship" that makes you feel comfortable the instant you meet him. He has a good word for everybody and is an optimist of the "first water."

It is to be hoped that Mr. Ford will never leave Canada, but if he should, it would be impossible to forget him, because of the many immense concrete structures that have been built with his cement, but another unique monument to his memory is the beautiful big steel freighter which has been named for him, "The Fordonian." This vessel enjoys the distinction of being the first commercial vessel, propelled by oil-burning engines, to be placed in commission on fresh water. "The Fordonian" is owned and operated by the Canada Interlake Line, and is 250 feet in length, with a carrying capacity of 2,800 tons.

For recreation, Mr. Ford betakes himself to the depths of the "big woods," with his gun for company, and there pursues the moose, deer and other big game, with the same tenacity that has produced such excellent results in cement sales, and his many trophies bear witness to his "hobby" for hunting.

*PLANS* are now being prepared for four large new buildings which will be added next year to those already comprising the University of Saskatchewan, Saskatoon, and upon which over \$2,000,000 have already been expended.

\* \* \*

*THE OAK FLOORS* and battleship linoleum in the private patients' wing of the new Toronto General Hospital have been treated with Ronuk, an English sanitary floor polish. This material has been successfully used in a large number of hospitals, schools and colleges in the United Kingdom, among the more important of which might be mentioned the National Portrait, Tate and Wallace Galleries of London; School of Technology and City Art Gallery of Manchester; also the St. Bartholomew's, University College and St. George's Hospitals. A booklet entitled "The Sanitary Treatment of Floors" has been issued by the company, entering into all phases of this antiseptic polish for floors, which may be obtained at their Canadian office, 53 Yonge street, Toronto.

\* \* \*

*IN DESIGNING* modern buildings of large construction the safety of the public is paramount to every other exigency. To eliminate fire danger is a leading consideration. Recent experience in large conflagrations has overthrown the confidence of architects and designers in materials which had been considered proof against intense heat. That pulpstone gypsum blocks were selected for the interior construction of the Booth and Masonic Temple buildings, Ottawa, is the result of the builders' demonstrated conviction that the safety of the public and the protection of the users would be unquestioned. As a result twelve thousand feet of pulpstone gypsum blocks have been used in the partitions and the furring for the brick and stone walls in the Booth building. In the Masonic Temple thirteen thousand feet were laid. The fireproof blocks are the product of the Alabastine Company of Paris, Ontario.

\* \* \*

*DURING THE PAST YEAR* Frank Brangwyn has been at work in London on a mural painting for the new Court House at Cleveland, Ohio. The work consists of a canvas 50 feet long and 15 feet high, representing King John signing the Magna Charta at Runnymede in 1215. The King, seated, with parchment in the act of signing, is seen in a group comprising the Earl of Pembroke, Pandulph, the Papal Legate; two bishops, Robert Fitzwalter, kneeling and closely watching John as he signs, and Stephen Langton, whose robe of rich orange red gives

the keynote of color to the panel. The last named is standing in a persuasive attitude, obviously completing arguments in favor of the King's unwilling act. Near him are Church dignitaries in their ecclesiastical robes. Attendants and nobles in armor, boatmen, and men bearing their masters' shields form a picturesque crowd. A notable feature of the work is its balance and strength and its masterly color harmony. Some idea of the magnitude of the task may be gathered from the fact that Mr. Brangwyn had to take one of the largest studios in London for the work. The canvas was built on a large timber frame, and the artist had to use a movable scaffold to reach some parts of the picture. Only the purest oil colors were employed, and to remove the high lights of the ordinary oil painting, which would make it difficult to see the details of the panel at the height at which it is being fixed, the artist mixed the oils with wax—an unusual medium, but one which should retain all the beauty and quality of the picture for at least three hundred years.

\* \* \*

*ONE OF THE VITAL* essentials in life is to move forward, not backward. This fact has aroused the best efforts of every successful business corporation as well as each individual who has made his worth felt in our present age. CONSTRUCTION is endeavoring to reach a position where it will be recognized as an important factor in the uplift of Canadian art and commercialistic growth. We want to show the best work which is being done throughout the Dominion and at the same time present it in the best manner possible for our readers and our advertisers. Beginning with the January issue, we will include each month a series of plate forms, illustrating a subject on heavy paper and on one side only of the page. In addition only full page advertisements will come in front of the editorial matter. These changes will improve the appearance of the magazine considerably, and also make it of infinitely more value to everybody concerned.

