

VOL. 6. NO. 6

JUNE, 1913

\$8.00 per Year
35c. per Copy

CONSTRUCTION

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



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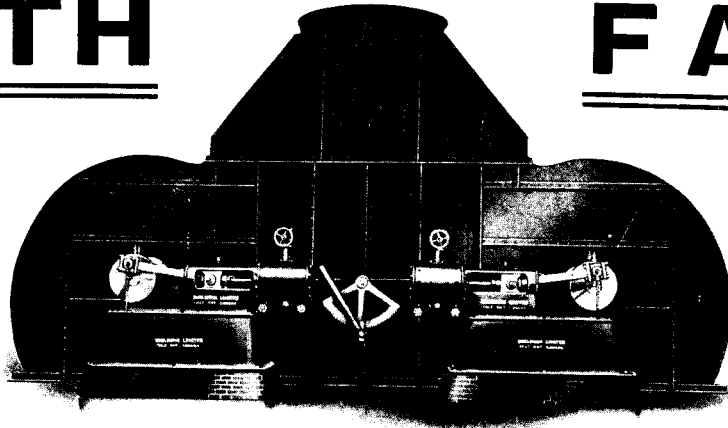
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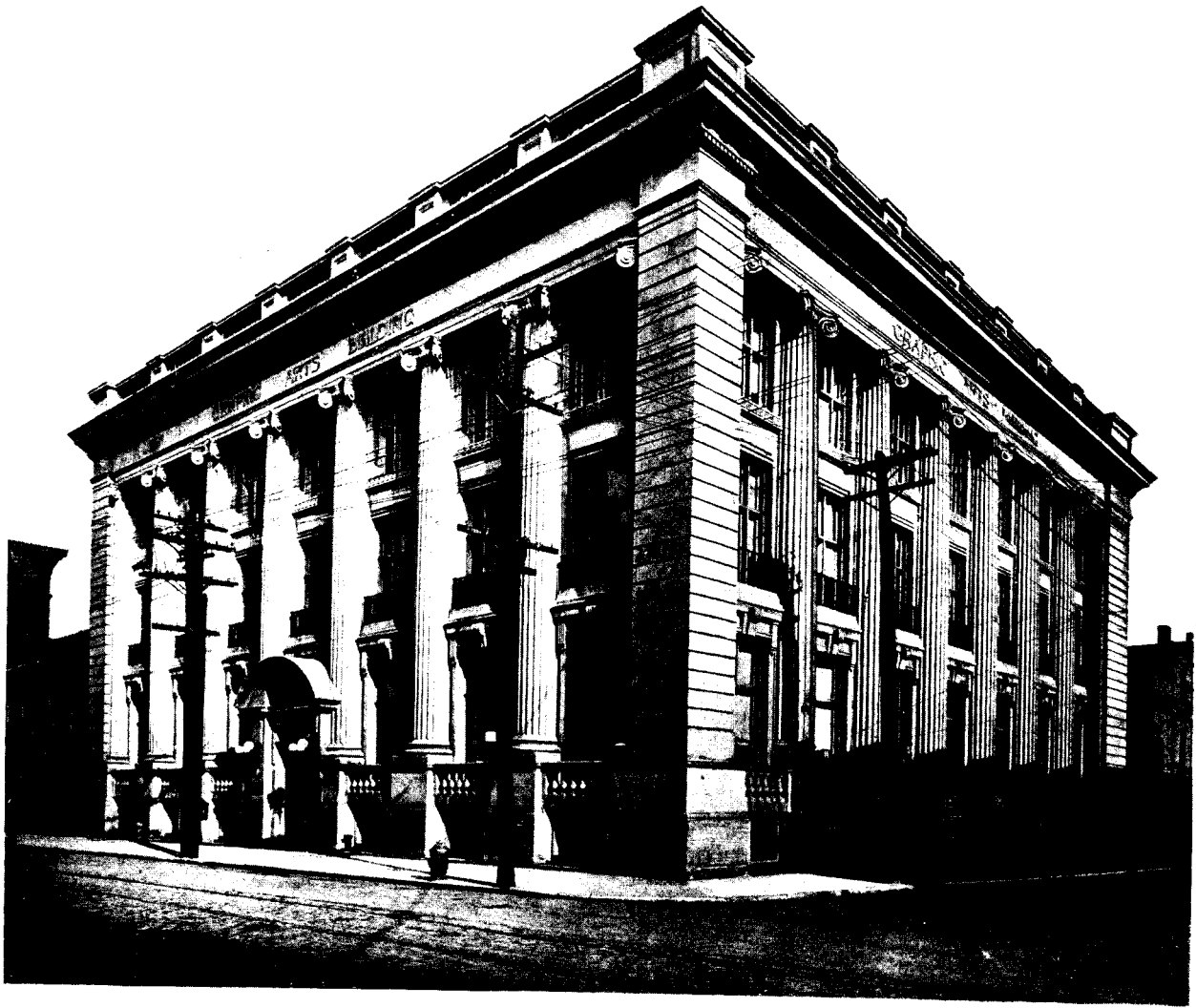
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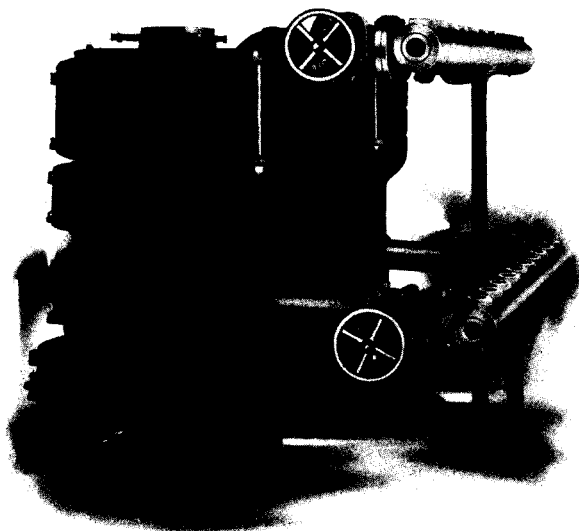
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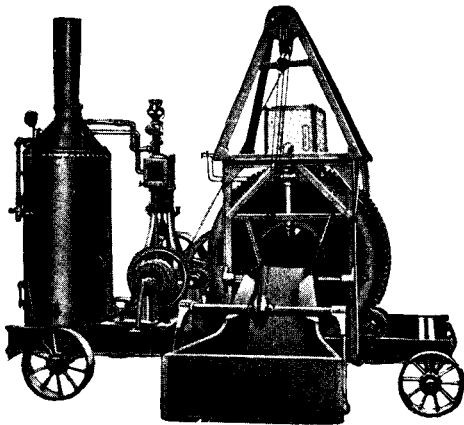
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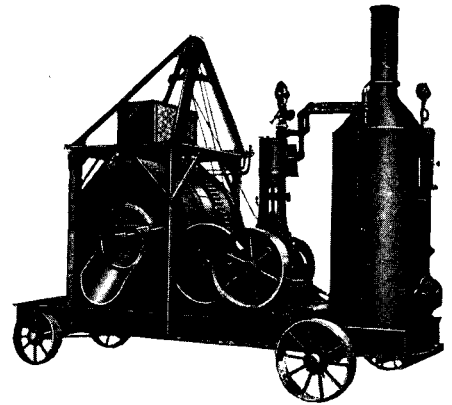
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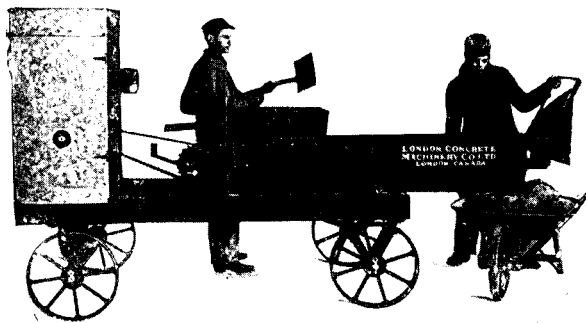
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The First Cost
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breaking down



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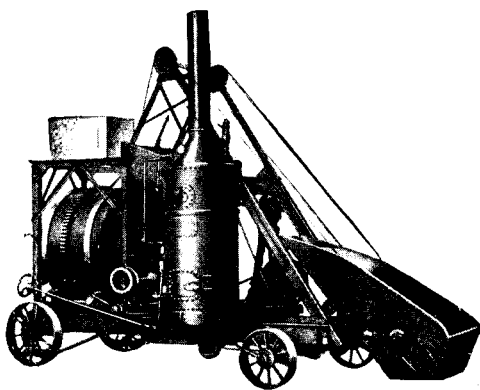


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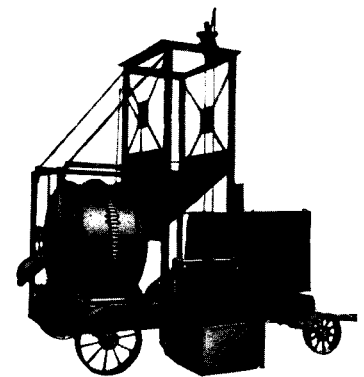
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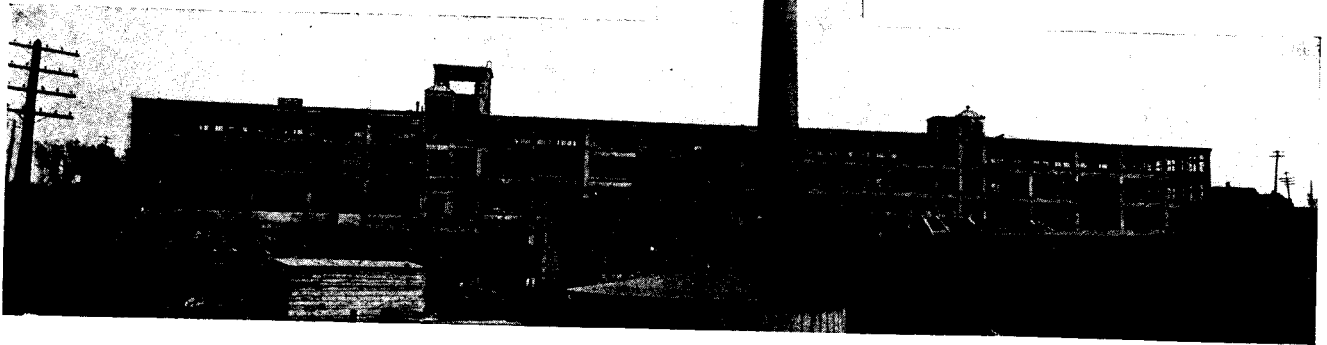
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You can have a copy free if you will mention this advertisement.



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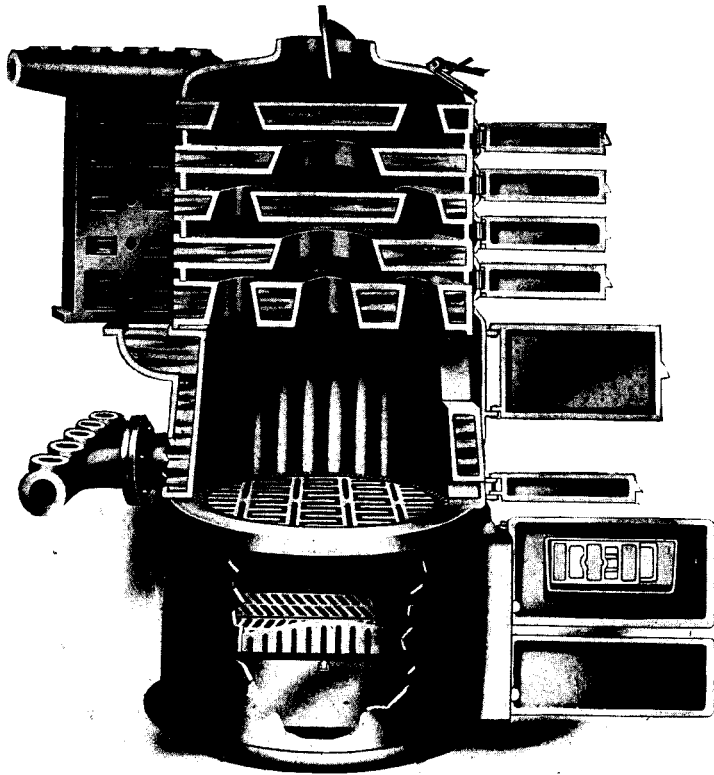
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The flues in the "Sovereign" are larger, and more broadly flared than ever applied in hot water boiler designing. It is the "baffled travel" that prevents the too direct and rapid outlet of the heat fumes from the fire bed.



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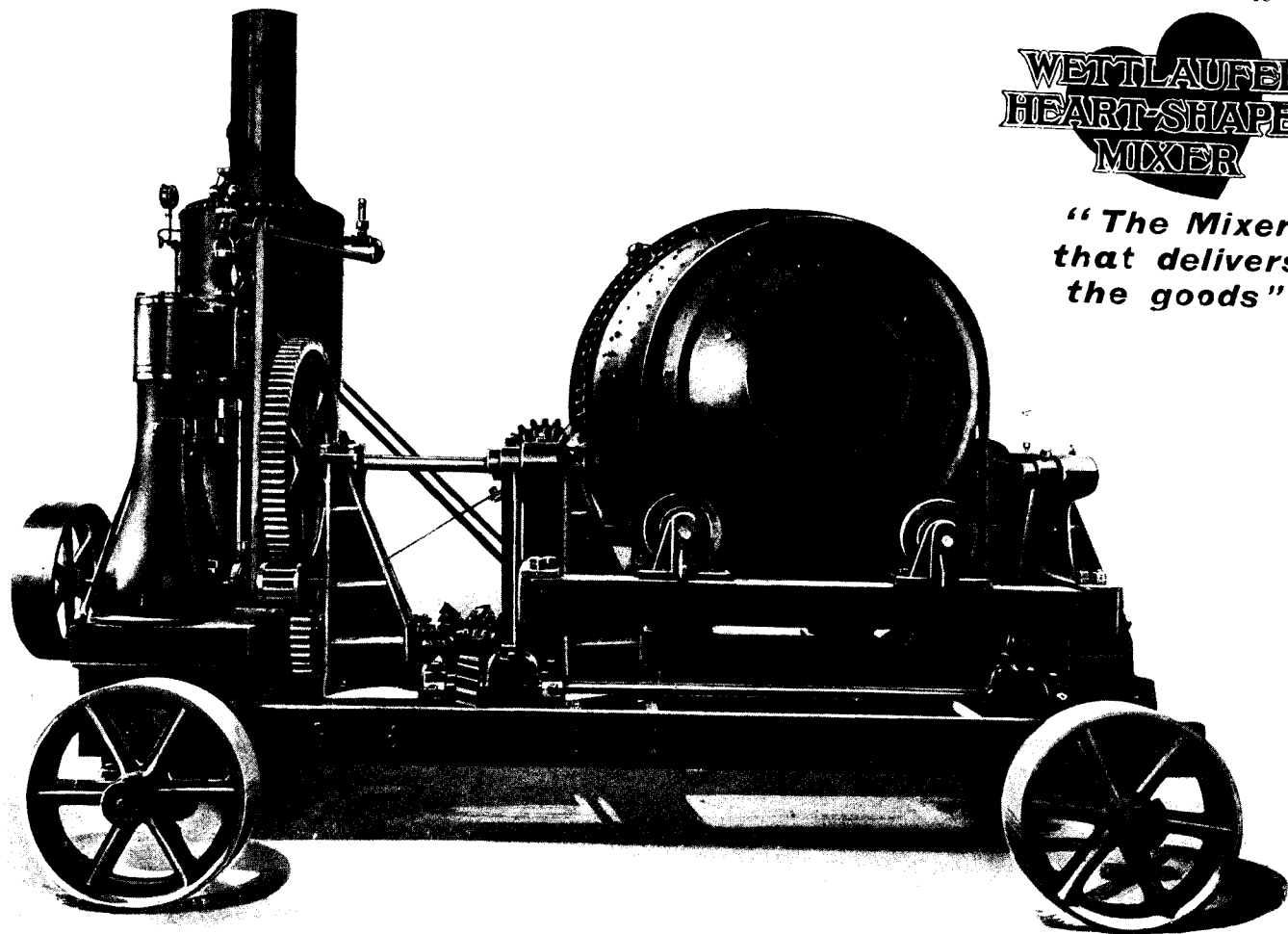
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HEART-SHAPED
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*"The Mixer
that delivers
the goods"*



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Heart-Shaped Mixer

The price you pay for a WETTLAUFER HEART-SHAPED MIXER is the same as you will pay for any other good mixer, but there is no comparison in the value you receive for your money.

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The WETTLAUFER has always been the leader on jobs where quick, sure results are necessary.

Call at any of our showrooms and see it work. We will gladly demonstrate it for you, and tell you the actual experiences of contractors who have used this mixer on all kinds of big concrete jobs. We will send you our catalogue on Hoists, Pumps, Stone Crushers, and Tile, Block and Brick Machines.

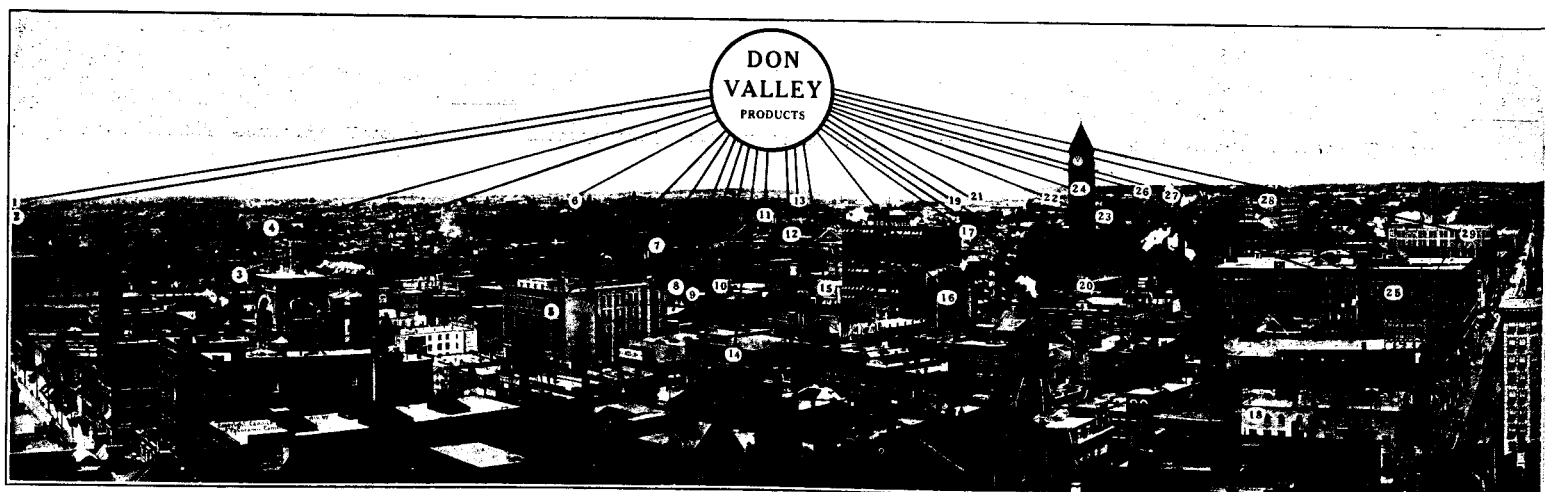
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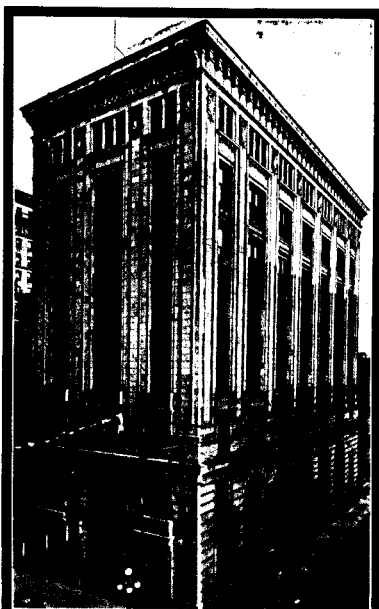


BUILDING

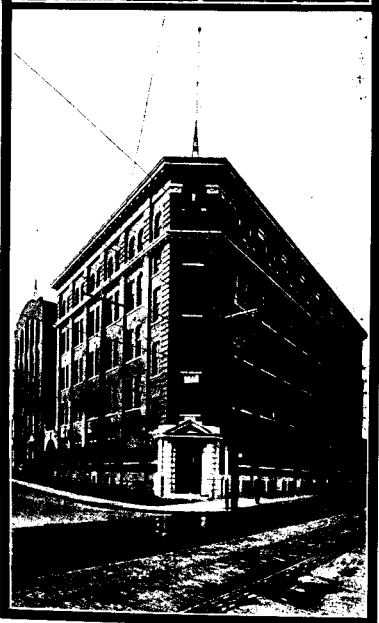
BUILDING ACTIVITIES in Toronto have in the last few years been of such vast proportions that it is practically a new city.

In the business district are to be seen hundreds of fine structures either recently completed or still in course of construction, and in the majority of cases the materials from which they are built are Don Valley Products. Don Valley Bricks and Porous Terra Cotta Fireproofing have the structural qualities necessary for buildings of the highest type. They are made in the largest plant of its kind in Canada and the clay from which they are made has no superior in America for producing the finest quality of clay products.

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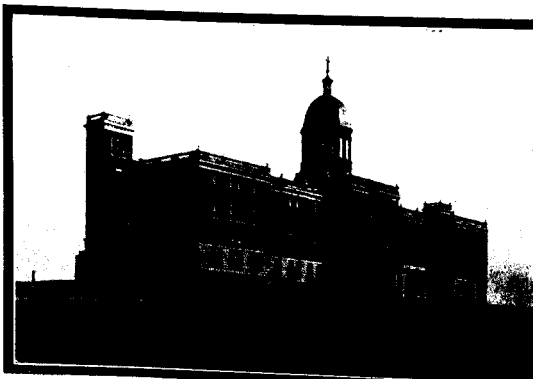
Standard Bank Building, Toronto.



Aluminum and Crown Stopper Co.'s Building, Toronto.

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36 Toronto St.
TORONTO



St. Augustine's Seminary, Toronto.



Library Wing, Parliament Buildings, Toronto.

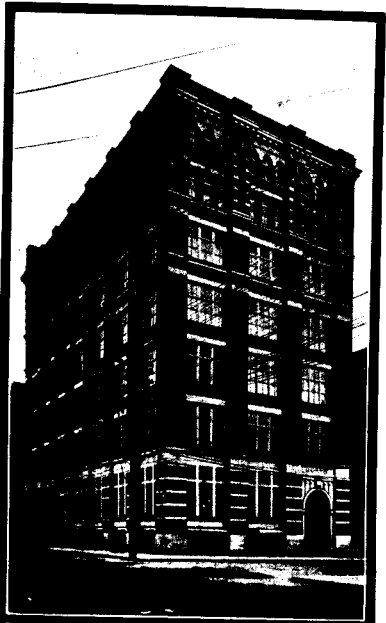


Bank of Ottawa (Branch), Toronto.

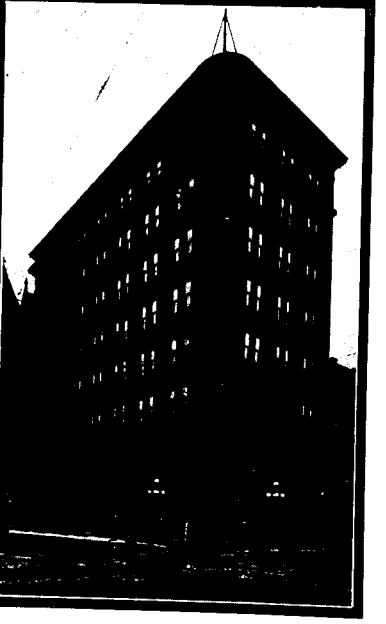


ING A CITY

- 1— B —Darling Building.
- 2— B —W. J. Gage Building.
- 3— B —Adelaide Street Fire Hall.
- 4— B —Phoebe Street Public School.
- 5—AB —Bell Telephone Building.
- 6— B —Canada Foundry Co.
- 7—AB —Osgoode Hall (New Addition).
- 8— B —Ford Motor Co.'s Building.
- 9— B —Schacht Motor Co.'s Building.
- 10— B —Russell Motor Car Co.'s Building.
- 11— B —St. Patrick's Church.
- 12—AB —Armouries.
- 13— B —Dental College.
- 14— B —Stair Building.
- 15—AB —Gayety Theatre.
- 16— B —Continental Life Building.
- 17— B —Manning Chambers.
- 18— B —Holt-Renfrew Building.
- 19— B —Physics Building, Toronto University.
- 20— B —Gerhard Heintzman Building.
- 21— B —Convocation Hall, Toronto University.
- 22— B —Engineering Building, Toronto University.
- 23—AB —General Hospital.
- 24— B —City Hall.
- 25—A —Robert Simpson Co. Building.
- 26— C —Sir Henry Pellatt's Stables.
- 27—A —Parliament Building.
- 28—AB —T. Eaton Co.'s Factory.
- 29—AB —T. Eaton Co.'s Store.
- 30—AB —Traders Bank Apartments.
- 31— B —Massey Hall.
- 32—AB —Heintzman & Co.'s Building.
- 33—ABC—McDonald & Willson Co.'s Building.
- 34— BC—Holy Blossom Synagogue.
- 35— B —Macmillan Publishing Co.'s Building.
- 36—A —Lumsden Building.
- 37— B —St. Michael's School.
- 38—AB —St. Michael's Hospital.
- 39— C —Vokes Hardware Co.'s Building.
- 40— B —Palm House, Allan Gardens.
- 41—AB —Birkbeck Building.
- 42— C —Orr Brothers Building.
- 43— B —Arena.
- 44—AB —Toronto Electric Light Co.'s Building.
- 45—AB —Shea's Theatre.
- 46— B —King Edward Apartments.
- 47—AB —McLaughlin Carriage Co. Garage.
- 48— B —Bennett & Wright Co.'s Building.
- 49— B —Robertson Bros. Building.
- 50— B —Fred Victor Mission.
- 51— B —New Government House.
- 52—AB —St. James' Parish House.
- 53— B —Sheet Metal Products Co.'s Building.
- 54— B —Christie, Brown Co.'s Building.
- 55—AB —Reinhardt Brewing Co.'s Building.
- 56— B —Gendron Mfg. Co.'s Building.
- 57— B —House of Providence.
- A—Porous Terra Cotta Fireproofing.
- B—Brick. C—Enamel Brick.



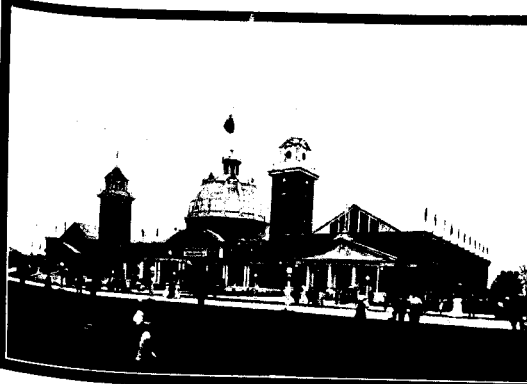
Ogilvie Building, Toronto.



Confederation Life Building, Toronto.

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New Government Building, Toronto Exhibition.



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which is used throughout the entire building. The finest examples of modern construction in Canada almost universally use Pedlar Metal Lath.

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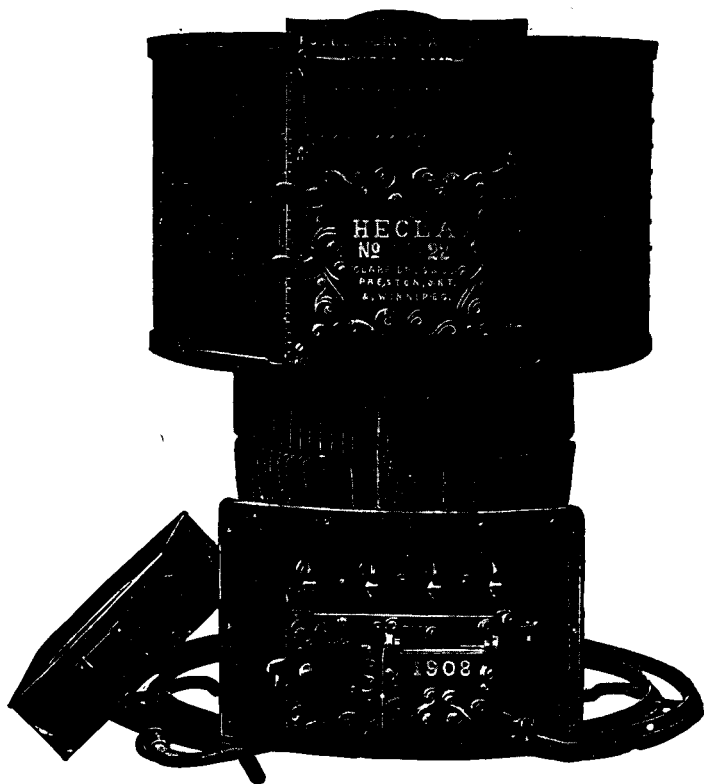
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The requisite for a successful Warm-Air Heating System is a good furnace; one that will not only supply an abundant quantity of pure warm air; but will, in addition, be economical in the consumption of fuel, easy to operate, safe from dust and smoke, 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.

"HECLA" FEATURES

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- Damper Regulator enables you to operate the dampers without going to the basement.
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STEEL RIBBED FIRE POTS
INDIVIDUAL GRATE BARS

PATENT FUSED JOINTS
CAST IRON COMBUSTION CHAMBER

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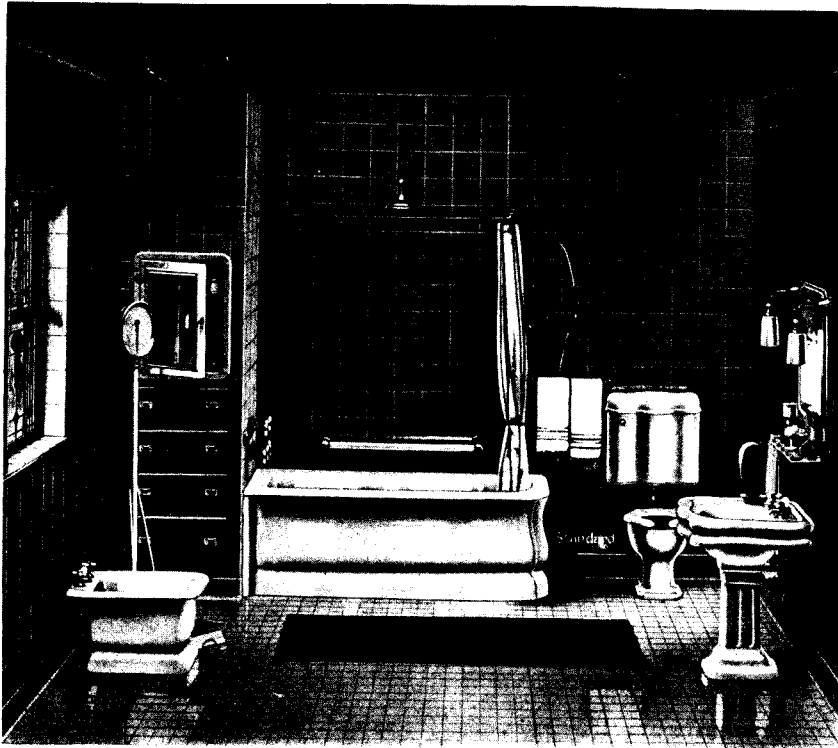
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“Standard Sanitary”

MODERN BATHROOM



Design P-90

This bathroom is extremely practical as well as beautiful, and combines every modern sanitary idea.

The leading feature is the “Standard Sanitary” Glenroy tiled-in bath, with enameled front plate, concealed fittings and overhead shower.

The bath is built into the floor and walls, affording no place for dirt and moisture to accumulate. The enameled exterior is very attractive and easily kept clean.

The graceful Arcadia Lavatory, Foot Bath, and Extended Lip Closet with Enameled Tank and Ivorite Seat, make an unusually complete and artistic bathroom at a very reasonable cost.

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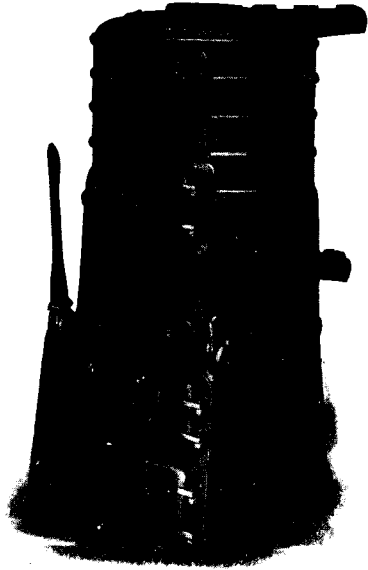
TORONTO STORE
55-59 Richmond Street East

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STEEL AND RADIATION, LIMITED

OUR PRODUCTS:

- “KING” HOT WATER BOILERS
- “ROYAL” ROUND STEAM BOILERS
- “ROYAL” SQUARE STEAM AND WATER BOILERS.
- “ROYAL” TANK HEATERS
- “KING” AND “IMPERIAL” RADIATORS



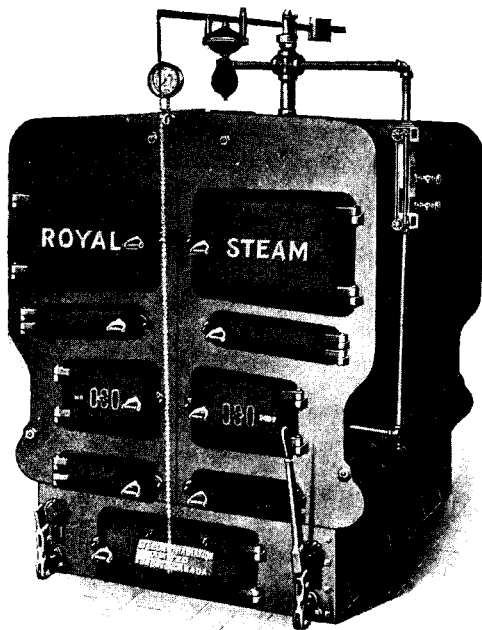
NO. 6 H. B. “KING”

Specify our products as outlined above and insure for your client “Satisfaction” and “Prompt Shipment.”

From present indications the demand for Boilers and Radiators will be greater than last year.

We are better equipped to meet this demand than any other manufacturer, with our new and modern plant at St. Catharines together with our Toronto Plant running night and day. Our output has been more than doubled.

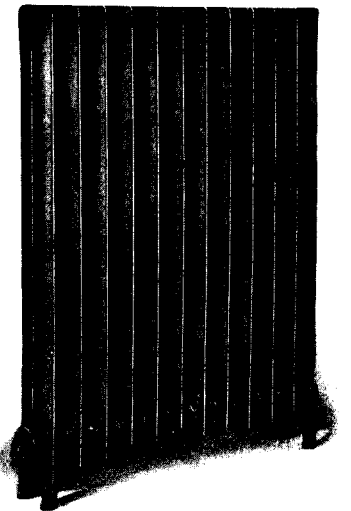
The “KING” Hot Water Boiler is favored and accepted everywhere as representing Efficiency of the highest type at lowest coal consumption of any boiler on the market.



S-48 “ROYAL” STEAM

Our “ROYAL” Round Steam and Square Sectional Steam and Water Boilers are already repeating the success of The “KING” Boiler.

“KING” Radiators are so well and favorably known that it is only necessary to mention them.



“IMPERIAL” ONE-COLUMN

We would draw attention, however, to our New “IMPERIAL” Radiator made only in one and two column plain, in every height. See Cut showing clear cut lines and clean smooth castings.

Catalogues mailed on request.

