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CONSTRUCTION

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



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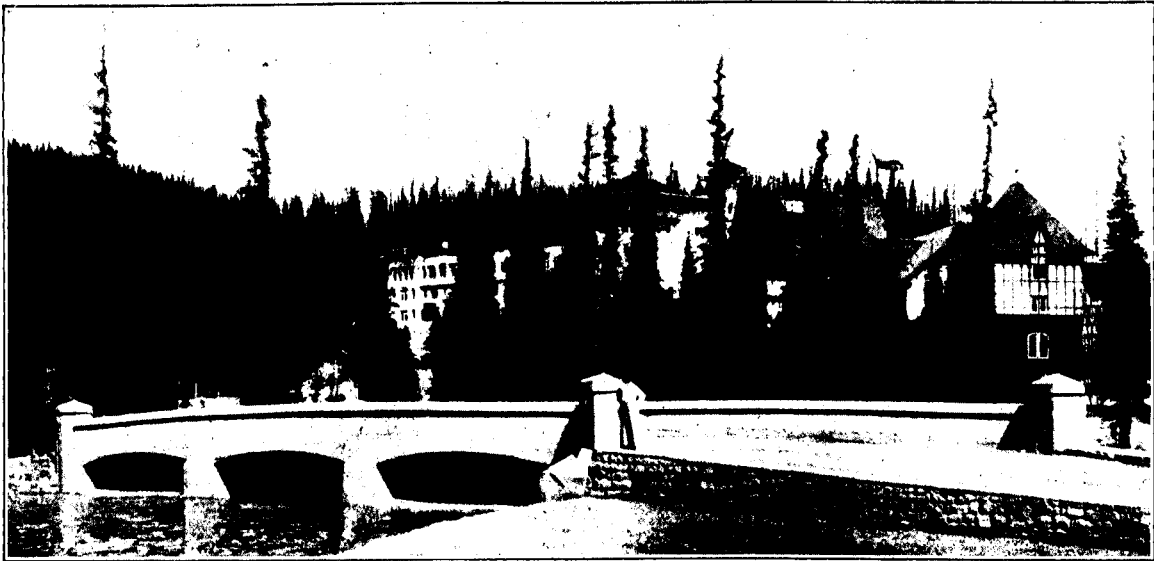
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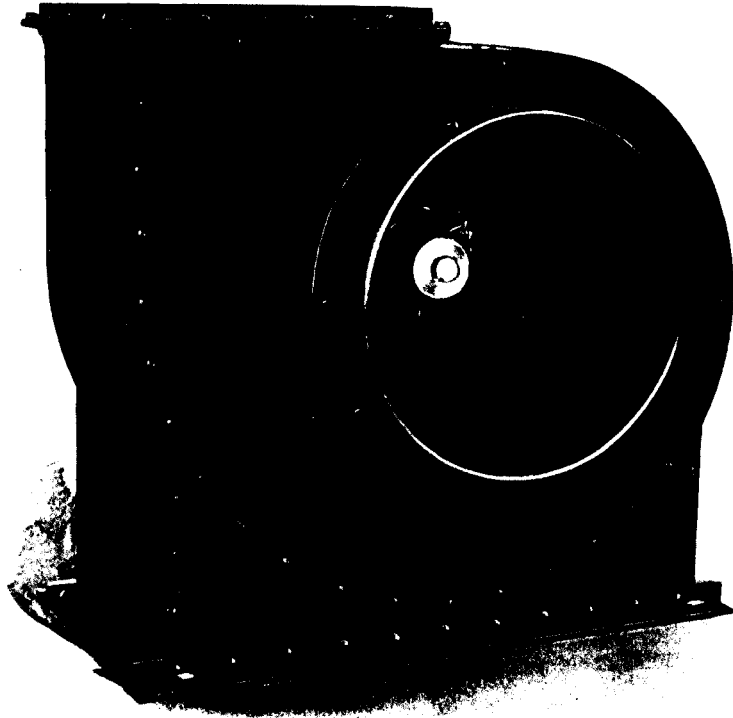
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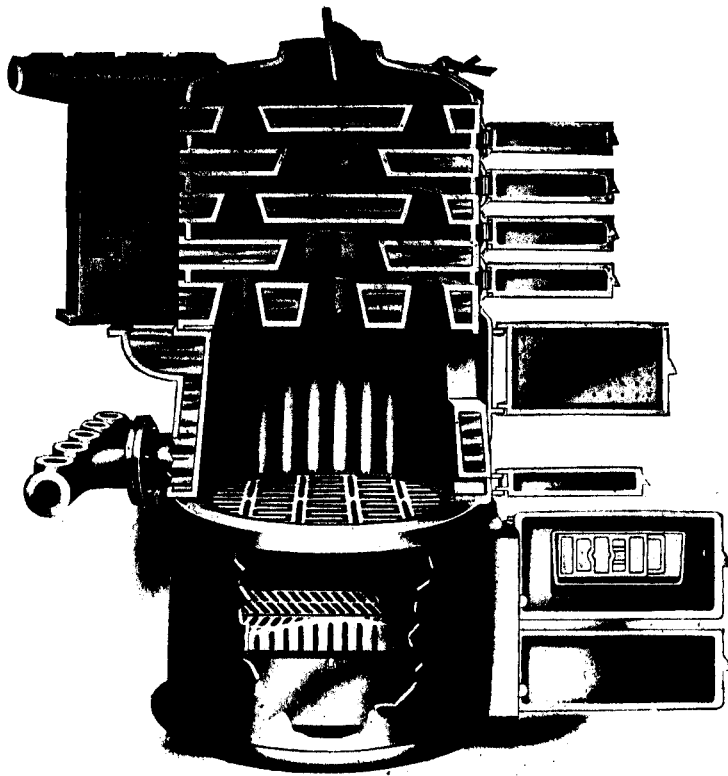
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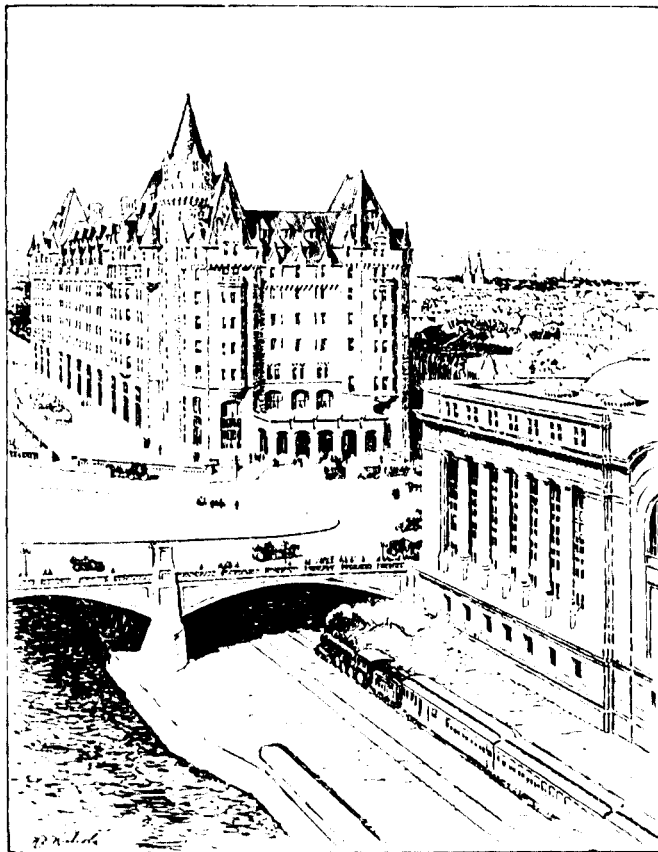
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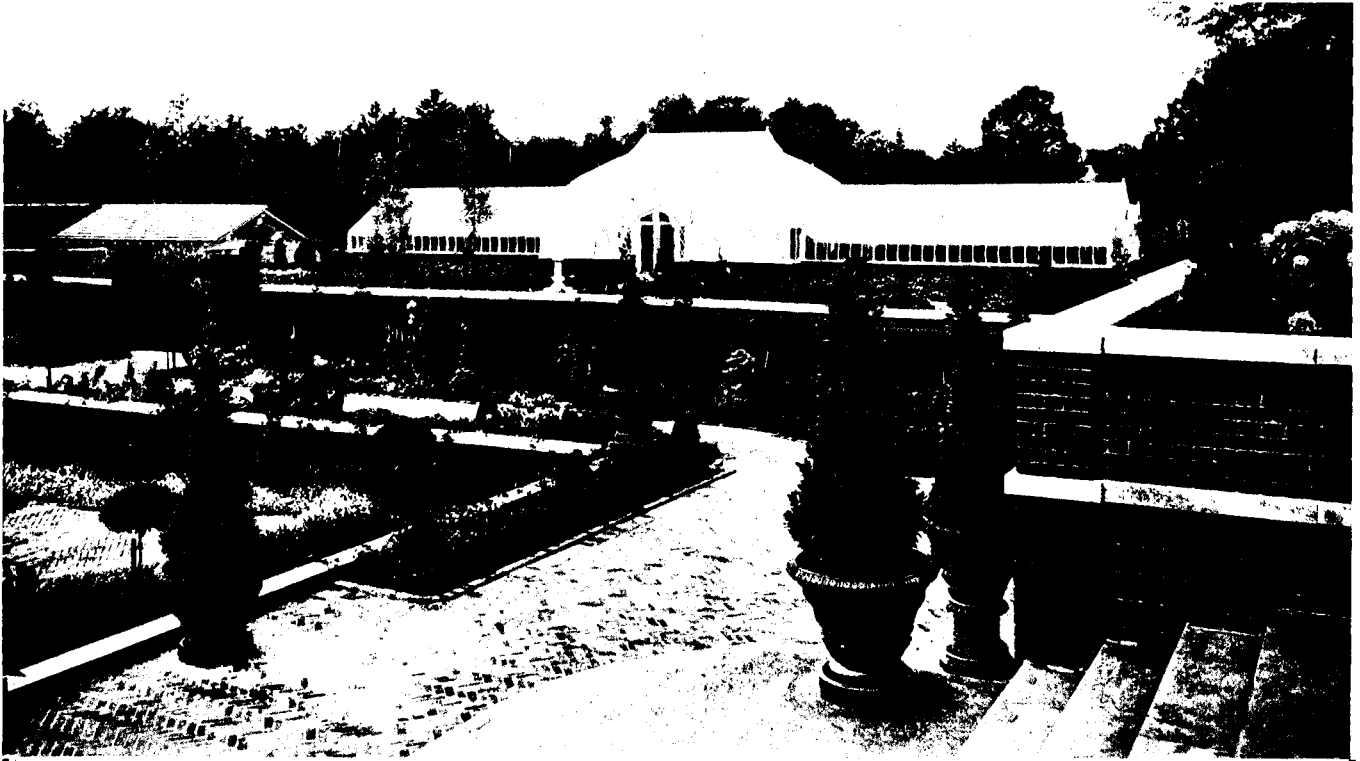
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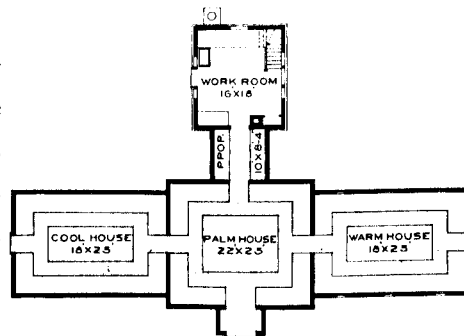
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As delightful as it is to carry out the Mother Country idea of joining the indoor gardens of glass directly to the residence; still it has certain drawbacks.