\* \* \*

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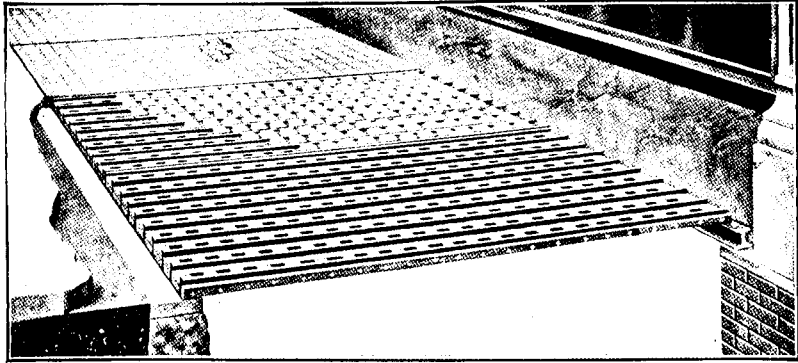
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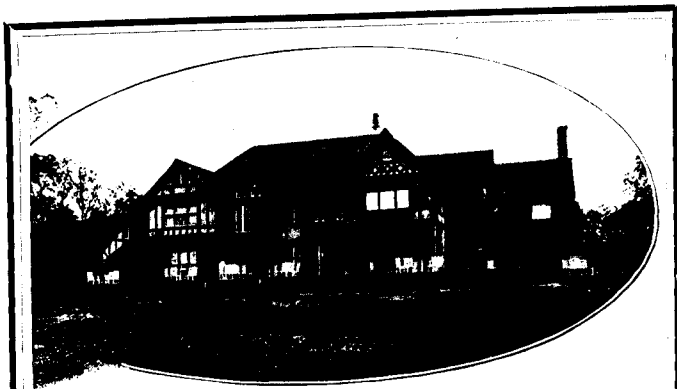
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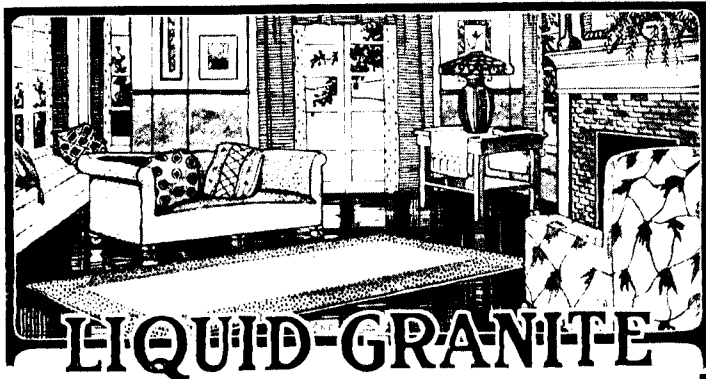
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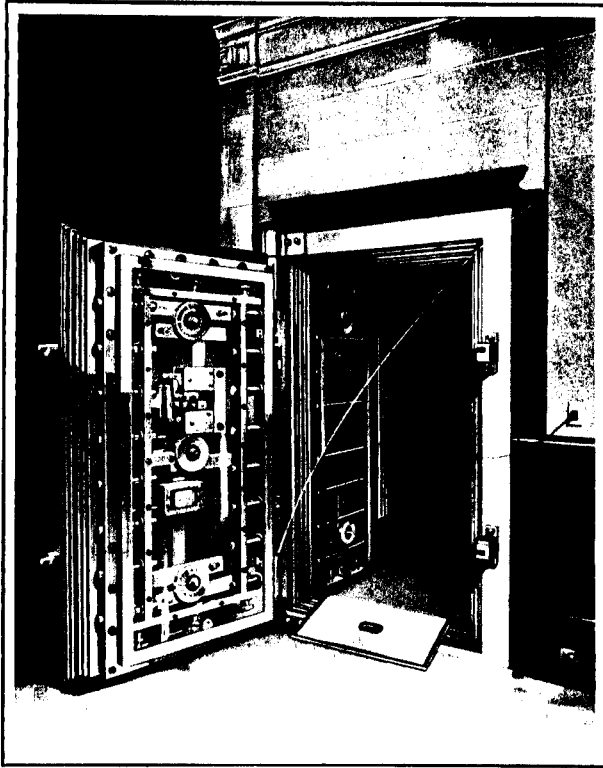