STEEL AND RADIATION, LIMITED

HEAD OFFICE, FRASER AVE., TORONTO

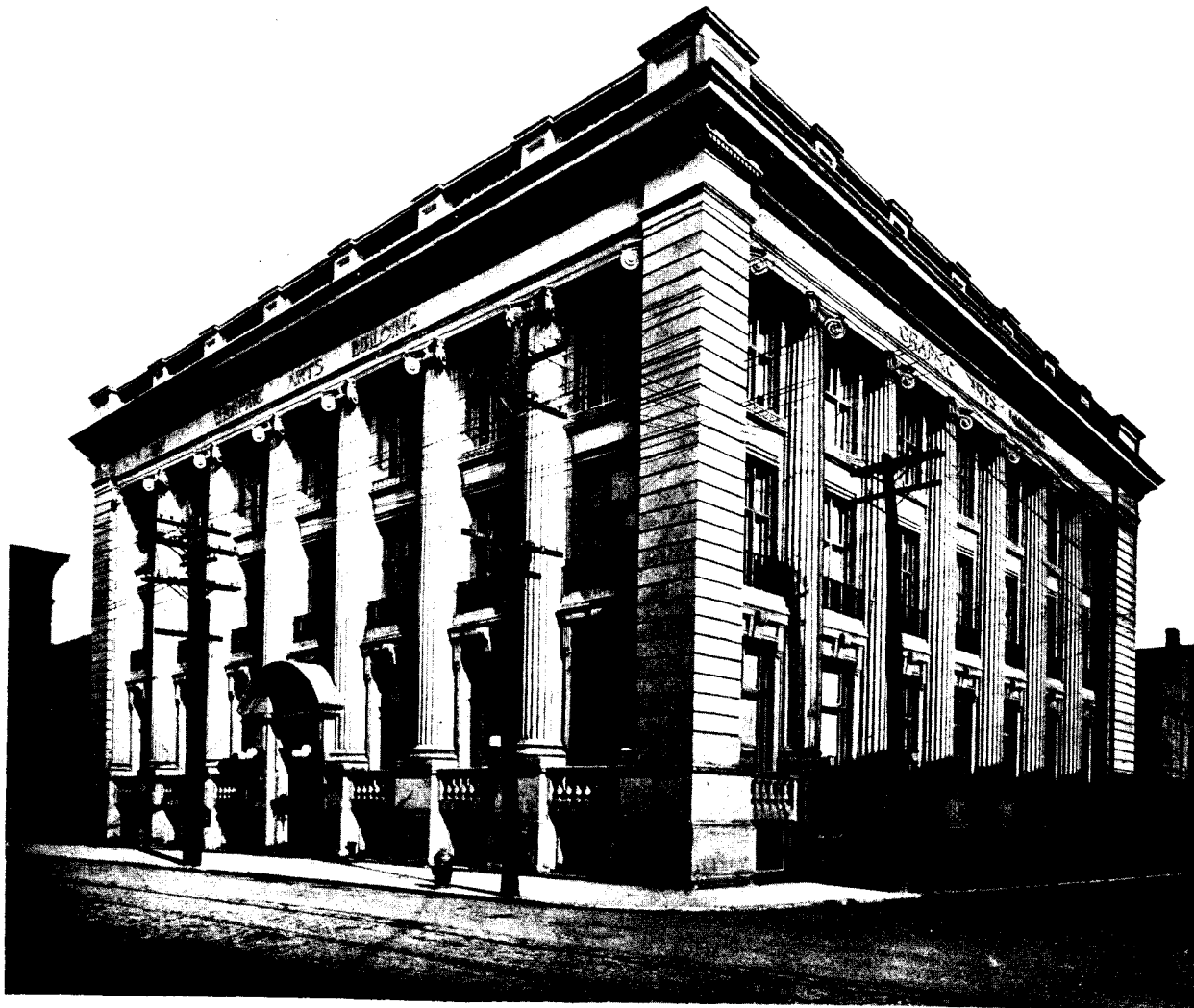
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TRADERS BANK BUILDING
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August 16th. 1912.

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In issuing your final certificate for the stone work of the Graphic Arts Building, permit me to say that I have been very much pleased with the manner in which you handled this important contract. The material is of an excellent quality, and deliveries were up to promises. The careful attention and courtesy of the officials of your Company has done much to facilitate the rapid completion of the building.

Yours truly,

The Roman Stone Co. Ltd.,
Temple Building,
Toronto.

F. S. Baker
Architect.

WE MAKE GOOD STONE

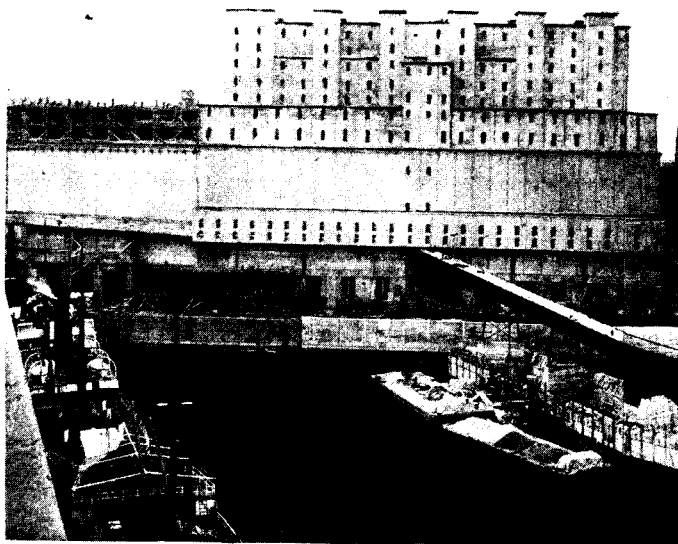
For the Most Difficult Waterproofing Problems

MEDUSA WATERPROOFING

is Specified

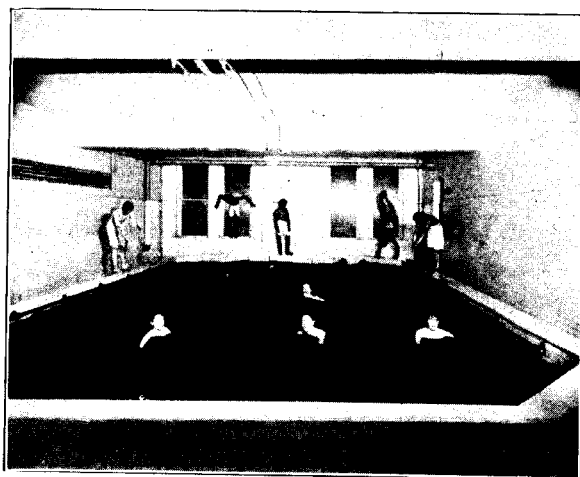
The waterproofing problems presented by the work shown in the accompanying illustrations are about as difficult as any the Architect or Engineer is called upon to solve.

For work of this character, concrete, when properly waterproofed has advantages that no other material possesses. The selection of MEDUSA WATERPROOFING shows that it fulfills the most exacting waterproofing requirements, and its success on this work points out to Canadian Architects and Builders the best and surest way to obtain satisfactory results on similar work.



Harbor Commissioners' Elevator, Montreal.
20 tons Medusa Waterproofing used.

MEDUSA WATERPROOFING is a dry white powder that is mixed with the dry cement before the addition of water. It makes the whole mixture waterproof. Its cost is more than covered by the saving in cement, as a comparatively poor mixture becomes permanently waterproof when MEDUSA is used.



The Y.M.C.A. Swimming Pool, Port Arthur
Waterproofed with Medusa Waterproofing

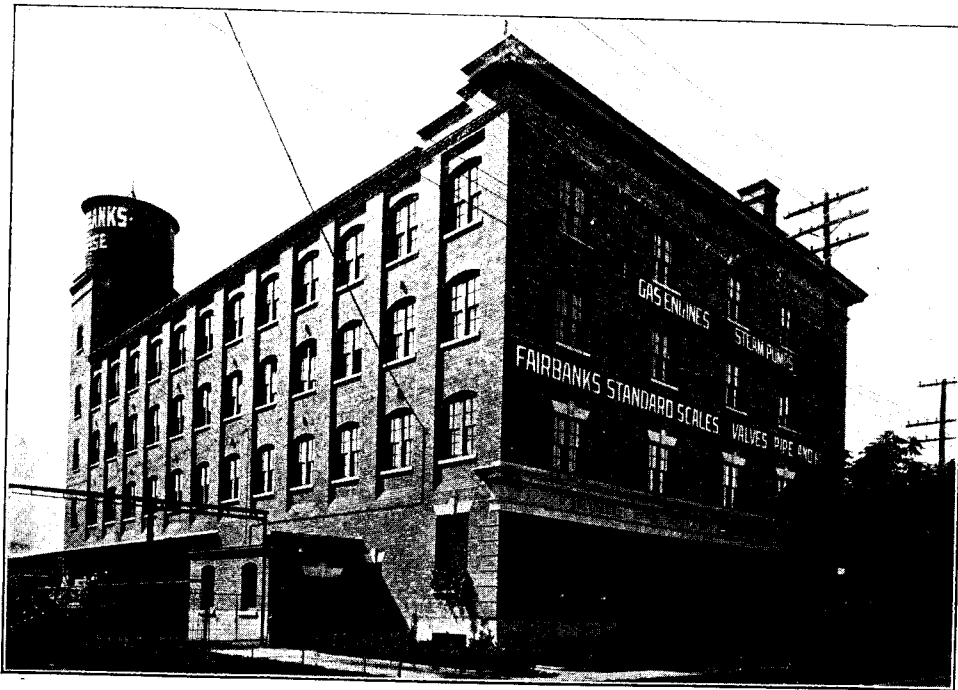
Used successfully for Foundations, Cellars, Reservoirs, Walks, Storage Tanks, Floors, Roofs, Stucco, Concrete Blocks, Cement Mortar. Does not affect the color, strength, or set of Portland Cement. Will withstand the most severe water pressure.

Have us send you particulars about MEDUSA WATERPROOFING. Among the many important building operations now under consideration, are a number in which concrete will be extensively used. To insure a successful job, MEDUSA WATERPROOFING should be specified in every case.

Manufactured by

Stinson-Reeb Builders' Supply Company, Limited

Tenth Floor, Eastern Townships Bank Bldg., Montreal, P.Q.



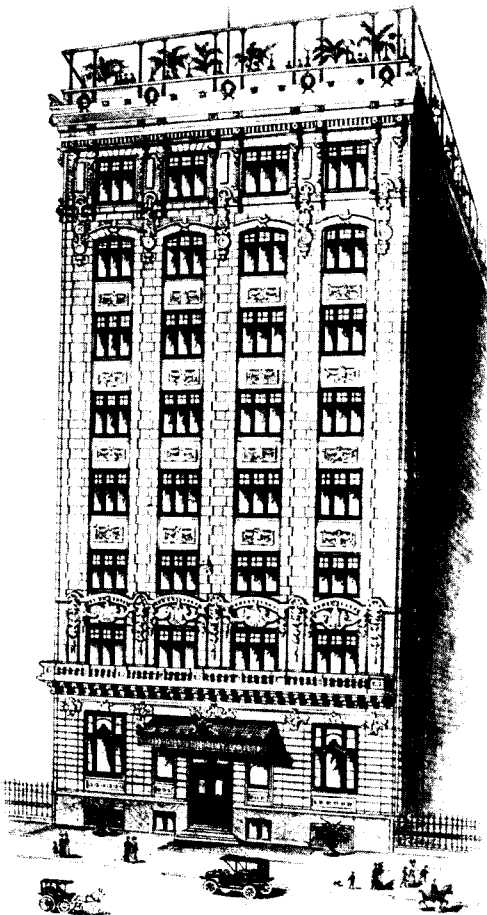
BUILT WITH PORT CREDIT WIRE CUT BRICK. Architect, T. Pringle & Son, Ltd.

WIRE CUT AND PRESSED BRICK

Our plant has a capacity to meet any order.

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McKinnon Building, Toronto



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Bishop St., Montreal

Proprietor - O. N. Henault
 Architect - C. A. Mitchell
 Superintendent J. E. E. Lyness
 Cost - - Over \$200,000

The Royal George Apartments recently completed is one of the finest buildings of its class in Canada. In the matter of appointments no expense has been spared. A feature of the conveniences installed is the Northern-Electric Inter-phone that provides the tenants with the most modern system of inter-communication to be had.

Illustrated descriptive literature giving full information about Northern-Electric Inter-Phones will be sent you on request. Write our nearest house.

THE Northern-Electric
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Manufacturer and Distributor of Telephone and Fire Alarm Apparatus and Electrical Supplies for every possible need.

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ACORN QUALITY FIRE-PROOF WINDOWS



WE claim for this window that it is the only one on the market to-day that is absolutely **wind-proof** as well as **fire-proof**. This is accomplished by the flange setting into the rabbit $\frac{7}{8}$ inch, which not only forms a perfect wind break, but does not interfere with the working of the sash.

The whole window is stamped by steam power, with steel dies, so that all parts are uniform.

When you want fire-proof windows ask for Acorn Quality, and be sure you take no other. If you get Acorn Quality you get satisfaction, and you get safety from wind and fire.

Before you decide to place your order be sure and write to us and get our prices, and let us show you what Acorn Quality Fire-proof Windows really are.

We feel sure of your decision.

The Metal Shingle & Siding Co.

Limited

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The Constructor Says—

“There is no use in doing a thing twice if you are only paid for doing it once. That is why I use no other brand of metal lath but Herringbone. Before I knew Herringbone, I used to lath twice a strip about two inches wide, along each edge of each sheet. It adds up at the end of the job.

“Now I use Herringbone. The selvage edge provides lap and lock at the same time, and best of all, it costs me nothing. The manufacturers measure the sheet for billing purposes from inside to outside of selvage, so that I only pay for the lath that shows after erection on the wall.”

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117 Home Life Building

TORONTO

The Metal Shingle & Siding Co., Manufacturers

If Greece had developed
 If a building paper,
 it would have been

NEPONSET

WATERPROOF BUILDING PAPER



BIRD & SON Hamilton, Ont., Montreal, St. John N B, Winnipeg, Vancouver
 [F. W. Bird & Son.]

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

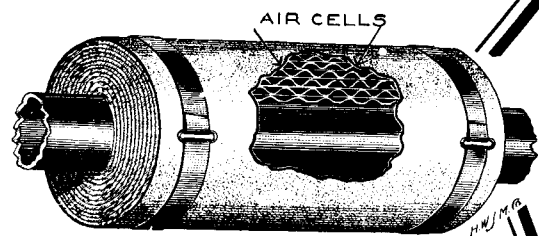
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As you of course know, insulation is based on the fact that heat cannot pass through dead or motionless air. Therefore, the more dead air a pipe covering confines, the greater its efficiency.

Now, J-M Asbestocel Pipe Covering is the only low-pressure covering we know of which confines air—and lots of it—in an absolutely *dead* state—the only one which permits no circulation whatever.

In other coverings the air channels run from end to end and the air is, of course, continually traveling back and forth.

But the air cells run *around* the pipe—each cell entirely separate in



J-M ASBESTOCEL PIPE COVERING

Thus the spaces are so small that the air has no chance to circulate.

Also, because of this arrangement of the air cells, J-M Asbestocel Pipe Covering is built on the arch principle and is therefore far *stronger* than other low-pressure coverings—doesn't crush down under weight—*lasts longer* than any other kind of low-pressure covering.

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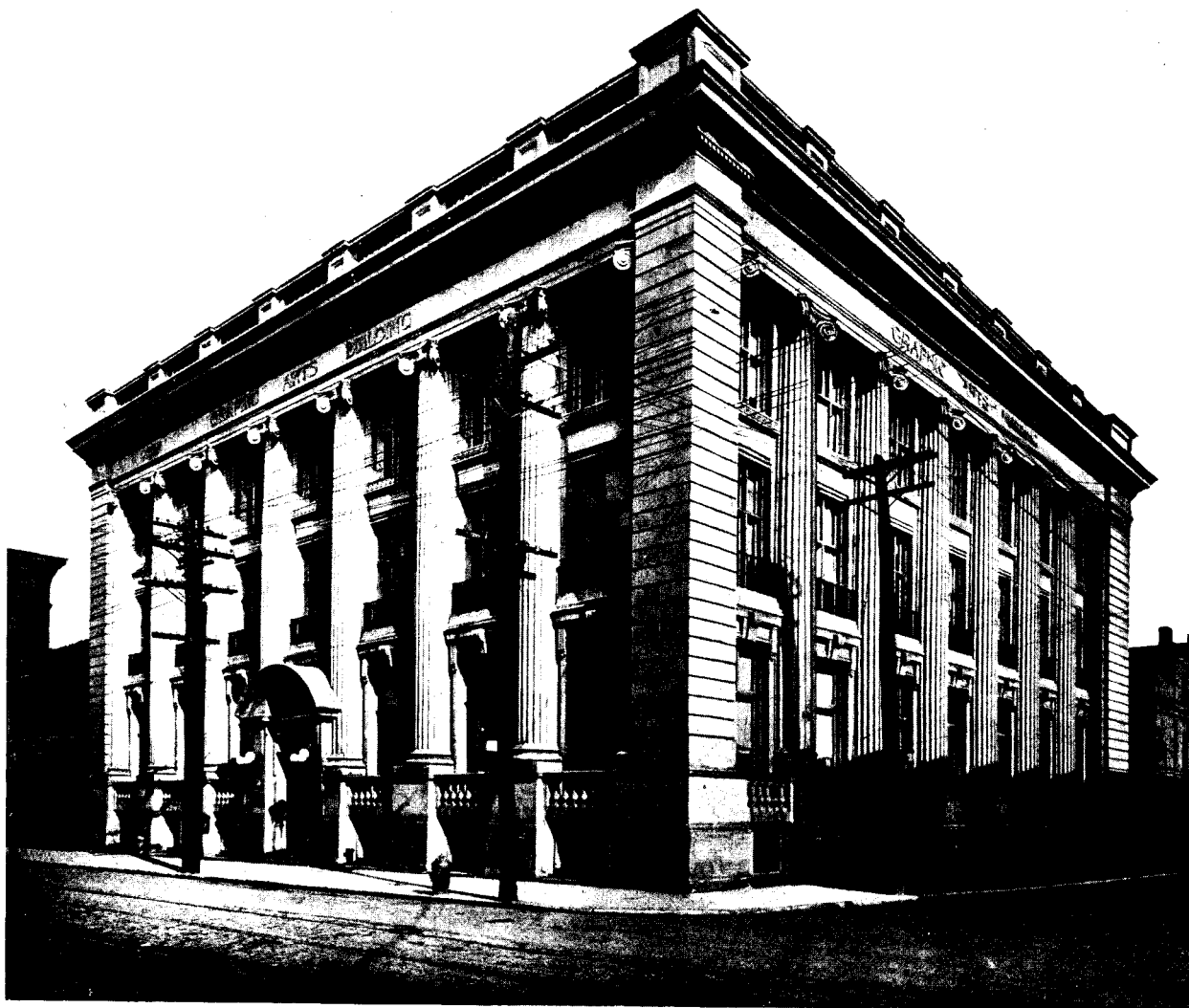
Asbestos Roofings, Packings
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MONTREAL

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GRAPHIC ARTS BUILDING Otis-Fensom Elevators installed in this building F. S. BAKER, Architect

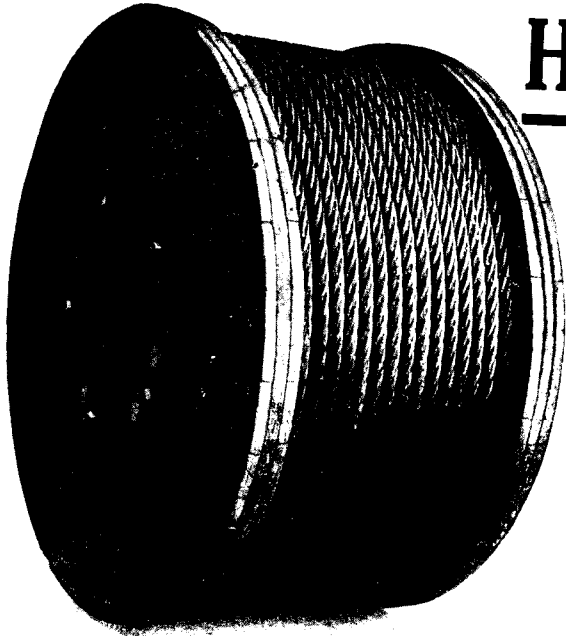
The Passenger and Freight Elevators
in this Building were made
and installed by the

**Otis-Fensom Elevator Company
Limited**

Head Office: Toronto

Works: Hamilton, Ont.

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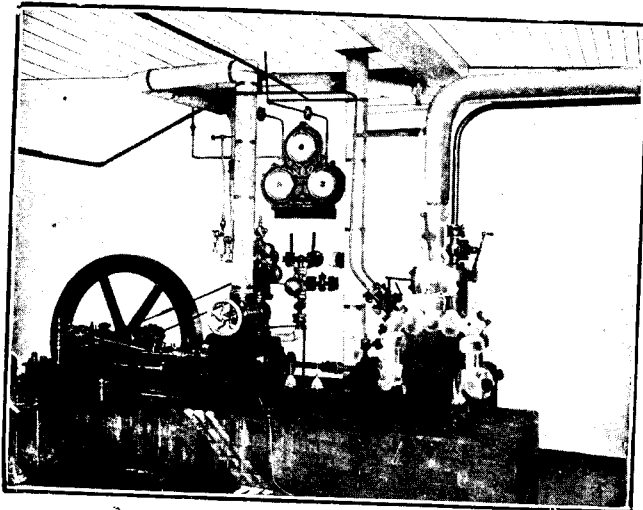
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Wire Rope
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REFRIGERATING AND ICE-MAKING MACHINERY
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ALL FITTINGS KEPT IN STOCK

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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.

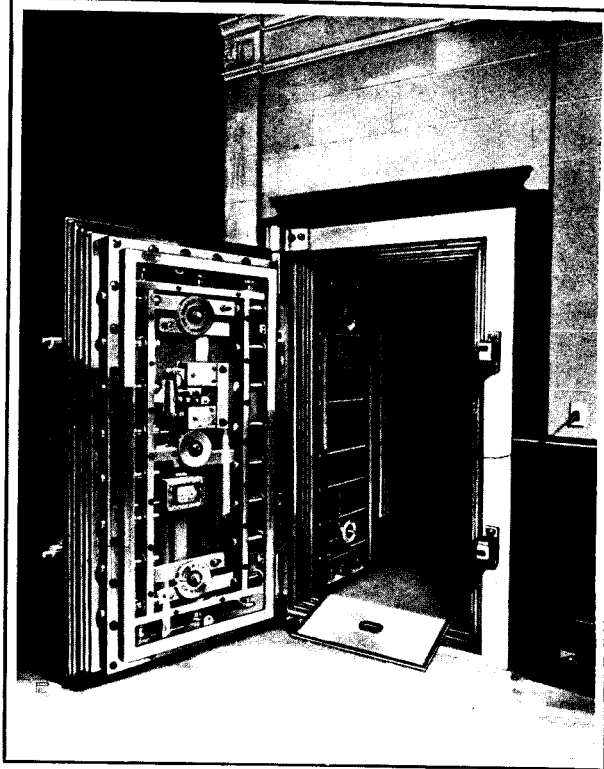
It will fulfil the following conditions:

- Moderate in price.
- Great covering capacity.
- Possesses great elasticity and tenacity.
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- Will not crack nor peel off.
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- 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.
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- Steel plates coated fifteen years ago still perfectly protected and good.
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- 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.

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FLAT WALL FINISHES

are the most up-to-date decorative materials for all buildings, public or private.

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The Perfect Washable, Flat Wall Finish

stands unrivalled for the decoration of walls and ceilings where beauty and absolute sanitation are of prime importance.

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Is Gained by Specifying

International Varnishes, Stains and Enamels

The materials of quality and world-wide reputation. Marketed in sealed cans containing Full Imperial Measure, under our own copyrighted trade name and label.

ELASTICA Architectural Finishes

ELASTICA FLOOR FINISH—The one perfect Floor Varnish is so tough that nothing mars it. It is water proof and never turns white or cracks.
ELASTICA NO. 1—For finest exterior work.
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KLEARTONE Stains, Acid or Oil

KLEARTONE STAINS preserve the natural beauty of the wood and for depth and clearness of tone are unexcelled.

Satinette White Enamel

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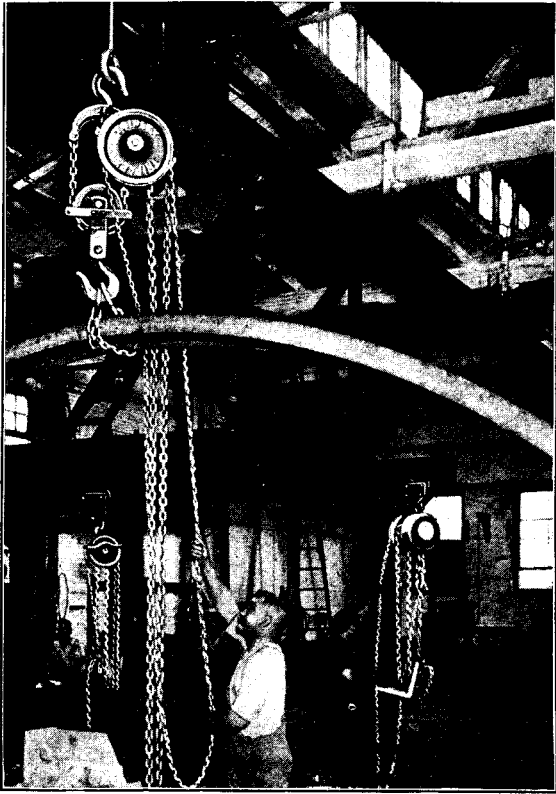
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NEW YORK CHICAGO LONDON BERLIN BRUSSELS MELBOURNE.

Largest in the world and first to establish definite standards of quality.

N. 31

THE TRIPLEX BLOCK



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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.

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SEBCO Expansion Bolts Insure Substantial Fastenings

They meet every requirement in building construction. The plumber, the electrician and the mechanic all have their particular uses for which there is a SEBCO Expansion Bolt especially adapted. They are in universal demand, and those who know always specify SEBCO Expansion Bolts.

For Construction Work in Building Bridges, Railroads, Factories, Etc.,

the SEBCO Expansion Bolts are simple, flexible, strong, rigid and absolutely the only safe and economical method of fastening fixtures to walls, floors and ceilings of concrete, stone, brick, etc.

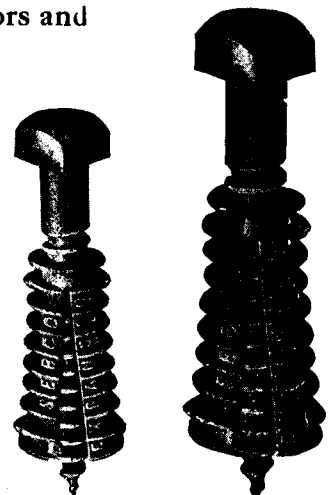
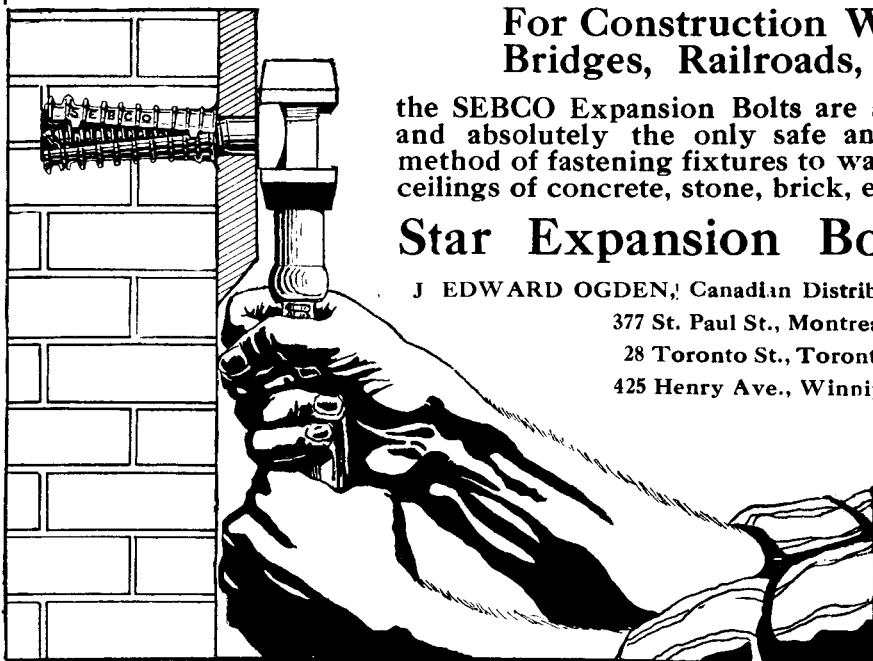
Star Expansion Bolts

J. EDWARD OGDEN, Canadian Distributor

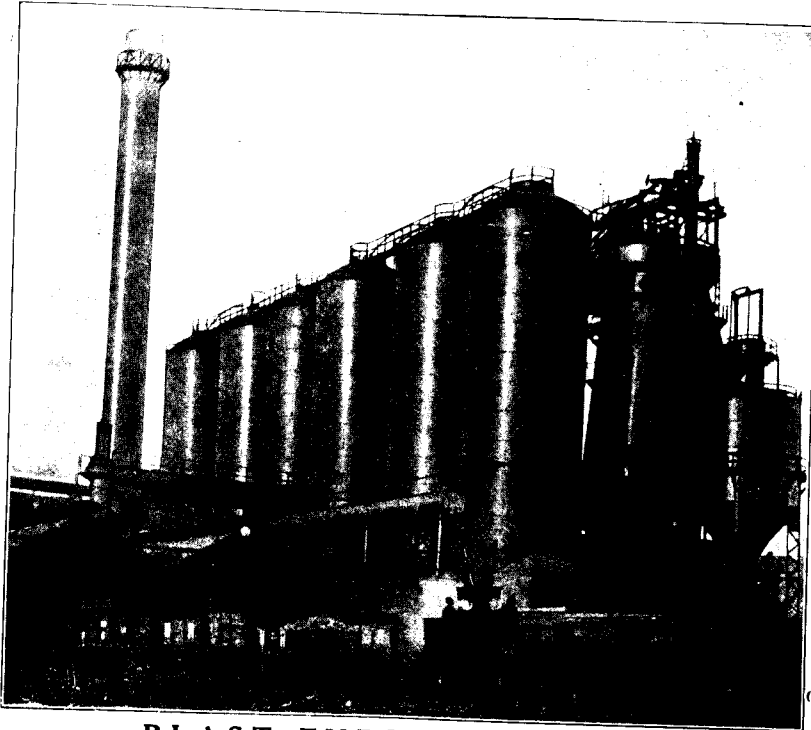
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"Bitumastic" Solution and Enamel



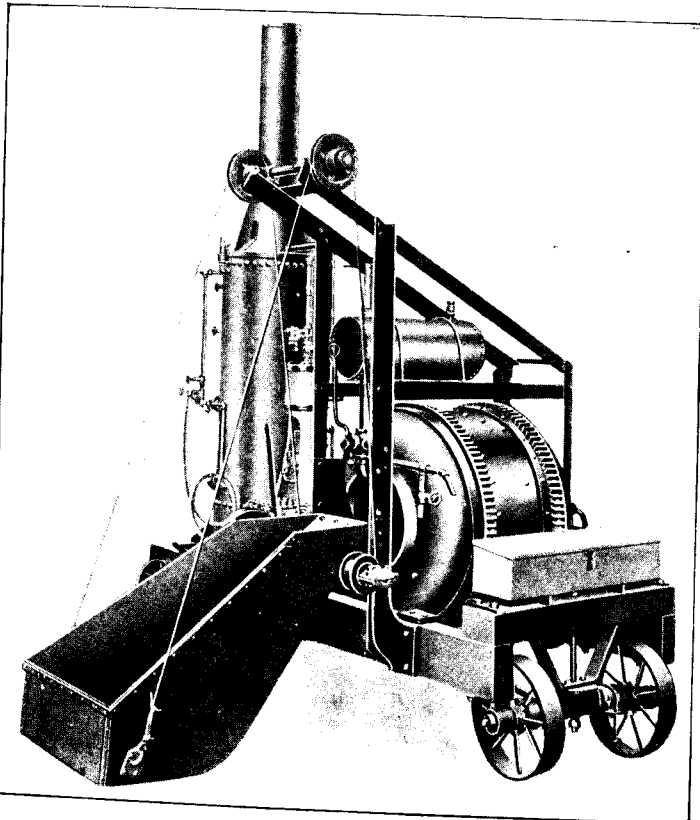
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All surfaces of these important structures were coated with two coats of Wailes, Dove & Co.'s patent "Bitumastic" Solution. *The* original anti-corrosive—very large covering capacity—dries quickly—does not crack or peel off. Is not affected by chemical fumes—hot smoke, salt or fresh water. Sample sent upon request.

Canadian Bitumastic Enamels Co.

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(Exclusive Ontario Agents)



Koehring Concrete Mixers

Are Best Because :

They will produce most of the best concrete at least total cost, when all costs are figured.

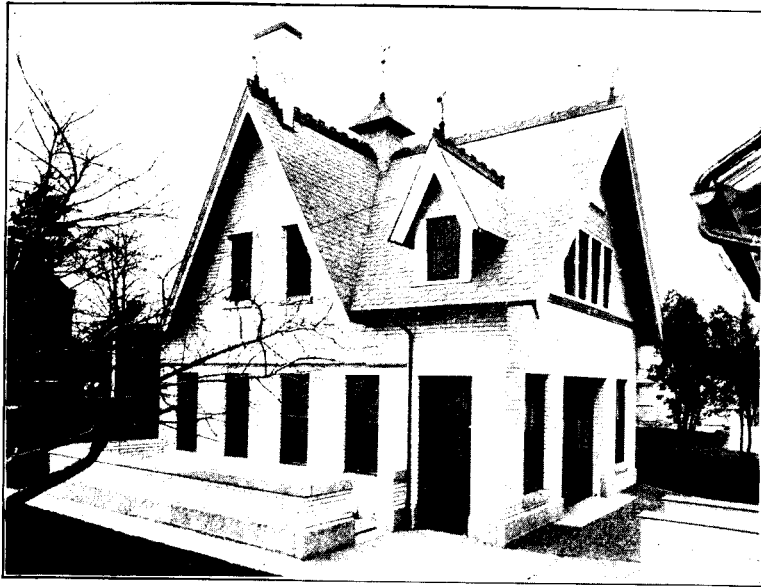
Our Catalogue Illustrates This Statement.

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PERMANENT IN CONSTRUCTION FIREPROOF and SANITARY



Mr. J. T. McCabe's Private Garage, East Orange, New Jersey.

The entire Exterior, Interior and even the Ceiling of this Garage is built of

"AMERICAN" ENAMELED BRICK

Private Garages like this share honor with the modern residence.

"AMERICAN" ENAMELED BRICK afford a bright, clean and thoroughly sanitary finish, and (manufactured at a temperature of 2,300 degrees Fahrenheit) insure absolute protection against any possible fire damage to the building.

Samples—Miniature or full size, bright or matt finish, in the standard colors, submitted, all charges prepaid. Prompt attention given to formal inquiries.

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A Garage of Asbestocement

The walls of this Garage are of *Asbestos Corrugated Sheathing*. The strips run from roof to ground without a break.

The roof is of

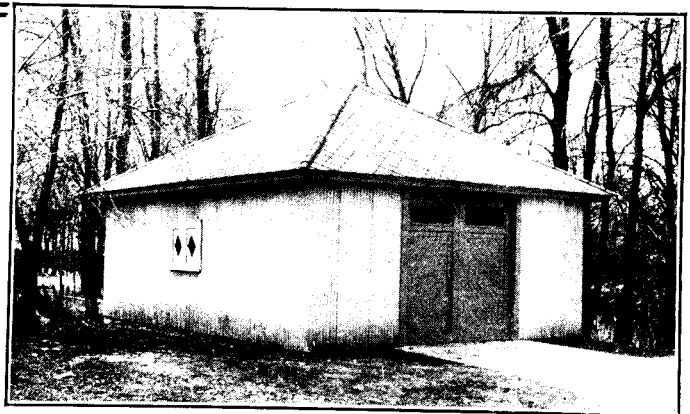
ASBESTOSLATE Cement Shingles

laid in the diagonal or French style, finished with our regular Ridge Roll.

The advantages of this type of construction are many.

So far as the exterior is concerned, the Garage is fireproof.

Walls and roof never need paint. The beautiful Newport Grey is absolutely permanent, and so are the Indian Red and Blue Black in which Asbestoslate Shingles are also made.



Garage at Woodlands, P.Q., owned by Mr. W. G. Ross, Harbor Commissioner of Montreal.

The building is permanently weather-proof. The Asbestocement hardens and toughens with age.

The light-colored, non-conducting Asbestocement "sheds" the sun's heat and prevents extremes of temperature within. This is important.

The cost is less than that of any other *permanent* construction.

For booklet C.N., giving full information about Asbestocement building material, write

ASBESTOS MANUFACTURING COMPANY, LIMITED

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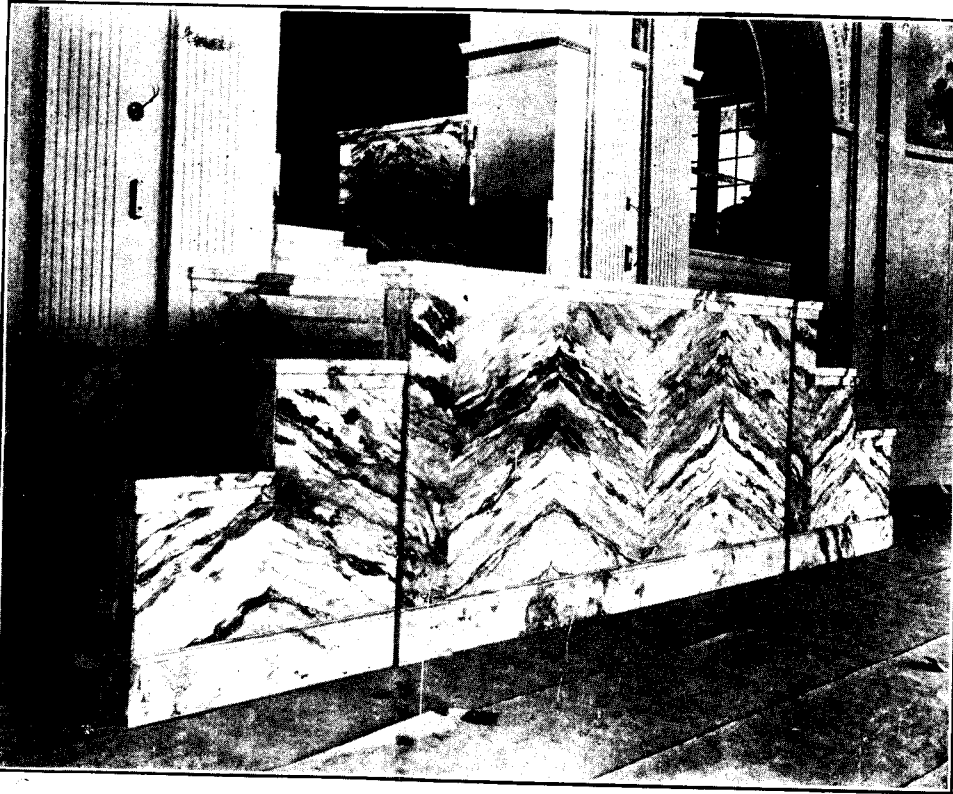
16 E

Factory at Lachine, P. Q. (near Montreal)

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Factory—MONTREAL, QUE

Quarries—SOUTH STUKELEY, QUE.