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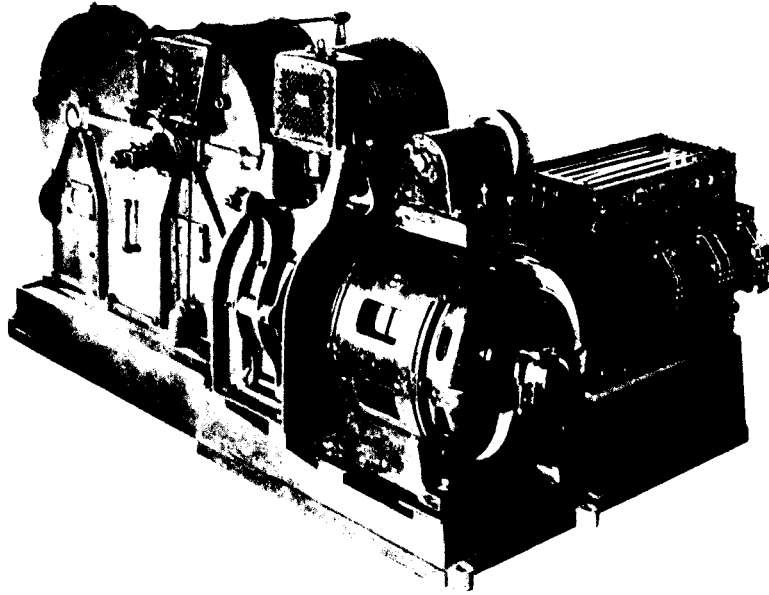
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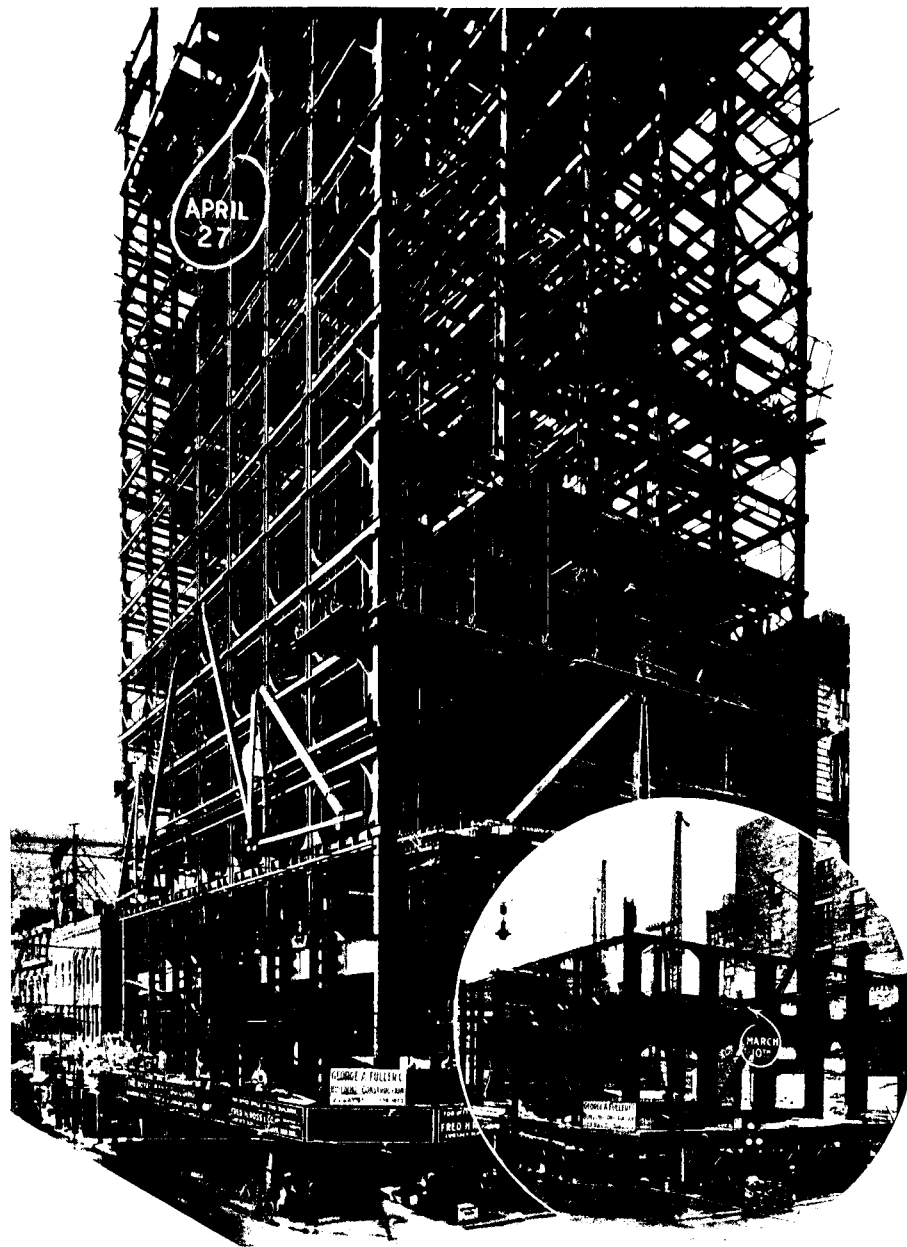
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Ross & Macdonald, Architects.
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THE progress views shown above indicate convincingly the rapidity with which the structural work on the new Royal Bank Building has advanced. The small view in the lower right hand corner shows where the building stood on March 10th; the larger illustration indicates the progress up to April 27th. The view on the opposite page was taken June 6th, and shows the building practically enclosed.

In less than seven weeks, the steel work was carried up from the second to the eighteenth storey, and the *porous terra cotta fireproofing* completed up to the eighth floor level.

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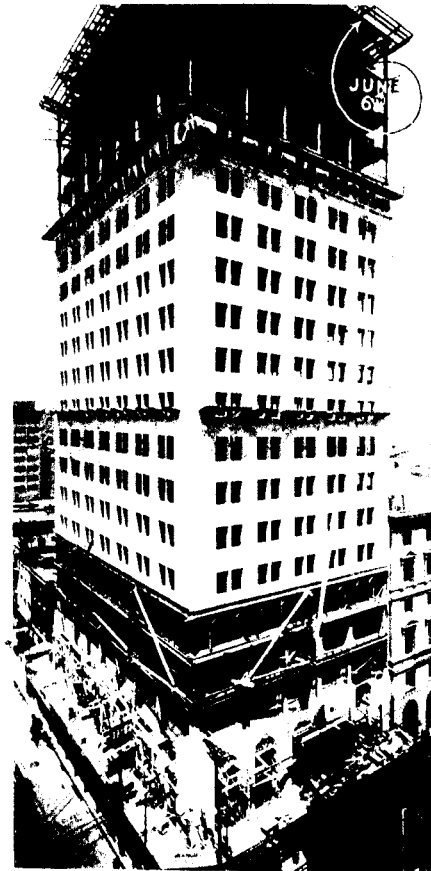
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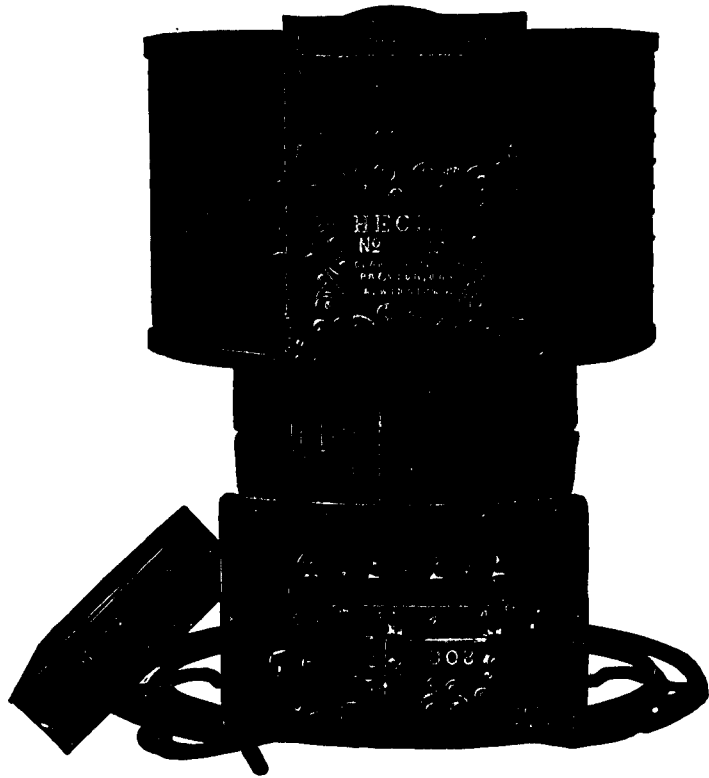
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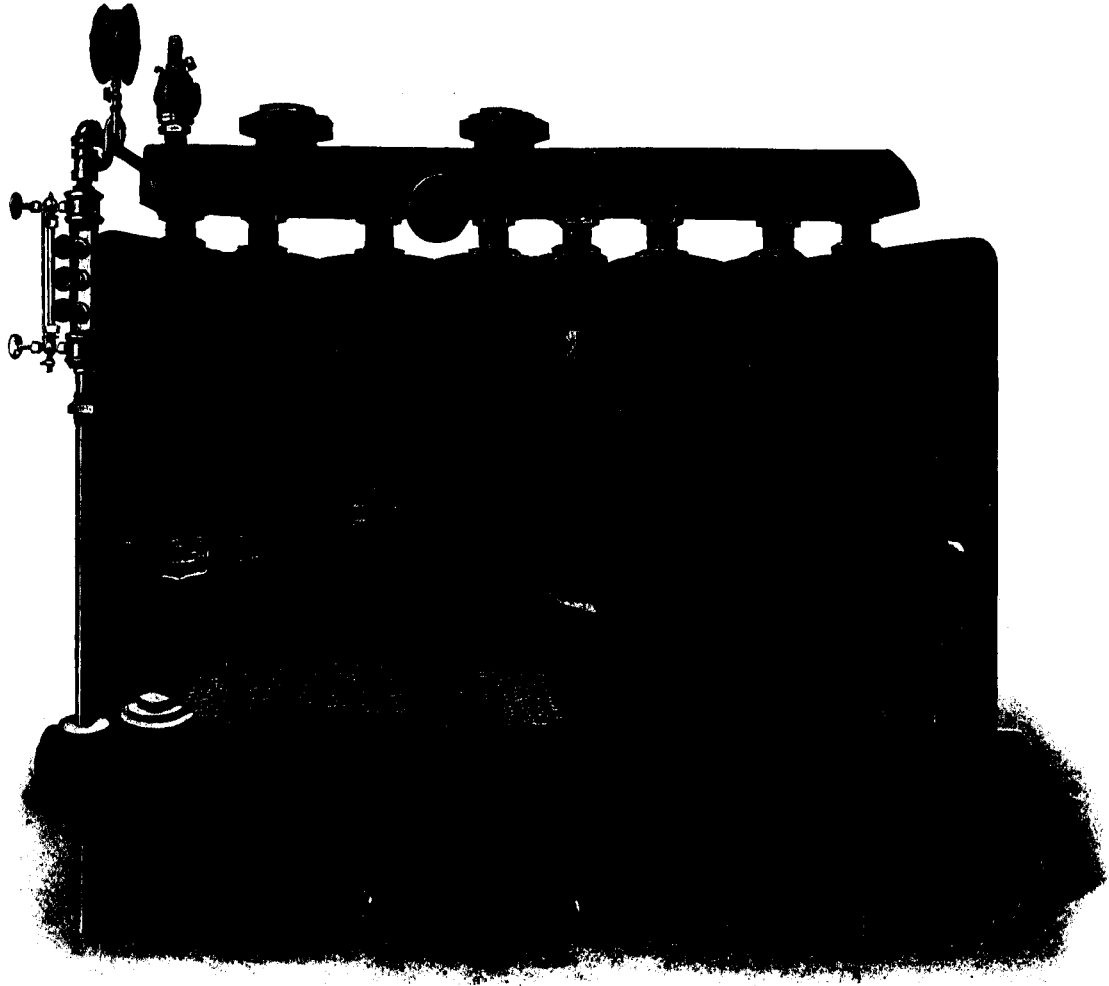
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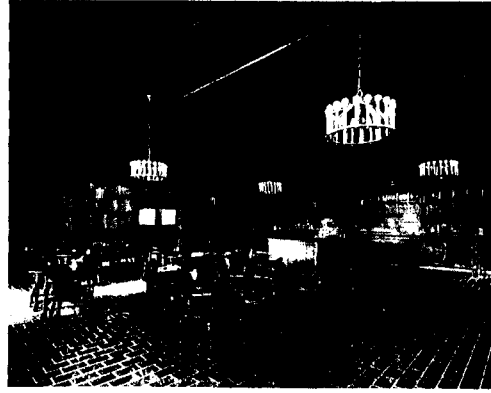
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Established and Manufacturing in Canada for Seventeen Years.

Refrigerating and Ice Making Machinery CORK INSULATION

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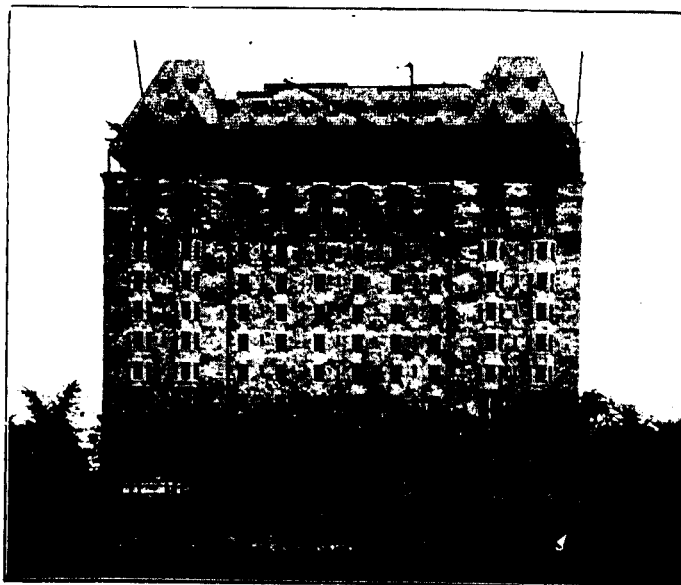
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Erected under Direction of Ross & Macdonald, Architects.
Contractors: Geo. A. Fuller Co., Ltd.
30,000 lbs. Medusa Waterproofing used in this building.

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Quotations will be given on receipt of specifications.