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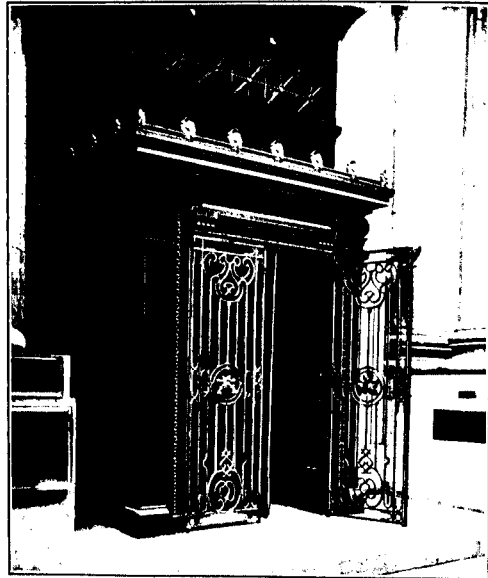
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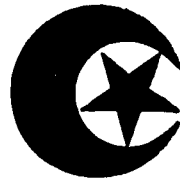
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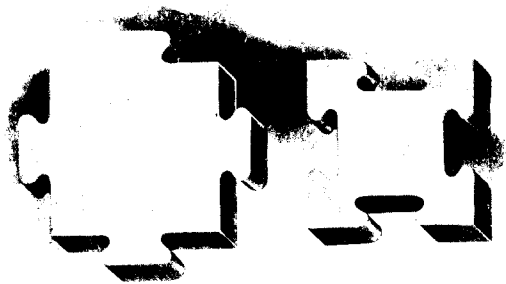
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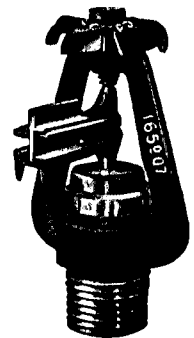
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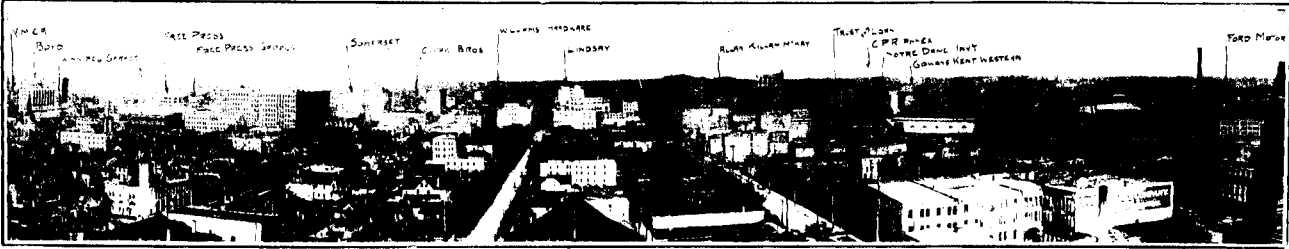
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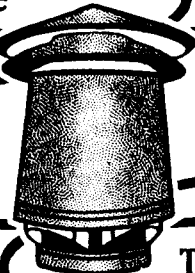
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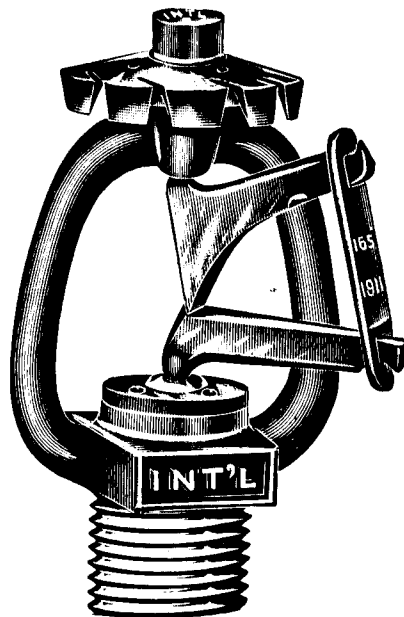
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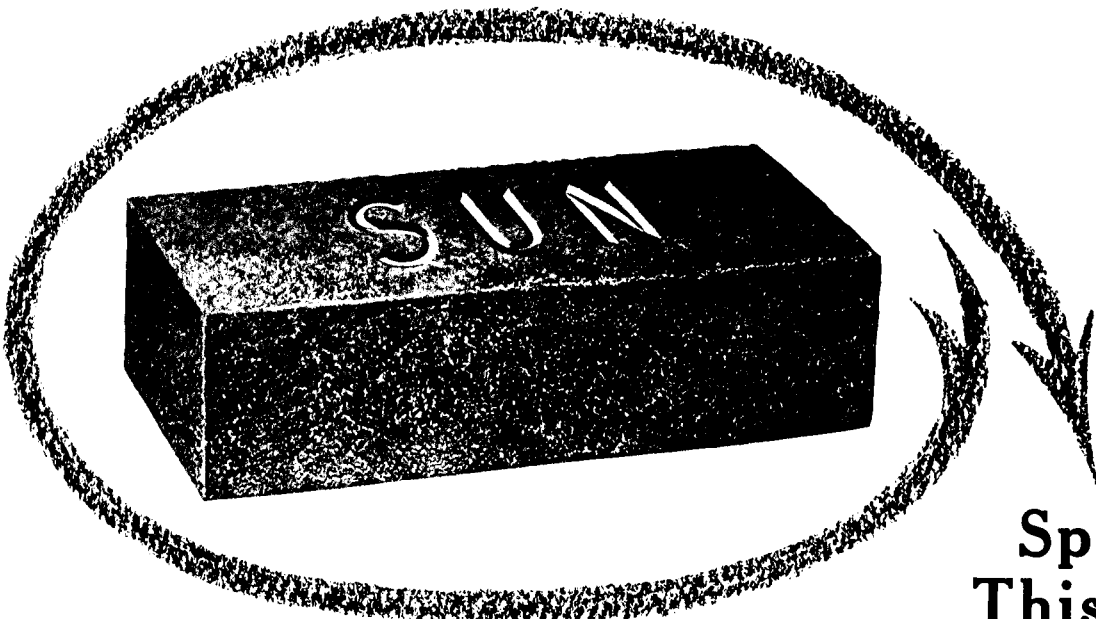
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