Royal Dominion Marble

This cut shows a view of
a stairway in the

Chateau Laurier
Ottawa

in our
Violetta Marble

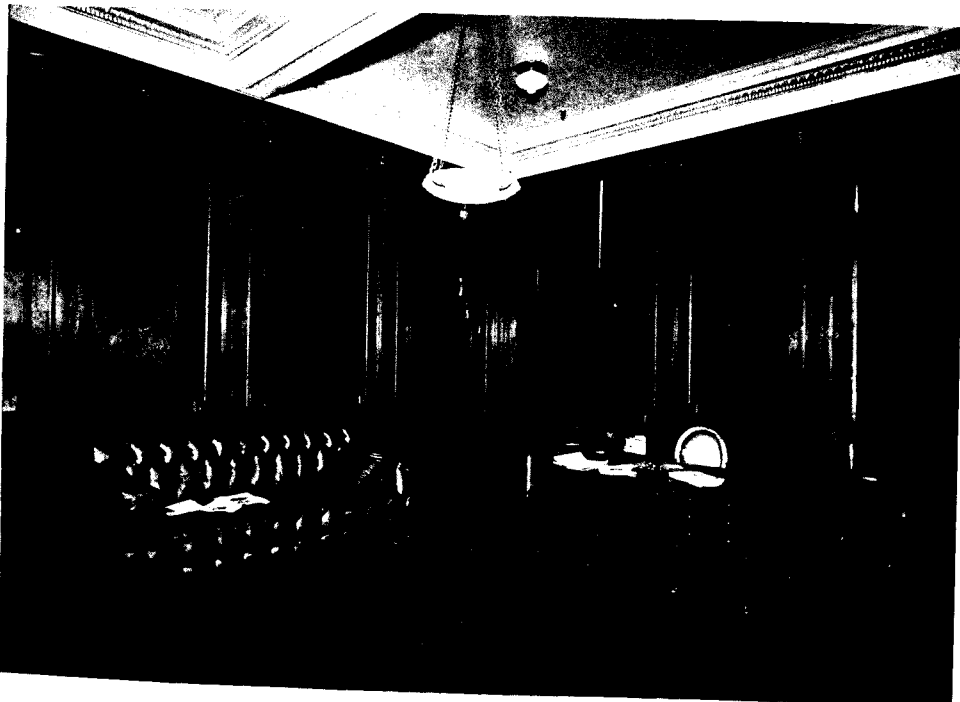
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Our cores for veneers
are naturally dried, ac-
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methods, which insures
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in finishing the work.

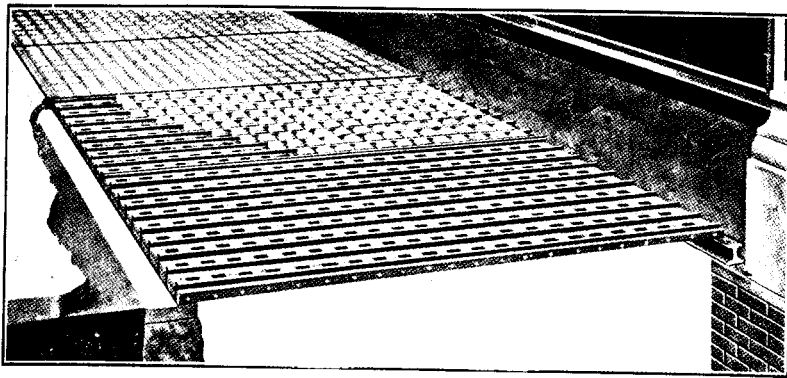
Two special saw frames
are now being made for
us, which will enable us
to perfect our processes
still further and handle
any size or quality of con-
tract.

H. M. LICKLEY LIMITED

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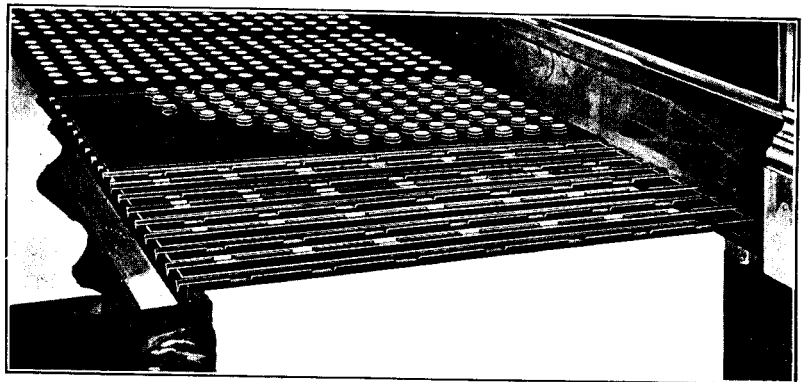
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PAVEMENT SIDEWALK GLASS



Simplex Sidewalk Construction

is the only double reinforced construction on the market and is the acme of perfection in sidewalk lighting. Architects and owners who understand and appreciate the advantages of SIMPLEX willingly pay the additional price for this construction.



Nu-Plan Sidewalk Construction

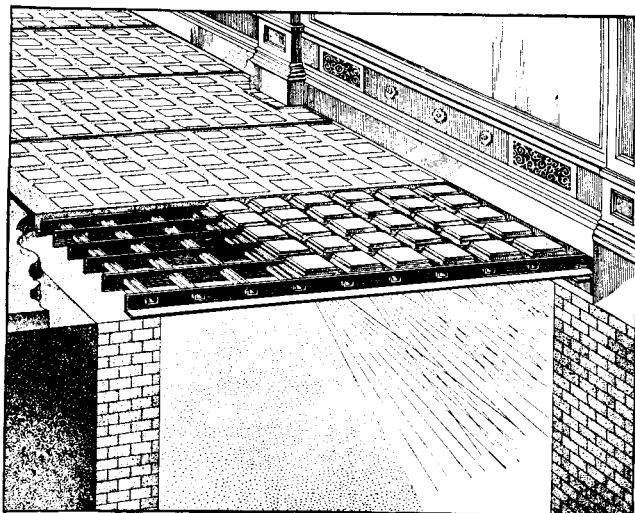
is shipped in knock-down form and is exceptionally easy to set up and can be installed by an ordinary cement finisher. This construction derives its enormous strength from the use of angles instead of bars.

All of the Above Constructions Are Covered by Canadian Patents

With any of the above we can furnish glass to suit the requirements of the basement or other part of the building to which light is required to be reflected.

We can supply the blank glass, the 3-point prism glass and the single pendant prism glass.

All glass sent out by us is coated with our patented plastic malleable compound, which insures glass from shaling from exposure of the cement or steel.



Barlock Sidewalk Construction

has stood the test of years, and installations of many years ago are still in good condition. The glass area of approximately 70 per cent. on the underside of this construction gives you the assurance of the maximum amount of lighting.

THE HOBBS MANUFACTURING COMPANY LIMITED
 MONTREAL TORONTO LONDON WINNIPEG VANCOUVER

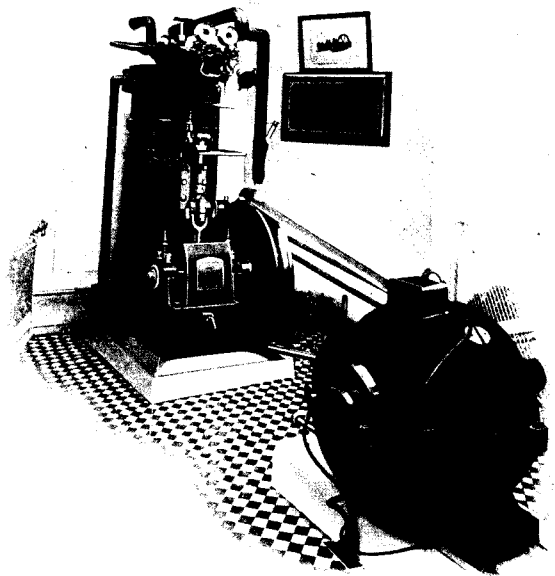
If you are interested in Sidewalk Prism Constructions that are guaranteed against leakage, write for particulars regarding these.

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**LINDE BRITISH
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In Great Britain 27 years - In Canada 18 years
*Has the largest output in the world
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Carbonic Acid Compression
"The Modern Method"

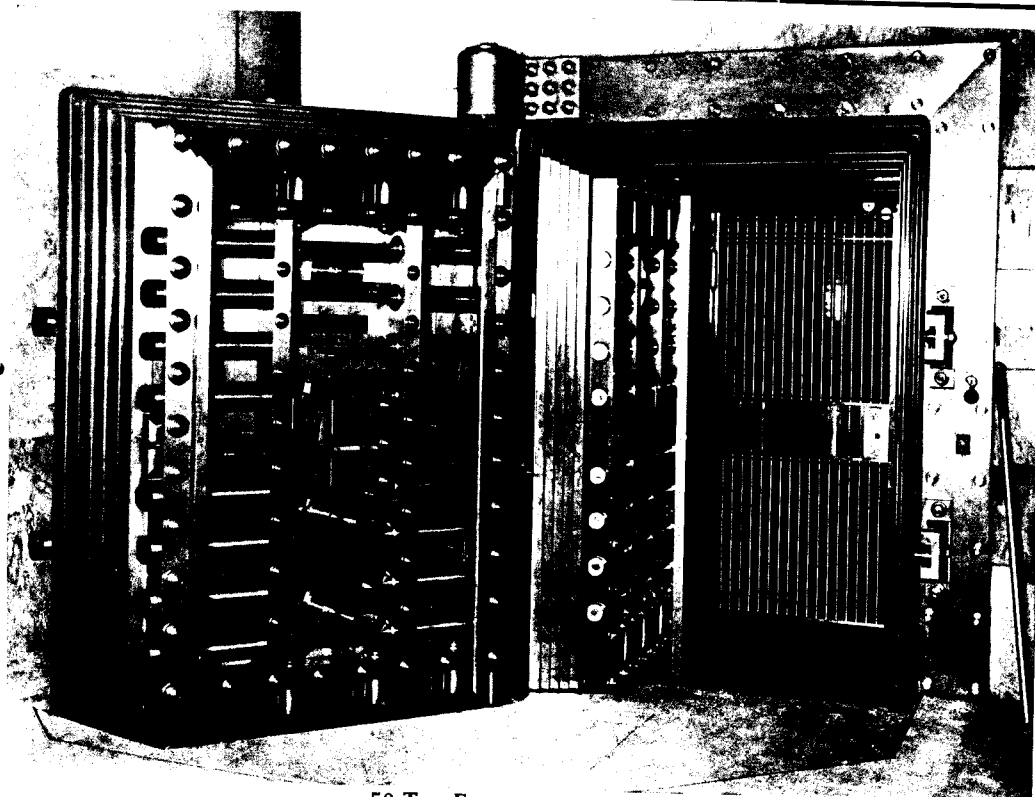
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- Ice-making if required.
- Need only unskilled attention and small floor space.
- Clean and absolutely safe.
- Always available.
- Delivery of most sizes from Montreal stock.



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

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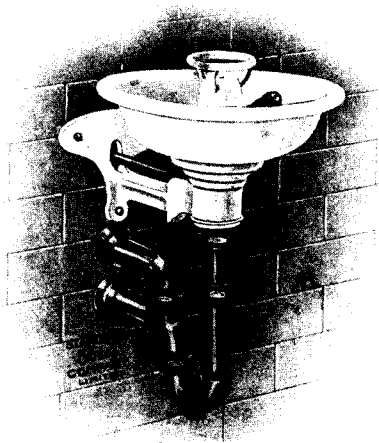


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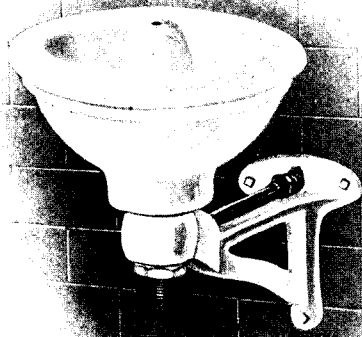


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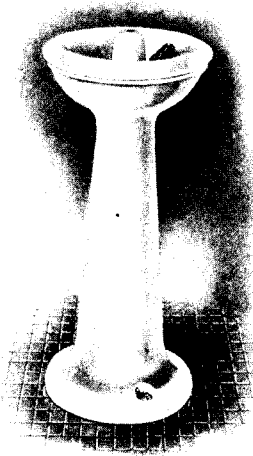


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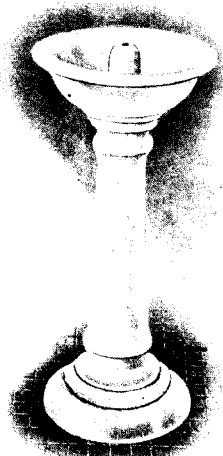


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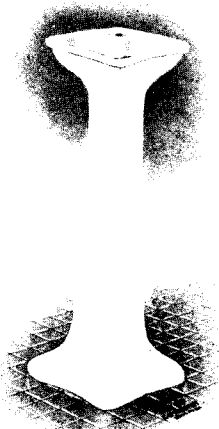


Plate F 3055

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CONSTRUCTION

VOL. VI

No. 6

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

BRANCH OFFICES :

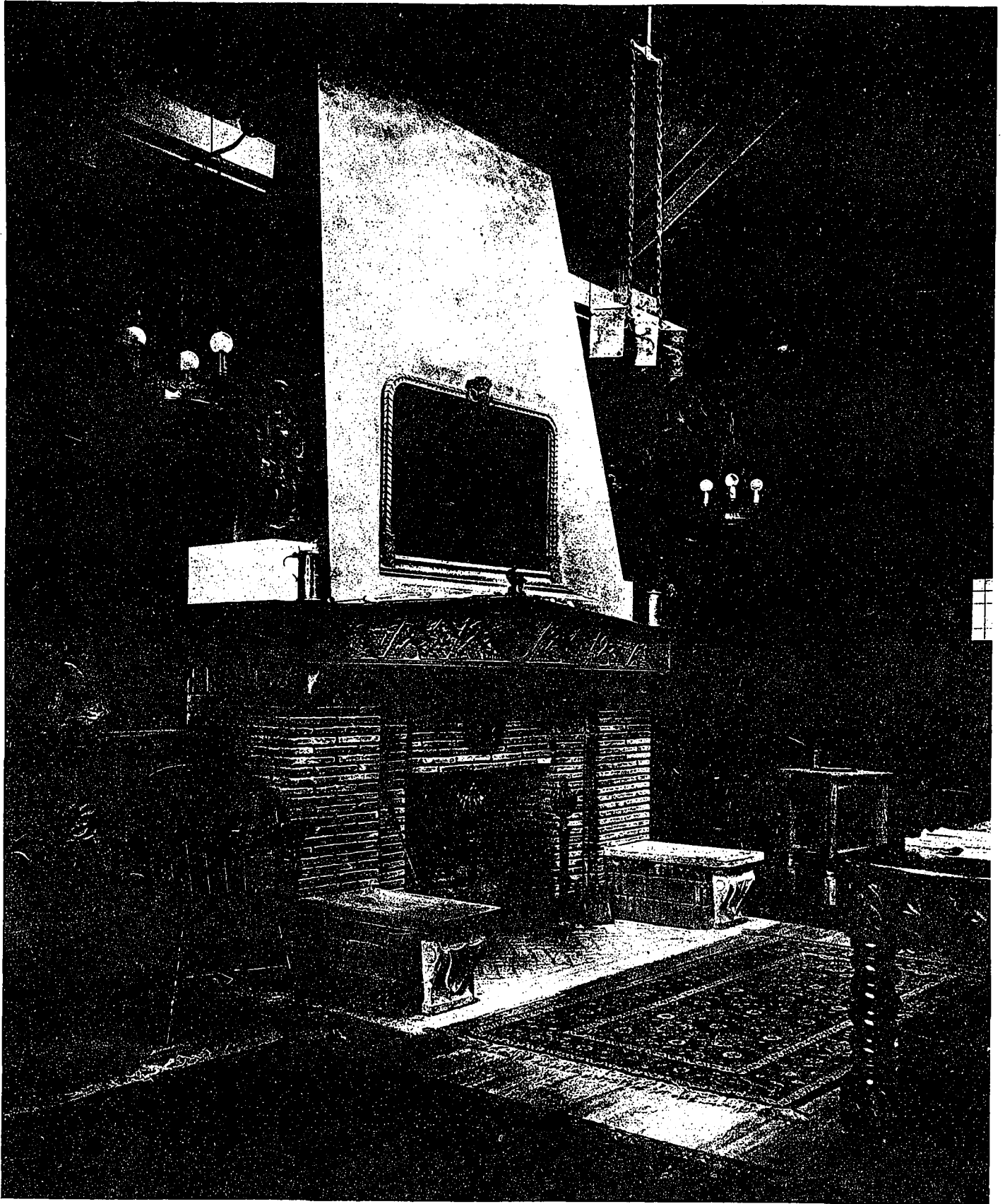
MONTREAL

WINNIPEG

VANCOUVER

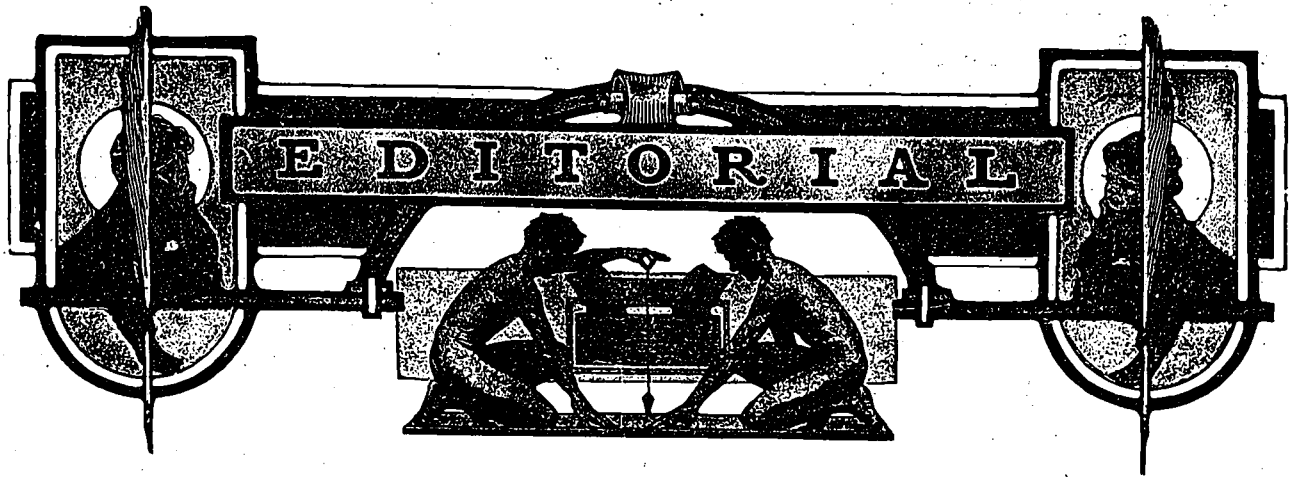
CHICAGO

NEW YORK



DETAIL OF FIRE PLACE,
"THE ARTS CLUB," MONTREAL.

EDWARD & W. S. MAXWELL,
ARCHITECTS.



Q *The National Gallery of Canada—The great need for architectural replicas in every city as well as famous statues.*

THE BILL incorporating the National Gallery of Canada will interest the artist world of Canada far more than the naval expenditure which has occupied such a prominent position on the stage of politics. The latter smacks of destruction and bitterness even though some claim that peace is only maintained through a sense of fear. The former, however, casts a glow of promise to those who are struggling amidst few incentives. Soon we will be privileged to work from casts of famous statues—the exact replicas of an illustrious past when art meant life. Already a large collection of famous works has been secured from the European countries and every effort will be bent to make this department of the National Gallery a most representative one. It is to be hoped that the restrictions will not be so great as to deprive anyone from a free and unlimited use of this valuable material. For instance, the gallery should be open on Saturday afternoons and Sundays. Senator Dandurand went a step farther by suggesting scholarships to young Canadian artists for European study. Surely nothing could be more commendable and without a doubt nothing could raise our art to a loftier plane. May this spirit prevail and may it be reinforced by the moral stamina of all thinking people. If it can be brought to a point where every city will have its own gallery containing the best examples and where the deserving can hope to study abroad—then the impetus to work for purity and truth along the lines of pure art will supersede the present desire to surrender all for the extra farthing. We would like to see these casts include the architectural world also. What Canada needs is a Trocadero in every city. What is more before the people in the various phases of art than our architecture? What needs more careful study and improvement? What graces a city more than artistic buildings? With proper facilities this progressive country could surpass in time all other countries in modern work.

Q *The one hundred years' peace celebration to be held among English-speaking people—Memorials for England, Canada and the States.*

THE CENTENNIAL of peace to be observed between the two great English-speaking nations, Great Britain and the United States, is of more import to the elimination of war than any other one historical achievement. As England has mothered the principles of a representative Government, so has she spread the influence of her ideals throughout the world, thereby maintaining honor and justice among the weaker countries. Her spirit and power has held less scrupulous kingdoms in check and allowed the children of the earth to grow into the developed strength of manhood. Who can foretell the influence for peace she will wield if the world knows what it already surmises—that the same intense devotion to law, order, truth and equality which has characterized her glorious past, will underlie this acknowledged cementation of the two nations whose combined resources are inexhaustible and whose efforts are bent in the direction of freedom and progress.

In addition to the benign influences this open confession of amicable relations between us will have upon the world in general, it will also reveal more clearly than ever before the close ties which exist between the Dominion of Canada and the States. Our political problems are practically the same; our industrial pursuits follow in the same direction; our commercial interests are identical; our pleasures, our sports, in fact every feature which enters into our private as well as national life is so interwoven that we will naturally unite in all questions which concern the welfare of each other's existence. Would it be possible for the States to have a serious complication with Japan without the same cause of contention producing a like result on our western coast? It is not proper to consider the imaginary line dividing us as a barrier foreign to our best interests. We are an offspring of the same mother and in problems of vital importance the two countries would act as one.

At the recent meeting of the conference held in

New York city for the purpose of adopting a programme, the Canadian and American sub-committees considered the question of suitable monuments along the border line. It was decided to build a memorial bridge in the neighborhood of the Niagara frontier; also to erect an arch at Rouse's Point, N.Y., in commemoration of the battle of Plattsburg, the last naval engagement which took place between England and the States. The arch will span the highway which is being constructed between Quebec and Miami, Florida. A number of other monuments will be considered such as the building of a tunnel between Detroit and Windsor, the erection of a bridge between Belle Isle and the mainland, etc.

Another outgrowth of the international conference was the plan to erect a statue of Queen Victoria in Washington and one of Abraham Lincoln in England. The scheme proposed will be carried out independently of other features arranged for the celebration itself. The memorials will be of heroic size and executed by the foremost sculptors. Action will also be taken to interest the Canadian and American Governments to contribute similar monumental ideas in Washington and Ottawa. Commemorative tablets at various points along the frontier as well as in public buildings will keep before the people the achievements of steady progress expressed by the celebration of the one hundred years of peace.

H. S. Perris, one of the English delegates, said just before leaving the American shores: "Whatever suspicions and fears of the object of the celebration may at one time have existed, we have heard scarcely a breath of them during the course of our tour, and we have taken every opportunity to make it clear that all nations of the world were invited to join sympathetically in the celebration and that the spirit in which we approached the celebration was that of Lincoln's commendable words, 'With malice toward none, with charity toward all.' Our British delegates have left your shores full of satisfaction at the great success of the conference and the subsequent tour, and more deeply impressed than ever with the close bonds, not only of blood relationship, but of friendly sympathy, born of common ideals and traditions, which bind our two great peoples together."

The spirit of confidence which permeated the action of each meeting augurs well for the success of the celebration and the educational and peaceful results accruing therefrom will more than repay the consistent endeavor of everybody concerned.

Gobelin tapestries—*An ingenious way to utilize these valuable relics—It may prove a proper solution to hot weather troubles.*

THE MOST serious events sometimes become the source of our keenest humor. To think of one sweltering in the close and stifling quarters of a French museum during the warmest part of the summer and still keeping cool through the imaginary effects of living in the deep shade of a heavily wood-

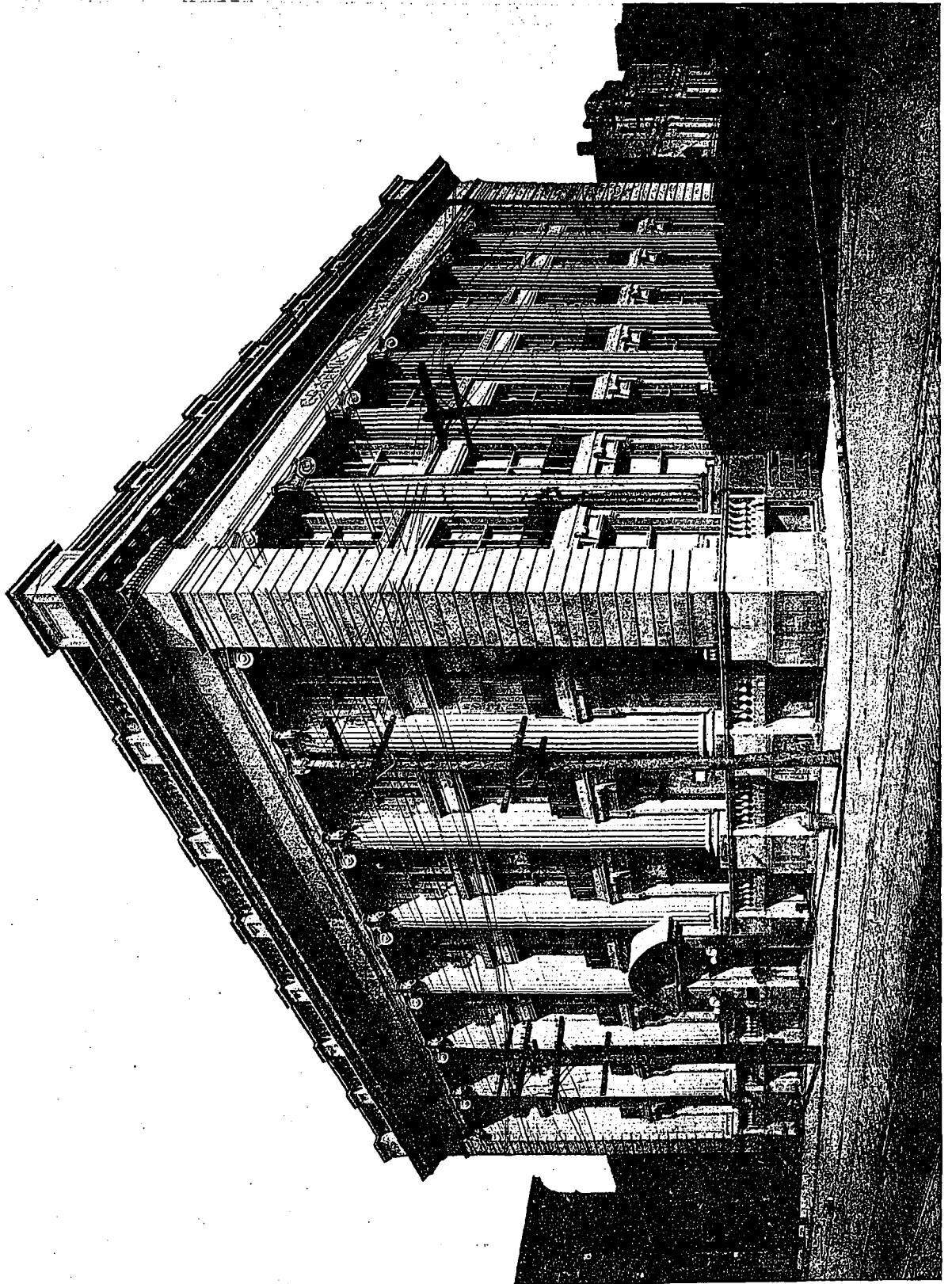
ed district with the winds of heaven rustling through the tree tops—this smacks of Munchausen fancy. Nevertheless this was the experience of our mutual friend the caretaker at Pau. It seems that the authorities in this little village had been greatly excited over the loss of some extremely precious Gobelin tapestries which they guarded religiously as one of their chief means of eternal revenue. The Government suspecting the wealthy American, began a quiet and extensive search for these priceless fabrics. After a considerable time some of the large pieces were found in a cupboard neatly sewn into a sack kept for the purpose of storing away the caretaker's cleaning materials. This seemed to be the only chance of replacing part of the lost material, but finally the keeper confessed that the embroideries representing the woodlawn scenes were used to line his own trousers as well as those of his boy. The indignation of the French authorities was hardly justifiable when we think that each small piece of these tapestries is worth the paltry sum of several hundred pounds. We feel the Government might pay these poor devils enough to clothe themselves—if not with cooler garments at least with less expensive ones.

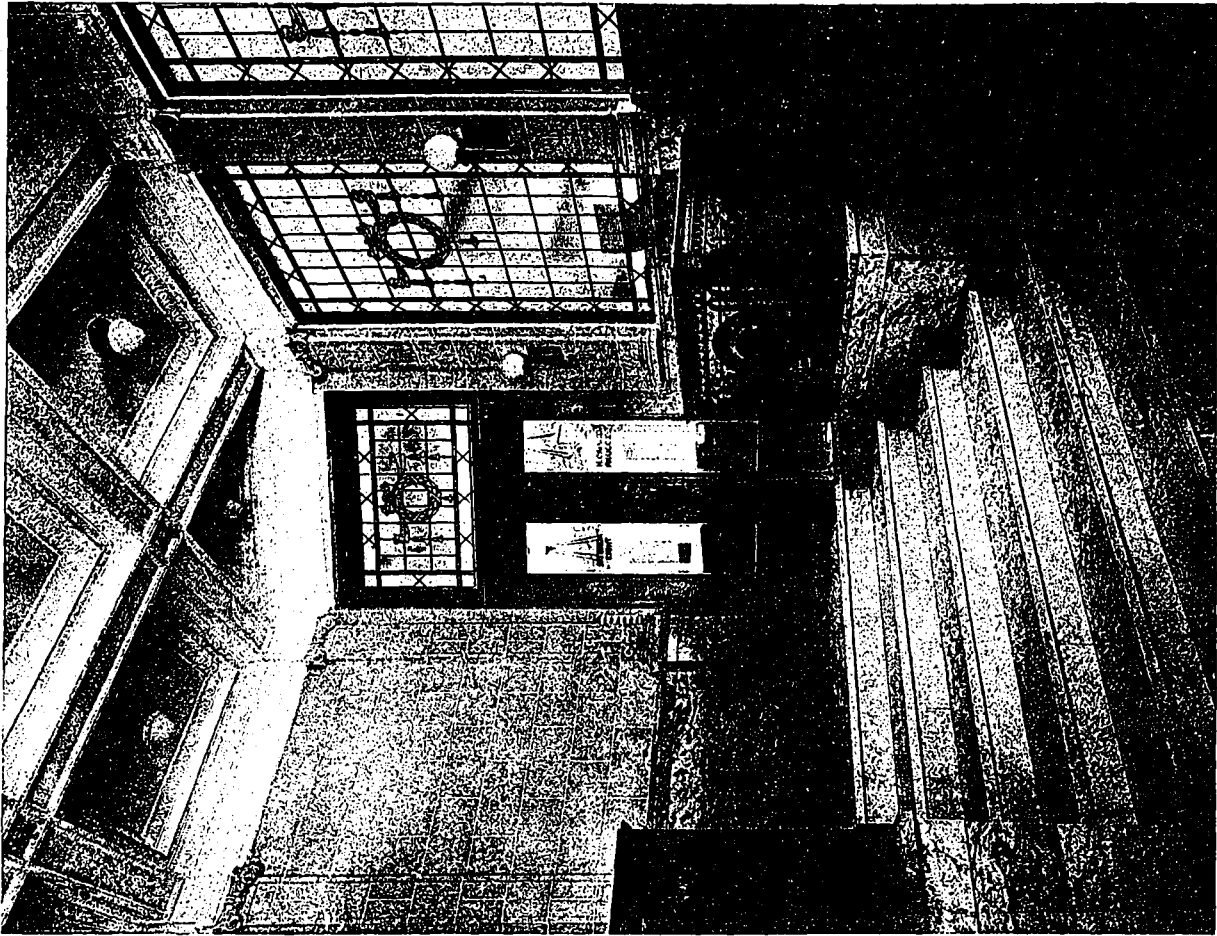
G Stanley Park, Toronto, in danger of being sold in order to purchase a larger tract some miles out—*poor logic.*

IN THE DESIRE to sell Stanley Park, Toronto, we are up against the question which comes along each year, no matter what the personnel of the city authorities may be. Every city seems to suffer from similar idiotic desires on the part of its council to either dispose of the parks or else rob them of their usefulness by granting space for civic or art buildings. It is one constant struggle for New York city to keep their Central Park intact. If a pumping station is needed the narrow-minded councillors begin at once to select which corner they can confiscate; if some philanthropist donates several thousand to the erection of a structure, intended mostly to glorify his name, he usually tacks on the assinine clause—to be given if placed in a prominent locality. So the fathers argue what more desirable spot than the boys' playground, and it takes one big struggle to beat them back. Now Toronto is called upon to sell Stanley Park—a most useful playground in the heart of a populous neighborhood. What is the argument? If we sell this park we can purchase a much larger tract several miles out. Fine logic that. If there is need ahead of a park which will be useful to the children some ten years hence, by all means let the city purchase it, but we must not lose sight of the fact that the city needs Stanley Park more to-day than ever before, and will need it five years hence more than now. Experience teaches us that these insane ideas will permeate the atmosphere every so often, but we are proud of the fact that the people appreciate the value of such parks and emphatically say No to all such suggestions.

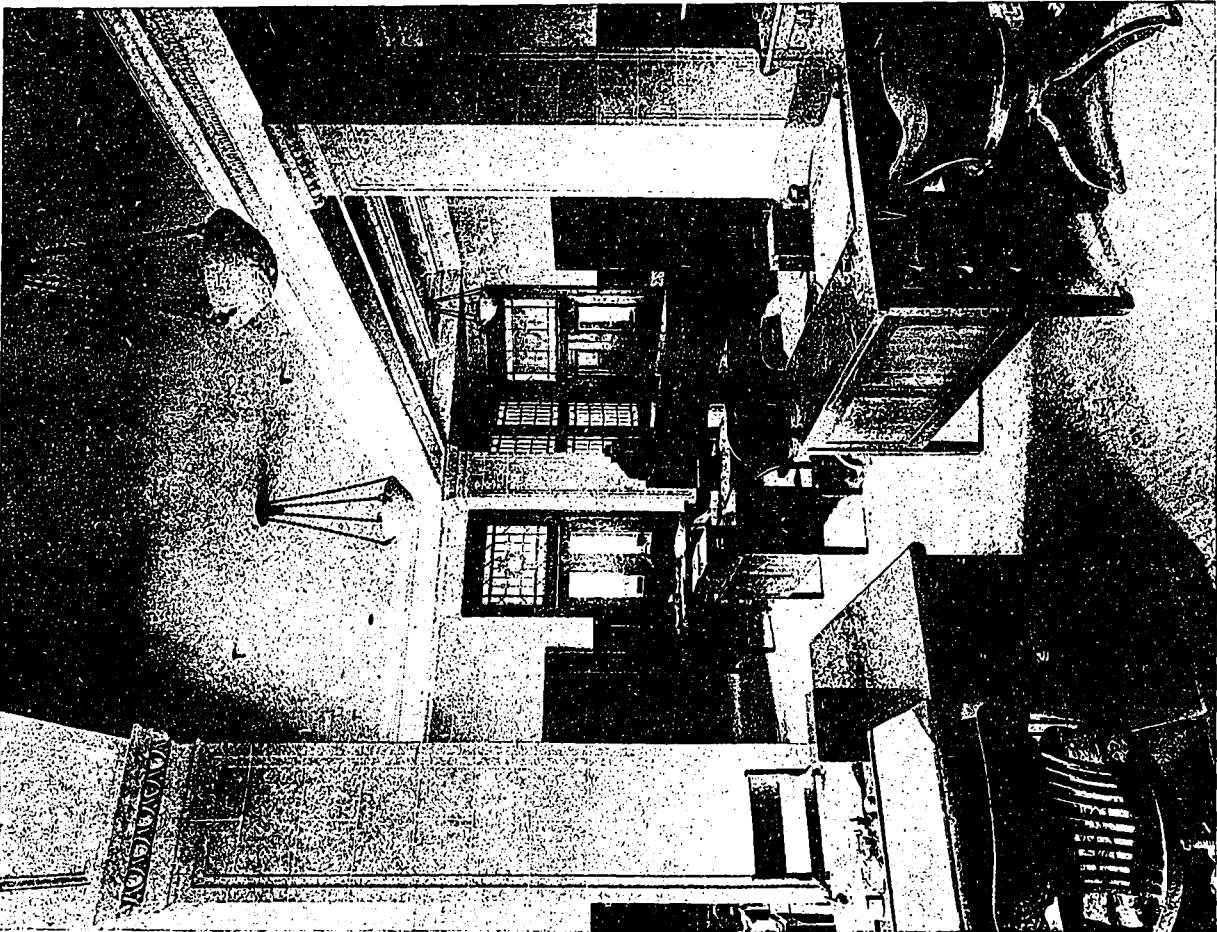
GRAPHIC ARTS
BUILDING,
TORONTO, CAN.