TIFFANY STUDIOS

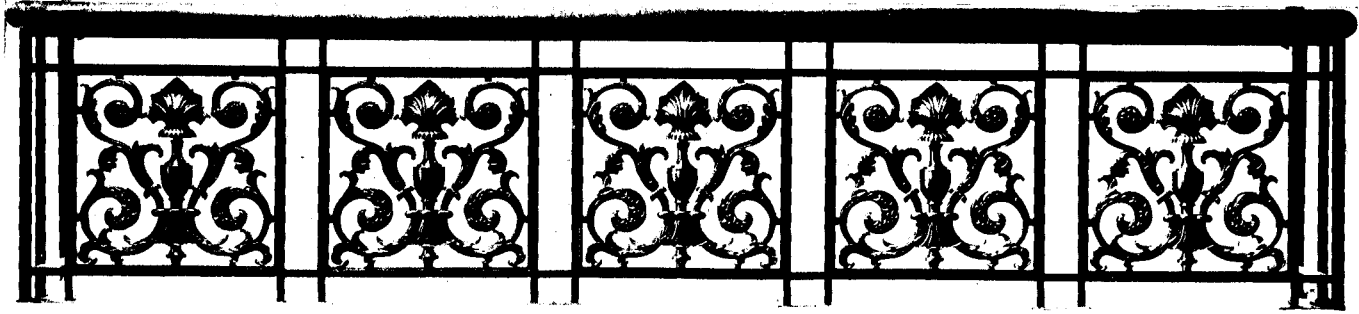


SEVENTH FLOOR LOBBY, FORT GARRY HOTEL, WINNIPEG, MAN.
Erected under the direction of Ross and Macdonald, Architects.

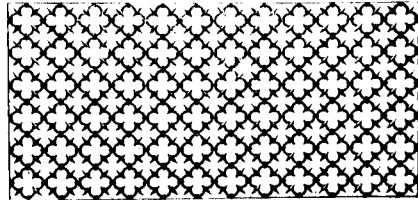
The decorations and lighting fixtures for the above hotel were executed by the Tiffany Studios. Estimates will be gladly submitted on complete decorative schemes, including Bronze, Wrought Iron, Lighting Fixtures, Furniture, Hangings, Leaded Glass and Glass Mosaic work. Booklets upon request.

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 CANADIAN OFFICE, 444 GUY ST., MONTREAL





Bronze Railing, Card Room Balcony.



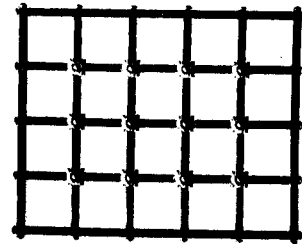
Bronze Grilles, Foyer.

WE ALSO
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Bronze Railing of Stairways.

Ball Room Balcony Railing.

Bronze Enclosure for
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Bronze Grilles, Palm Room.

The entire ornamental
bronze work of this
magnificent Grand
Trunk Hotel was exe-
cuted by Estey Bros.
Co., Montreal.



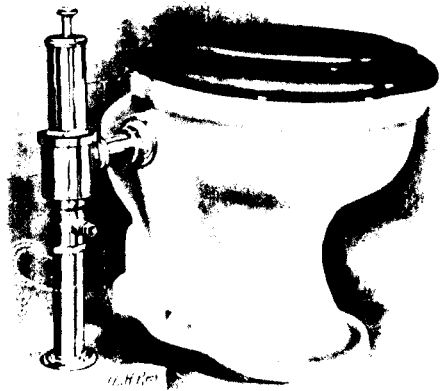
For bronze work of
unique and exception-
ally high quality grilles,
railings, and ornamental
work of all description,
write us.

THE FORT GARRY HOTEL, WINNIPEG

4 ST. CECILE ST. **ESTEY BROS. CO.** MONTREAL, QUE.
BRANCHES, TORONTO, WINNIPEG CALGARY, VANCOUVER.



Bronze Railing on Mezzanine Floor overlooking Rotunda.



THE REGENT. C 1000.

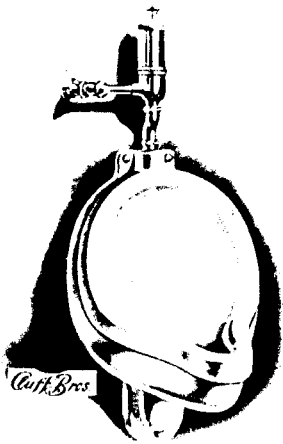


VICTORIA. C 3005.



The Fort Garry Hotel, Winnipeg

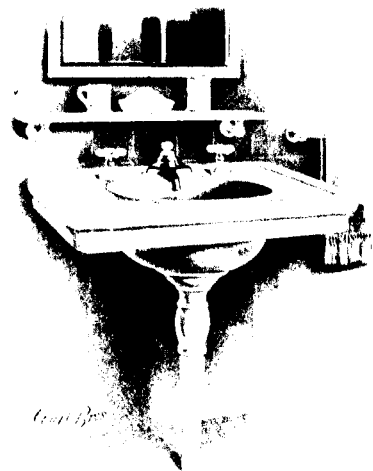
Equipped throughout with
solid Porcelain Fixtures
as illustrated.



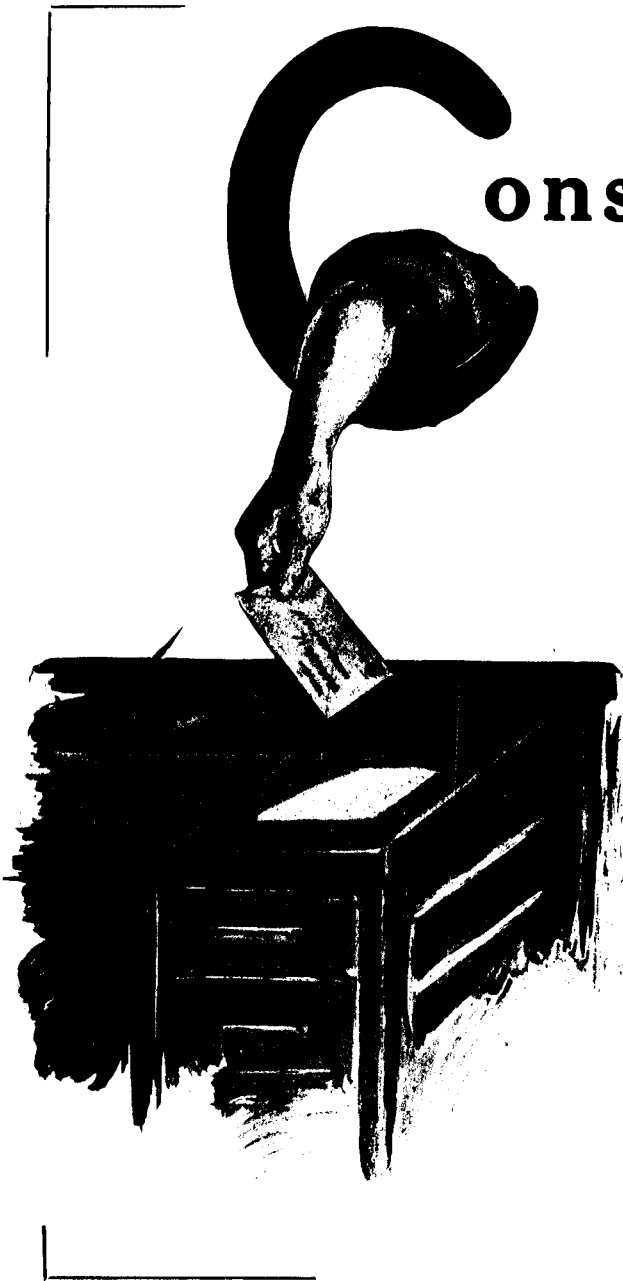
THE ROCKFORD. C 6026.

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Reliable Building and Engineering news for the exclusive use of Advertisers in "Construction." A daily Report regarding all activities in the building trades. For full particulars address "Construction," corner Richmond and Sheppard Streets, Toronto, Canada



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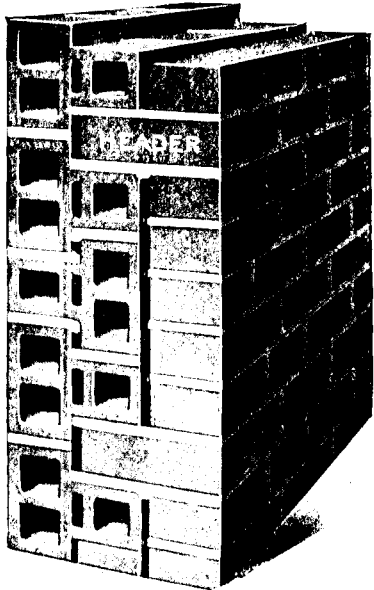
Dennison Interlocking Hollow Tile has other advantages than its complete fire prevention.

The insulation of its air chambers and general mode of construction nullifies and reduces the effect of outside upon inside temperature.

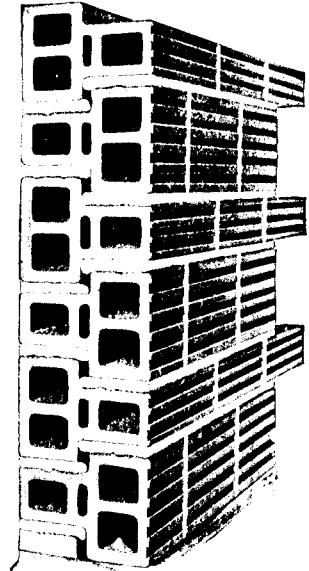
It is the ideal method of construction.

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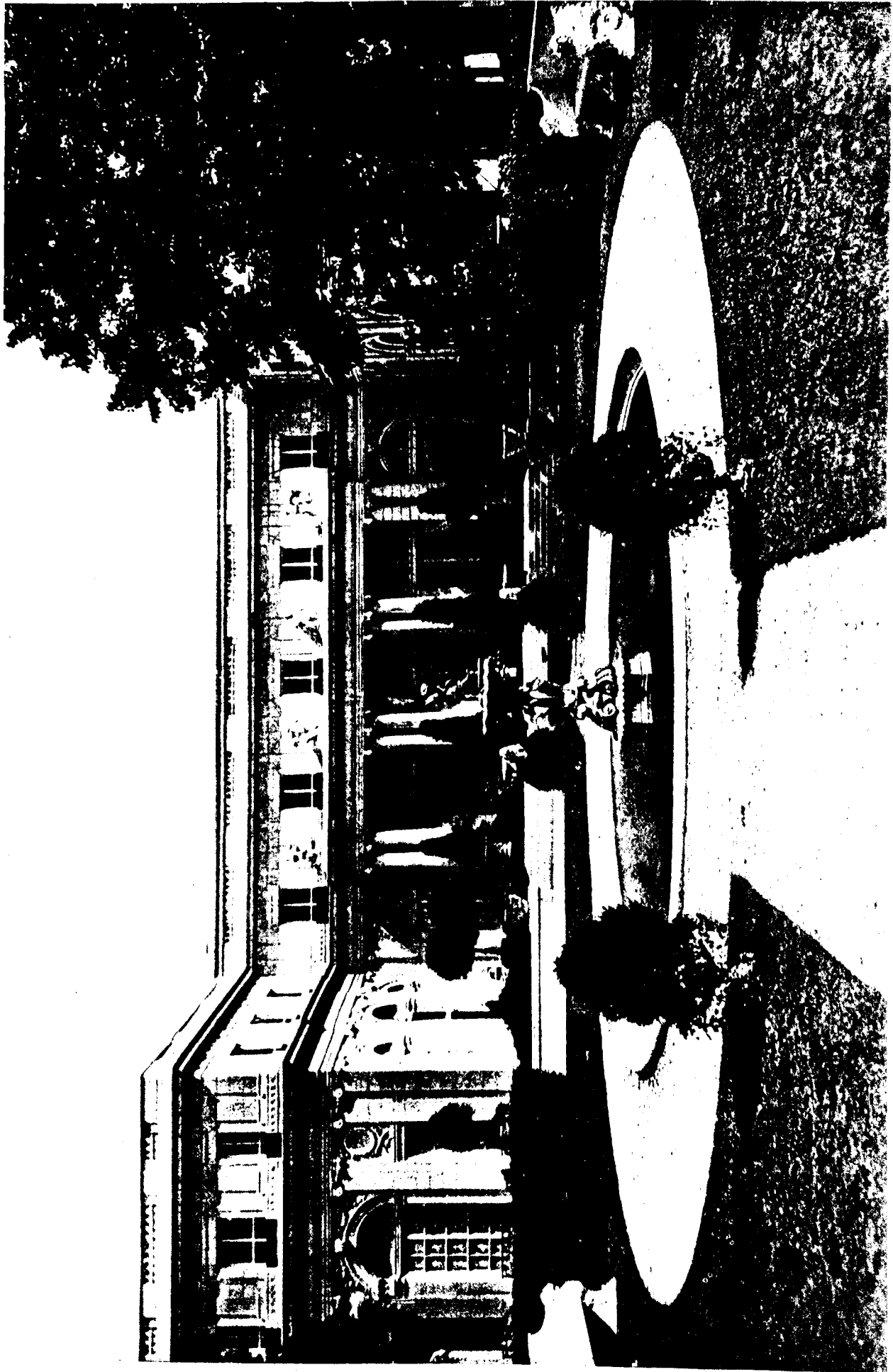


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View of portion of train shed roof of Grand Trunk Central Station, Ottawa, showing our PATENT PUTTYLESS SKYLIGHTS AND "CROWN" VENTILATORS. These Skylights we made in copper and glazed with wired glass.