F. S. BAKER,
ARCHITECT.





ROTUNDA



MAIN OFFICE

GRAPHIC ARTS BUILDING, TORONTO, ONT.
F. S. BAKER, ARCHITECT



The Graphic Arts Building, Toronto

F. S. Baker, Architect

TORONTO'S RAPID GROWTH in size as well as artistic merit is evidenced in the new Graphic Arts Building. The structure was built to accommodate the publishing house of H. Gagnier, Limited, and the engraving firm of Grip, Limited. To properly provide for two companies so vastly different in their scope of work was a problem quite complex and of an unusual character. How creditably this has been accomplished is best shown by the general arrangement of the plans and the facility with which each concern is able to transact its tremendous business.

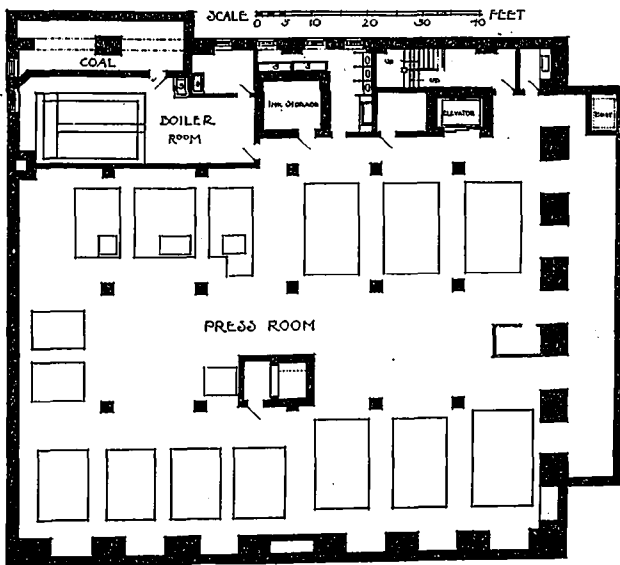
The building is located at the intersection of Richmond and Sheppard Streets, and stands as a monument to the great commercial activities of Toronto. Designed in a modern English adaptation of the Italian Renaissance, it presents a dignified appearance. The base course is raised so as to provide ample light in the basement and is broken only by the two entrances. Rising above this course are massive engaged columns extending through three stories which support a fitting cornice and balustrade. The columns are tied together at each floor with bands of stone, varied in treatment to suit the needs of each story. A wrought iron balcony is placed at the second floor which gives the necessary touch to what might otherwise prove a monotonous effect. The windows are large so as to furnish the maximum amount of light and are designed so as not to sacrifice

either strength or elegance to the general effect. The fourth floor is hidden by the cornice treatment, but so planned as to secure plenty of daylight on all sides.

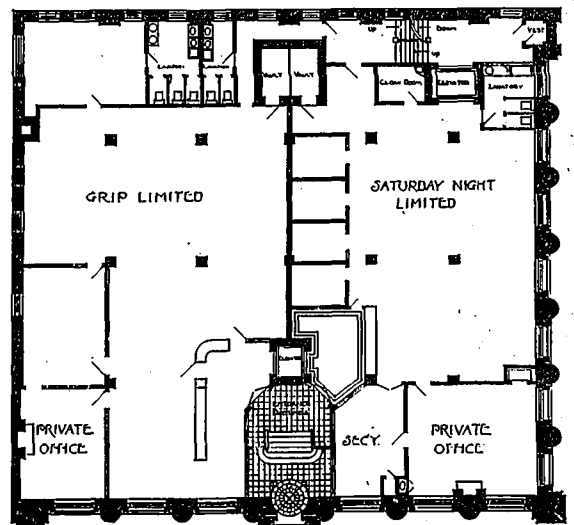
The two main facades are designed in Indiana and Roman stone of pleasing texture, the light tone of which softens the cold atmosphere usually prevailing in buildings erected of this material. The window sashes are pivoted and brought near to the floor, which in turn are protected by means of the balconies.

One of the charming pieces of detail is the main entrance, which leads through bronze doors into the rotunda. This rotunda is finished in Canadian marbles up to the coffered fibrous plastered ceiling. At the sides are screens glazed with leaded glass of unusual character. The revolving door and other wood work is of mahogany, the stairs leading to the landing opening into the two main divisions are of marble, and the balustrade of bronze. The doors to the right enter the offices of H. Gagnier, Limited, while those on the left give access to Grip, Limited. One passenger elevator, opening into each office, is situated directly inside the entrance lobby and runs to all floors.

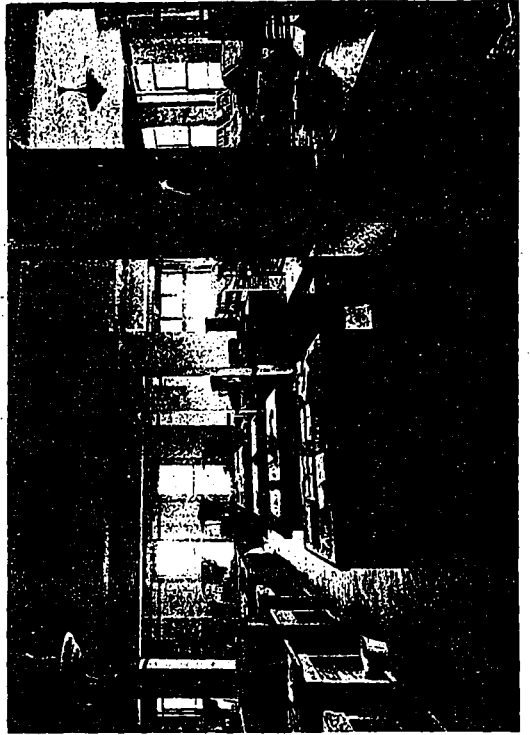
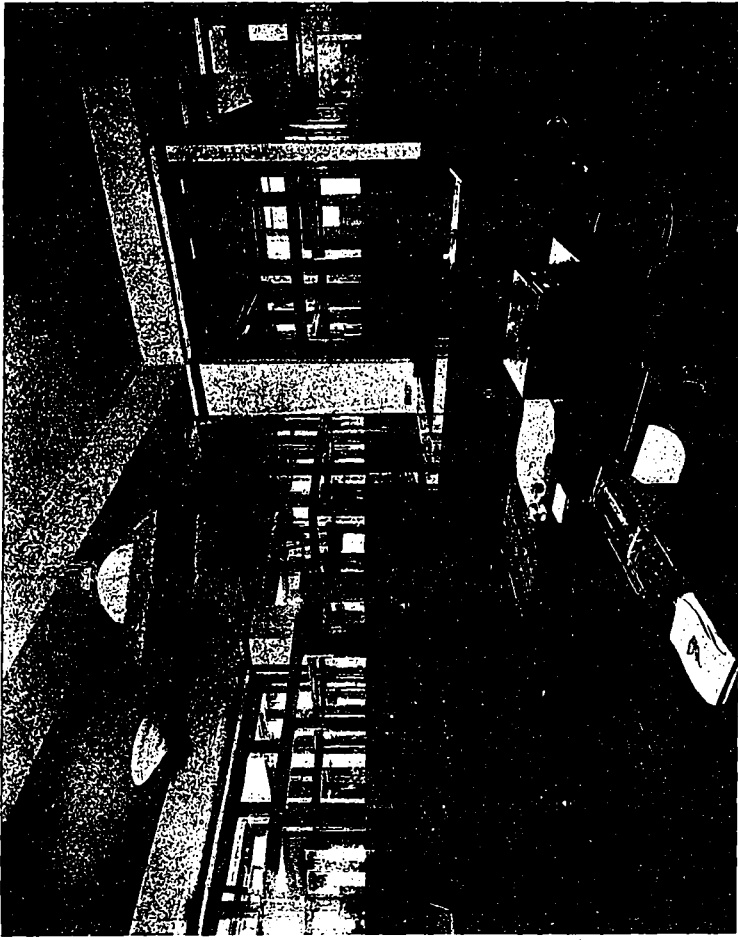
The main office of H. Gagnier, Limited, has a Circassian walnut dado five feet six inches in height, above which imitation Caen stone extends to the ceiling. At the entrance corner of the office, which is 45 by 60 feet, is a public space with floor of marble



BASEMENT PLAN.



FIRST FLOOR PLAN.



EDITORIAL
DEPARTMENT

COMPOSING
ROOM

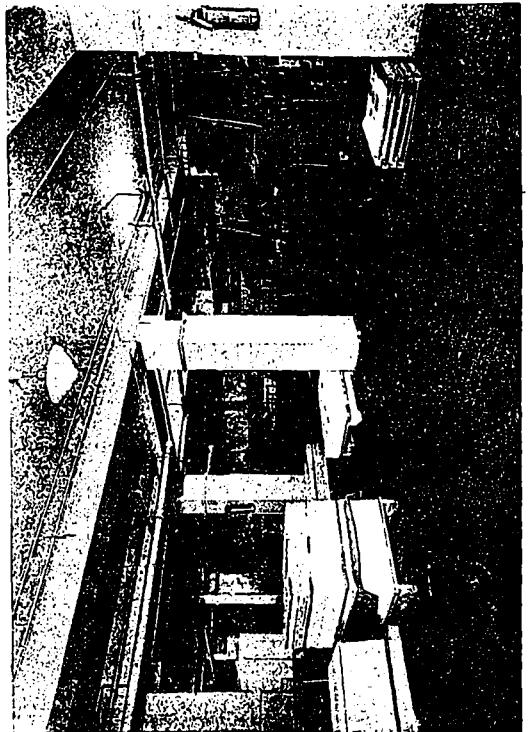
GRAPHIC ARTS BUILDING,
TORONTO.

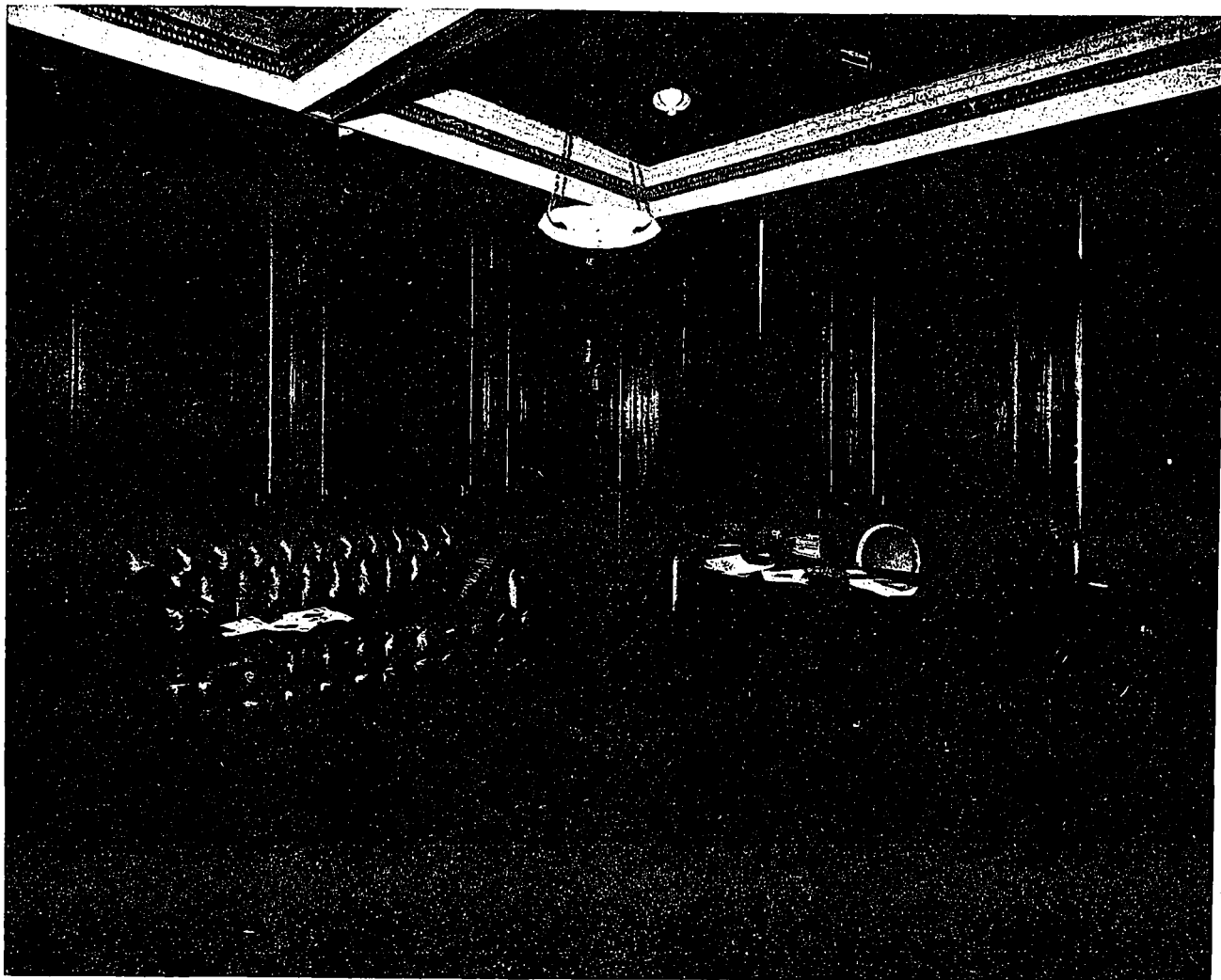
F. S. BAKER, ARCHITECT



SECRETARY'S
OFFICE

PRESS
ROOM





PRIVATE OFFICE OF H. GAGNIER, LIMITED.

mosaic, dado and counter of Canadian marble. Adjacent to the main office is the manager's suite, consisting of his private office and the secretary's room. Here the Circassian walnut panels are carried to the ceiling and matched so as to lend a varied charm to each one. Accommodations have been made for a large recessed safe and wash basin so as not to break the harmonious treatment of the pilaster and panel effect. The fireplace is faced with Canadian marble and possesses some delicate carving; the ceiling is of hard plaster finished in ivory tints, and the floor of highly polished black walnut.

To the left of the entrance rotunda are the offices of Grip, Limited, arranged with public space into which the passenger elevator opens and screened by walnut counters and gates. The main office, 48 by 65 feet, has a four-foot dado of Circassian walnut above which is imitation Caen stone. The manager's room maintains the character of the other office with a high dado and fireplace of Canadian marble.

Both of these offices, which occupy the first floor, open directly into the side entrance hallway, which accommodates also a passenger and freight elevator in addition to the main staircase.

The basement is planned as a printing office with solid foundations underneath the large presses in order to prevent vibration. A sidewalk area and hoist for shipping and receiving has been placed on

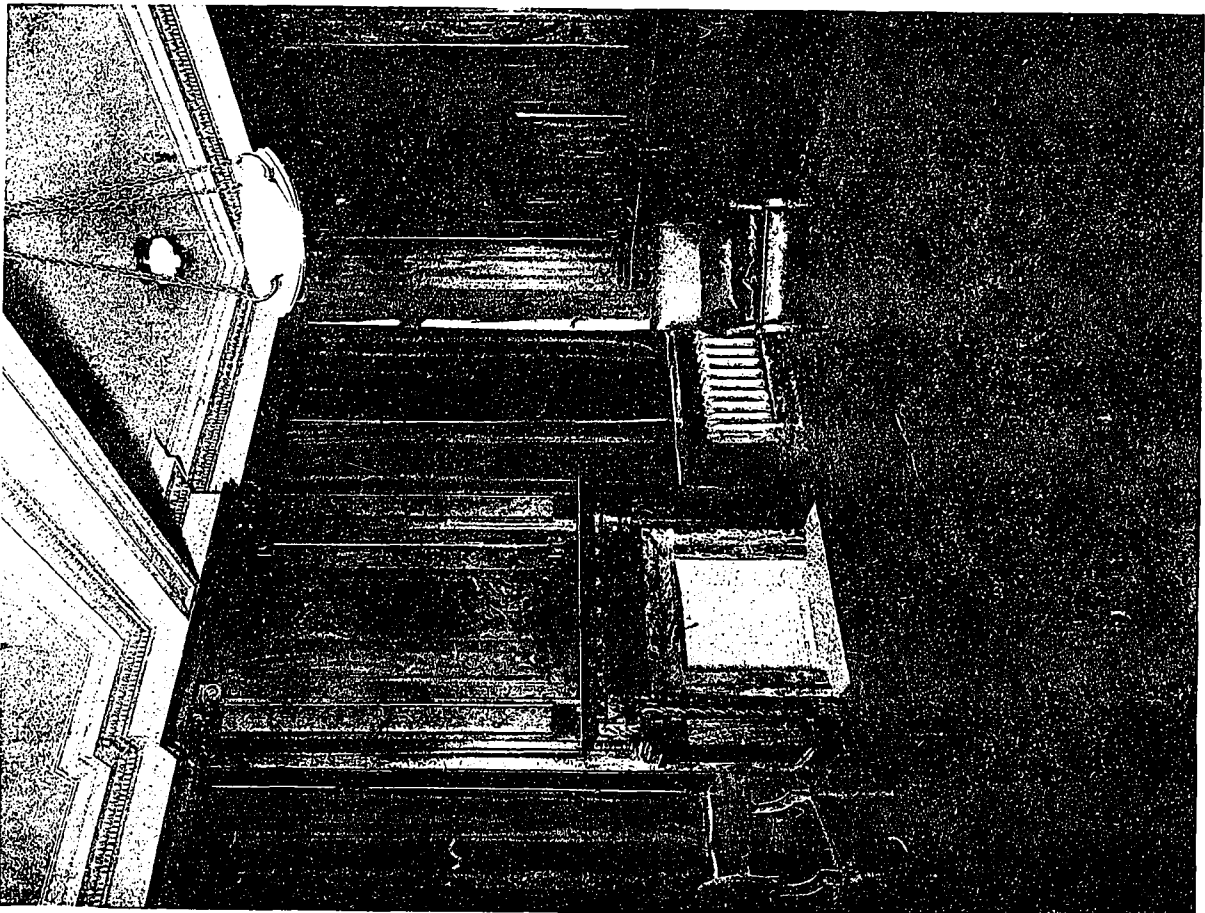
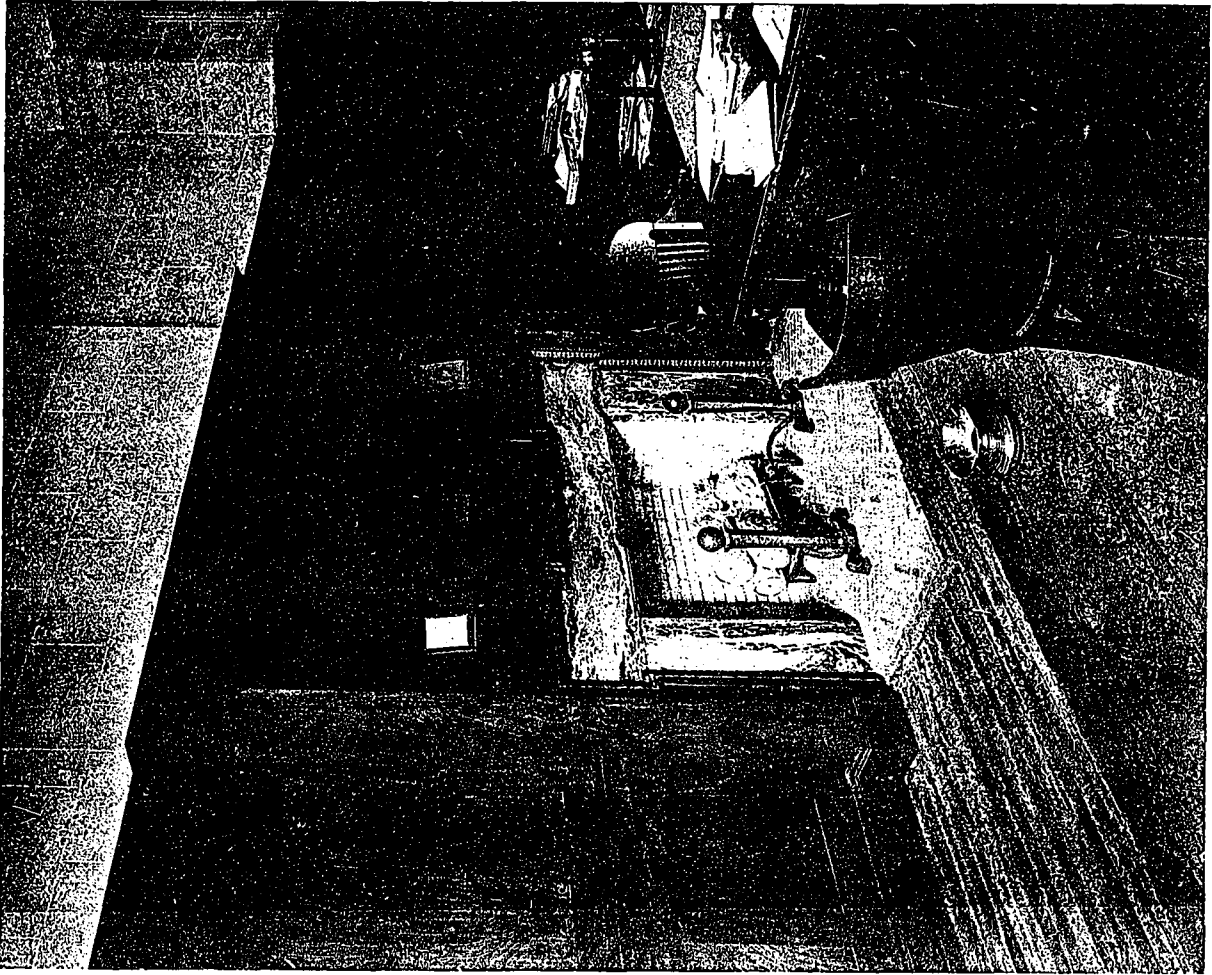
the west side. Part of the basement is separated and contains the tubular boilers, domestic hot water apparatus, foundry for casting type-metal, coal storage, ash carriers, hoist, water sumps, etc. The floor is of maple, the walls and ceiling of cement plaster.

On the second floor are located the library, editorial offices of "Saturday Night," "Construction," several other publications, and the composing room. This floor, as well as the other floors above, are finished in mahoganyed birch with maple floors, burlap dado, and tinted walls. The third floor accommodates a circulation department, bindery, and art room; the fourth floor provides for the engraving department, shipping room and stock room; the fifth floor contains two large photographic galleries with skylights so arranged as to be warmed by steam coils and cooled by water sprays.

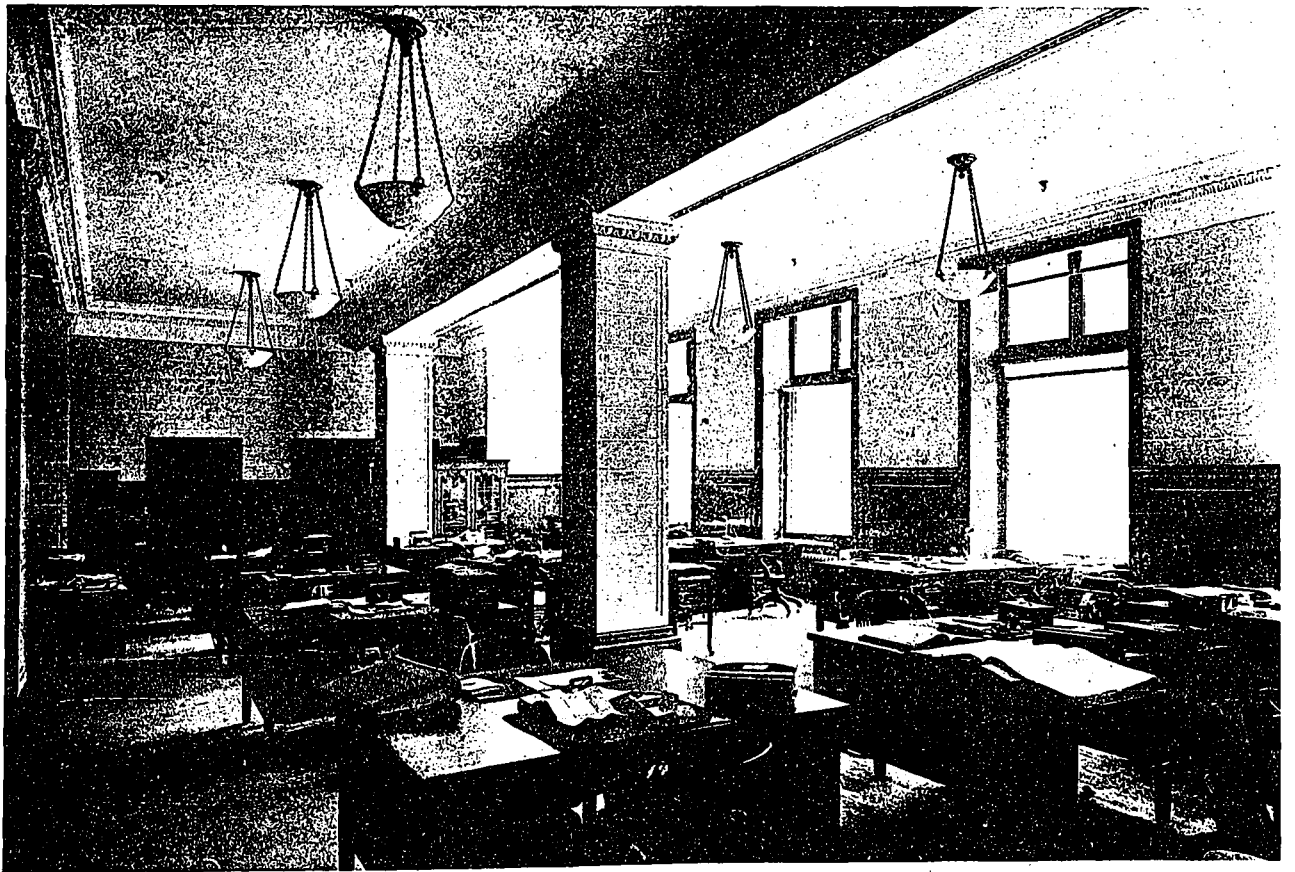
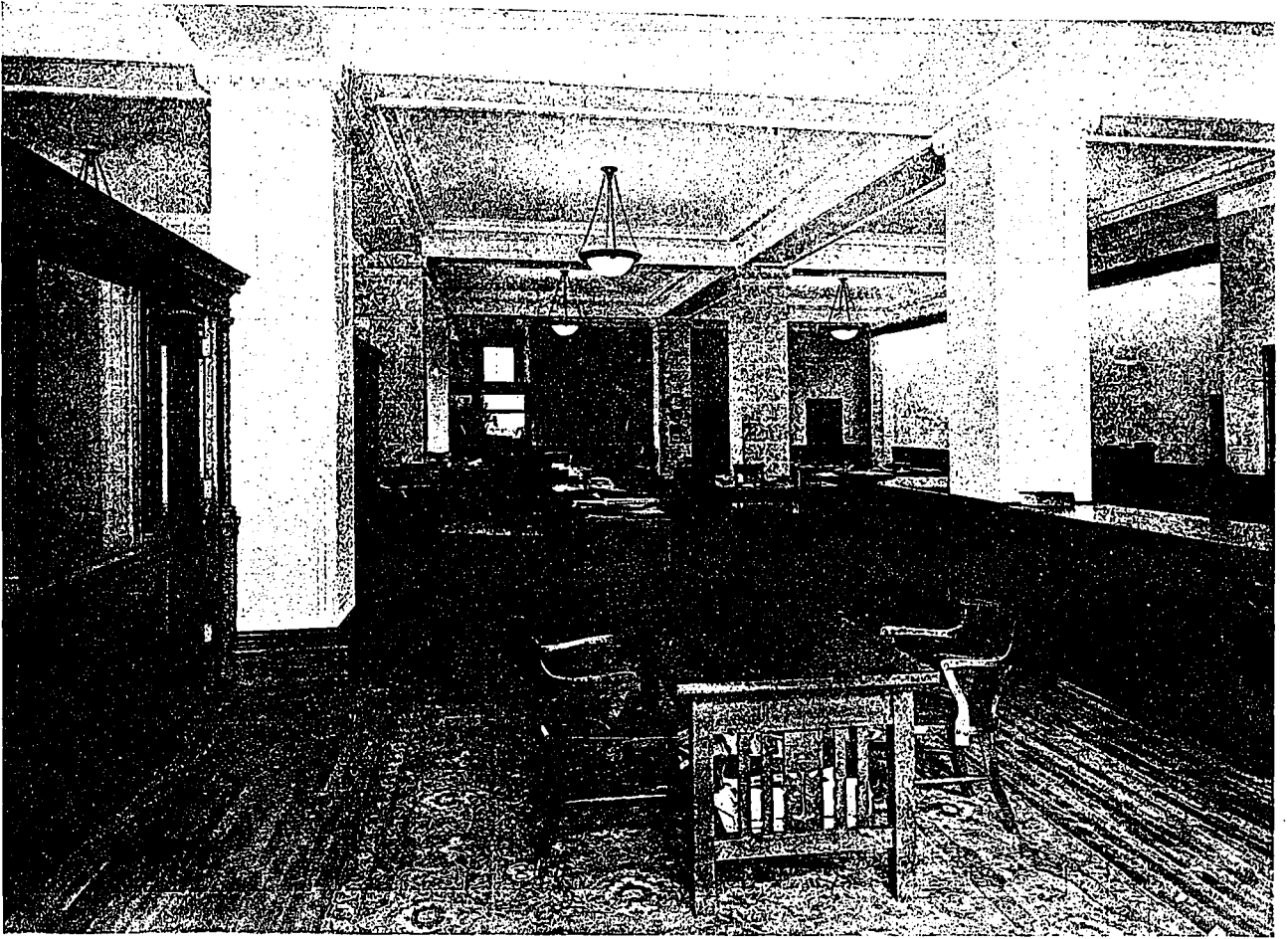
Ample lavatories have been arranged throughout the building with tiled floors and walls to a height of seven feet. A system of duro stone sinks and tile drainage for conducting acids to the street drain has been installed.

Indirect lighting is used throughout and each floor is operated by few switches. A complete automatic sprinkler system has been installed in addition to the usual standpipe and hose.

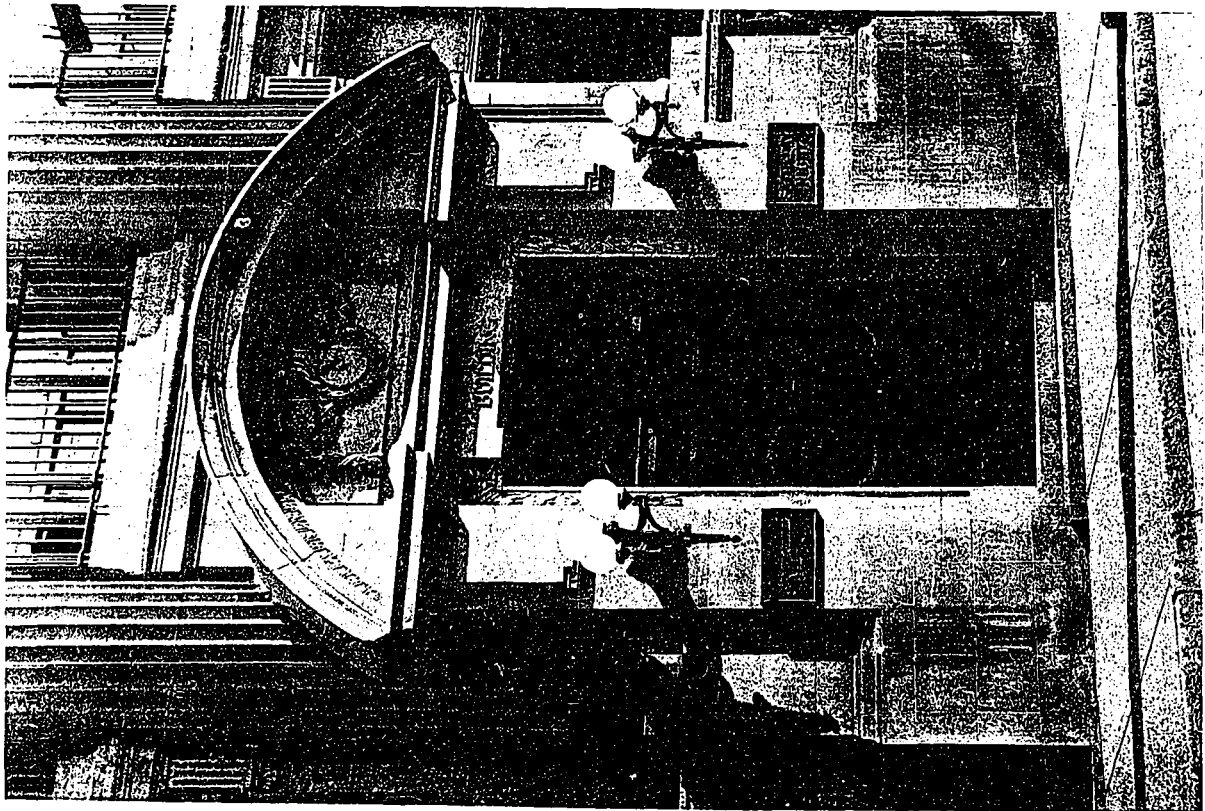
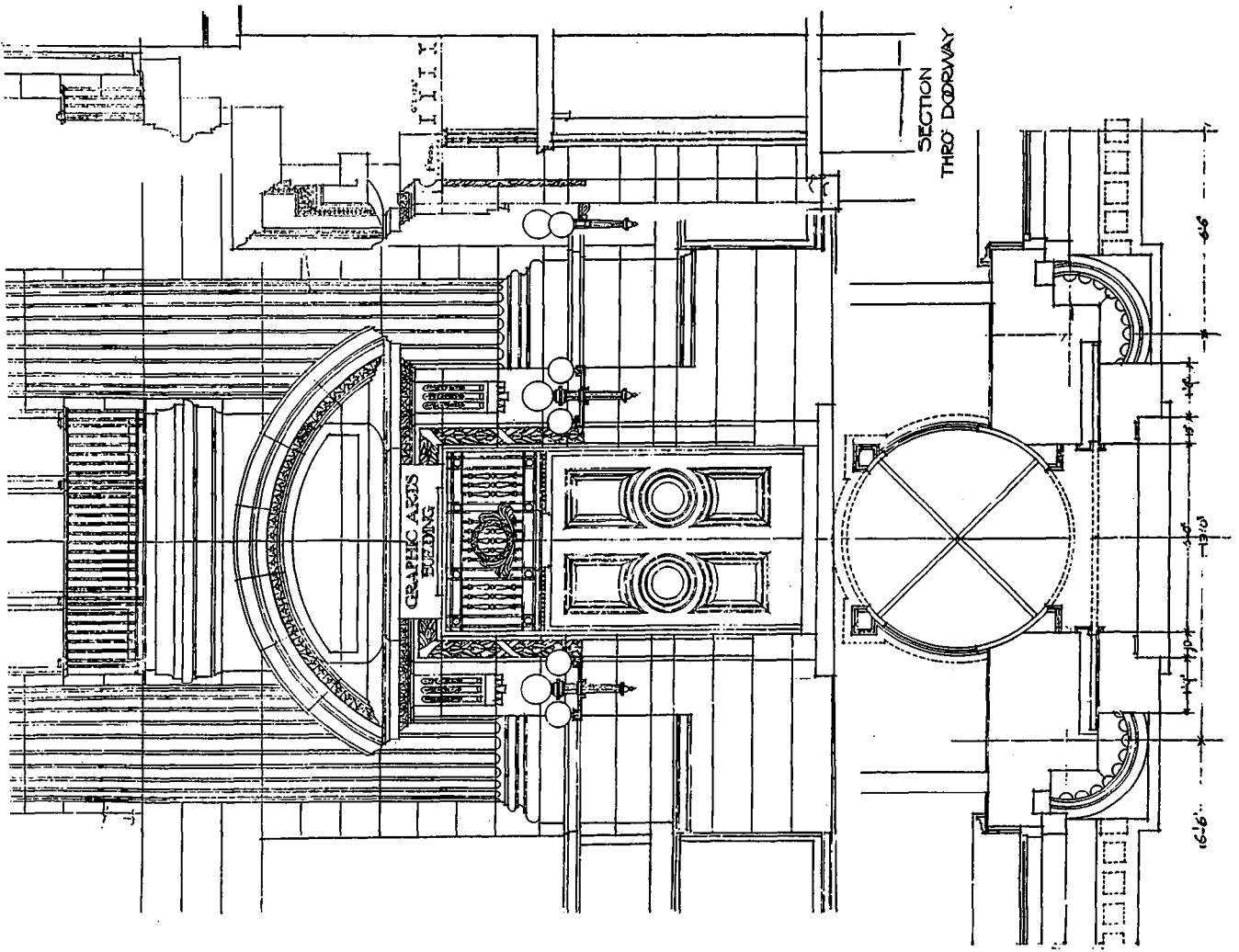
The cost of the building, exclusive of furnishings, was 20 cents per cubic foot.



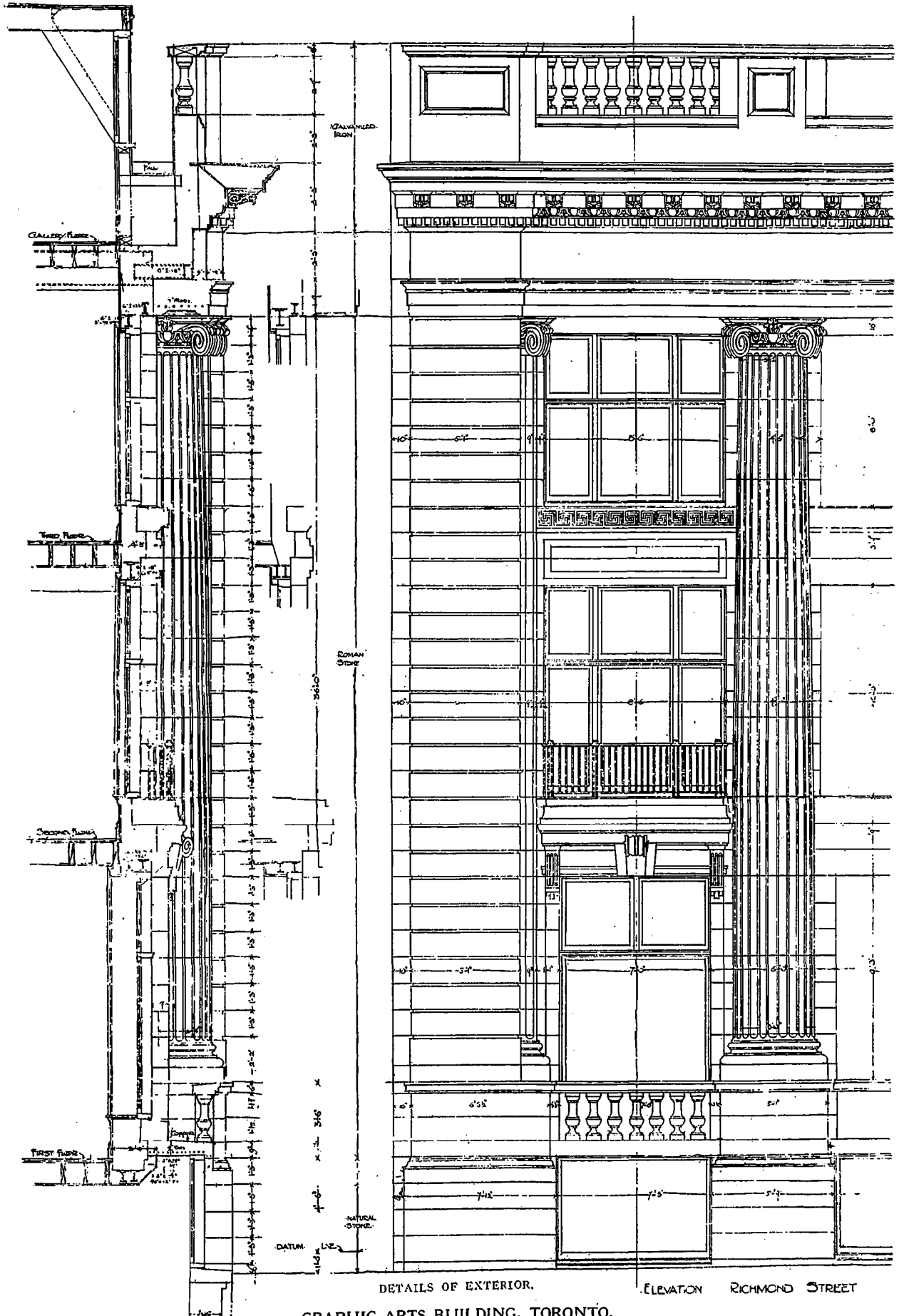
DETAILS OF PRIVATE OFFICES.
GRAPHIC ARTS BUILDING, TORONTO.
F. S. BAKER, ARCHITECT.



TWO MAIN OFFICES ON FIRST FLOOR.
GRAPHIC ARTS BUILDING, TORONTO.
F. S. BAKER, ARCHITECT.

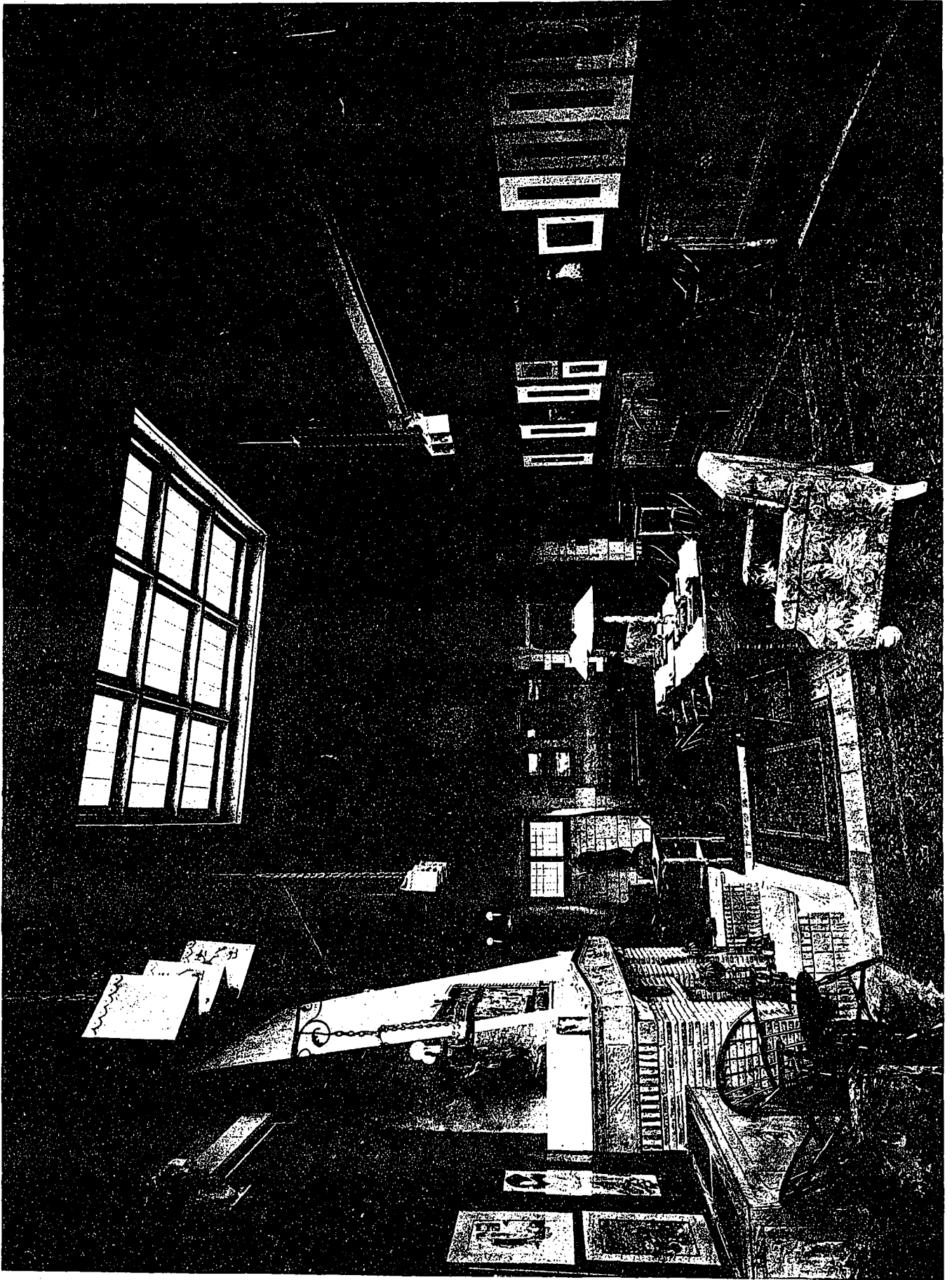


DETAILS OF MAIN ENTRANCE.
 GRAPHIC ARTS BUILDING, TORONTO.
 F. S. BAKER, ARCHITECT.



DETAILS OF EXTERIOR.
GRAPHIC ARTS BUILDING, TORONTO.
F. S. BAKER, ARCHITECT.

ELEVATION RICHMOND STREET



E. & W. S. MAXWELL, ARCHITECTS.

"THE ARTS CLUB," MONTREAL, QUE.

CLUB ROOM.

"The Arts Club, Limited," Montreal

EDWARD & W. S. MAXWELL, Architects

THE ARTS CLUB owes its inception to a group of artists, architects and amateur painters, who have been in the habit of meeting in the studio of Mr. Maurice Cullen, R.C.A., to paint from the model on Saturday afternoons. The suggestion that an Art Club be formed and suitable quarters procured was met with enthusiasm. It was agreed that permanent quarters were desirable and a temporary committee was formed to see if sufficient money could be raised to purchase a building. The usual difficulties incidental to financing the undertaking were encountered, but in the end an amount was subscribed which enabled the committee to purchase an old house at No. 51 Victoria street, and during the spring of last year plans were prepared and the contracts let for the necessary alterations.

It is well to mention that a provisional lease was arranged with a decorator whereby the club undertook to provide a store on the ground floor. This greatly facilitated the financing and enabled the committee to see their way clear to make the club a success without inflating the membership.

The membership consists of professional painters, sculptors, architects and musicians, and amateurs who have ability in these directions, as well as others who by their interest and sympathy are qualified to enter into the spirit of such a club.

Each month there is held an exhibition of works of art, ancient or modern, serious or otherwise; and on these occasions the opening evening is enlivened by music, song and good fellowship, accompanied by "churchwardens" and liquid, as well as solid re-

freshment. So far the following exhibitions have been held: Pictures by Canadian artists; Japanese prints and paintings; a fakir show; and a memorial exhibition of Mr. Henri Julien's work. The fakir show exhibits were auctioned for the benefit of the club and from the amount received it is evident that Montrealers are partial to advanced art movements.

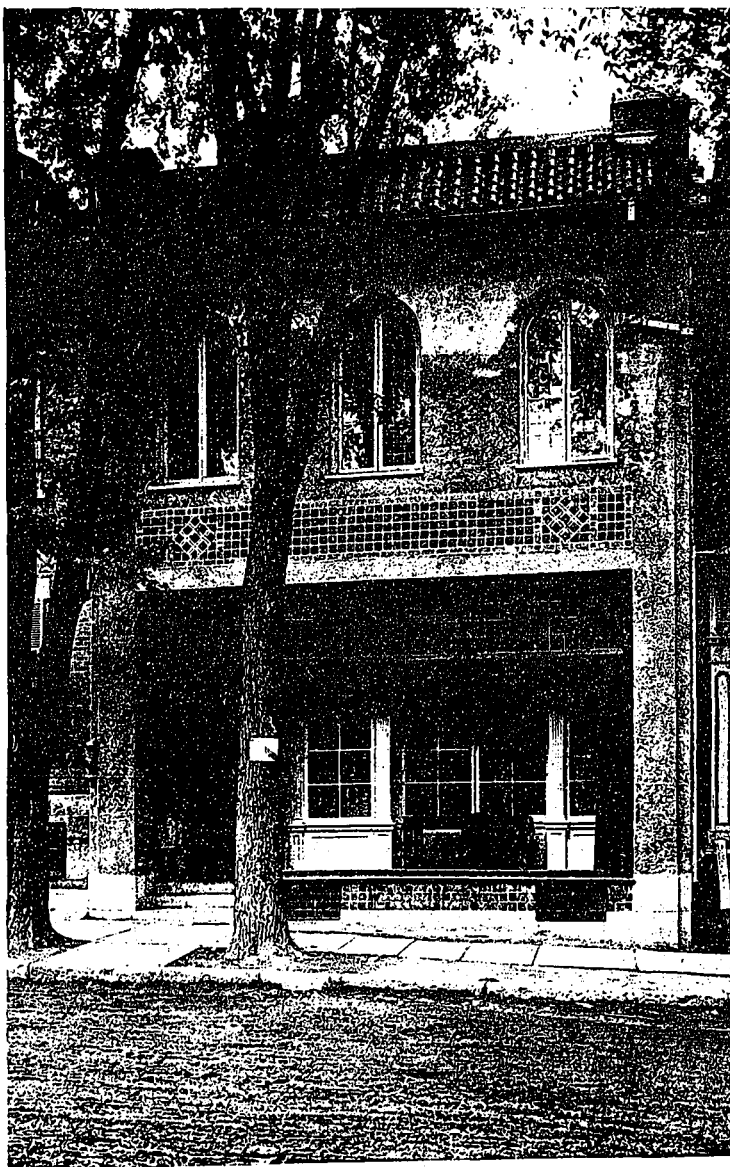
Several times a week lunch is served in the club and during the evening a fair number use the club room and the billiard room.

The old building consisted of the usual three story and basement dwelling with a mansard roof—four rooms to a floor, quite uninteresting in every respect. The alterations and additions have provided a store on the ground floor, the tenant, Mr. Duncan Fraser, fitting up the interior in such a way as to

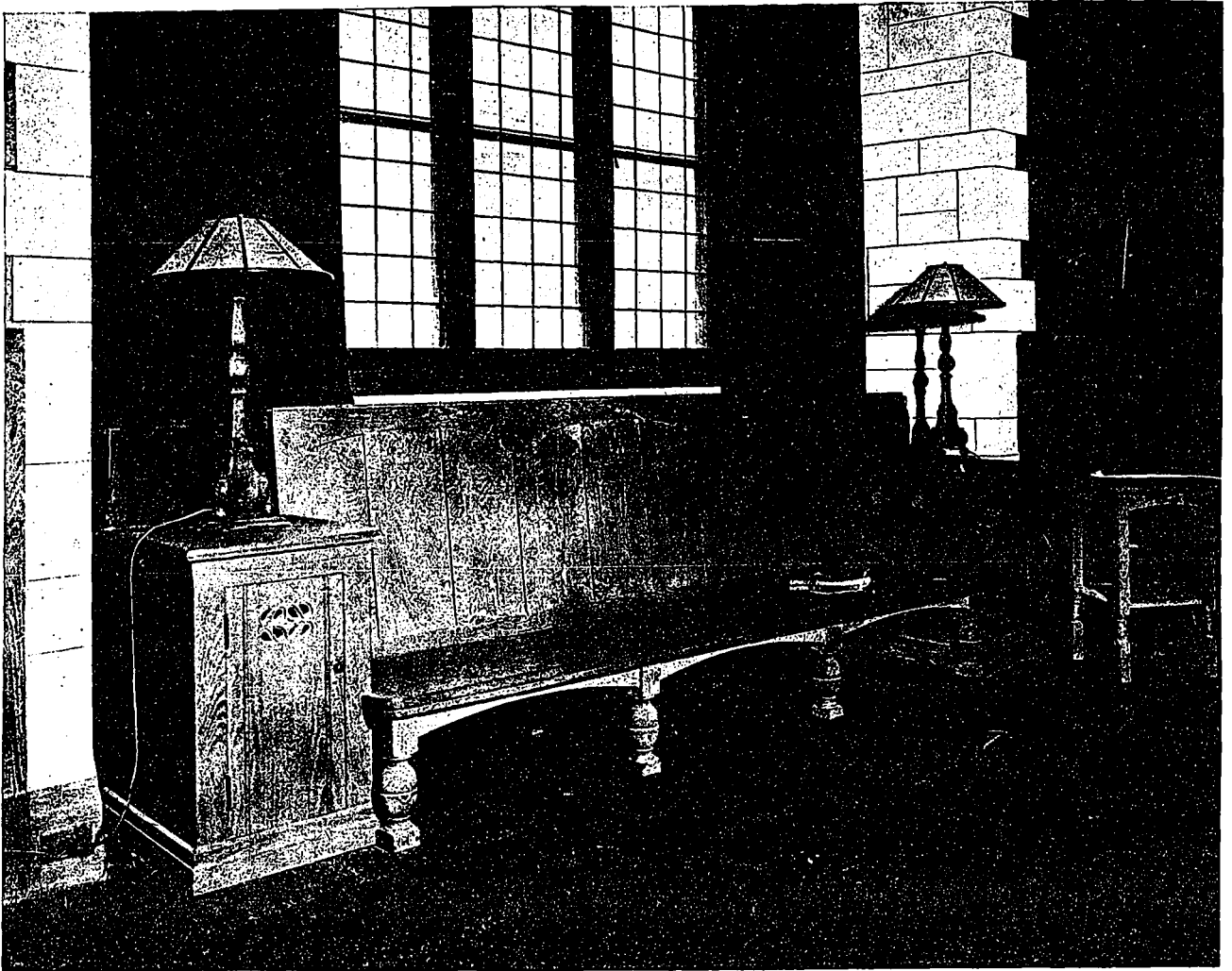
obtain good reception rooms, a "studio" in which to show his merchandise, and a good sized workshop with a mezzanine story above.

The club is entered from an exterior vestibule, which has a Grueby red tile floor and walls of rough cast with tiles inserted at intervals. At the head of the staircase is a small hall with access to the billiard room, the coat room, the steward's supply room, and, towards the rear, to the exhibition corridor and main club room.

The billiard room, which occupies the whole front of the building, contains an English table. The decorative scheme consists of grey wavy grass cloth with tapestry curtains in which green predominates. The ceiling has four plaster beams supported on stone corbels, and the windows are of square lead quarries.



"THE ARTS CLUB," MONTREAL, QUE.



DETAIL OF FURNITURE.

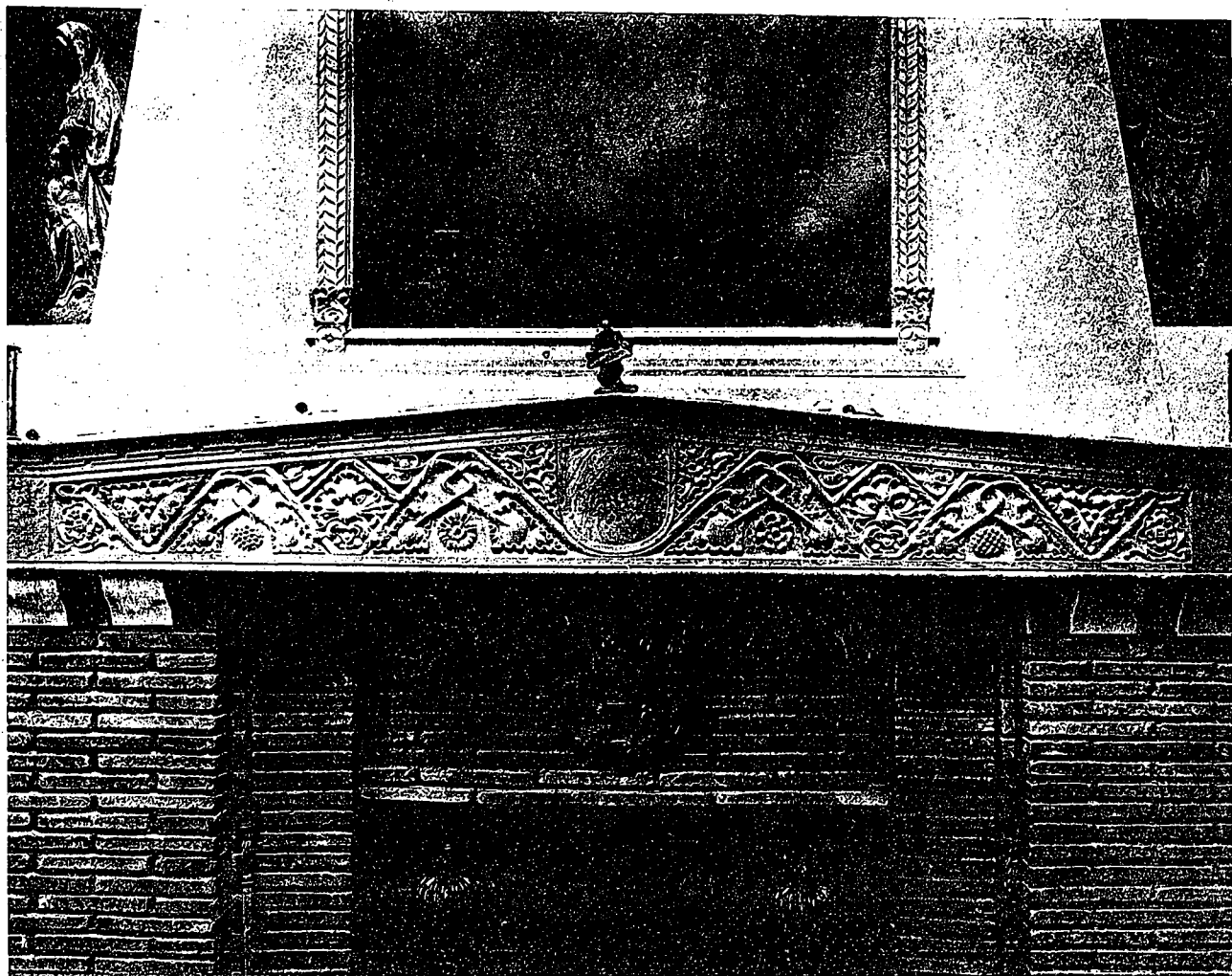
The exhibition corridor has a beamed ceiling of chestnut, and the walls are covered with grey fabri-kona cloth, while the lighting is by the indirect system. This leads to the large club room, the arched entrance having stone reveals.

The club room offered an interesting problem to solve, as it was necessary to have conditions of lighting similar to those in a picture gallery, and at the same time retain a homelike atmosphere. After considerable study a hall of Tudor type was decided on and the general form of the room, with the use of deep stone reveals is obviously inspired by the period. The room is 21 feet 6 inches wide and 41 feet long, the ceiling being 15 feet high. At the rear is a large mullioned window having squares of leaded glass, while at either side cupboards are recessed into the wall. The opposite end of the room has an entrance in the form of a Tudor arch with a decorated lunette by Mr. Maurice Cullen, R.C.A. The shimmering effect of the gold background showing between the paint, applied in the manner of the "pointillists," is excellent. A mediæval castle towers above the mist and in the clouds appears a winged Pegasus.

In this wall is a casement window set in a deep framework of the same stone treatment. Above the window is a decoration by Mr. Clarence Gagnon,

A.R.C.A., showing the Baie St. Paul in winter garb.

The dominating feature of the room is a mantel piece occupying the centre of the south wall. A massive carved beam supported by stone corbels, which enter into the constructive brickwork of the chimney-piece, was used in place of the usual shelf. This beam recalls in its detail the treatment found in the gables of half-timber houses in England. The carving is executed in the old spirit, while an interesting finish resembling driftwood has been obtained by brushing the wood with a wire brush, acid staining and a filler of dust color. The bricks are "Scotch scones," 9 x 1 x 4½ inches, such as the steel companies use for lining furnaces. The color varies from buff to a low keyed brown and the raked out joints give character to the work. The sloping hood of sanded plaster was painted and then subdued by a stain into which a powder of pale dust color was introduced somewhat unevenly. The same finish is on the sanded ceilings. Over the beam of the mantel a panel has been arranged, which will receive a decoration by Mr. Wm. Brymner, P.R.C.A. The frame surrounding the panel is well carved and surmounted by the monogram of the club and a crown. The stone blocks at either side of the mantel support early French carved and colored wood figures of



DETAIL OF MANTEL.

fourteenth and sixteenth century workmanship. Seat fenders and a herringbone hearth of the same brick complete the design.

The andirons and fire tools are of Paul Beau's excellent workmanship.

The walls are covered with a Japanese gold grass cloth of a deep rich tone, and are equipped with a heavy picture moulding under the stone cornices and a lighter one set about 7 feet 6 inches from the floor. They are covered with grass cloth, which renders them almost invisible.

The ceiling beams are of plaster excellently modelled in the Elizabethan style by Mr. Geo. W. Hill, A.R.C.A.

The radiators are screened with coil cases, having pierced bronze grille tops. This method of screening is quite practical and the tops are at a level which enables them to be used for exhibiting sculpture and decorative objects.

Under the large window there is an Elizabethan bench with cupboards of pedestal form at either end. A radiator is back of the seat, and with this disposition there is no draught from the window, while the radiators are out of sight.

Reflectors of unusual type are suspended from six points in the ceiling, and the lighting of the walls is

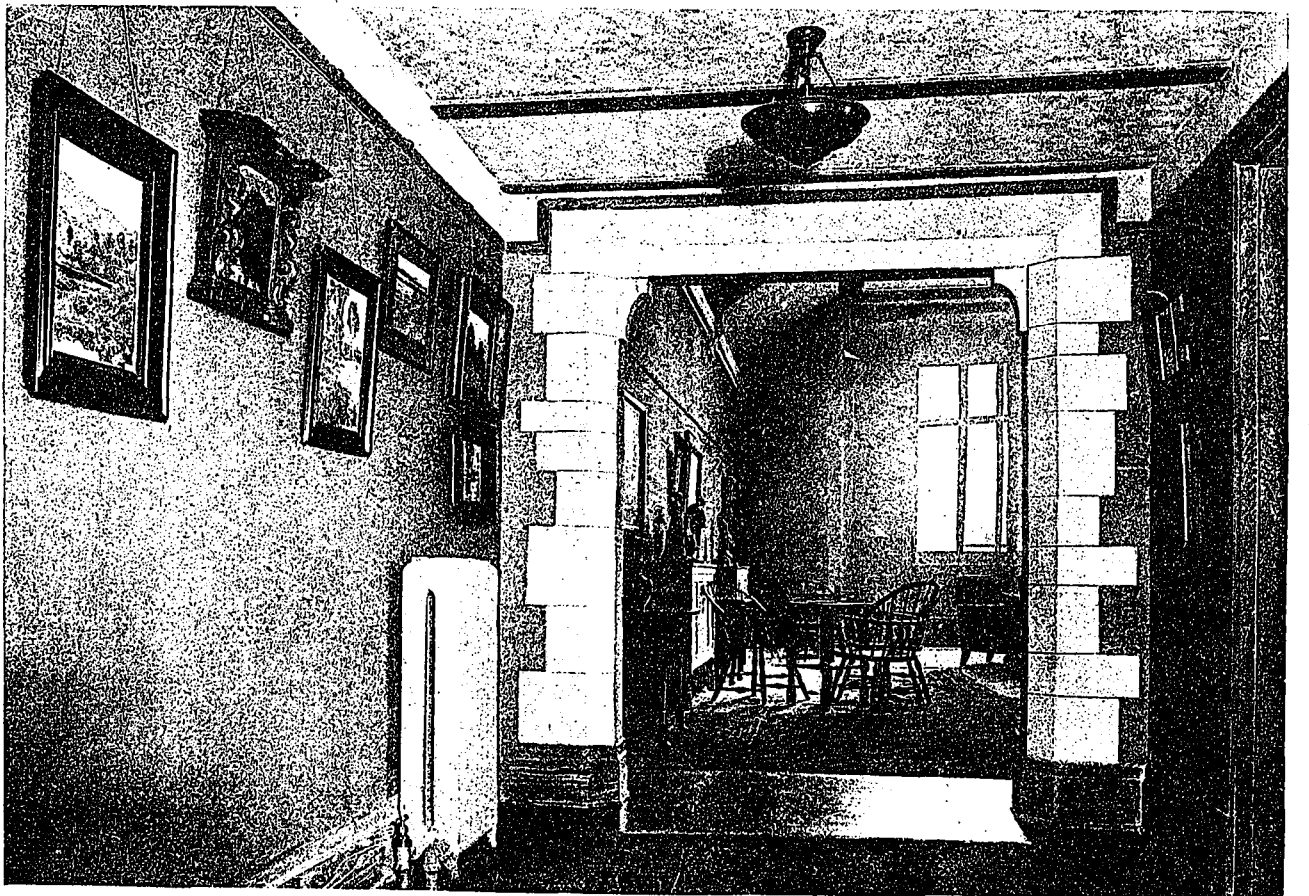
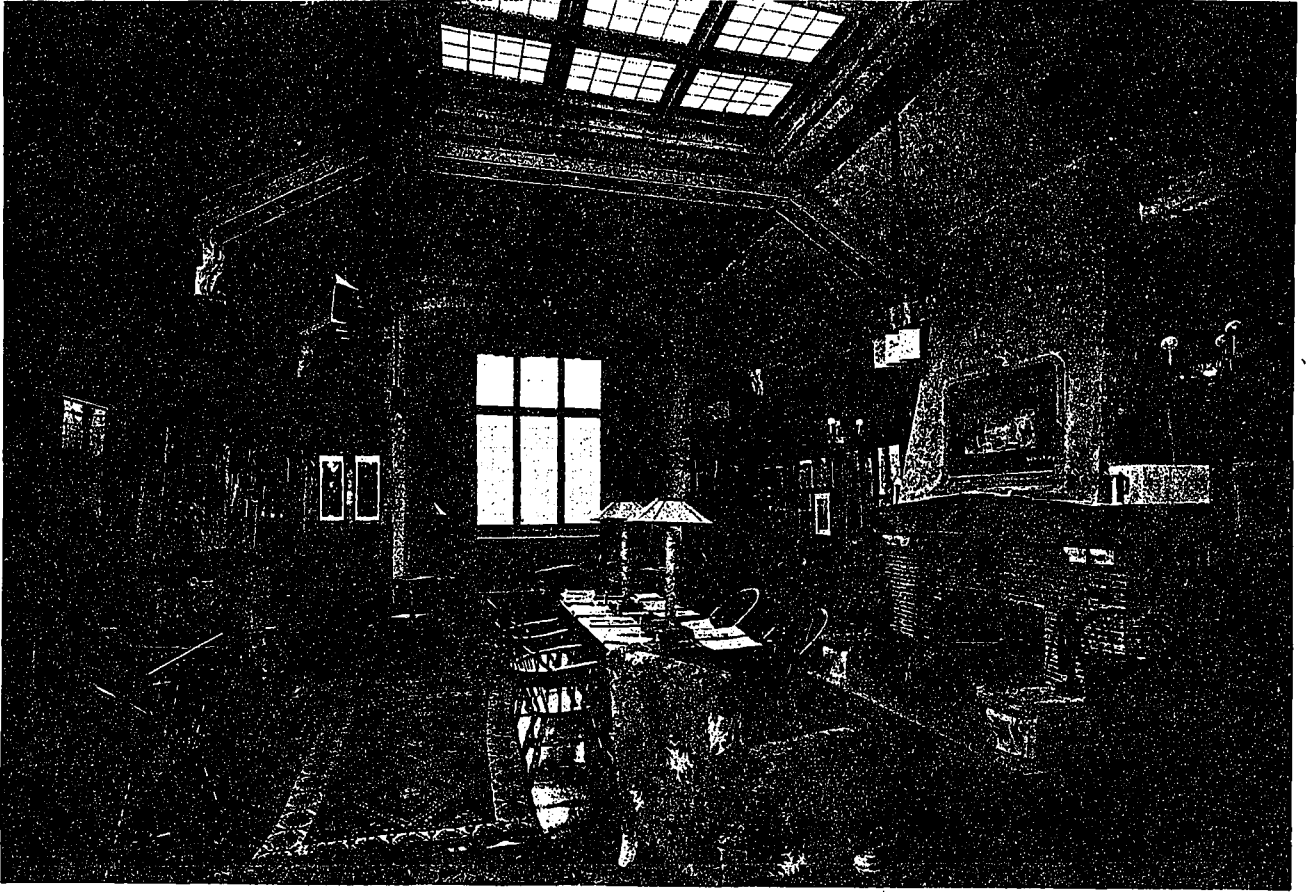
excellent, though the usual disfiguring trough is dispensed with. A supplementary system of table lamps with grass cloth shades furnishes a more homelike and agreeable lighting for ordinary occasions. At either side of the mantel are sixteenth century wrought iron cranes converted into electric fixtures by Mr. Paul Beau.

The furniture consists of a massive Elizabethan table in the centre of the room, upholstered sofas and arm chairs, covered with a vigorous pattern of verdure tapestry, and reproductions of old Windsor chairs.

There is a double skylight, heated by coils; the inner pivoted lights being glazed with ground antique glass which, when open, give excellent ventilation. The rugs are of Persian workmanship, quiet and deep in color and tone.

The top floor of the building contains the caretaker's quarters, consisting of bedroom, bathroom, and kitchen, with a small room leading to the roof terrace on Victoria street.

The exterior may be called rather Spanish in type, the walls being of cement rough cast of fine grain, with a cornice in the nature of sloping eaves, covered with Ludovici dull sea green tiles. The large square opening affords a suitable treatment for the entrance to the club and the store front.



CLUB ROOM
CORRIDOR

"THE ARTS CLUB," MONTREAL.

E. & W. S. MAXWELL,
ARCHITECTS.

The Ontario Club, Toronto

WALTER N. MOORHOUSE

THE TASK presented to Sproatt & Rolph, architects, in altering the old Standard Bank building located at the corner of Jordan and Wellington streets, was of an unusual nature, and furnished an interesting problem both from an architectural standpoint and as an engineering undertaking. On the one hand were the requirements of a first-class club such as the Ontario Club; on the other, a building of clumsy design and solid construction occupied by a banking establishment and a firm of wholesale clothiers.

The chief difficulties in the construction and design of the interior were: (1) The floors of the

building had to be fireproofed according to city by-laws. The existing mansard roof was supported by temporary trusses 16 feet deep and nearly 60 feet span, constructed with the floor joists as they were removed. These trusses were placed so as not to interfere with the erection of the new columns. All the floors were then torn out and steel rods with turn-buckles were carried across the building to act as ties. When the whole interior was removed, the work of placing the footings began. The dead loads due to the fireproof construction were so great as to necessitate the use of wall columns. The footings of these

were placed one at a time with great care so as not to disturb the unbraced shell of the building, over 80 feet in height. Underpinning walls were built on each side of the footing with grooves so placed that a firm bond was obtained with the main column footing when the concrete was poured.

The confined space presented great difficulties to the steel erectors. There was very little room to operate a derrick of suitable proportions, and when the steel was placed it was exceedingly difficult to do the rivetting at the walls, on account of the nearness of the existing masonry. As the framing ap-

proached the existing roof, the problem became more arduous. The work of placing the steel roof beams on top of the columns, under the existing roof joists was exceedingly strenuous, as very little efficient mechanical aid could be used on account of the confinement of the space. As soon as these beams were placed, the temporary trusses and tie rods were cut away and removed, and the wall columns firmly anchored to the existing masonry.

(2) Adapting the planning and interior design suitable for the purpose to existing window openings.

(3) Concealment of pipes, ducts, etc. These were many in number, some of large size, and were only exposed in unimportant locations.

In plan the entrance hall leads directly into the main dining room, which, with the serverly, occupies the remainder of the first floor. An elevator and stairway lead from the hall down to the members' cloak room, lavatories and barber shop in the basement and up to the other rooms of the club. A gallery overlooking the dining room forms a break in the main stairway and affords a good point of view of any function taking place in the dining room.

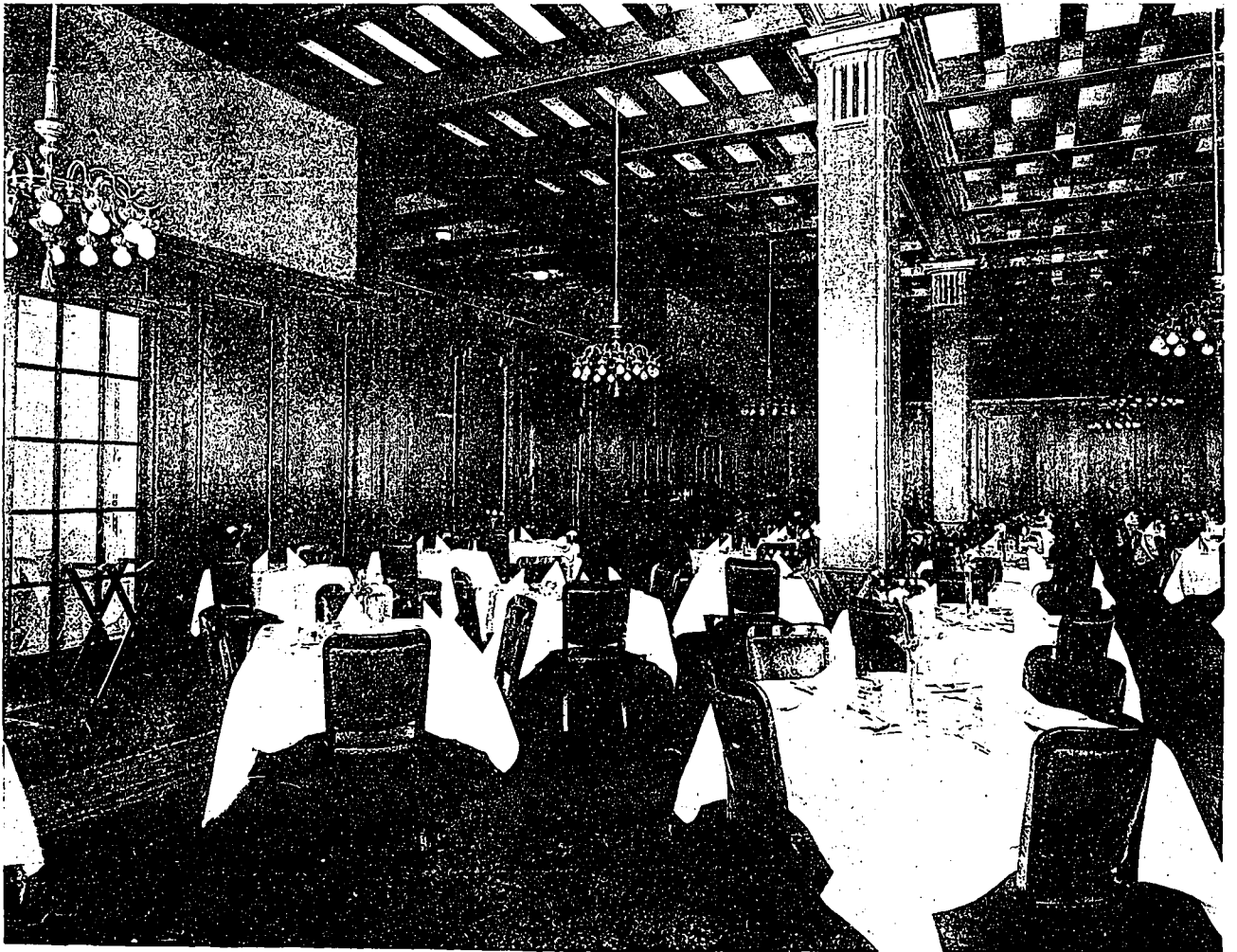
The main stair continues to the second floor, which accommodates the club lounge, library, magazine room and two private dining rooms.