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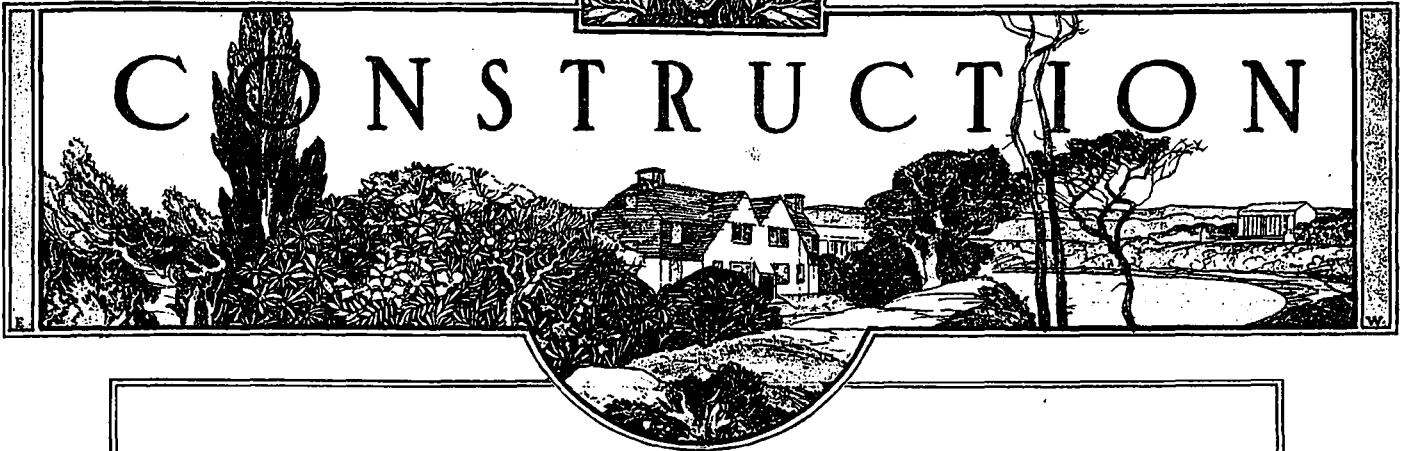
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OTTAWA

CANADA



CONSTRUCTION



June, 1914

Vol. 7., No. 6

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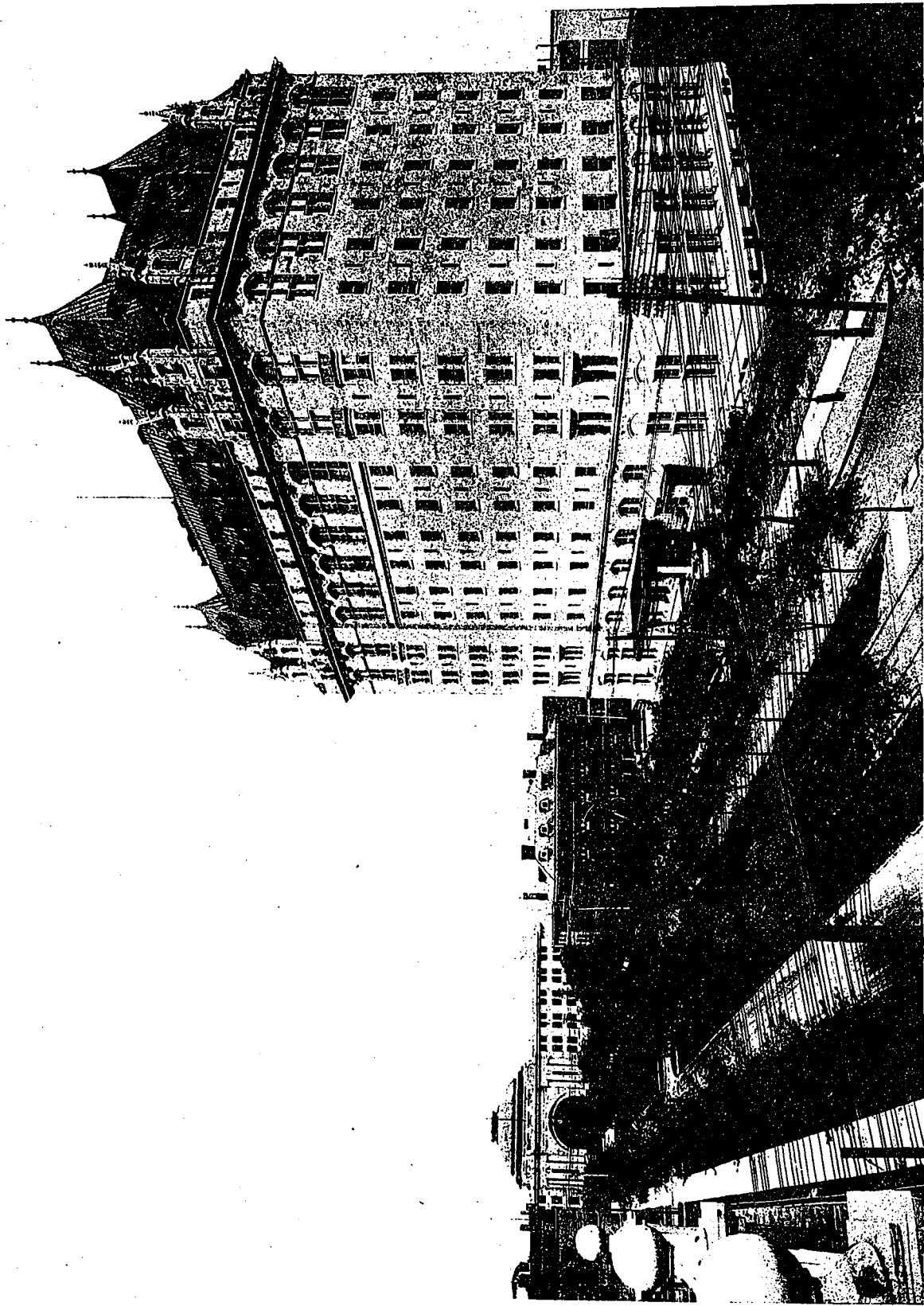
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BRANCH OFFICES:

MONTREAL WINNIPEG CHICAGO NEW YORK



FORT GARRY HOTEL, WINNIPEG, MANITOBA.



The modern hotel in respect to the vast changes which enter into its construction, decoration and equipment—a result of study and experiment.

THE MODERN HOTEL, while still in an experimental stage, is gradually approaching the state of perfection from the standpoint of the travelling public. There is no longer a constant dread of fire since the construction throughout is, in most cases, thoroughly fireproof. And no hotel should be allowed which does not practically guarantee the lives of its guests, regardless of the locality or existing conditions. That so many people have lost their lives in flimsy structures is lamentable, but this irreparable loss has awakened a keen desire on the part of the financiers backing such projects to build for safety as well as comfort. A change is also evidenced in the decorative qualities, and the gaudy mass of needless ornament is being replaced by a simplicity and refinement more in keeping with the tastes of those who patronize hotels. The public lobby is no longer an advertisement for mercenary proprietors, but rather an endeavor to create the feeling of homeliness. Instead of the main office occupying the most important position of the main floor, and assuming control of the entire business transacted, it has been placed in a conspicuous but unobtrusive part of the foyer or rotunda, while the clerk located on each floor near the elevator attends to the service on that floor. The sleeping quarters have undergone a similar transformation. The figured paper on the walls is a feature of by-gone days and instead the plaster is tinted; the brass bedsteads are disappearing for wood designs that correspond in style with the other fittings of the room. Until recently it was beyond reason to have an interior toilet and many a pleasing facade has been spoiled on this account. But with a proper ventilating system the inside bathroom is better than one on the outside, since the current of air is always positive from the room through the bath and up the vent-shaft. New ideas have brought about efficiency and economy in the kitchen service. Such problems as ventilation, refrigeration, smoke, draft, equipment, have been carefully studied so as to meet the most exacting de-

mands of a discriminating public. The use of tiles in all departments is quite a potent factor in the modern hotel. They are not only sanitary but decorative. Their utilitarian value is recognized for bathroom finish; their artistic effect in relief modelling and colored enamels appreciated in restaurant rooms and rathskellers; their refinement of feeling and form in panel designs and conventionalized groupings of fruits and flowers; their non-staining and lasting qualities so suitable for kitchen and service floors—all combine to make this phase of burnt clay a most practical and æsthetic one.

First international city planning held in Toronto—The influence of its discussions and exhibition—The draft bill presented for a Town Planning Act.

THE FIRST International Conference on City Planning held recently in Toronto under the auspices of the Commission of Conservation was an inspiring success from the standpoint of all parties interested in the sane progress of this great movement. The strong personnel of the speakers kept the enthusiasm on all phases of the work keyed to a high pitch. No less profitable were the discussions which brought out more strongly the practical phases of each address and which gave to this representative body many new ideas worthy of consistent study. That the Canadian cities will profit greatly from this conference is assured, for already steps have been taken to hold a strictly Canadian convention so that the suggestions offered by the speakers, who were mostly from other countries, may be considered in relation to local needs and that more definite action can be taken for the furtherance of city planning throughout the various Provinces.

One point of special interest to the people is the draft bill of a Town Planning Act which was thoroughly discussed and changed in an endeavor to meet the existing conditions in all parts of the Dominion and which is to be submitted to the various legislatures for enactment. The Act calls for a central town planning board, with a permanent paid official at its head; a local housing board which borrows money only with the consent of the municipality

and which has the right of appeal to the central board in carrying out its schemes. In commenting on the bill, Hon. George Langley, minister of municipal affairs for Saskatchewan, objected to the provision which would place the administration of a town planning scheme under the direction of a board not directly responsible to the council of the municipality concerned, and would, moreover, transfer much of the authority to a provincial board.

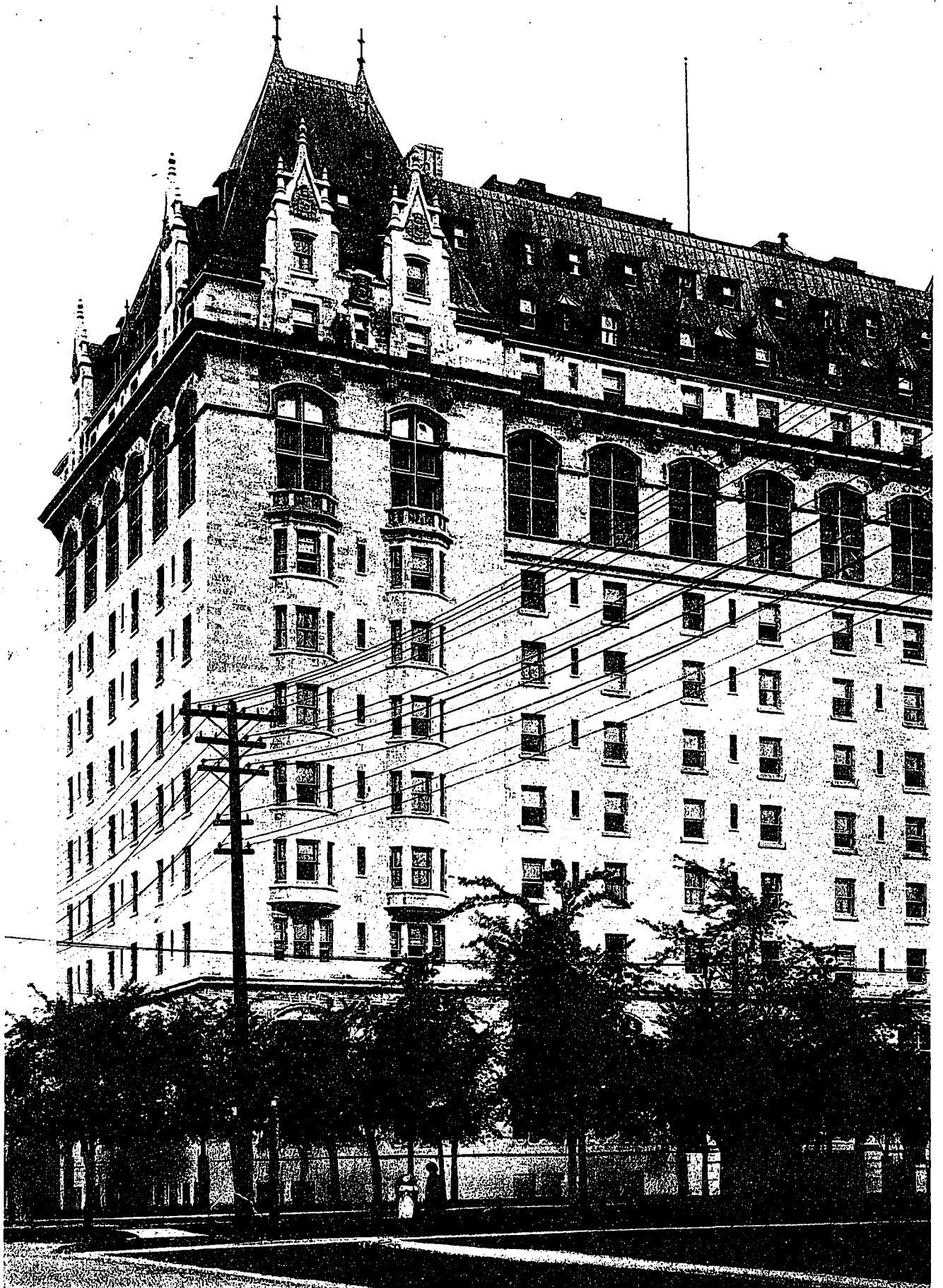
C. H. Mitchell, of the Toronto Civic Guild, expressed the idea that it would be hard to keep the work of the local boards defined from that of the municipal council. Other frank expressions were offered from which it is safe to predict that a draft will eventually be drawn which should prove satisfactory to all persons concerned and which will enable the various cities to unravel the perplexing problems of the present as well as provide for their future expansion.