The third floor is occupied by the billiard room, two card rooms and a lavatory. The billiard room is furnished with seven English and one American billiard tables.

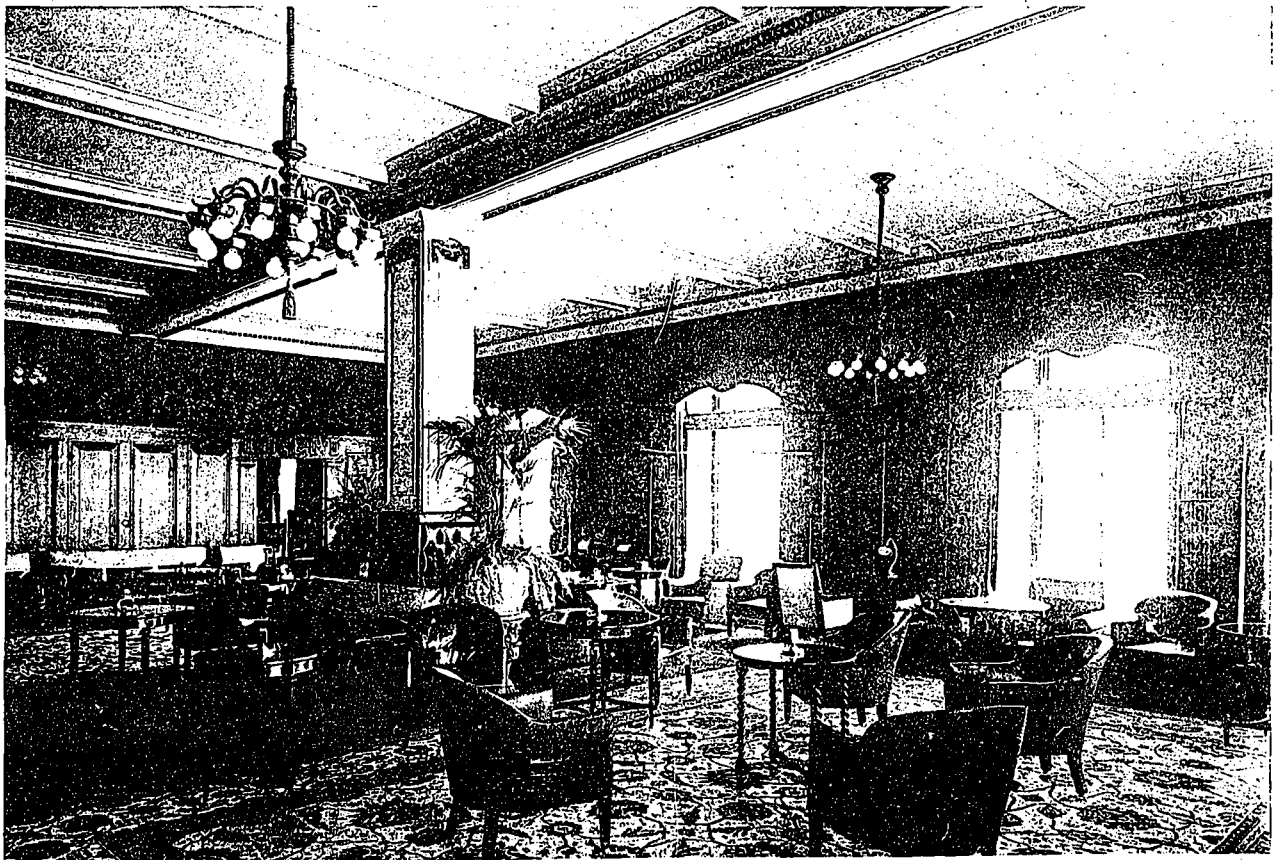
The fourth and fifth floors are divided into members' living quarters. A capacious kitchen occupies about one-third of the whole fifth floor and efficient service accommodation is arranged for in the rear hall on all floors.

The outside walls and roof are all that remain of the original structure, as has been stated. The floor





DINING ROOM—LOOKING FROM AND TOWARDS THE BALCONY.
THE ONTARIO CLUB, TORONTO, ONT.
SPROATT & ROLPH, ARCHITECTS.



READING ROOM.
CLUB ROOM.

THE ONTARIO CLUB, TORONTO, ONT.

SPROATT & ROLPH,
ARCHITECTS.



LIBRARY.

framing is steel with reinforced concrete slabs and a cinder concrete fill around wood sleepers to take the finished flooring. The partitions, except in the basement, are metal, being formed of $\frac{7}{8}$ in. steel channels wired together and metal lathed. Ceiling furring is done in a similar manner, rod hangers having been placed in the slab where required. Conduits for electric wiring were placed in the forms before pouring of concrete, as also were sleeves for pipes, etc. Beams and columns in all cases were encased in concrete. The old roof and mansard were thoroughly fireproofed with asbestos board and the spaces between the joists packed with mineral wool.

The entrance hall is treated in a formal manner with Caen stone walls; floor of tile with Laurentian marble laid diagonally, and a green Bancroft border and base; and stairway of an ornamental design in solid bronze.

The dining room is in dark oak, wax finish, with panelling 11 feet high; a frieze decorated with crimson damask and the ceiling of beam treatment in oak.

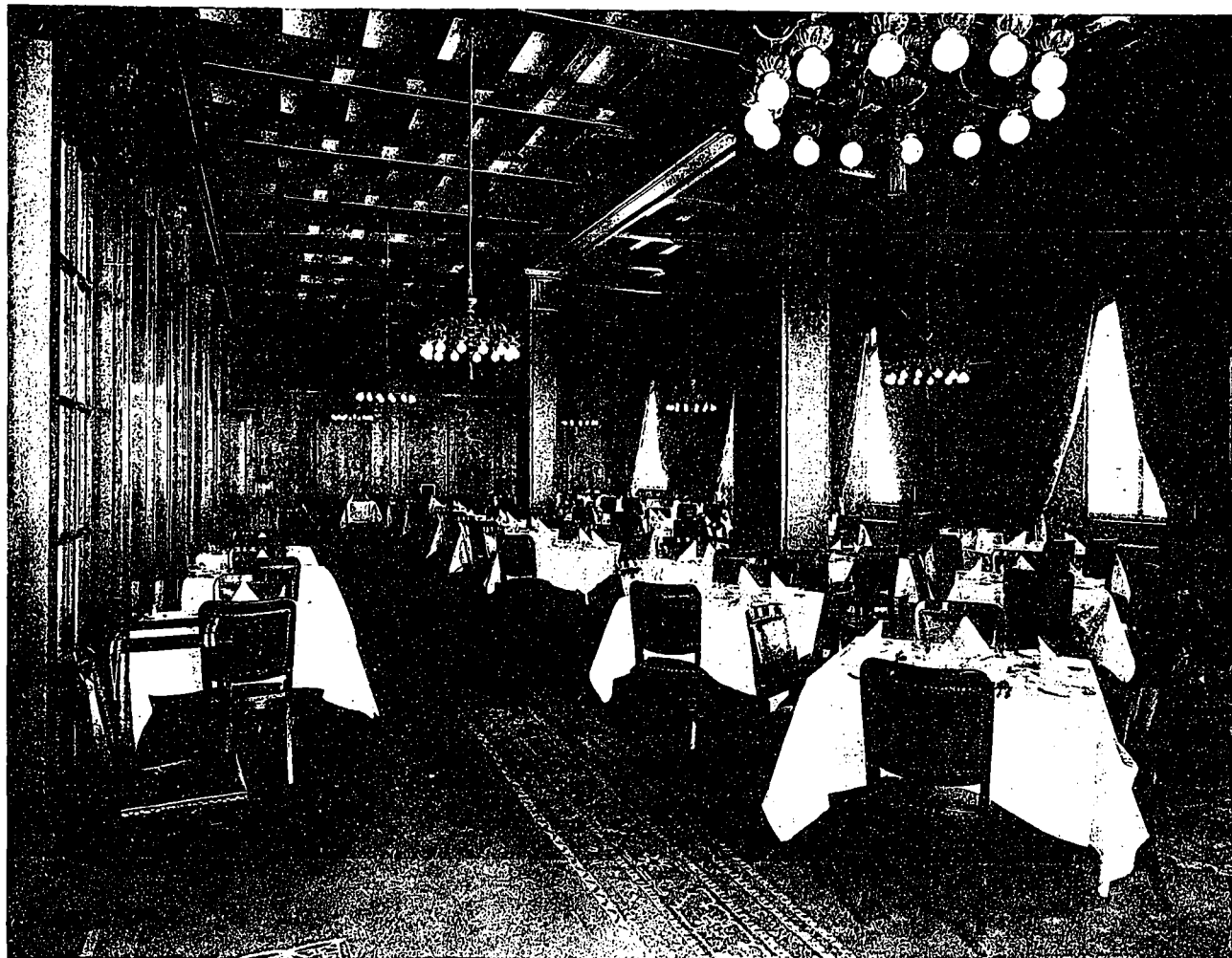
The club room is panelled in oak 8 feet high, having a frieze decorated with tapestry and a plaster beamed ceiling. The general character of the design is carried through the other rooms on the floor. The billiard room is also finished in oak in a colonial

design, which is in keeping with its intended use.

The bedroom floors are treated in pine, white enamelled, with floors of birch. In the basement the lavatories and barber shop have white Italian marble walls and terrazzo floors, while the kitchen, servery and bath rooms have terrazzo floors and white tiled walls. The members' stair from the gallery to the fifth floor is bronze plated with white Italian marble treads and green Bancroft strings.

The lighting fixtures in the main rooms are bronze finish and of distinctive design. The semi-indirect fixtures in the entrance hall are of Italian workmanship, in alabaster.

In order to obtain the maximum of comfort for the members, considerable study was made of existing work of similar character the question of efficient service being given the greatest consideration. The various cooked meats, etc., are carried down from the kitchen in electric dumb waiters and placed directly in a steam table in the servery. The circulation from the dining room through the servery is such that there can be no congestion, the fixtures being so placed that a waiter can pass directly through in one direction only, depositing dirty dishes as he enters and procuring whatever he requires before re-entering the dining room. The system of checking supplies throughout is a most efficient one,



DINING ROOM.

and the plan has been arranged in accordance with this system. The control of the dumb waiters facilitates service on the other floors as may be required and an additional electric dumb waiter from the wine cellar and bar to the various floors takes care of this important branch of club service. In connection with orders to the bar, a gravity tube system is used.

The kitchen fixtures and dish washing apparatus, etc., in the servery are supplied with live steam from a boiler separate from the steam heating plant. The hot water for the lavatories, etc., is also an independent service.

The elevator equipment is electric and consists of a freight hoist of one ton capacity and a passenger elevator, in addition to the three dumb waiters already mentioned.

The steam heating plant consists of a tubular boiler, 14 feet long by 4 feet 6 inches diameter, the radiators being equipped throughout with thermograde valves set to operate at half-pound pressure. An electric automatic pump controls the returns to a sump. In addition there is an indirect heating system supplying the main rooms with warm air, the registers being placed near the ceiling. The air from the intake is first passed through a water curtain washer and over vent steam coils. An automatic control regulates the humidity of the various rooms.

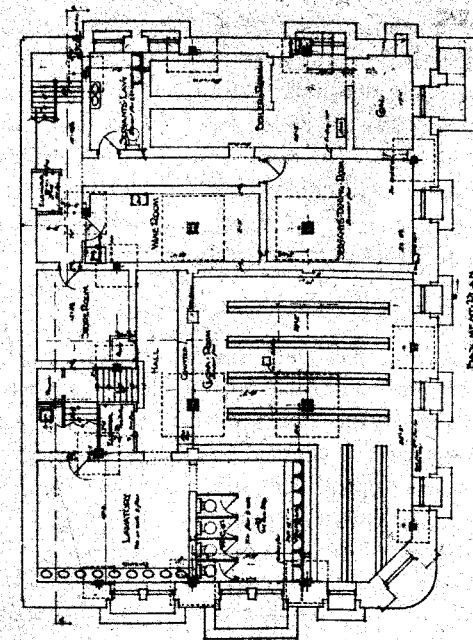
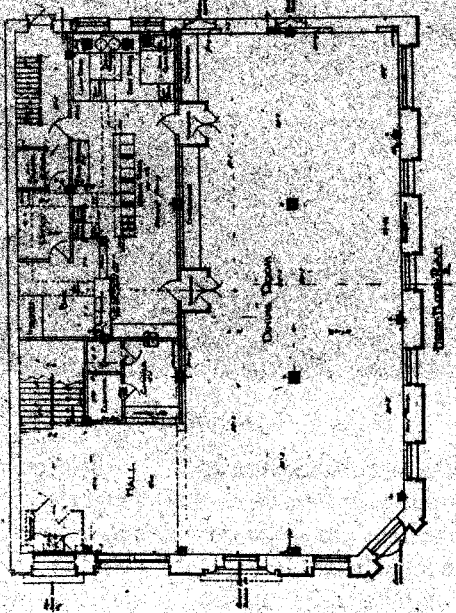
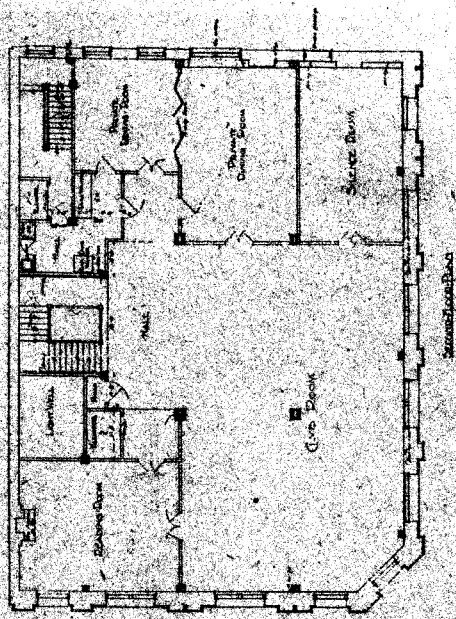
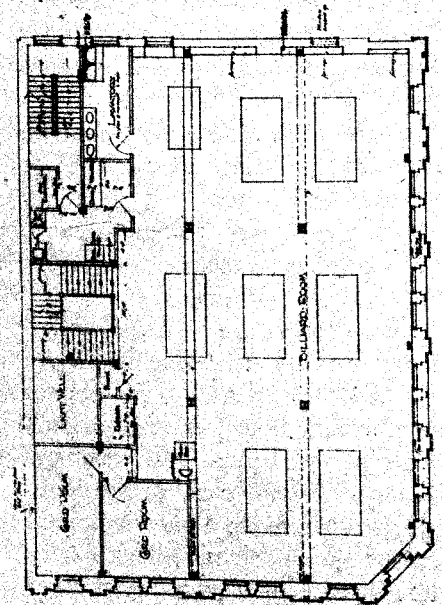
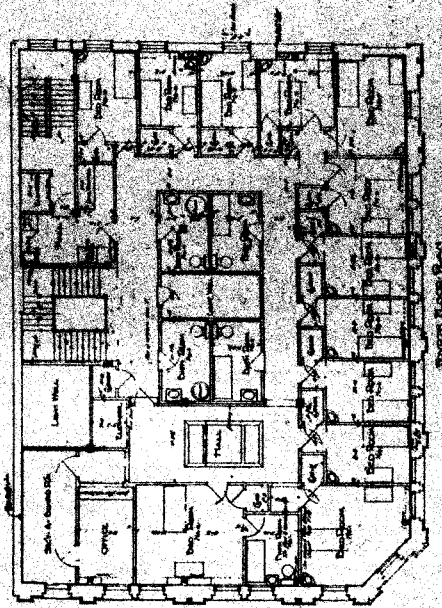
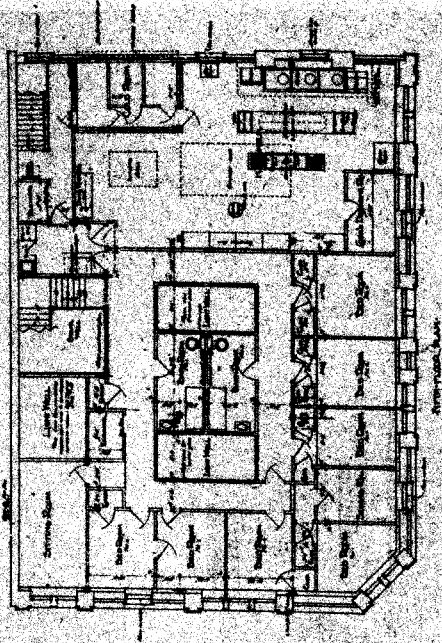
The exhaust ventilation is taken care of by two separate systems, one fan serving the main rooms, exhausting from both ceiling and floor registers, and one the serveries and lavatories. These fans are direct connected and are situated on the roof.

Two lines of piping serve the building with connections for vacuum cleaning, the machine being placed in the basement. A complete refrigerating plant provides the club with ice, and supplies cooling coils for the refrigerators in the servery and in three large cold rooms off the kitchen.

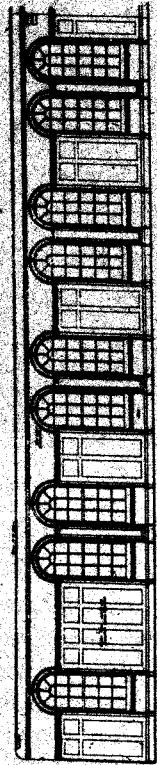
The plumbing throughout is of the most modern design, the members' toilets being operated by a flushometer tank situated on the roof. The fittings of the lavatories throughout are Primus pattern.

The barber shop is fitted with three chairs and a shoe-shine fixture.

The members' living quarters are equipped in the most up-to-date manner each bedroom having a clothes closet, basin, and telephone. The phones are operated from a switch board in the porter's office, with twenty-six private stops. A members' telephone is placed on each floor close to the main stairway. The club has a complete annunciator bell system, and speaking tubes, and is piped for gas in the servants' quarters in case of any accident happening to the electric lighting.

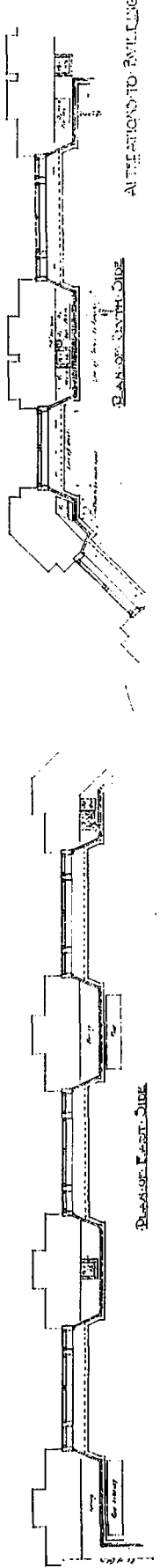
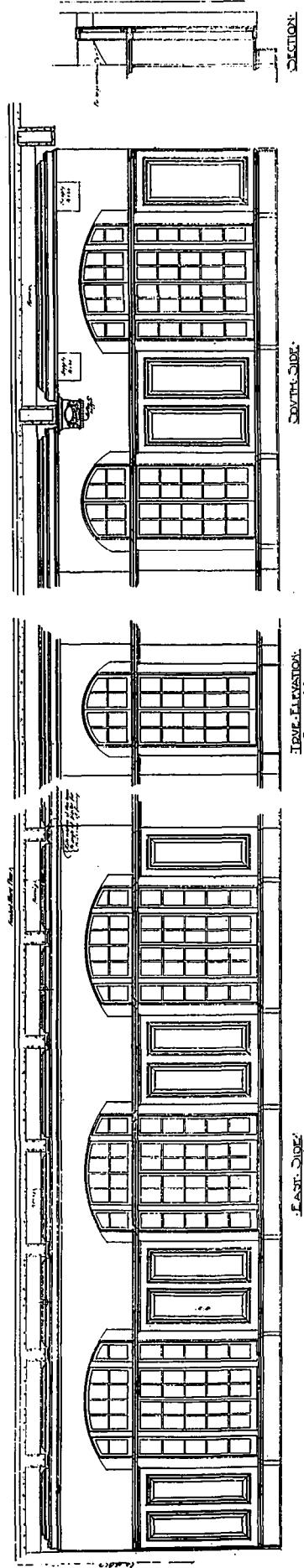
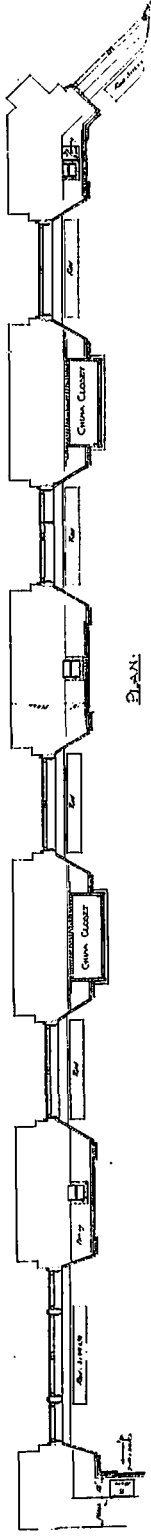
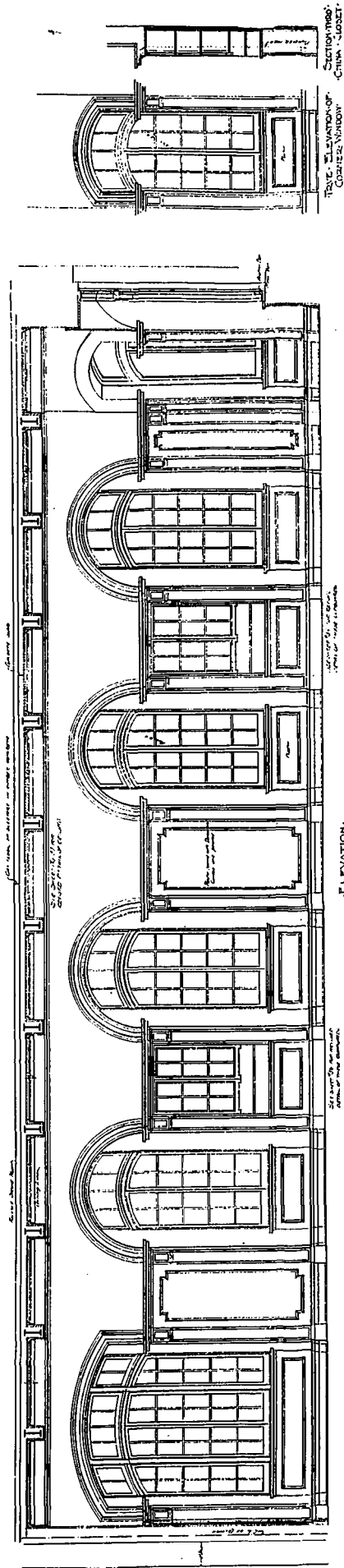


SPROATT & ROLPH,
ARCHITECTS.



DETAIL OF BILLIARD ROOM.

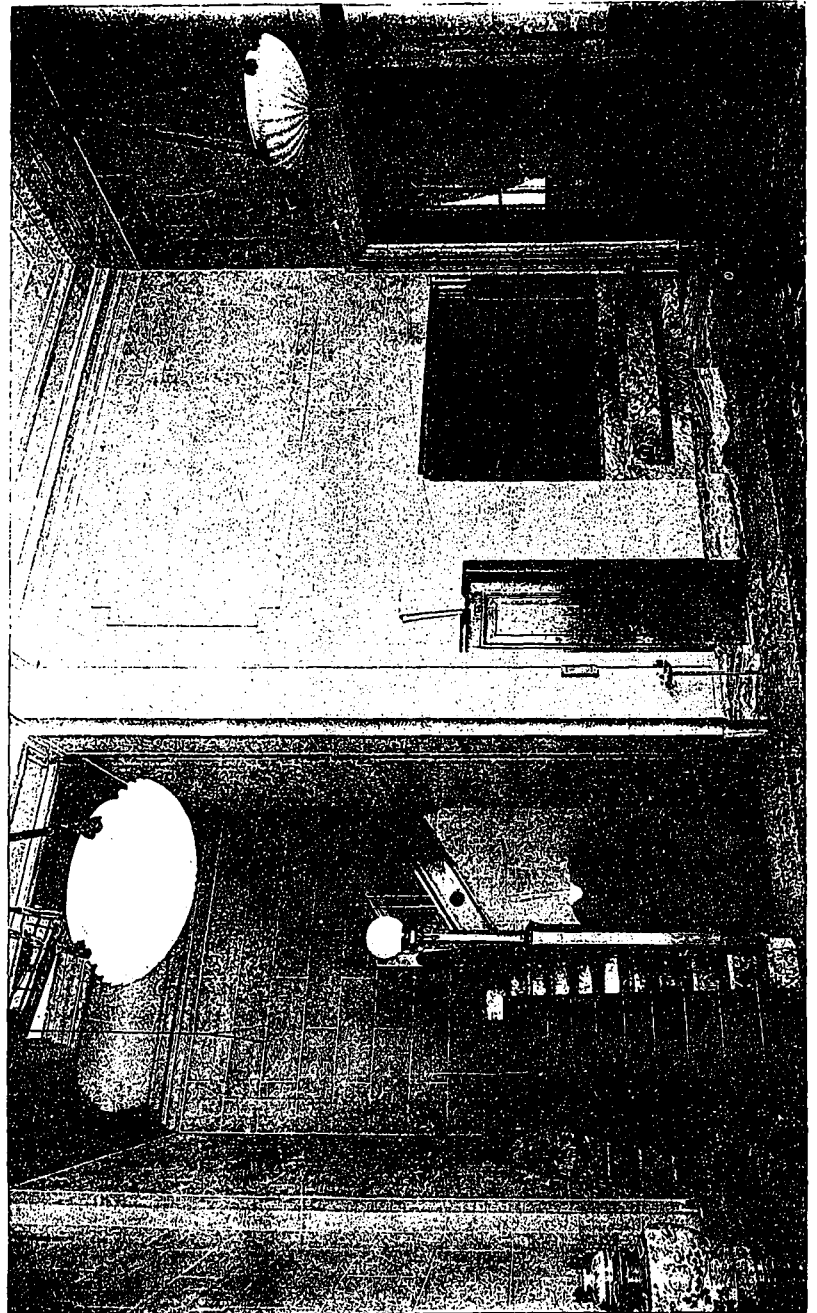
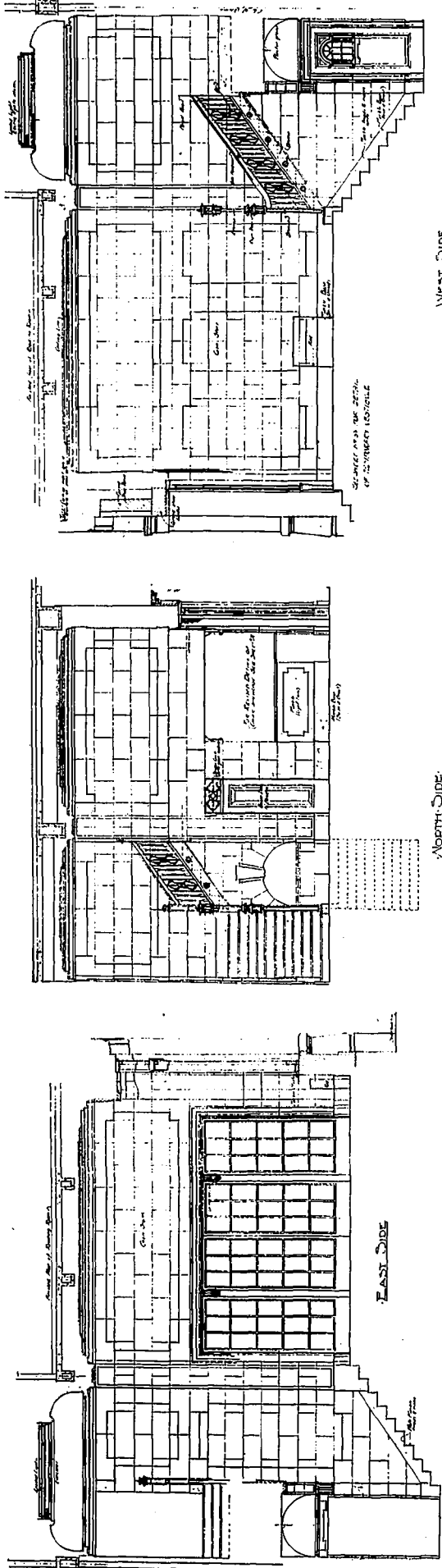
PLANS OF
THE ONTARIO CLUB, TORONTO, ONT.



DETAILS OF DINING ROOM.
 DETAILS OF CLUB ROOM.

THE ONTARIO CLUB, TORONTO, ONT.

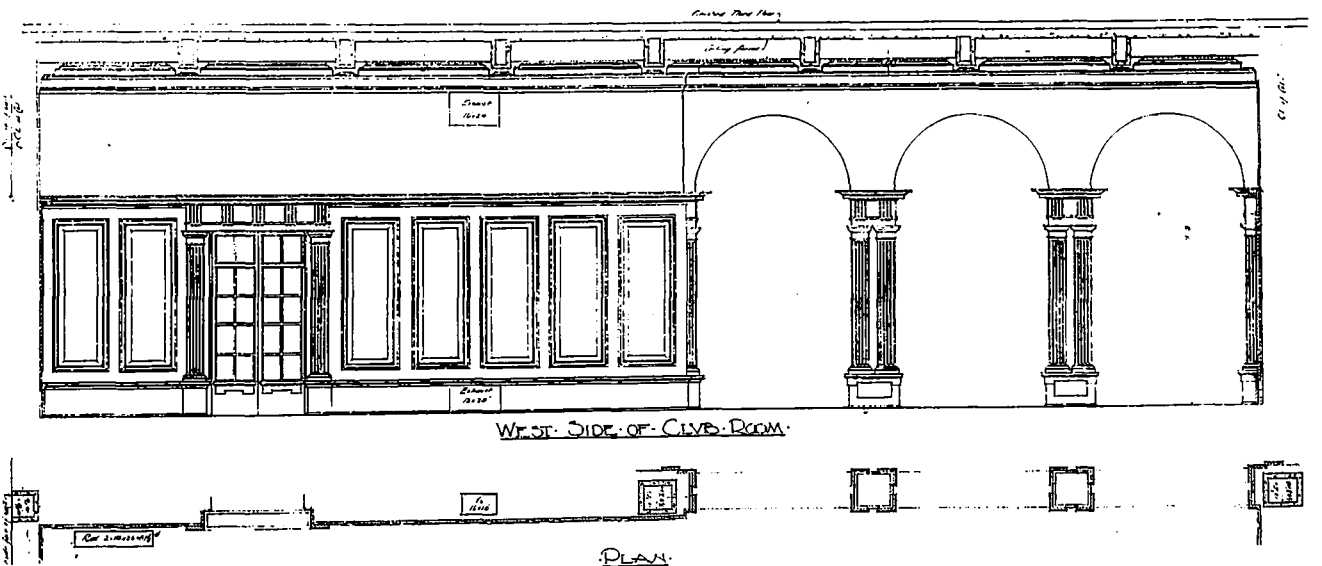
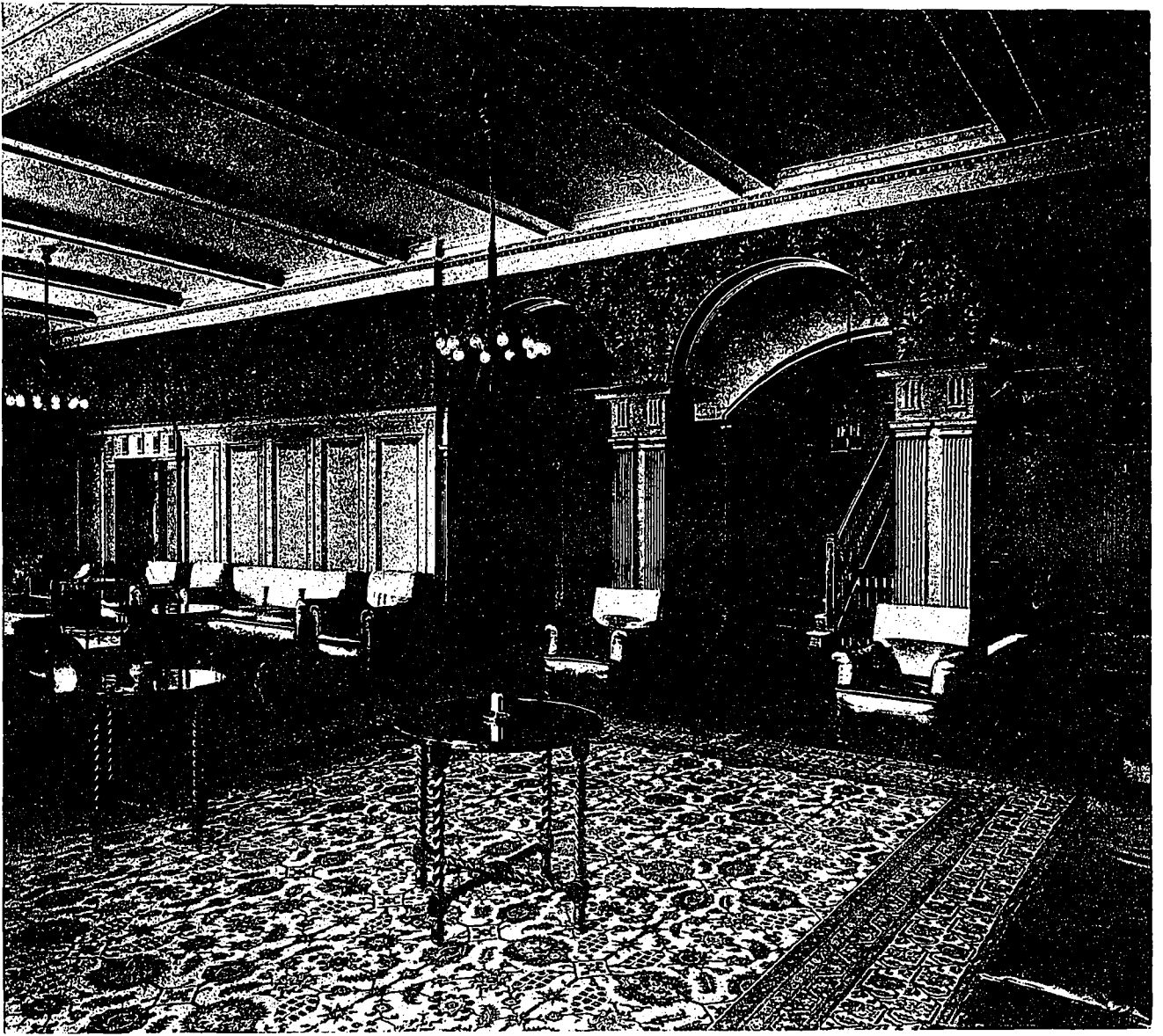
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DETAIL OF
ENTRANCE
HALL.

SPROATT & ROLPH,
ARCHITECTS.

THE
ONTARIO CLUB,
TORONTO, ONT.

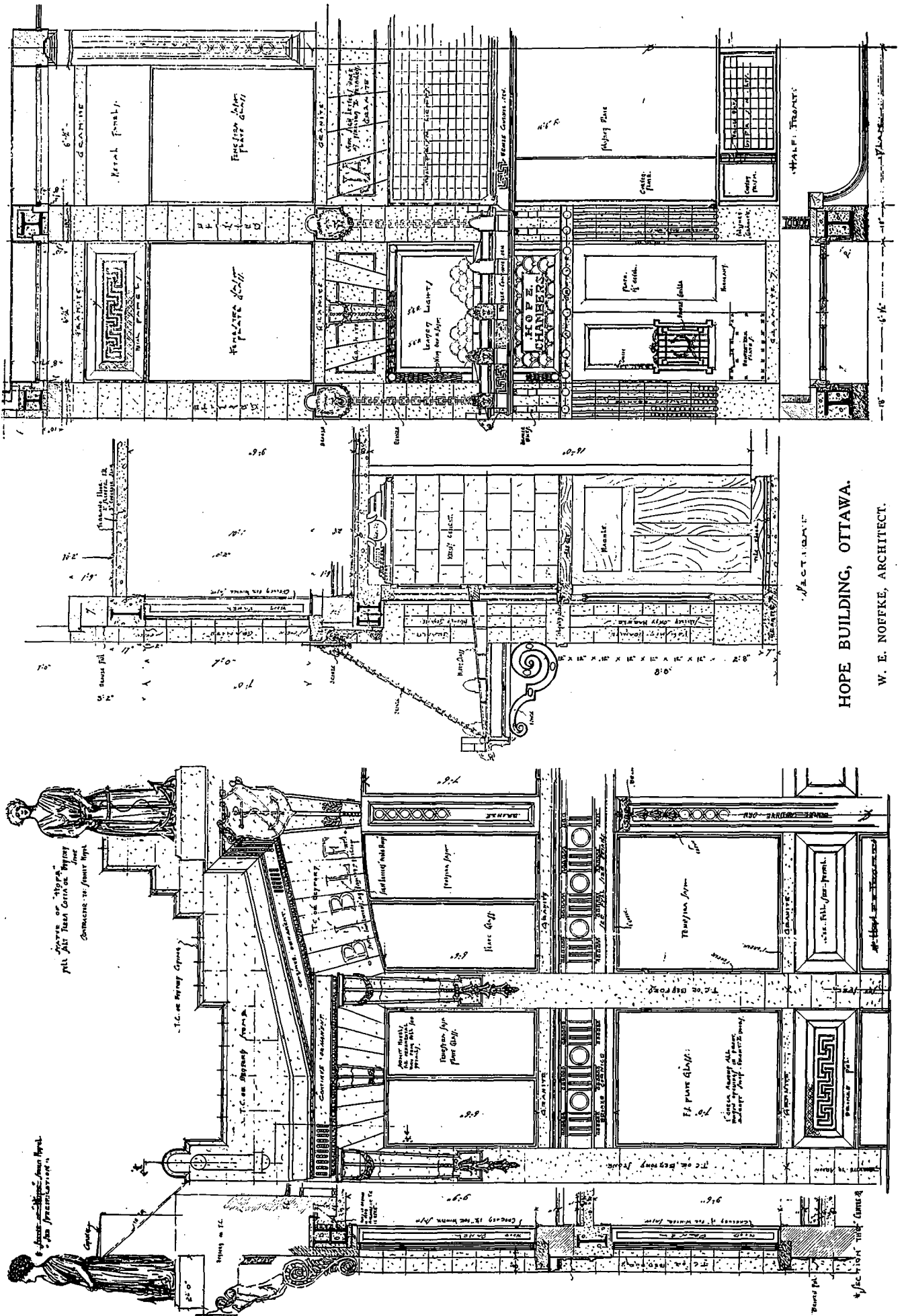


WEST SIDE OF CLUB ROOM.