Aside from the discussions there was an exhibition which presented the intricate problems met with in the States and the solution adopted for each one. This collection under the direction of the "American City" furnished examples of practically every feature which might arise in the broad question of town planning. In addition to this the Canadian work was also shown, including plans for the future development of Toronto, Montreal, Calgary, Saskatoon, along with suggestive schemes of a practical and theoretical nature. The best plans and ideas of the exhibition, along with the papers, will be taken up in a future number of CONSTRUCTION with a sincere hope that it will assist in furthering this most worthy movement of City Planning.

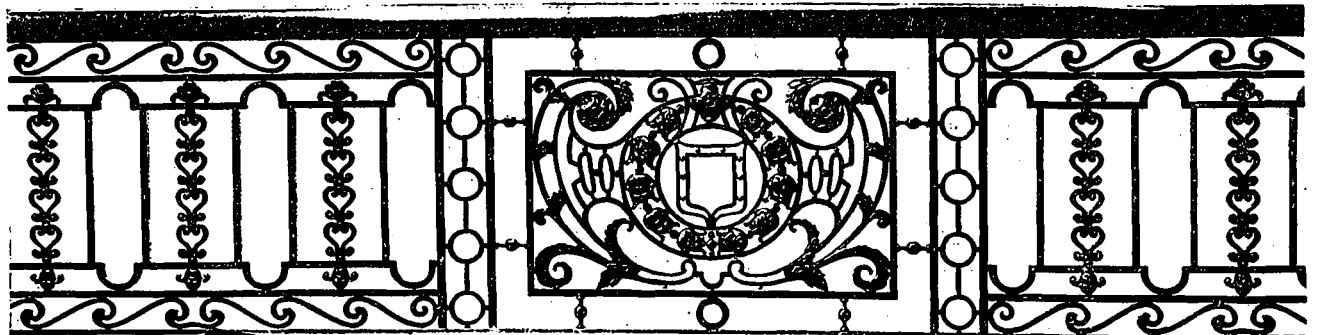
The billboard nuisance—Action taken in other countries to regulate all forms of public advertising—Laws needed in Canada to prevent its abuse.

HOW LONG the privilege will be extended to outdoor advertisers to depreciate the value of property, endanger public safety and mar the artistic appearance of our streets, is questionable. However, the matter is being seriously considered in various large cities where radical reform is about to be or has been enforced. In December, 1912, a commission was appointed in New York City to investigate this question, not only in the States, but also in European countries. The result of their work has been to recommend legislation which would prohibit all outdoor advertising structures, except shop-signs, advertisements on vehicles, etc., on or in the immediate neighborhood of parks, squares, public buildings, schools, boulevards and streets

of exceptional character, even to the exclusion of advertising structures which obstruct fine views. In addition to this they would eliminate all large electric signs in residential districts; prohibit all signs fastened across doors and windows; limit roof signs to ten feet in height; and take away all advertisements on tenement houses and dwellings. To appreciate why such drastic action is necessary, it is well to note that 3,800,000 square feet of billboards exist in New York alone, many of them being unsightly, while others are vulgarly attractive. Practically 300,000 square feet of additional space is added each year, most of which is used for liquors, tobacco, chewing-gum, and amusements. That such form of advertisement is profitable has been disputed by very reliable critics. One firm which spends \$1,000,000 per annum on this form of advertising says: "The results are not what we hoped for—we have spent a large amount on outdoor advertising and it is not profitable compared with other forms—newspapers, magazines, pamphlets, etc., are basic." If this be true, then the rights and interests of the general public should be considered. In the first place, many signs are objectionable and whether or no the people discountenance them, they are continually before one's vision so that it is impossible to escape their obtrusiveness. They mar the æsthetic appearance of every inspiring view, whether it be the country through which we pass or the very heart of the business districts. The one chief object is to utilize the position where the most people pass and which cannot fail to attract. Such violation of art and good taste is to be condemned. Private enterprises should not be forced upon the people at the sacrifice of beautiful parks and artistic thoroughfares; and the architectural effect of churches, public buildings and private residences. In this regard it would be well to accept the experience and final action of European countries. In England, Parliament adopted laws preventing the exhibition of advertisements which would injure the artistic effect of public parks and highways or disfigure the beauty of a landscape. France permits of no defacement of streets or public places with crude announcements of private enterprises. Germany restricts street billboards and permits them only to the kiosks located at prominent street intersections. In cities like Buenos Aires, Rio de Janeiro, Lima, and Valparaiso, all outdoor advertising is strictly regulated and taxed. The work already done in the various Canadian cities is commendable and should be continued until the Government enacts certain measures which will preserve a dignified appearance to our rural sections as well as our cities, and protect the people from the forceful and objectionable announcements of a few mercenary individuals and corporations.



DETAIL OF FORT GARRY HOTEL, WINNIPEG, MAN.
ERECTED UNDER THE DIRECTION OF ROSS & MACDONALD, ARCHITECTS.



DETAIL OF ROTUNDA AND MEZZANINE GALLERY, FORT GARRY HOTEL, WINNIPEG, MANITOBA.

Fort Garry Hotel, Winnipeg

OCCUPYING the site of the historical fort belonging to the Hudson's Bay Company, the Fort Garry Hotel stands as a living monument to the progressive spirit of our early settlers. In 1793 the traders awoke to the fact that others were cutting off their trade with the Indians, and as a result forged their way through an unknown country to the junction of the Assiniboine and Red Rivers. Here they built their first fort, called Gibraltar, 1806, which fell into the hands of the North-West Company after a reign of violence, murder and robbery. In 1816 the fort was retaken and destroyed, only to be established again in 1822 under the name of Fort Garry, through the amalgamation of the Hudson's Bay and North-West Companies. During the year 1835 it was rebuilt with large stone walls 280 by 240 feet, well bastioned and defended by thirteen six-pound guns, while in 1850 the present gateway was added, which alone escaped the demolition of 1882. Fifteen years later the Hudson's Bay Company presented to the city of Winnipeg the gateway and park wherein it is located.

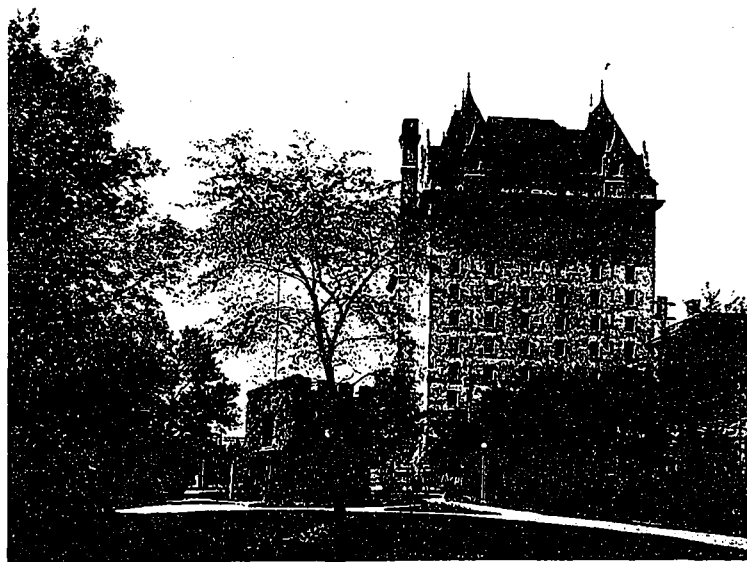
To appreciate the need of a modern, up-to-date hotel like the Fort Garry in Winnipeg, it is only necessary to consider briefly the city's rapid growth. In 1825 Alexander Ross, a fur trader, received from the Hudson's Bay Company a gift of one hundred acres of land, upon which has since been built the city of Winnipeg. In 1855 the city prided herself in having a population of 5,970 people, also twenty windmills and eight watermills. From the incorporation of the Hudson's Bay post in 1874 to the present time the population has reached 270,000, with her wide streets flanked with imposing edifices, the indications of a commercialistic age.

The railway hotel has become a prominent feature in the tremendous growth of Canada. The Grand Trunk Pacific Railway have grasped the essential needs of an extensive country where long stretches exist between the various settlements, and are erecting a far better class

of buildings for the travelling public than could be entertained by private enterprises, especially in small cities and places of rest and recreation. The Fort Garry enables passengers to find safe and satisfactory accommodations within a few rods of the station and away from the noise and dirt of the business section or the railway lines themselves. In addition to the Fort Garry the Grand Trunk Pacific Railway have built the Chateau Laurier at Ottawa, and the Highland Inn at Algonquin Park; while they have in the course of construction the Macdonald at Edmonton, which will be opened this coming October; the Qu'Appelle at Regina, the Prince Rupert at Prince Rupert, and the Minaki Annex and Inn. In all of these hotels every modern convenience known has been or is being introduced. All the mechanical as well as service departments are the resultant of the experience obtained in the best hostleries of Europe and America.

Rising to a height of fourteen stories, the Fort Garry Hotel furnishes a magnificent view

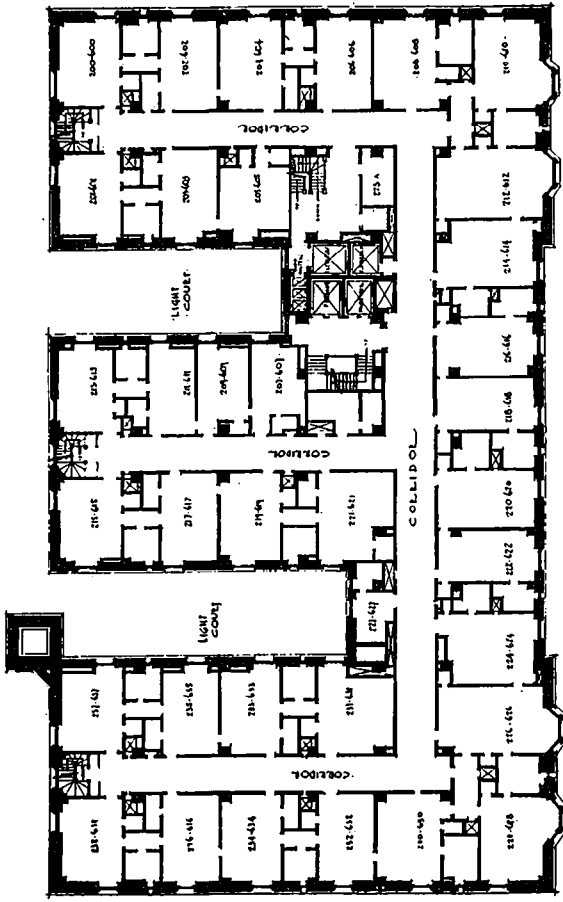
in every direction. Directly in front is the large number of tall and artistic business blocks which are rapidly emerging into one unbroken palisade of activity stretching across the city. To the east is the Union Depot, lying near the river, beyond which is St. Boniface, with her splendid cathedral and college group, while off in the distance lies Transcona. Turning to the south, the



GATEWAY TO OLD FORT GARRY.