DETAILS OF CLUB ROOM.

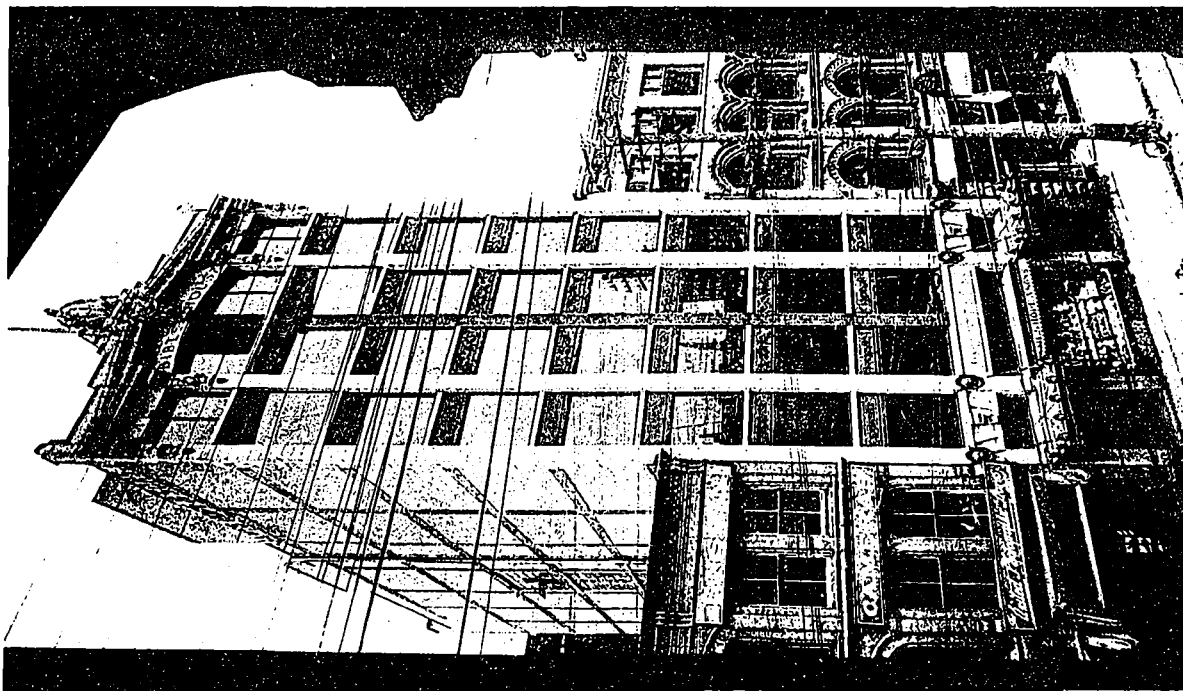
THE ONTARIO CLUB, TORONTO, ONT.

SPROATT & ROLPH, ARCHITECTS.



HOPE BUILDING, OTTAWA.

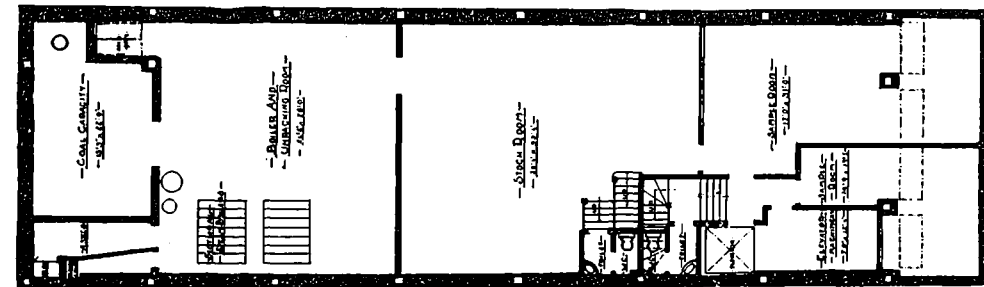
W. E. NOFFKE, ARCHITECT.



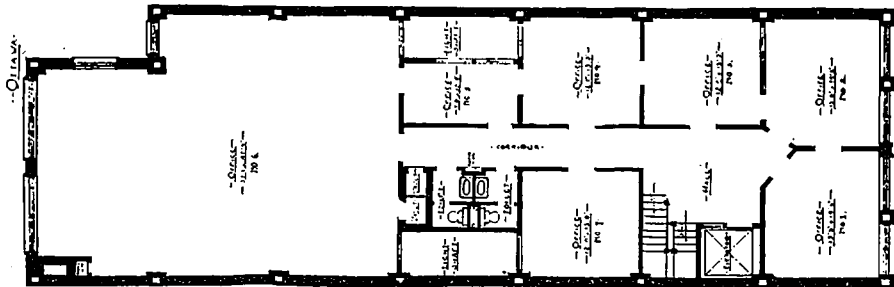
THE HOPE BUILDING, OTTAWA, ONT.

W. E. NOFFKE, ARCHITECT.

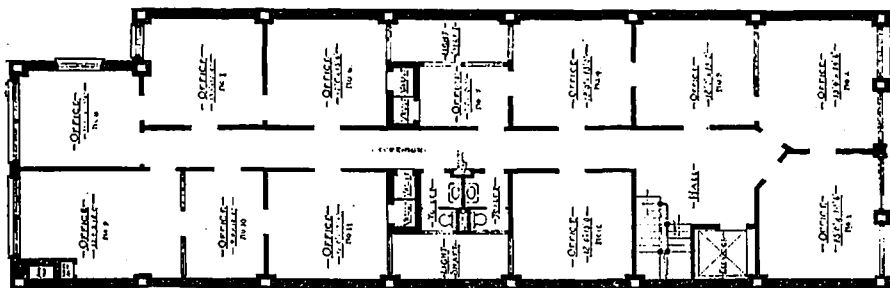
The size of the building is 32 x 99 feet, consisting of 9 stories and a basement, the ground floor being used for a book store, and the basement for printing presses, show rooms, boiler rooms, etc. All floors above the ground are used for offices, with a total number of 96, each floor being provided with ladies' and gentlemen's lavatories, mail chute and waste paper chute. The building is finished in Stanstead granite with panels between the windows of cast bronze; the marquee is also of bronze. The cost of the building was approximately \$112,000, or 25c. per cubic foot. The construction of the building is structural steel and 4 inch concrete slab. All floors are finished with terrazo, all halls and corridors with ceramic-mosaic. The heating is by the modulation system; the ventilation by overhead exhaust fan.



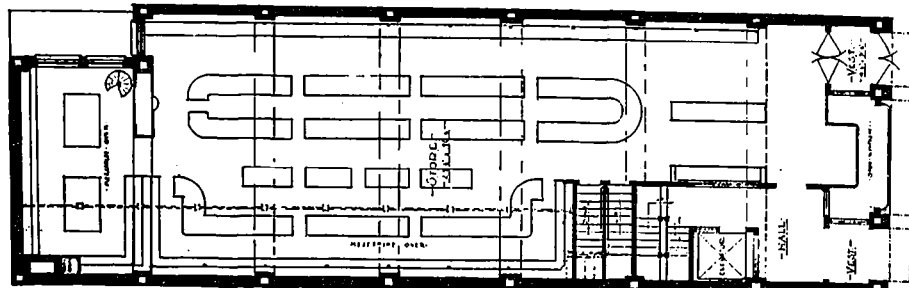
BASEMENT PLAN.



GROUND FLOOR PLAN.



1-8 FLOOR PLANS.



NINTH FLOOR PLANS.

VIEW OF MAIN FACADE AND PLANS OF BUILDING.

CONSTRUCTION

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



FREDERICK REED, Editor

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets,
Toronto, - - - Canada

BRANCH OFFICES:

MONTREAL—171 St. James Street
WINNIPEG, MAN.—13 Royal Bank Building
VANCOUVER—334 Granville Street
CHICAGO—Advertising Building
NEW YORK—156 5th Avenue

CORRESPONDENCE—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS—Canada and Great Britain, \$2.00 per annum. United States, the Continent and all Postal Union countries, \$4.00 per annum, in advance. Single copies, 35c.

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

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.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. 6 Toronto, June, 1913 No. 6

CURRENT TOPICS

J. N. SEMMENS of Winnipeg was the architect in charge of the Bank of Montreal illustrated in the April issue of "Construction."

* * *

THE SASKATOON Architects' Association has adopted a resolution providing that the plans and specifications for all new buildings to be erected shall be placed on deposit in the offices of the Builders' Exchange.

* * *

POINTE CLAIRE will build a new boulevard one hundred feet in width. This driveway will run along the brow of the hill parallel to Lake St. Louis and will present magnificent views of the valley and lake below. The boulevard will extend from Beaconsfield to Dorval.

A MEETING of the Council of the R.A.I.C. will be held in the rooms of the Ontario Association of Architects, 94 King street west, Toronto, on Tuesday, 17th June, 1913, at 10 o'clock a.m. for the organization of the 1913 General Annual Assembly, and the transaction of any other business that may arise.

* * *

BUILDING OPERATIONS in Regina are surpassing former records. The main buildings being erected are the Grand Trunk hotel, costing \$2,000,000; Sherwood department store, \$1,000,000; McCallum, Hill, ten story structure, facing Victoria square; churches, colleges, and hundreds of residential houses.

* * *

CONSIDERABLE damage is being done to old bits of architecture by the vibrations of the subway. The latest building to be affected is the chapel of the mediæval priory of Saint-Martin-des-Champs—St. Martin of the Fields, Paris. The main chapel has for a century formed the exhibition hall of patent inventions at the end of the Conservatory of Arts and Trades. It is the little old sacristy which has perished at last, its unique vaulted roof falling in because its walls began falling out. In this building the Gothic arch was first employed. It was begun in the year 1060, before the abbey church of Saint-Denis, which was the first great construction to make the Gothic style known.

* * *

RODIN, the famous sculptor, is working on what is considered to be his masterpiece, "The Biplane." It is only symbolical and is described by many who have seen it as of marvelous beauty. The sculpture consists of a tall, slender, unadorned shaft surmounted by what may be described as a lengthened sphere on which twin figures stand side by side, their bodies, which almost touch, curving gracefully backward. Their faces are upturned. Only one foot of each rests on the sphere, which seems to spring from beneath them in the moment of flight, and their wings are only half opened. The two figures, which seem to aid and support each other in flight, symbolize the two wings of the biplane.

* * *

INTEREST is evidenced everywhere over the controversy between the French Government and George Grey Barnard as to the latter's right to remove from France the arches, columns and capitals purchased six years ago. These architectural details belong to the Abbey St. Michel de Cruxa, near Prades, in the Eastern Pyrenees, and were purchased with a removal proviso. Mr. Barnard has repeatedly shipped parts of the old abbey, including some thirty columns and capitals. His idea is to construct an eleventh century cloister in America as a permanent object lesson of mediæval art. The Government is laying its claim by classing the ruins as public monuments, but the general opinion is that such action would be impossible since the sculptor secured a contract of purchase so long ago.

A Plea for a Better System of Estimating the Cost of Buildings*

G. Alexander Wright, Licentiate R.I.B.A.

THE ever-increasing amount of unproductive time, and usually money, which contractors are called upon to expend in preparing, gratuitously, quantities, as well as prices, often for an owner's benefit, suggests that the time has arrived when all concerned should take up, and seriously consider, the possibility of adopting a modern and more sensible system of estimating, such, for example, as has been long in successful operation in older communities. Not a mere copying of such methods, for I advocate the creation of a standardized method of our own—an American system, practical above all things; a system that will be in line with our otherwise progressive building methods; a system that shall be clear and accurate, and that shall stand for square dealing between contractor and owner—in short, a system that shall give every man his due, no more and no less; a progressive system, free from the defects of other systems, such as unnecessary elaboration, and yet one that will reveal to the bidder, at a glance, the actual quantity of material and labor in a structure, in any individual trade. When bidders are invited to submit bids, they are theoretically asked of course to submit competitive prices, but in actual practice their bids are based upon competitive quantities, before the competition in prices commences; which, in my opinion, is as unjust to the contractor as it is ridiculous. A building can only contain a certain amount of material, and no amount of figuring by contractors against each other can make that quantity any more or any less. Where, then, is the sense in a dozen or more general contractors competing against each other in taking quantities? One or more bidders, through being hurried, or being unable to take off the quantities accurately, leaves something out. What happens? Their bids are consequently low, and the owner benefits, at the low bidder's expense, whilst the competent or more careful bidder loses the job, because his quantities are more accurate, or because there may have been room for uncertainty when figuring the plans and specifications.

Not long ago, a general contractor (whom I have known over twenty years) told me that if contractors figured to do competitive work just exactly as plans and specifications called for, a man would not get "one job in fifty." Now, if this is true, and personally I believe it is, there is something very rotten in our methods. In my judgment it lies in our antiquated estimating practices.

Those of us who know something of the unsatis-

factory conditions under which bidders are often obliged to figure, time after time without result, have realized that hundreds of thousands of dollars in time and money are taken from contractors' pockets every year, simply because they do not, so far, limit competition between themselves to the matter of prices. They go on competing, and I suggest gambling, with each other as to the quantity of material a building will take, whereas I contend that that is a question of fact, and that competition in the quantities between contractors never can, and never will, in any way, change the fact that a certain fixed quantity of material and labor is necessary to do every job. There can be no legitimate competition in taking off quantities of materials, except that unfortunate competition which bidders make themselves when they take off too much, or, as too often happens, too little.

The legitimate competition can only come in where one man can handle a job better than another, or one man may have some advantage over another in buying, and so forth. All this kind of competition is legitimate enough, but it must be obvious that no amount of figuring can reduce the real quantity of material which a building will take, and so my contention is that it would be proper and fair to start all bidders figuring upon the same basis, by furnishing each with a schedule, or bill of quantities, showing accurately and clearly the different quantities and kinds of materials which the bidder is invited to figure upon; and even then there would be plenty of competition left, in placing profitable prices against each item.

Our present method (or rather, want of method) in estimating, and the rapid strides being made in construction, are, as I have said, forcing upon the contractor, more and more every year, an increasing waste of time and money in figuring out quantities. This senseless waste and competition cannot go on for ever. It has already brought men to bankruptcy all over the country, and has often prevented the making of a proper and legitimate profit among those who do succeed in keeping their heads above water.

This is a live question, and it deserves the earnest consideration of all contractors' associations and architectural societies from the Atlantic to the Pacific coast.

No new or untried principle is involved. It is simply that of a definite quantity of work, for a definite amount of money. In substance the owner says "I want this quantity of work done. The drawings and specifications show you how this quantity of work is to be assembled or put together: Now, tell me how much money will this cost? I want you to

*An address given before the General Contractors' Association, of San Francisco, April 10th, 1913.

do the quantity of work called for; no more, no less."

At present, the successful bidder often says, in effect, to an owner, "I will erect your building according to plans and specifications," but—mentally—he says, "I do not figure that it will take as much flooring, concrete, plastering, or painting as my competitors think it will!" Let me ask, Is this a proper or fair competition between contractors themselves? Is it fair to their own interests? There is only one individual who stands to gain anything under such imperfect methods, the owner, and not always he.

It may be stated that the Quantity System is equally applicable to engineering works, such as railroad work, sewerage disposal schemes, canals, pumping stations, etc.

Before proceeding to a further consideration of this subject, I may be pardoned perhaps for expressing the opinion, after having had over twenty years' intimate experience with the workings of the Quantity System of estimating, and over another twenty years in San Francisco (without any such system), that I know of nothing in connection with the work of the contractor that would be more beneficial than the adoption of some equitable recognized system of estimating upon bills of quantities, and these latter would be equally valuable, whether sub-contracts were eventually let or not.

It is not the idea that we accept the methods of any particular country—the author hopes he is too much of an American citizen to suggest that—but where contractors in older communities favor a certain system to the exclusion of the very thing we practice here, then I suggest that we might well stop for a moment and take notice of what is being done. For example, in the year 1909 a conference was held in Great Britain between the National Federation of Building Trade Employers, the Institute of Builders and the London Master Builders' Association, and a resolution was adopted recommending contractors who were members of these powerful organizations to decline to bid in competition against each other, unless bills of quantities were supplied for their use at the owner's expense. A deputation from these contractors' organizations afterwards attended before the principal body of architects, who promised to further the aims of the contractors as far as was within their power; and to-day the Quantity System is in full operation, not only in the case of private owners, but in all building work for Government and municipal authorities, and upon the principle that it is impossible to obtain accurate bids without accurate quantities.

There must be some good reason for all this, and I suggest that it is worth consideration by any body of men, architects or contractors, who are endeavoring to get and to do better work, and thus elevate the building business to the honorable position which it is entitled to occupy, and to bring about such conditions as will cause owners to hold the competent architect, as well as the contractor, in higher esteem,

and not regard him, as is too often the case now, with suspicion.

Now let us consider, for a moment, a few of the disadvantages of existing methods:

First—The time usually given for figuring is far too short for the accurate taking off of quantities, in addition to the pricing and figuring out of the many items. A bidder usually has contract work in progress, and other matters to be attended to during the daytime; other plans are to be figured by a certain time, and but little can be accomplished in the eight-hour working day, and so advantage must be taken of the night hours, sometimes all night, and even Sundays (as I happen to know), and any other time. Only those who have worked under these conditions and over blue prints at night, hour after hour, taking off items, can appreciate the many difficulties, pitfalls, and liability to error through figuring against time after the real work of the business day is over. But the plans must be returned first thing in the morning, or the bid must be in by a certain hour the next day. Nothing but hurry—hurry—hurry. In not a few cases more information is necessary; something is not quite clear. The plans and specifications do not agree on some point. Which is right? There is no time to find out, the only person who can enlighten you is asleep, perhaps, while the careful estimator is burning the midnight oil, and wrestling with problems which can be avoided and entirely eliminated under a more modern system of estimating.

Again, the careful bidder who honestly tries to get in all the items, and figures to do the work as called for, is frequently beaten by a less competent bidder, who forgets something, or who, maybe, is willing to take a chance anyway, in order to get the job. True, omissions in lists of materials are sometimes unavoidable, under existing methods, which unfortunately aim at speed rather than accuracy.

It is, to say the least, disappointing to a careful bidder on a large job to find his bid just above the lowest, and after the low man has signed up the contract, it develops that the painting, or some such item, was left out. This, however, could not occur with the Quantity System.

This is no overdrawn picture, as I know from personal experience. The competent bidder who gets in all his items to-day is usually under a disadvantage unless he happens to be figuring against men of his own stamp. Meanwhile it would appear that the chances are in favor of the owner, most of the time, and it seems to be a case of "heads I win, tails you lose." Surely it is time there was a change.

The existence of present conditions, whilst much to be regretted, is due to a blind continuance of early-day custom. It is in no way up to date, nor conducive to progress, nor to that business success to which a bona fide contractor is entitled. It is entirely unsuited to modern construction and modern methods. The tallow candle, years ago, was a great invention, but how many of us would light our homes to-day by this method? And yet our estimating methods

of to-day date from the same identical period as the tallow candle. Other countries have long ago graduated from such primitive methods, but we are content to stand still, and we are, in this respect, away behind the times. It seems to be almost inconceivable that shrewd business men are still willing to spend their time, all going over the same ground, figuring against each other on quantities, knowing all the time that they are all, save one (and sometimes even that one), simply wasting their time. By the adoption of some sensible system, all this quantity taking could be done by one competent person.

The great difference we find in bids arises, in my opinion, not so much in the prices or money values placed against the quantities, as it does from errors in the quantities themselves, the accurate preparation of which calls for special training and continuous concentration of mind, which the busy contractor of to-day can seldom find time to acquire.

Now we will investigate a bill of quantities, such as we are considering. What is it? and how is it used?

First of all, it is a document, handed free of expense to each bidder, lithographed or similarly duplicated, in order that all bidders' copies may be exactly alike. It will contain everything which it is essential for a contractor to know when making up a figure, with a separate section for each trade, such as excavation, concrete, brickwork, and so forth. A general summary is provided at the end of the bill, in which is entered the net cost of each trade; this summary is footed up, the profit the bidder expects to make is added, plus the cost of the quantities, the result being, of course, the amount of the bid.

The methods of measurement must conform to the standards used by each individual trade, and through the bill the greatest care is taken to have everything systematized; all cubic, square and lineal feet, and numbers of items, will be found all together under their respective heads. In this way, immediate reference may be made to any item required, even though the entire bill may contain hundreds of items, and so every item has its proper place—nothing is left to chance. Detail sketches also appear in the margins whenever necessary, to show a bidder at a glance what is required. These, as we know, are of more value to an estimator than the long written descriptions one sometimes finds in specifications. The keynote of the Quantity Surveyor is accuracy. In going through the drawings and specifications he has come across all those doubtful questions which always crop up when figuring under present methods. He will have taken them all up with the architect, and adjusted them, before the quantities are handed to bidders, so that everything is all plain sailing.

Nothing is "near enough" for a Quantity Surveyor—he scrutinizes every part of the work closely, clears up any doubts, or anything capable of a double interpretation, and his work leaves no loopholes for either the owner, the contractor or the architect to take advantage of. The result is that it is seldom

necessary for a bidder to ask questions of the architect when making up a figure. If he should wish to do so probably he would be referred to the surveyor, who is familiar with every minute detail of the work.

Further, and right here, lies one of the greatest advantages of the Quantity System. It is not necessary, except in a general way, for a bidder to study the drawings and specifications at all, and he certainly does not have to figure them. He simply prices the bill of quantities, and, in these days of hurry and bustle, this is as much as a contractor can be expected to do for nothing. This enables the competent contractor (the one who has unit prices at his finger ends) to make up a bid for, say a \$100,000 building, in a few hours, and he has the satisfaction of knowing, when the unit price is placed against each item, that nothing has been forgotten; in other words, he only contracts to furnish so much material and labor—and surely this is absolutely right in principle. Good reasons exist why the general contractor should have faith in his own judgment and accustom himself to price items in every trade which goes to make up the building business. It is the only consistent method of estimating, for anyone who claims to be a general contractor. Experience has taught most competent men that it pays to do it. The mere getting together of figures from sub-bidders, and footing up the totals of the lowest, is not estimating at all. That is mere schoolboy work. However, I am led to believe that this is now the exception among general contractors in San Francisco rather than the rule. The ideal contractor is the one who makes up his own estimates, and not he who is dependent, for any reason, upon sub-contractors, who thus become the real estimators. If every general contractor would keep a prime-cost book of all trades, and quantities were supplied to him, he would soon be in a position to give a fairly close figure upon any sized structure, without first taking sub-bids, and this I suggest is the most consistent, satisfactory, and profitable method to pursue, when bidding upon work as a whole; but of course it requires care and experience.

Further, one of the greatest arguments in favor of letting contracts as a whole is, of course, the fact that a general contractor has the ability to figure all trades in his own office, and that he knows how to, and will supervise the work of sub-contractors, if any. If architects can be assured of this being done, it would be better for all concerned.

In general practice I believe the accuracy of the bill of quantities should be guaranteed. Such a document might well be made the basis of the contract, equally with the drawings and specifications; if this were done, the chief cause of disputes between owner and contractor would be removed.

This, I submit, is entirely logical and right—a certain quantity of work for a certain sum of money, the owner to determine the former and the contractor to fix the latter. Surely this is morally just and fair.

It may be asked, Where are these competent sur-

veyors to be found? And it would be a natural inquiry, as it is no part of the duty of architects to prepare such quantities. In fact, the relation of the architect to the contractor should preclude him from having anything to do with furnishing quantities. This should be attended to by a disinterested specialist—the quantity surveyor. In older countries, young men of education are now apprenticed to practising surveyors, and it has become a recognized profession. Years ago these quantity surveyors frequently came from the ranks of the architects; others possessing the necessary education were possibly contractors, building superintendents or estimators. I have known contractors' representatives who commenced life in the workshop, who, after securing the advantages of special training, made experienced and very competent quantity surveyors. There must be a beginning to everything, and doubtless there are many men in this country who, after some little training in the technique of this work, should make reliable quantity surveyors. The principal qualifications are honesty of purpose and a knowledge of architecture and construction. The surveyor should be a neat draftsman and have actual experience in conducting building operations. He should possess the ability to readily detect discrepancies or conditions which might give rise to misunderstandings during construction, and last but not least, the necessary mentality to act disinterestedly. He must do what is right in measuring, as between the contractor and the owner. The usual custom is for the architect to furnish the quantity surveyor with a set of the drawings and a draft specification, and the latter then commences work in his own offices. During this period the architect and surveyor are in frequent consultation, to the end that all uncertainties are cleared up and adjusted upon the drawings and specifications. In short, no effort is spared to obtain perfect clearness and accuracy before bidders commence figuring.

Such uncertainties are bound to crop up; they are unavoidable. They nevertheless perplex the contractor when he is figuring, and his foreman on the job, and create unnecessary trouble and sometimes bitter disputes; and then, in such cases, one of the parties to the contract is usually a loser.

Now that we have briefly considered the qualifications of a quantity surveyor, let us take note of what the preparation of a bill of quantities involves. It may well be said that during the last forty years it has been brought to a mathematical science, and yet it is really surprising what a vague idea exists concerning the methods, objects and uses of the Quantity System. The fact remains, however, that, where the system has been adopted, responsible contractors refuse to figure without it. Some day that will be the attitude of contractors in this country—when they fully realize the folly of wasting their time and money in competing against each other on quantities as well as on prices.

But to return: Three distinct processes are involved, and each calls for different operations.

First—"Taking off" and entering every item (or "dimension," as it is called) upon the dimension sheets. This is always done in exactly the same order, in every building; no dimension, however small, is omitted—no guess-work of any kind is permitted. The exact location in the building of every dimension taken is carefully noted, and every figure or note taken is preserved for future reference.

It is impossible to illustrate here the work in detail involved in taking off each trade, but the following may serve to show the general idea: Let us follow a surveyor for a moment in taking off his dimensions for a few items of—we will say common brick work. He always commences taking dimensions at the same point on each floor plan; every length of wall from one angle to the next is measured separately and the dimensions entered in "waste," as it is termed. We will assume that it takes say fourteen dimensions to go clear around a building—these fourteen dimensions and their locations are permanently recorded, footed up, and the total lineal feet is then placed immediately below this, and a line drawn across the column to separate it from the next item. The dimension is squared, i.e., the number of square feet these figures represent is figured out, and opposite to the total we find a description, thus, for example: 21-inch wall of standard common brick work laid up with lime, mortar and Portland cement, gauged three to one, pointed with flat joints one side for whitewash and raked out the other side for cementing.

In good practice it might be best to give the number of square feet superficial of wall, and give the thickness. The same method is adopted with each story, with its varying thicknesses of walls, every dimension being entered in precisely the same order, with its particular location noted.

Then we come to deduction of openings. Those with inside and outside reveals (as in the case of box-frame windows) are taken separately, door openings the same. Those of one size and one thickness of wall are "timesed," as we say, and entered in the dimension column, so: "Ddt. 9/3 feet 9 inches x 7 feet 13 inches outside wall, fifth floor."

Then should follow an item, "extra labor," to so many 8-inch common brick segment arches in say three half-brick rowlocks to 4-foot 6-inch openings with 3-inch rise in 8-inch wall, include for cutting skewbacks, etc., and for wood-turning piece and setting and striking. In case richer mortar was specified for arches, it would be so stated, and the proportions.

When rough cutting to brick work is required, every square foot of it would be measured. Brick work in footings or foundations, or walls below ground or at unusual heights, should be all segregated and given separately, with full descriptions.

Such items as the following are then taken by the square yard or square foot—viz., selected common

brick facing. If joints are struck and cut (as face work), it is taken as a separate item, as should be the case with any portions that are to be pointed with special or colored mortar. Cementing by the square yard if on ordinary plain surfaces, but if in widths of 12 inches or under, then this is separated and taken by lineal foot; should this work occur on circular surfaces, it would be so described, kept separate, and the radius given. Lineal dimensions are taken of all rough splays and chamfers, flues, pointing to flashings, projecting courses, with the number of mitres, splays, or stops in same; brick sills, with the returns, are numbered, if any. The labor of forming quoins, square or splayed, and (in certain cases) the lineal feet of plumbing angles and reveals, might be taken, also leveling up for joists, bond iron and the like.

The foregoing applies to common brick work, as before stated. Now, where "face" brick are used, the entire surface of such facing is measured by the square foot, including reveals and soffits (but openings deducted), the kind of mortar and the labor of pointing being given. Here would be taken such items as face arches. Fair cutting by the square foot on same principle as mentioned for common brick work. Then come lineal feet of each course, of which figured sketches should appear. Raking mouldings or belts separate; then follow the number of external, internal, raking, skew or other mitres; also square ends, etc. (if any). All other lineal feet items follow in their proper order, and then in a similar way, concluding with numbered items, which would be described and (if necessary) sketched in the margin. I am aware that this is but a very elementary illustration of the detailed method of taking off, but the principle applies throughout every department, in every trade, from the excavator to the painter, but it would be too great an undertaking to go fully into details here in each case.

Surveyors' quantities are usually measured net, and it is so stated in the preamble of the bill—upon the understanding that the unit price for each item is to be made, by the contractor, to cover trade customs, etc., which differ in each locality.

The before-mentioned dimension sheets are usually checked over with the drawings by a second person, and then all totals are abstracted; that is to say, they are transferred to abstract sheets, under separate headings. In this way many similar items of the same value are collected together and footed up and checked. This reduces the number of items which appear eventually in the finished bill, which is written direct from those abstract sheets, and any further sketches or descriptions necessary for the bidder to thoroughly understand what is required are then finally added. When completed, a sufficient number of copies of these bills are lithographed, or otherwise duplicated, and a copy is sent by the surveyor to the list of prospective bidders, whose names and addresses have been previously furnished him by the architect.

Some of the advantages of the Quantity System of estimating to the contractor are as follows: (1) Saving of time and money; (2) Greater precision in measuring; (3) No uncertainty as to interpretation of plans or specifications (the quantities should govern); (4) No visits to the architect's office when figuring, for explanations or otherwise; (5) No other work is contracted for except the quantity set forth in the quantities; (6) The contractor, if he so desires, can check up the quantities before signing a contract,—in an American system of estimating, the quantities should, I think, form part of the contract; (7) No bidder can inadvertently leave out anything, and so in this way arrive at too low a figure; (8) Not having to spend time taking out his quantities, the contractor has time to attend to more profitable business; (9) Systematically arranged bills of quantities duly priced (whether work has been secured or not) form excellent data for making future estimates.

Before an American system can be put into operation it will be necessary:

First—That a committee of representative contractors be selected to standardize a method of measurement to be universally followed by all contractors and architects.

Second—That competent men, mutually satisfactory to contractors and architects, be retained in such numbers as the volume of work may demand. These men, or quantity surveyors, could be placed under bond, covering their competency and integrity until they have been proved and assured; such appointments to be permanent, except for good cause; the compensation of these surveyors to be fixed at a certain percentage upon the total of each estimate; each bidder, of course, adding this amount to his bid.

Third—I suggest, also, that a law be passed requiring that a bill of quantities be furnished (free of expense to bidders) upon all State and other public buildings. I advocated this as far back as the year 1893, and it may interest you to know that such a law is actually in effect in the State of Pennsylvania, and has been since 1895. It does not, however, go quite far enough, as the quantities furnished have no guarantee as to their accuracy. Quantity question is attracting much attention at the present moment among contractors in Boston, New York and other cities, and I may mention, perhaps, that a programme is now being formulated to bring this Quantity System to the attention of every building contractors' association and every architects' society in this country.

Fourth—In connection with the Quantity System I still advocate (as I did in a brochure on arbitration which I published in 1894) the creation of a technical tribunal, or court of arbitration, where nothing but building suits and disputes shall be determined and adjusted. (See also the *American Architect*, April 13, 1901.) Such court is to be presided over by a specially selected judge and at least two other persons of practical experience in the actual construction of buildings, and in estimating the value of build-

ers' work, and familiar with building trade methods, terms, processes and customs. I maintain that such technical matters as building construction, values, etc., should not be decided solely by technical law, nor by laymen alone, however skilled in other ways, notwithstanding the custom of calling expert witnesses before them. I consider that it would be an advantage to disputants if a majority on the bench had a first-hand practical knowledge of building construction and methods, such as I have indicated, where technical disputes might be determined in a few days, once and for all, and without delays, which only tire the contractor out and thereby force him to accept a settlement more or less unjust, from a practical standpoint.

I am hoping to shortly see a committee appointed in every building employers' organization in this country, to take up and seriously consider such matters as I have touched upon this evening. Nothing, in my judgment, will tend to elevate the building business and to promote a feeling of mutual confidence and respect between the architect, the contractor and the owner more than the Quantity System of estimating, which, as I think I have shown, aims at absolutely square dealing between the man who pays for the structure and the man who builds it.

In conclusion, during a recent trip East and to Europe, it was my privilege, through your courteous secretary, to be kept in touch with your activity and the progress recently being made by this organization. I wish to extend to your president, directors and members my sincere congratulations upon the progressive methods you have so far adopted, and to tender you my best wishes for continued success.

I would like to add, as President Wilson is reported to have put it recently, that "nothing is done to-day as it was done twenty years ago." That is the essential fact. I read somewhere the other day that this age we are living in to-day is a new age, an age in which everybody all over the world is doing new things, with interesting, important, wonderful new devices, new methods, new machines to make new products; new proofs of the power of the human mind to conceive and to control, and the human hand to construct instruments with which to conquer the forces of nature and bring them to the service of humanity—these are the characteristics of the age we live in. Never have the creative forces of mankind moved so fast as in the lifetime of us who are now on earth. Never before have there been so many people in the world eager to know what the world is doing and how it is doing it.

* * *

On April 10th, Mr. G. Alexander Wright, architect, addressed the Association on the very interesting subject of "Quantity Estimating."

The large attendance present at the meeting testified to the interest taken in the subject, and while for many reasons it may not be practical or possible to get this plan of estimating work adopted in the archi-

tecs' offices, it is, nevertheless, a subject upon which the contractors should be fully informed, and it is worthy of note that a large number of the big contractors in this city to-day are employing estimators to assist them in figuring their work.

Mr. Wright, in his address, did not recommend a mere copying of the methods in use in England, but rather suggested an American system which would be practical for local conditions.

At the close of the address numerous intelligent questions were asked Mr. Wright, and a number of those present seemed to favor the system, having worked under it in other countries.

The objection is made that the owners could probably not be induced to pay the fee for a quantity survey on their job before it is put out for figures. Then, too, it is thought by some that the architect, with quantities of the work in front of him, might be tempted to go still further into the contracting business than some of them have already seen fit to do, and that the information might, therefore, be used to the disadvantage of the contractors. Of course, conditions vary in different localities, and while there may be some architects here who would take advantage of obtaining information as to the quantities of work and material in their buildings, there would probably not be many of such, and, in any event, it is finally the question of cost which must settle the awarding of a contract; and it is a well known fact that some contractors are able to obtain slightly better prices than others for their materials, and, again, others are able to construct buildings at a less cost than others, owing to their more efficient management.

One thing is certain—if all architects thought and dealt squarely and honestly the adoption of the system would undoubtedly be of advantage to all the contractors.

It may be well to state that this system of estimating is now under consideration by other organizations of builders in other parts of the country, and there seems to be a general tendency among up-to-date contractors throughout the country to adopt a more careful and accurate system of estimating the cost of a contract. The old days when a contractor practically cubed up a building and put in his bill, trusting to good fortune to make a profit on the work, have gone by. More money is spent for plumbing fixtures, wiring, etc., to-day than was ever thought of twenty years ago, and the man who roughly estimates the cost of a building at this time gets a job only when he has made a mistake.

The system is no experiment, and is being followed, and has been followed, for years past in several countries of the world, and the Association owes a vote of thanks for the intelligent and courteous manner in which Mr. Wright placed the subject before the stockholders. However, he, himself, states that it is impossible to attempt to give a thorough understanding of the question in one lecture.—*General Contractors' Association Review.*

Strength Test of Reinforced Brickwork

THE FOLLOWING tests of reinforced brickwork were made recently at Winnipeg before a representative body of architects and builders. For some time a practical method of reinforcing brick has held the attention of burnt clay experts and it has fallen to W. H. Brown, architect, of York, England, to furnish a thorough and simple means for producing the desired result.

The test was made to determine the carrying capacity of a reinforced beam resting on two end supports and of a cantilever beam.