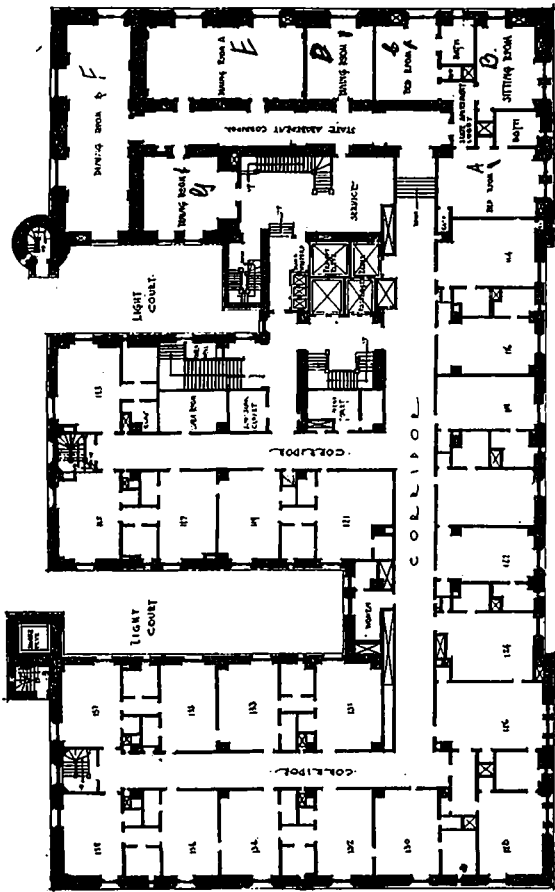
rivers wind gracefully off into the never ending distance of a prairie land, disturbed here and there with towns of local interest, prominent buildings and aquatic clubs. Westward in the midst of a regular forest are found the homes, the churches, the legislative buildings, in striking contrast to the skyline of the business section on the right. Off in the distance is the Assiniboine Park.

No less attractive is the immediate surroundings of the hotel. From the large entrance archway of the Union Station the eye is carried along the wide Broadway boulevard with its

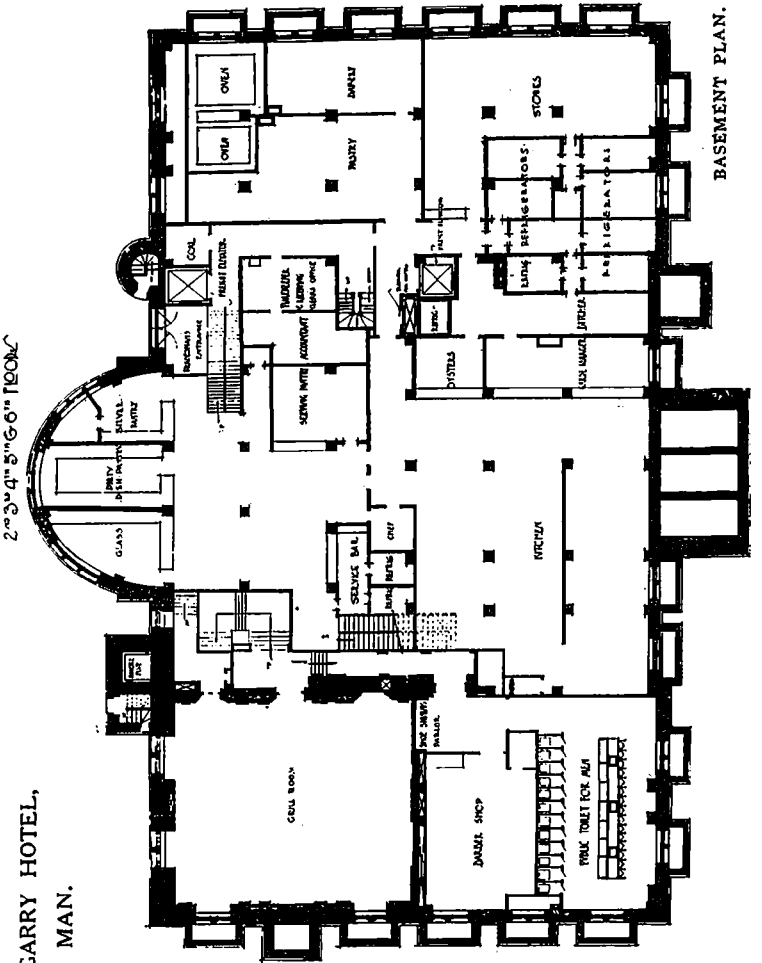


TYPICAL FLOOR PLAN
2'-0" 3'-0" 5'-0" 6'-0" 7'-0" 8'-0"

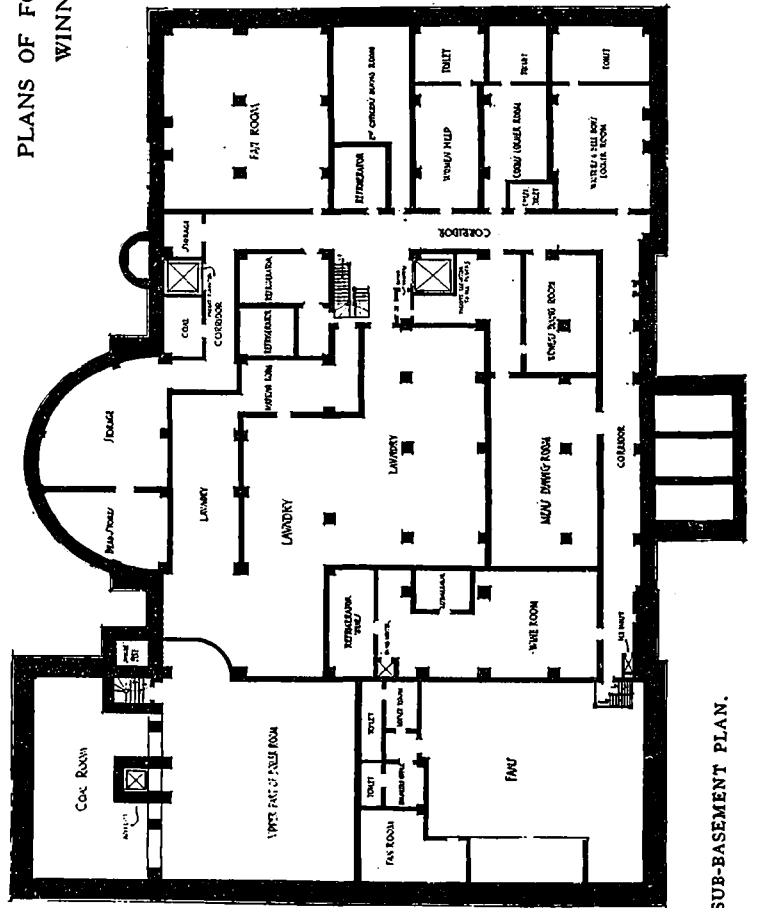
PLANS OF FORT GARRY HOTEL,
WINNIPEG, MAN.



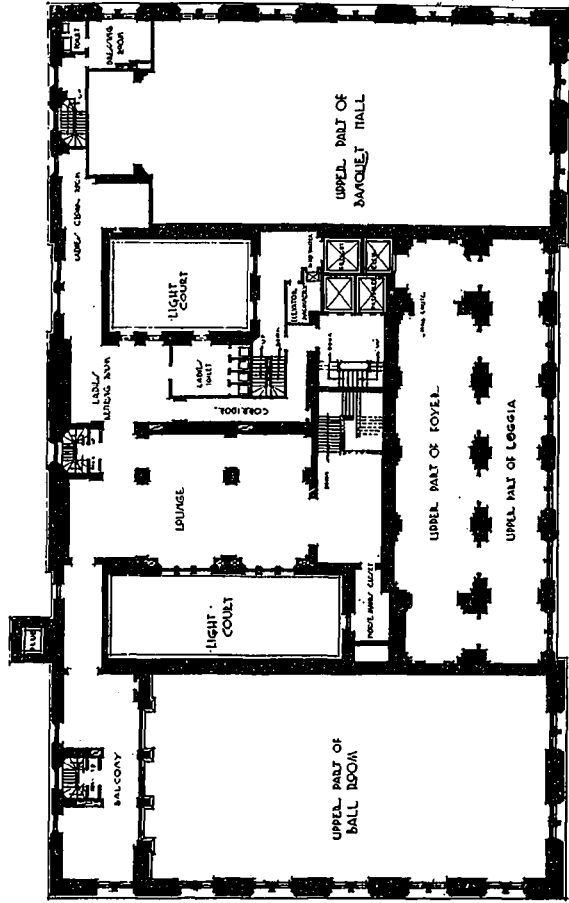
FIRST FLOOR PLAN.



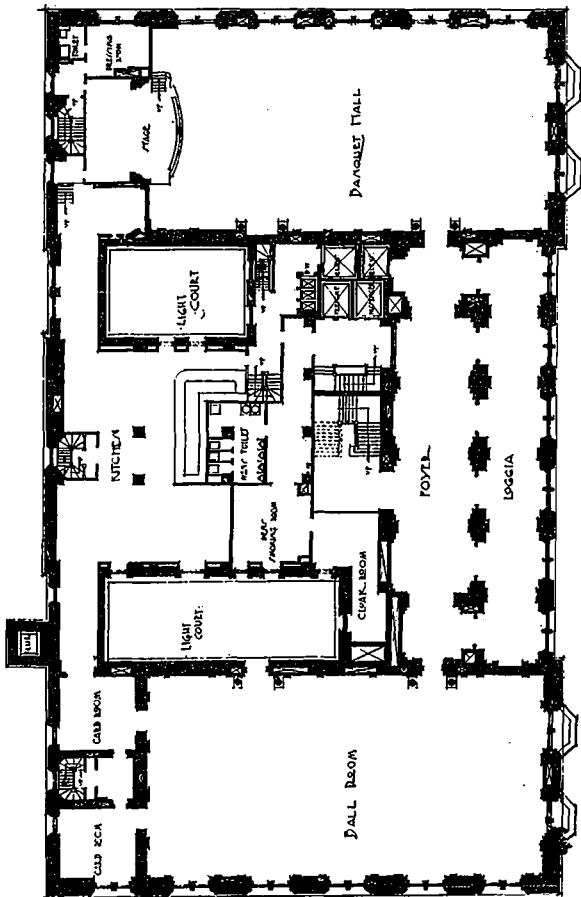
BASEMENT PLAN.



SUB-BASEMENT PLAN.

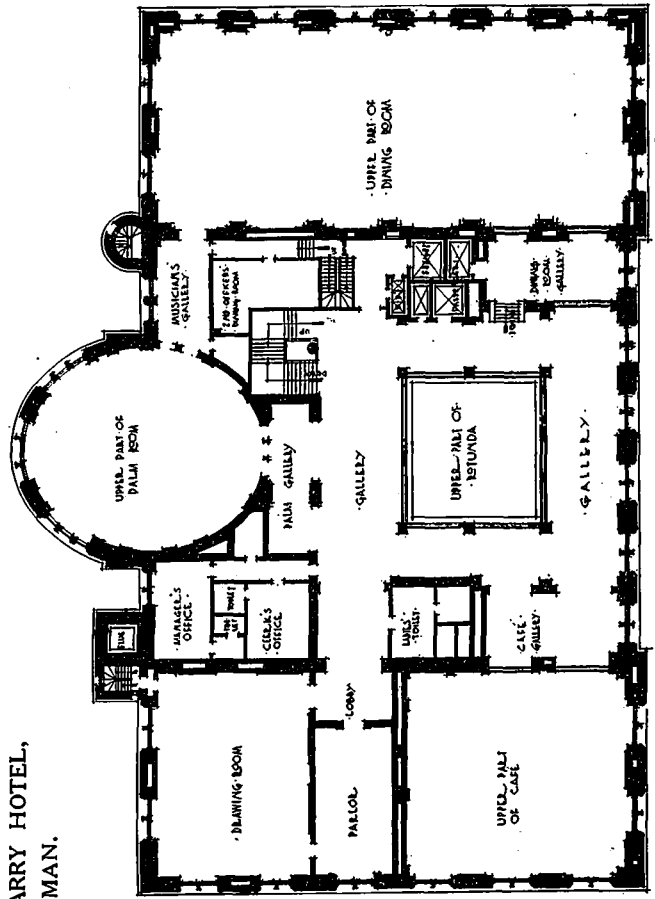


BALL ROOM MEZZANINE FLOOR PLAN

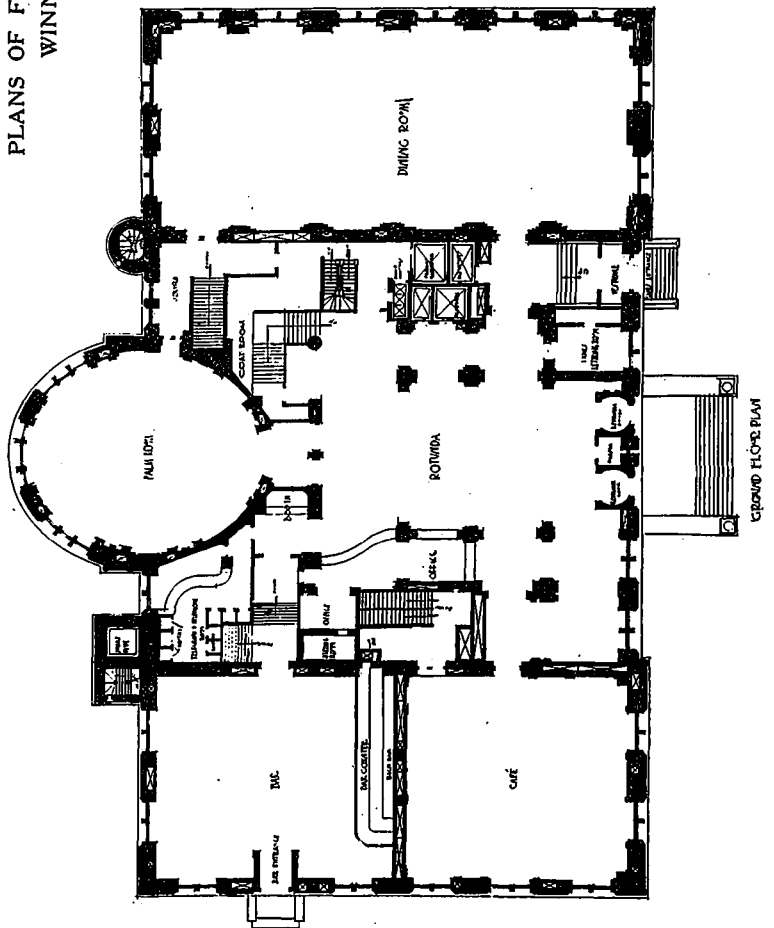


BALL ROOM GROUND FLOOR PLAN

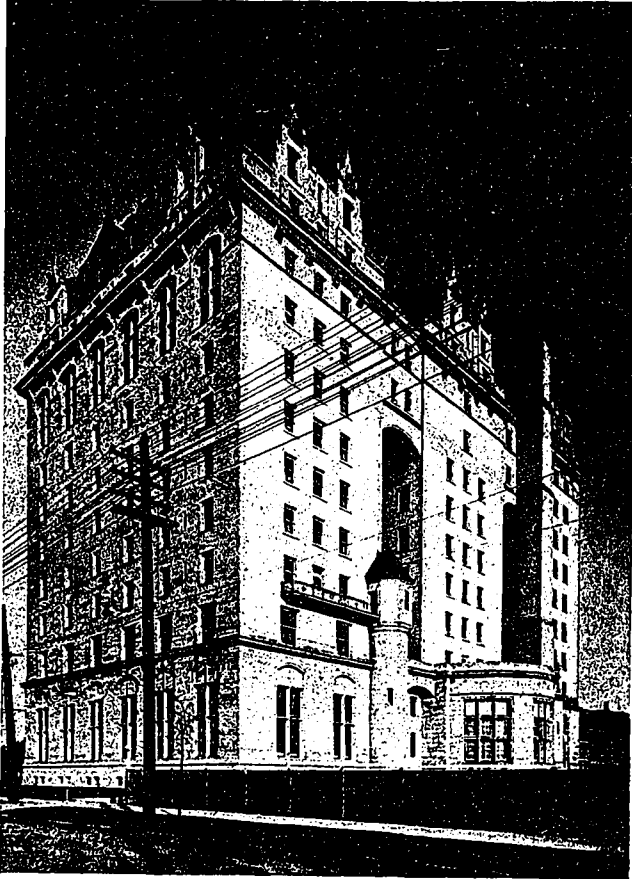
PLANS OF FORT GARRY HOTEL,
WINNIPEG, MAN.



GROUND FLOOR MEZZANINE PLAN



GROUND FLOOR PLAN



REAR OF FORT GARRY.

centre parking containing a double planting of trees, on the outside of which are driveways, also enclosed with corresponding rows of foliage. To the right of the avenue is the Fort Garry Court, to the left the Hotel with the small park forming an appropriate setting for the old Fort Garry entrance. In perfect harmony with the atmosphere of the Union Station, the Government buildings and the residential section, the Fort Garry Hotel rises majestically, presenting an artistic creation on all four facades. The exterior treatment is an adaptation of Francois I and recalls the vivid and pleasant

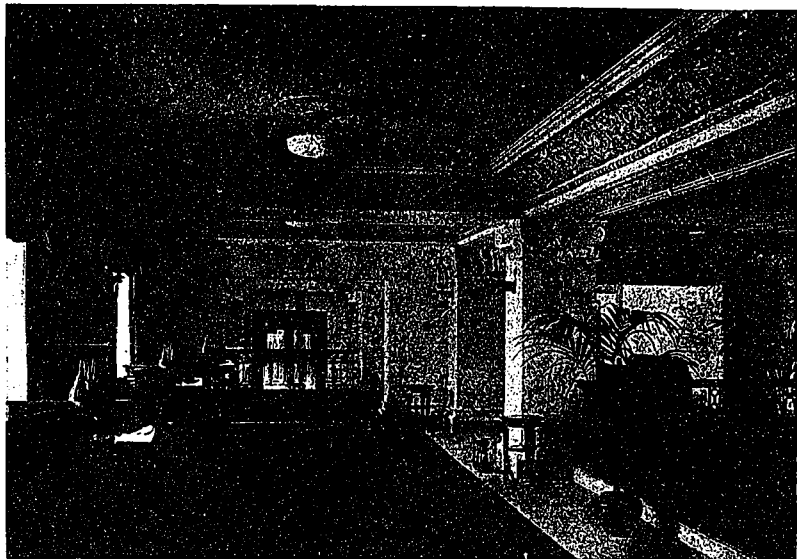
memories of the old French chateaus in Normandy and Touraine. The style is especially practical in a country of extreme heat and cold where large heavy projections are inadvisable. The pleasing ensemble has been obtained through the use of Indiana buff limestone, which extends from the base of Canadian gray granite to the copper roofing. The main entrance is adequately marked by the broad steps and bold but harmonious marquise, built of ornamental cast and wrought iron; supported with heavy columns, consoles and square linked chains. Separate entrances have been provided for the main dining room and the bar.

The impression received upon entering the rotunda—forty-four by fifty-six feet—is a feeling akin to that of a real home life. The eye naturally sees the ensemble and appreciates at once the true atmosphere. Everywhere are scattered flower vases and boxes modelled in cream terra-cotta after the best examples of Italian work; oak divans and chairs upholstered in Spanish leather or tapestry, finished with brass studs, depicting the age of Louis XIV, which style prevails throughout the rotunda; and electric fixtures flooding the place with the light of day. The marble floor of Napoleon gray inlaid with Belgian block is given the restfulness of the other fittings by means of two large heavy hand-tufted Donegal rugs. The walls are finished with an imported artificial Caen stone of a special treatment which gives it a natural texture and takes away the harsh, smooth surface usually accompanying this method of decoration. In order to harmonize the whole of the ground floor this material has been employed on all wall surfaces of the rotunda, palm room, cafe, main dining room, and mezzanine floor. Large archways span the entire distance between the corner piers which support the balcony above, the one between the entrance and rotunda having for its keystone the shield of the Province of Manitoba; the one

opposite, the Canadian emblem. The span to the left as one enters forms ample seclusion for the office, although having perfect surveillance of the main entrance, elevators and public dining rooms; the one to the right forms an open vestibule effect to the passenger elevators, affording plenty of light at no sacrifice of valuable space on the various floors. Standing directly inside the Broadway entrance, one obtains through the rear archway a view of the



DETAIL OF MAIN ENTRANCE.



MEZZANINE FLOOR, SHOWING WRITING DESKS.

palm room, on one side the main dining-room, on the other the cafe, while directly overhead is the ornate balustrade of antique bronze, encircling the open well and drawing into perfect unison the treatment below with the enriched ceiling above.

In the rotunda facing the main office stands a master clock artistically carved in solid oak. It is fitted with an electric device for synchronizing it with the time at the Government observatory; the connection being made by means of direct wire communication. It controls the time on all clocks throughout the hotel, and operates every second a time stamp in the various departments. As everything of a business nature has to be stamped it is possible to locate and correct an error quickly, since the marking indicates the person in charge, the date, exact time to the second and the name of the hotel. The master clock is equipped with a high grade jewelled bearing movement, and operates two finely finished transmitters, which in turn strike the Westminster peal through a set of tubular bells. All of the above instruments, clocks, time stamps, etc., are self-winding.

The desk enclosing the office is of carved oak, with an artistic monogram of G. T. in the centre of the main panel; the woodwork of the newsstand, vestibuled entrance, hat racks, etc., is also of oak, panelled and moulded in keeping with the general design. Two large antique bronze fixtures hang from the ceiling, each containing thirty-six lights, while the plain panels on the wall and piers are enriched with two and three-candle light brackets. From the ceiling of the mezzanine floor hang indirect circular fixtures with alabaster bowls. To the right of the rotunda is the stairway of Hauteville marble, possessing a heavy iron bronze balustrade extremely rich in design. Commendable features of the stairs are their accessibility to all parts of the

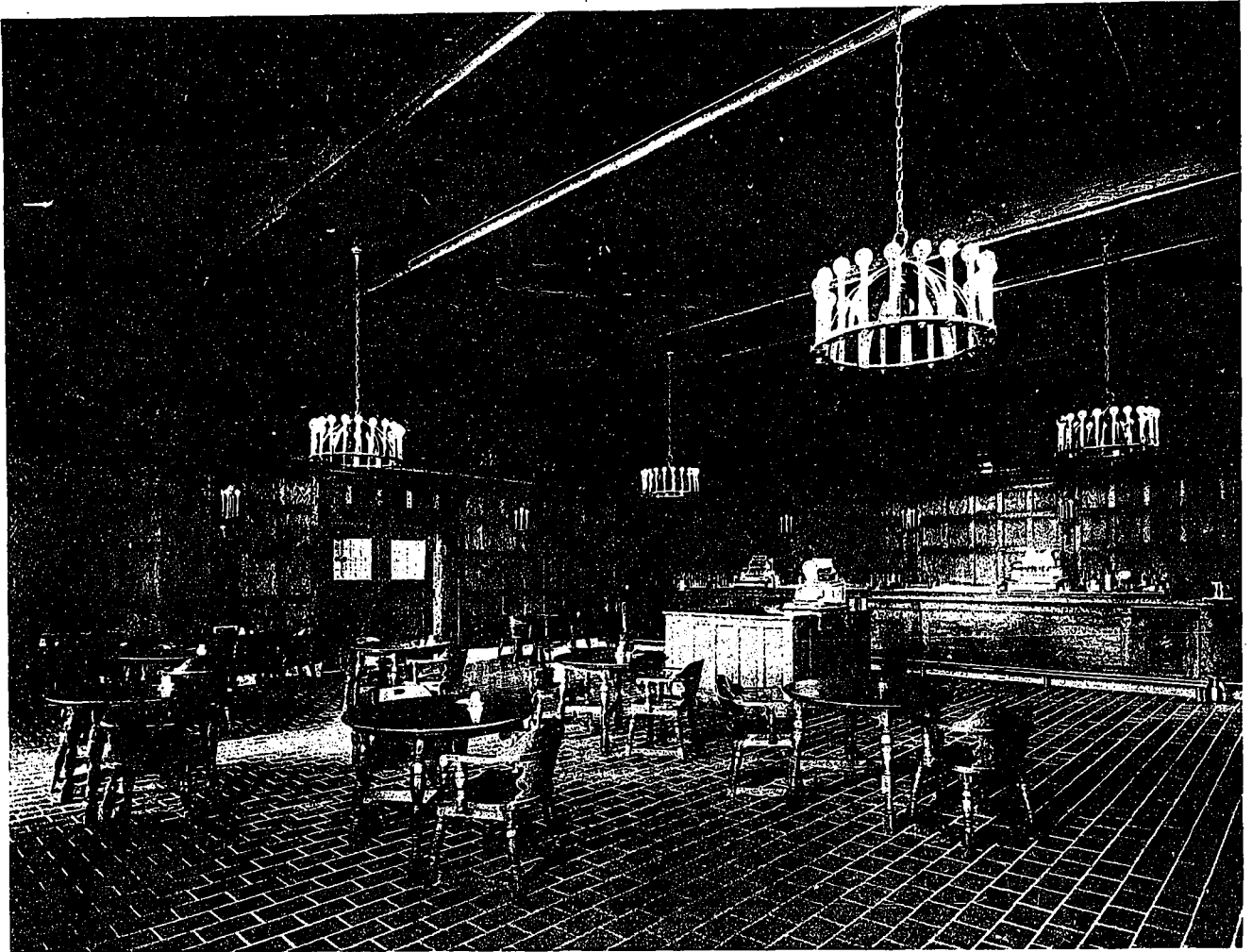
building and freedom from the elevator shafts.

The mezzanine used principally for a lounge and gentlemen's writing space is one of the chief charms upon the interior. From here may be watched the activity below in a quiet manner while resting on the deep red upholstered furniture of Louis XIV. period. The heavy red carpets partly covering the floor of Napoleon gray marble, the electric shades with florid design, the large ceiling panels in cream and gold, the Italian damask window curtains of a cardinal red, with gallon and bullion trimmings—all furnish a comfort and warmth rarely found in a building of a public nature. The windows here, as throughout the ground floor, consist

of metal frames and best quality of British polished plate glass. Towards the front are small balconies, from which may be obtained excellent views of the main dining-room and cafe. Leading off from the rear is a passage containing a



MASTER CLOCK.



BAR ROOM.

glass dome with gilded ribs and dull green floral panels, which ends in the ladies' drawing-room, thirty by forty-two feet. The walls are hung in silk amber panels, terminating in an acanthus leaf moulding; the floor is covered with a heavy Wilton carpet of trellis design, surrounded by a border of roses and flowing leaf design in greens and pinks; the ceiling is finished in plain paneling effects, with reeded bands surrounding. Each wall panel has a three-light fixture finished in old gold, the ceiling containing clusters in a circular form. The ladies' writing room adjacent has a similar treatment, the mahogany furniture being upholstered, and the tapering legs ending in spade feet.