In construction the test consisted of a hollow reinforced brick beam, 2 ft. 11 in. deep and 8 in. wide, supported on two brick piers so as to form a simple beam of 9 ft. 8½ in. clear span between piers, and a cantilever beam of 4 ft. 6 in. clear overhang. The beam was built with its length running approximately in an easterly and westerly direction with the cantilever at the east end, and consisted of two separate walls with 1½ in. air space between. The south wall was 4 in. thick and built of twelve courses of brick, laid flat, with vertical joints staggered. Wire mesh reinforcement was laid in the mortar of each course, and also below the lower courses of bricks. The north wall was 2½ in. thick and was built of eight courses of brick, laid on edge, with vertical joints staggered. The reinforcement was laid similar to that in the south wall.

The brickwork of the beam extended in to the

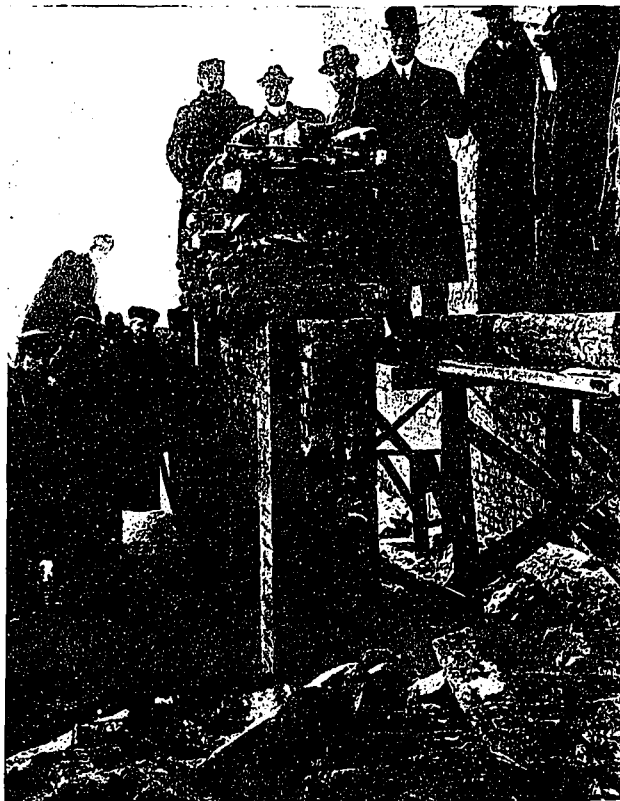
brick piers so that every other course had half of the brick in the pier and half in the beam itself, while the other course had a vertical mortar joint where the beam connected with the pier. The reinforcement was continuous over the piers, while the two walls were tied together at intervals by the reinforcement. The piers were built on a concrete foundation, which was laid directly on frozen ground, no special foundation being prepared.

All bricks used in the wall were of ordinary white clay purchased from a local manufacturer. A test of six samples of these bricks was made, and results are shown in Table A.

Table A.

Specimen No.	Method of testing.	Area, crush surface.	Loads at first crack.		Crushing loads.	
			Total load.	Load per sq. inch.	Total load.	Load per sq. inch.
			Lbs.	Lbs.	Lbs.	Lbs.
1	On edge	21.8	20,000	917	55,400	2,520
2	On edge	19.9	37,000	1,860	77,800	3,910
3	On edge	20.4	37,000	1,815	74,000	3,620
4	Flat. . .	31.0	35,000	1,130	155,000	5,000
5	Flat. . .	32.9	50,000	1,520	100,000	3,040
6	Flat. . .	32.9	50,000	1,520	106,000	3,220

Note—All crushing surfaces were coated with plaster of paris to insure an even bearing surface. Specimen No. 1 showed hair cracks before testing.



LOAD 10,504 LBS.

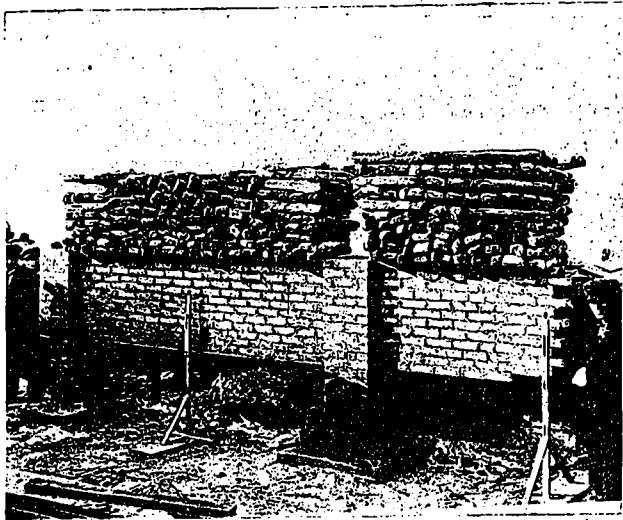


BRICKS CRUSHED BEFORE REINFORCEMENT GAVE WAY.

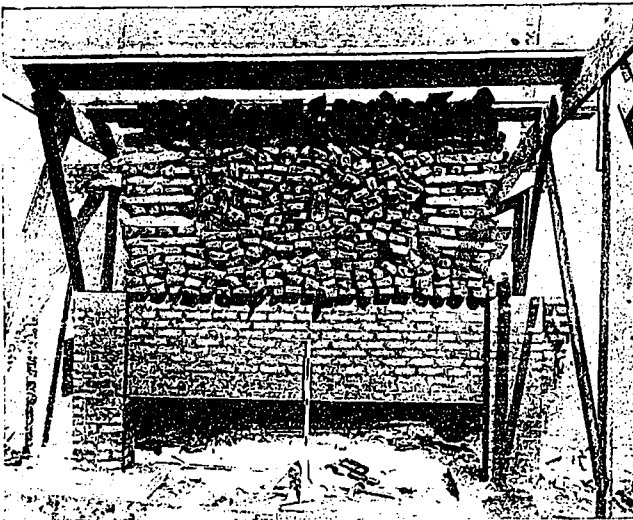
The concrete consisted of one part Portland cement to three parts of very fine sand. The reinforcing used was a special wire woven mesh steel

diagonal wiring of No. 19 gauge, meshed so that a transverse section cuts the four longitudinal strands and three diagonal strands. The width of this fabric is about two and one-half inches.

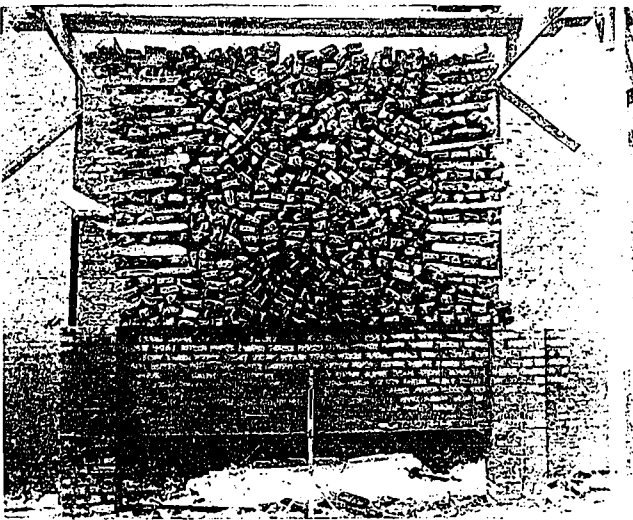
During the construction of piers and beams the space was housed in with ordinary board sheathing and fire was kept going the whole time of the construction until within two or three days of the date of the test. The outside temperatures from date of construction to date of test are given in Table B.



LOAD 12,512 LBS. TO THE LEFT AND 6,740 TO THE RIGHT.



LOAD 27,747 LBS.



LOAD 39,282 LBS.

fabric, of high elastic limit, consisting of four longitudinal strands, No. 17 gauge, held in place by

Table B.—Maximum and Minimum Temperatures, January 20th to February 21st, 1913.

Date.	Maximum.	Minimum.
Jan. 20	—21.9°F.	—28.3°F.
21	—16.0	—25.7
22	6.1	— 8.0
23	—12.5	—21.1
24	— 5.8	—21.2
25	14.9	— 2.7
26	5.6	—12.9
27	4.2	— 6.2
28	13.2	— 5.1
29	17.2	12.6
30	9.6	— 7.9
31	— 9.7	—25.5
Feb. 1	5.2	—21.4
2	2.6	—12.1
3	— 9.3	—23.5
4	—11.8	—25.5
5	— 4.8	—22.6
6	— 3.5	—12.3
7	21.9	— 2.7
8	5.9	— 9.9
9	— 1.8	—20.0
10	11.9	— 4.9
11	— 9.7	—16.8
12	13.8	—24.3
13	23.3	3.1
14	26.7	— 3.1
15	10.8	—10.2
16	13.6	2.9
17	24.8	10.0
18	28.3	21.5
19	13.2	5.4
20	10.9	— 4.4
21	11.4	—18.3

Precaution was given, however, to exclude frost from the building, but it would appear that there was a slight degree of frost on the lower course of the cantilever at the end of the overhang.

The test was made by piling pig iron on top of the beam and cantilever, care being taken to spread the bottom courses of pigs so as to prevent, as far as possible, any arching effect. The test started at 1 p.m. February 20th, and the main beam and cantilever beam were loaded alternately until the main span carried a load of 12,502 pounds, and the cantilever span carried a load of 3,091 pounds. The cantilever beam was then loaded to destruction before placing any further loads on the main span. No hair cracks developed in the cantilever arm until a load of 8,882 lbs. was reached, at which time a hair crack developed at the top where the cantilever arm joined the pier. The loading and deflection observed are noted in Table C.

Table C.

No. of loading.	Time.	Main span.		Cantilever span.	
		Total loading.	Observed deflection.	Total loading.	Observed deflection.
		Lbs.	In.	Lbs.	In.
1	Feb. 20th, 1.00 p.m.	1,029	0.		
2		2,030	0.		
3				1,043	0.
4		3,074	.02		
5		4,096	.02		
6				2,072	.01
7		5,122	.02		
8		6,196	.02		
9	2.00 p.m.			3,091	.01
10	2.45 p.m.	7,216	.02		
11		8,259	.02		
12		9,312	.02		
13		10,388	.02		
14		11,436	.02		
15		12,502	.03		
16			.03	4,126	.01
17			.03	5,138	.01
18			.03	6,166	.01
19			.03	6,740	c.01
20	3.35 p.m.		.02	7,247	.11
21			.02	7,807	.11
22			.02	8,312	.11
23			.02	8,882	d.14
24			.03	9,415	.22
25				9,946	.27
26			.04	10,506	e.37
27		13,057	.04		
28		14,115	.04		
29		15,154	.04		
30		16,203			
31		17,282	.04		
32		18,292	.05		
33		19,362	.06		
34		20,433	.07		
35		21,456	a.07		
36		22,497	.07		
37		23,527	.07		
38		24,551	.08		
39	5.00 p.m.	25,605	.09		
		Interval 30 in.			
40	5.30 p.m.	26,682			
41	5.45 p.m.	27,746	b.13		
42	Feb. 21st, 10.00 a.m.	28,811			
43		29,870			
44		30,903			
45		31,930			
46		33,002			
47		34,039			
48		35,131			
49		36,178			
50		37,198			
51		38,232			
52	12.30 p.m.	39,282			
53	4.30 p.m.	40,363			
54	5.00 p.m.	41,129f			

a—Hair cracks started at middle and sides of bottom of beam. Cracks at middle of south wall, extending six courses from bottom.

b—Last load February 20th. February 21st, 9 a.m., deflection before any loading. Three distinct cracks at middle, also crack at lower ends extending diagonally to the middle of span at the top.

c—No hair cracks.

d—Slight hair cracks.

e—Cantilever failed by shearing near support.

f—Loading fell to the north, caused by deflection and partial failure of north wall, thus throwing whole structure piers and all towards the south.

During the loading of the cantilever arm to destruction, a slight crack was noticed at the junction of the main beam and the east pier, due to the deflection of the cantilever arm. This closed up after the failure of the cantilever and did not seem to affect the main beam. After the failure of the cantilever, loading was continued on the main span until 5.45 p.m. February 20th, the total load on the beam then being 27,746 lbs., which load was left on over night. Owing to the deflection of the beam the horizontal mortar joints of the piers opened up at their outer edges, on the same horizontal plane as the bottom of the beam.

Loading was resumed at 10 a.m., February 21st, and continued until 12.30 p.m., the total weight on the beam then being 39,282 lbs., which load was then left on the beam until 4.30 p.m. When the total load reached 41,129 lbs. the structure failed due to the north wall 2½ in. thick giving way and allowing the load to fall towards the north, thus throwing the whole structure (beam and piers) towards the south, the piers themselves separating from the foundation. The north wall, which was only 2½ in. thick, probably failed by diagonal tension, a distinct crack having been noticed extending from the ends of the beam near the bottom to the top of the beam near the centre. The loading and the observed deflections are shown in Table C.

E. Brydone Jack, C.E., Professor of Civil Engineering at the University of Manitoba, in summarizing, said that the results of this test showed a remarkable increase in the strength of the brick walls, due to the use of the reinforcement, and very clearly illustrated its value for building operations, where brickwork had to act as a beam to carry loads.

* * *

The advantage in reinforcing a building similar to the above method lies in the fact that the thickness of the walls can be reduced one-third. Take a wall, for example, thirteen inches thick—fifty by one hundred feet—this would mean 105,000 brick. By means of the reinforcement the wall could consist of an outer course of four inches and an inner one of three inches with a cavity between. This makes a difference of 35,000 brick and will reduce the cost twenty per cent. In addition to the amount saved the hollow wall is more conducive to atmospheric changes in winter and summer, possesses more strength and lessens the weight on the foundations. The following reasons have been cited in favor of this method: Saving in foundation, saving in maintenance, saving in depreciation, saving in interest, increased life, freedom from condensation and freedom from noise, increased beauty of appearance. Similar tests have been held in different countries, resulting in a revision of by-laws, permitting of the use of reinforcing by means of special wire-woven mesh steel fabric. It is impossible to predict the outcome of this new method, but it is certain to produce the desired results and give to brickwork the enduring qualities necessary under all conditions.

A NEW FACTORY, costing in the neighborhood of a quarter of a million dollars, and employing upwards of a hundred men, is projected by the Metal Shingle and Siding Co. of Saskatoon. At the present time, temporary buildings are now under way for the company, and these will be replaced soon by the large brick and steel permanent structure.

* * *

THE BULLETIN of the British Chamber of Commerce for Italy states that on the occasion of the thirteenth Congress of Italian Engineers and Architects, which will take place at Messina in the autumn of 1913, there will be organized in that city a building exhibition with the object of illustrating the best technical, artistic, and hygienic arrangements, decorating and building materials, etc., suitable for the reconstruction of the destroyed city.

* * *

A. T. ENLOW has resigned as manager of sales of the Stark Rolling Mill Co., to become associated as partner with the Pedlar People, Oshawa, Ont., Canada. Mr. Enlow has had an active time in the sheet trade of the United States, starting twenty years ago and having been closely connected with the various companies ever since. While sales manager of the Stark Rolling Mill Co., he devoted considerable time to the exploiting of Toncan metal, the wonderful anti-corrosive, rust-resisting sheet metal product, in the Canadian field, and through the Pedlar People made it almost as well known here as in the States.

* * *

THE "Country Life" Book of Cottages, costing from \$750 to \$3,000, by Lawrence Weaver, is a treatise on cottage building setting forth some of the conditions imposed by varying limits of cost. The work abounds in illustrations of actual buildings, showing how different architects have succeeded in providing convenient and successful cottages at a reasonable cost. The chapters treat of cottages for laborers, cheapest types of rural homes, cottages for estate servants, cottages for \$2,000, \$2,500 and \$3,000, gate lodges, the repairing of old cottages, the grouping of cottages, and village planning. The book is published by Country Life, Limited, 20 Tavistock street, Covent Garden, W. C., London. Price, \$1.25.

* * *

THE TEST of reinforced brickwork given in this number is the outcome of an experiment by W. H. Brown of York, England. Mr. Brown started to manufacture in England, Australia and India. In Canada the patent was turned over to the Reinforced Brickwork Company, Limited, who are manufacturing at Walkerville, with their head office in Winnipeg. It did not take Mr. Brown a long time to have the matter introduced, and the result is that to-day

over 40,000 buildings are using "H.B." reinforcement, in less than two years after the same was placed on the market. A similar test was held recently at Vancouver. The cantilever part of the test stood up until 8,200 pounds had been loaded on, at which weight it broke. The span of the brickwork was loaded on Monday afternoon with a weight of 20,153, at which time darkness came on and the test was postponed until next morning. Pig iron to the amount of 26,734 was loaded on and the wall still held up. The supply of iron having been exhausted, the wall was then hammered down by means of a plank. The deflection of the span under this great weight was one-half an inch. The firm which arranged the test was the Dominion Equipment and Supply Company.

* * *

BECAUSE of a recent notice of the removal of the New York offices of the Yale & Towne Manufacturing Company from 9 Murray street to 9 East Fortieth street, New York city, there seems to have been some confusion in the minds of Canadians that this might have reference to some change in the Canadian offices of Canadian Yale & Towne, Ltd., at St. Catharines, Ont. This is not so. The Yale offices at St. Catharines are the headquarters for all Yale locks and hardware sold in Canada, and all Canadian mail should be sent to this address. The makers of Yale locks and hardware take great pride in the fact that Yale products sold in Canada are now both made in Canada and distributed through a Canadian organization. The Yale plant at St. Catharines is growing so fast that it bids fair some day to rival in size the parent Yale works at Stamford, Connecticut.

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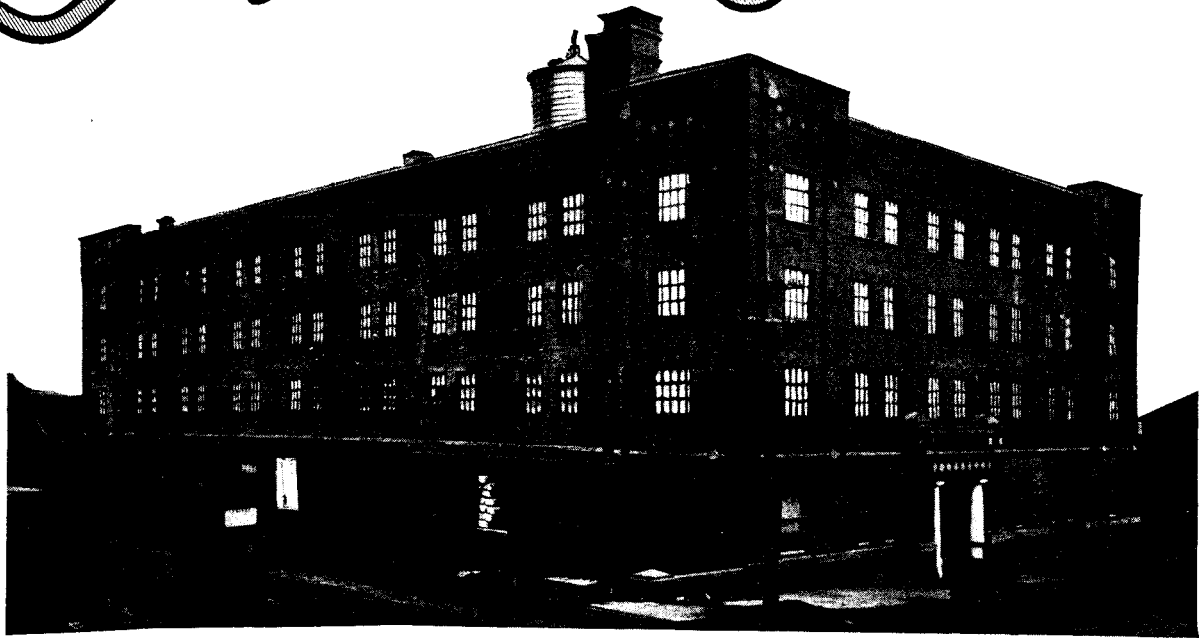
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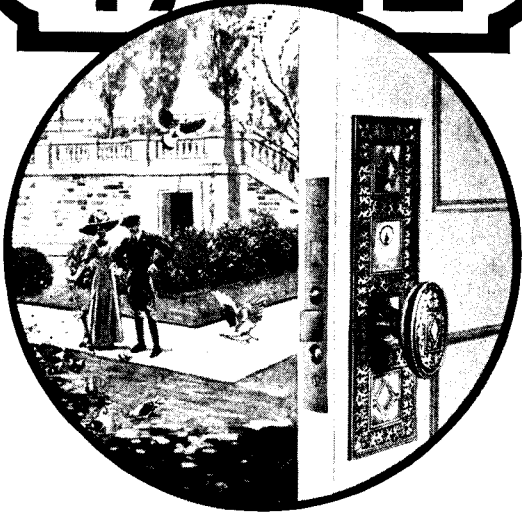
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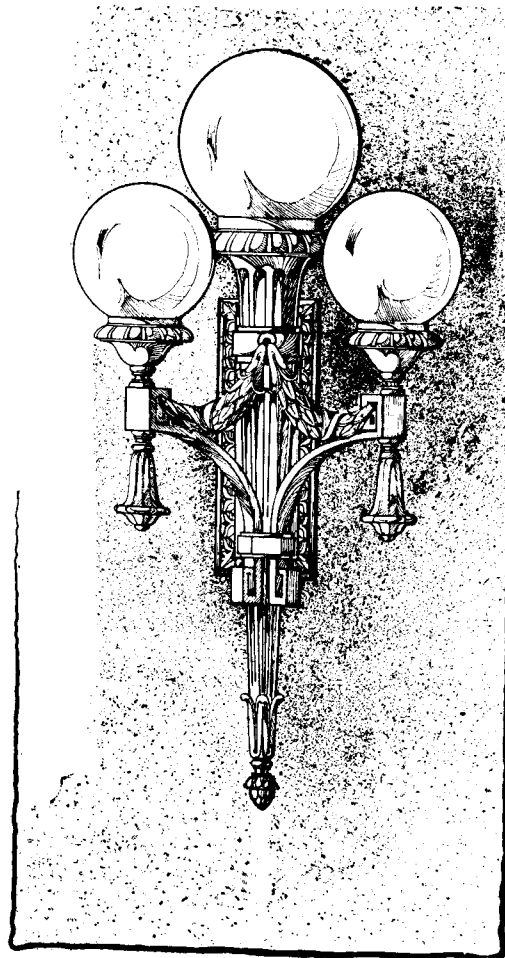
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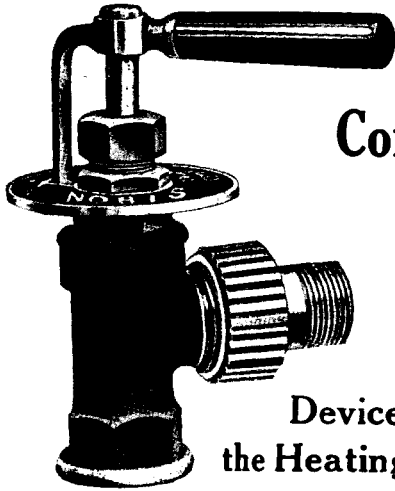
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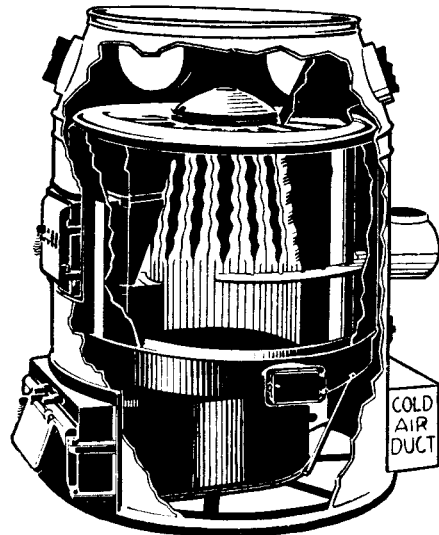
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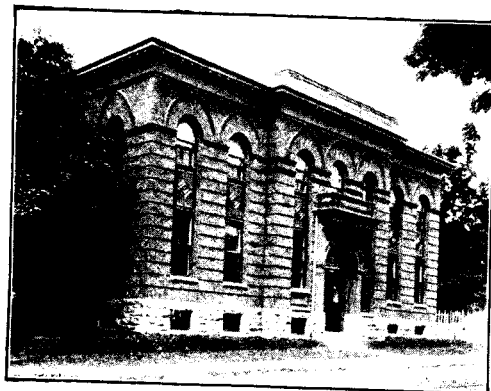
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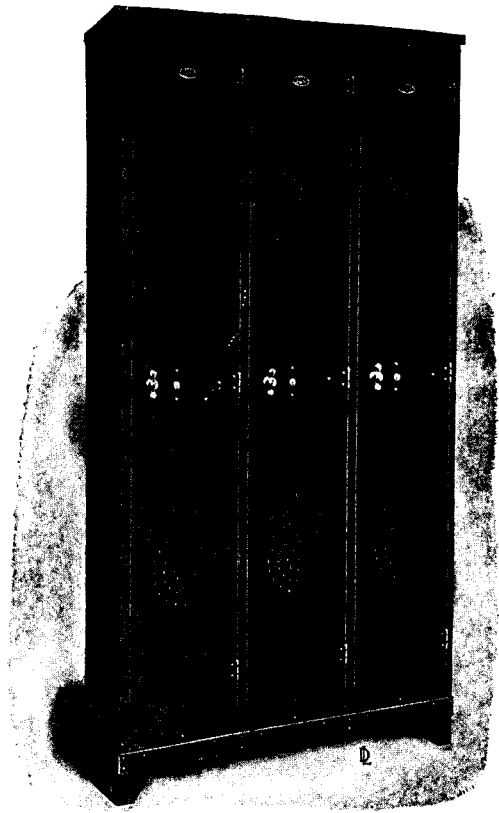
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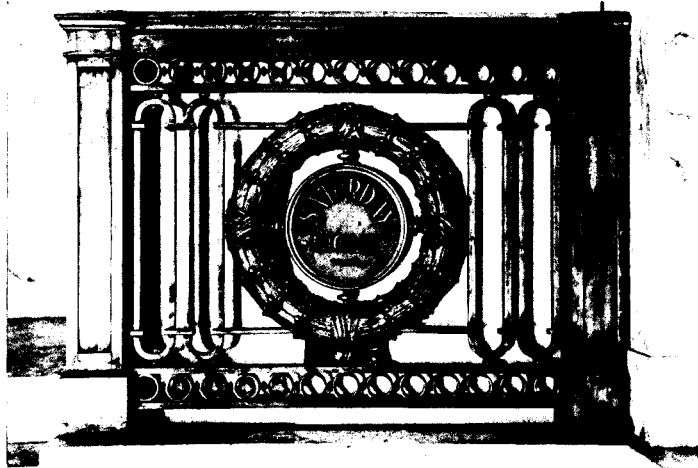


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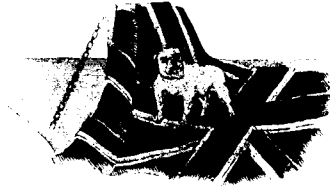
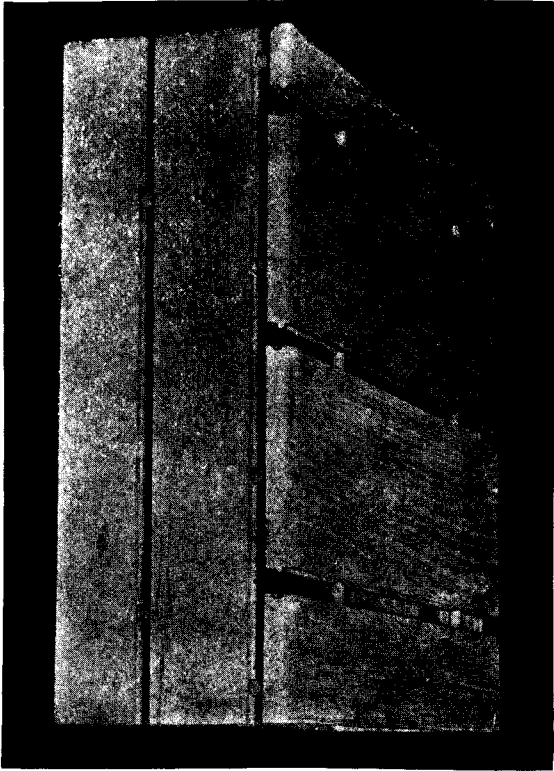
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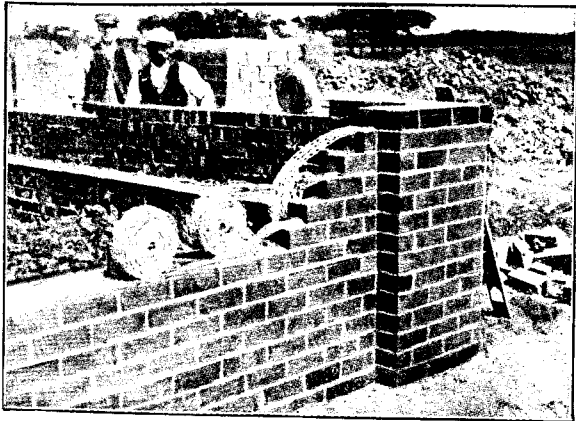


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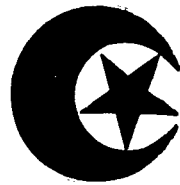
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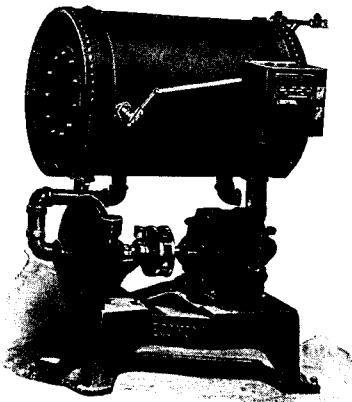
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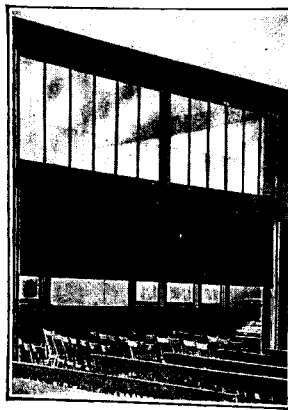
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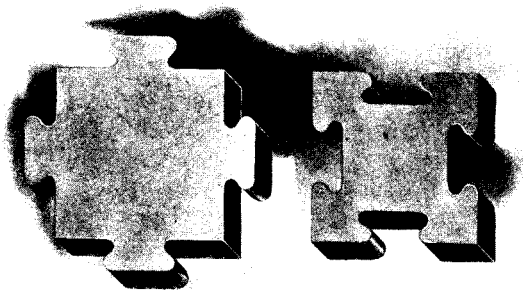
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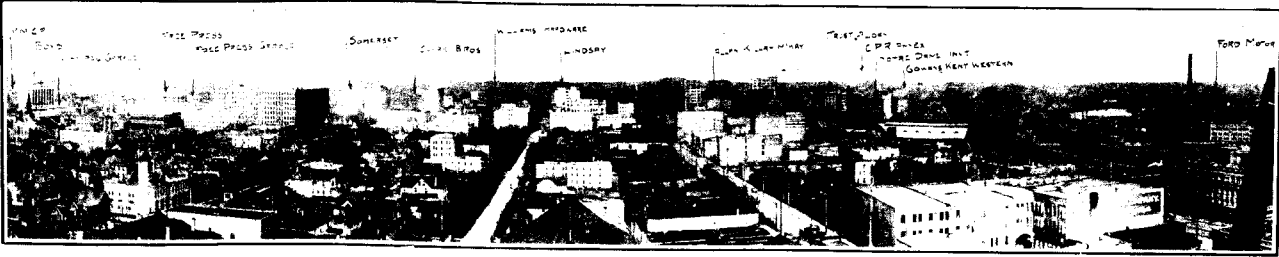
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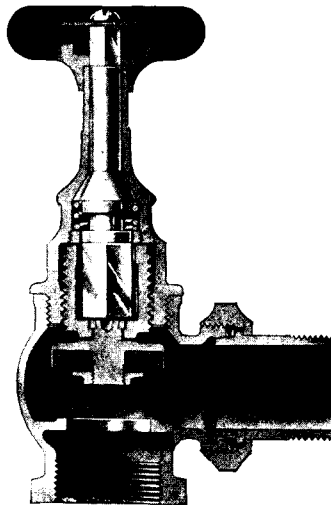
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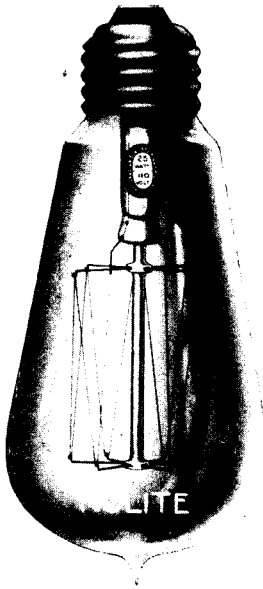
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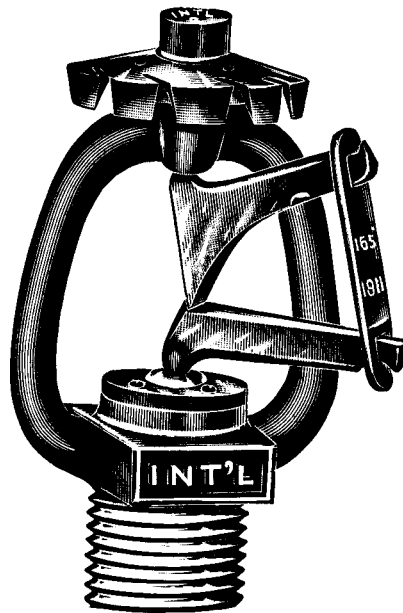
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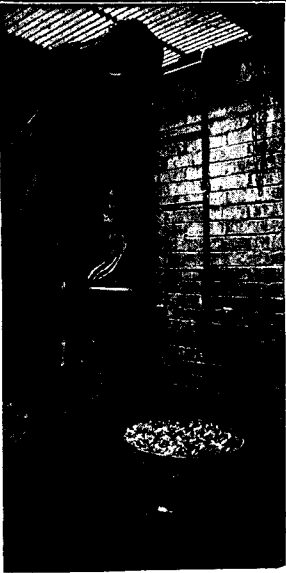
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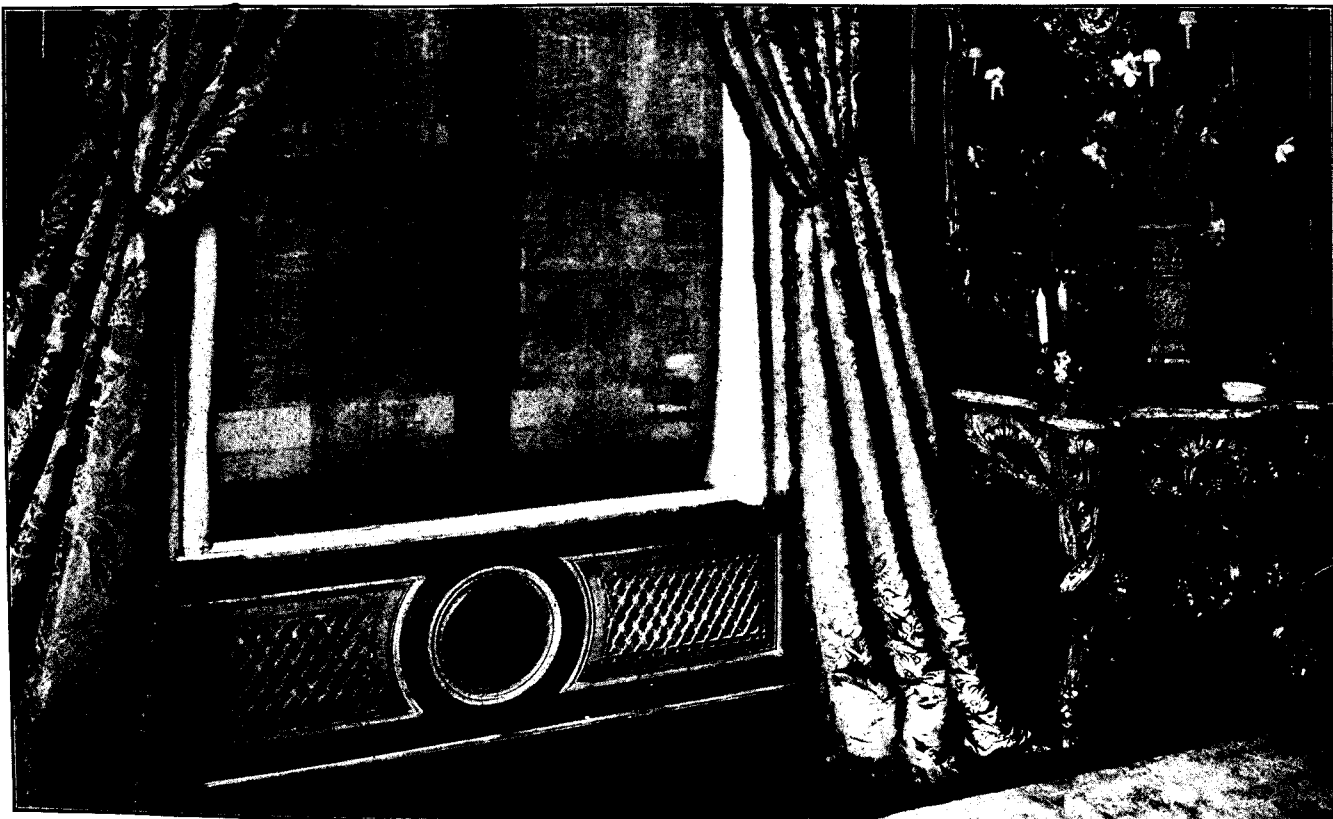
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