The architects sensed the desire of the travelling public for simplicity and dignity when they designed the main dining-room. Extending the full depth of the building and forty-three feet in width, the artificial stone reaches from the base course of Botticino marble through two storeys to the ceiling, divided into six full length panels in cream and gold. These in turn are re-panelled to accommodate an extensive series of well modelled bas-reliefs of local and national interest, the more important of which are the sunburst, Scotch thistle, porcu-

pine, dragon, etc. The soffit of the beams are also ornamented in low relief with models of a pine cone, laurel, tulip and other features typical of Canadian life. Here is demonstrated the advisability of large window openings, which are always better in respect to lighting as well as decorating. The draperies consist of Venetian figured velvet with a straight lambrequin, the chairs of characteristic X and stretcher design with coverings fastened by brass studs, the carpet of a two-toned olive green Wilton, and all woodwork of a silver gray oak. The large electroliers hanging from the ceilings, and appliques fixtures on the walls are of antique bronze. In time when the walls mellow this room will be an ensemble of architectural refinement, possessing a quiet dignity and a harmonious charm unusual in public dining-rooms.

As stated before, the view from the main entrance through the imposing rotunda leads to the circular palm room, some forty-four feet in diameter. The room has been designed in the Adams style, with a thought towards the restful comfort of the guests, and everything was excluded which might interfere with the harmonious relationship of the tout ensemble. Covering the entire wall surface and rounded ceiling, the slightly textured Caen stone evidences the



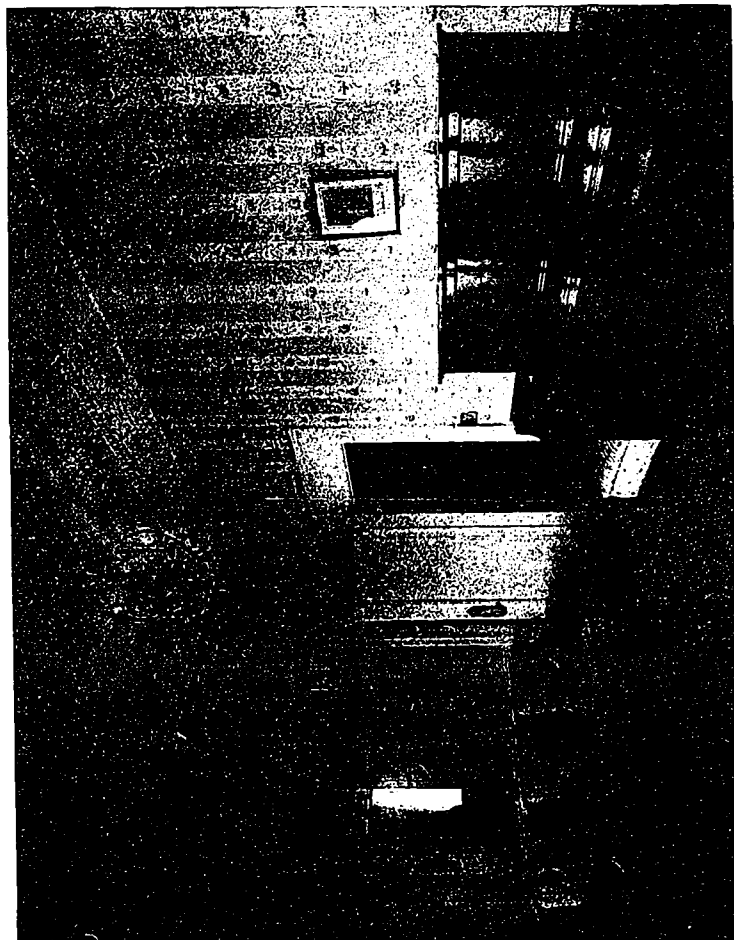
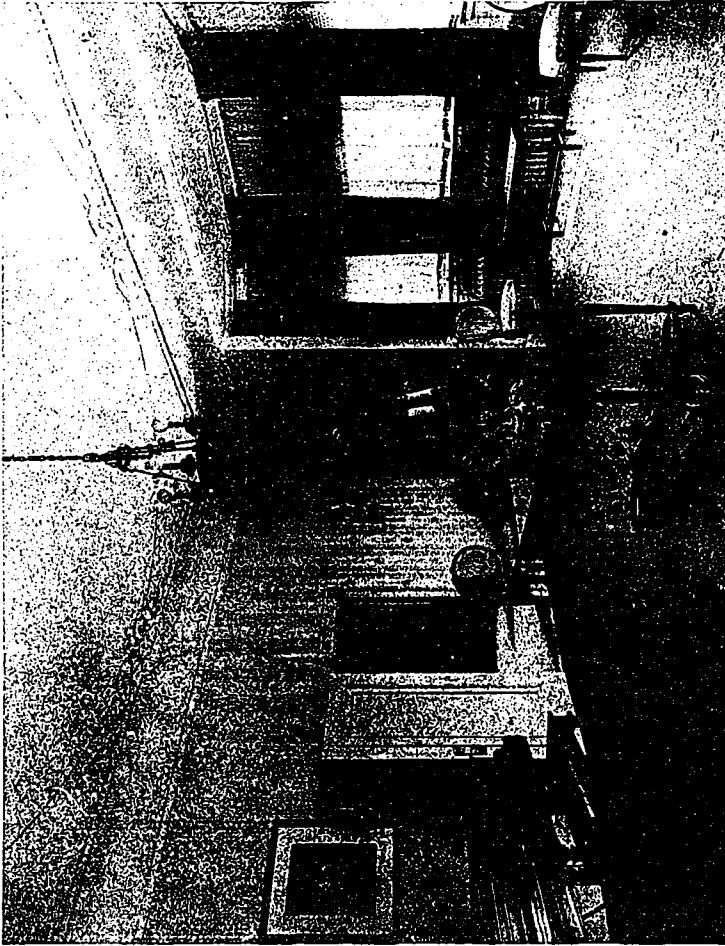
GRILL ROOM.

charming effect to be obtained by the proper use of one material. The detail is kept in low relief, and the ceiling reflects the care taken in laying out the floor pattern, with Napoleon gray and Belgian black marble. Even the ventilating screens in the frieze have entered into the scheme in such a way as to become part of the general design. Here also is the large window treatment brought into sympathetic relationship by green and gold damask curtains. The furnishings are of birch; the rug of hand-tufted Donegal; the fountain and flower boxes, replicas of well known work. In addition to the antique finished lighting fixture suspended from the centre of the ceiling with eight clusters of seven candles each, the pilasters have bracket clusters similar in finish and style, while around the wall are placed thirteen small tables, each one having a small antique lamp. A musicians' gallery has been placed on the mezzanine floor so as to furnish music, both to this room and the main dining-room, which will in no way interfere with the conversation carried on by the diners, but rather lends itself to their enjoyment, with its soft and subdued tones. The plan of this room in conjunction with the two other rooms of the ground floor is undoubtedly a perfect arrange-

ment for dining service, both from the point of convenience to the guest, as well as economy and efficiency to the hotel management.

The third and last restaurant on the ground floor is the cafe or breakfast room, approximately forty-five feet square and extending through two stories. The walls have a Doric treatment with a great fret running between the pilaster caps, above which are decorative frieze panels for the accommodation of ventilating registers. Three large panels finished in gold and cream form the ceiling, each one being subdivided into squares from which are hung the inverted electroliers by a series of chains finished in antique silver. The walls have a four-foot marble wainscot, relieving the effect which might arise from an over use of the Caen stone treatment. At the thirty small tables are hardwood chairs of the Hepplewhite shield shaped back with epaulettes of silk velour harmonizing gracefully with the mulberry silk velour hangings finished in galloon and bullion trimmings. Besides the nine large ceiling fixtures are the wall brackets, each containing three lights and typical of the eighteenth century school of architecture.

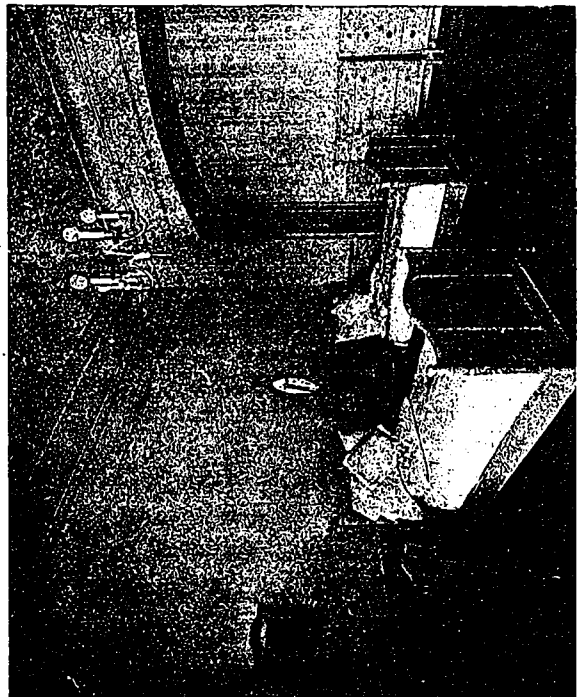
CONSTRUCTION



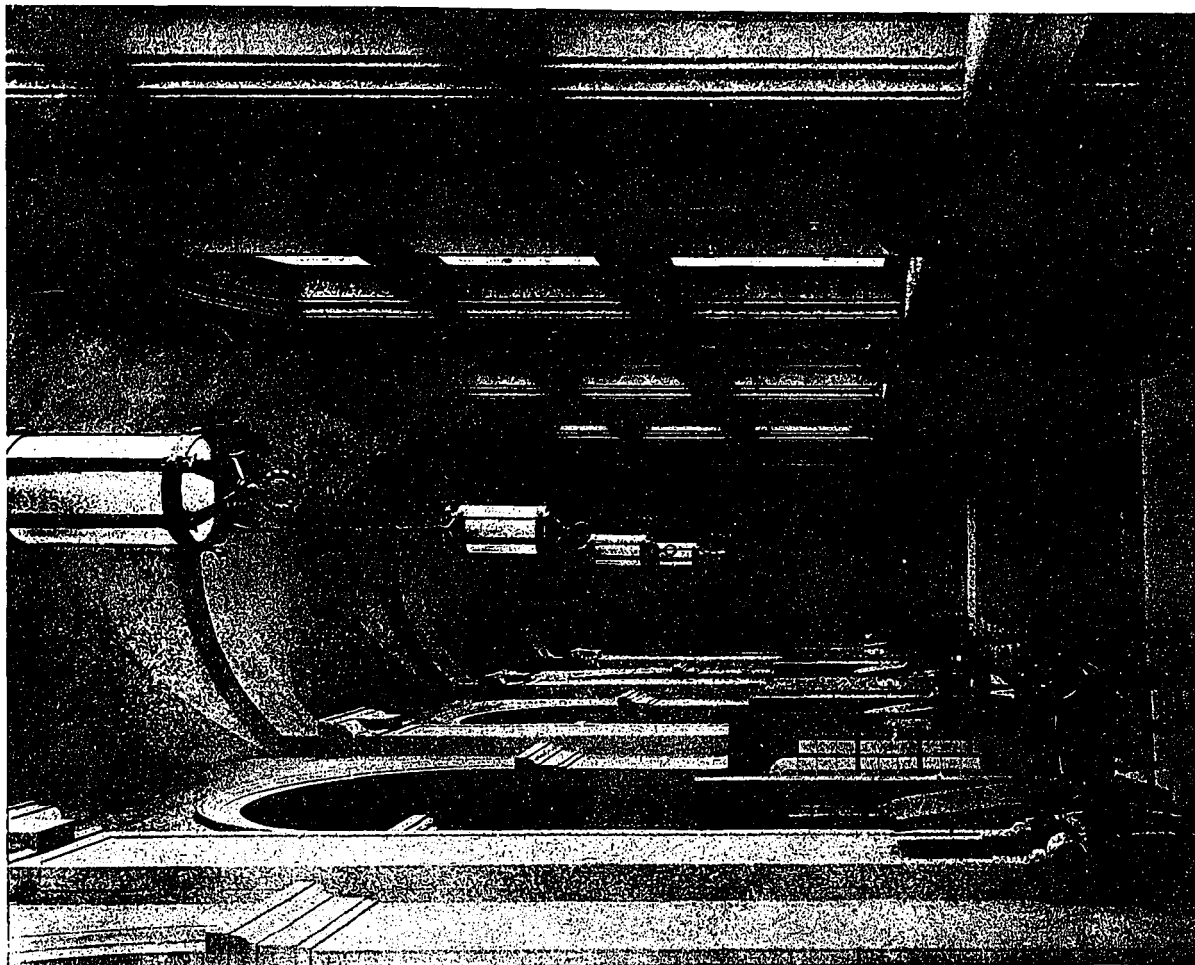
BED ROOM.

SITTING ROOMS.

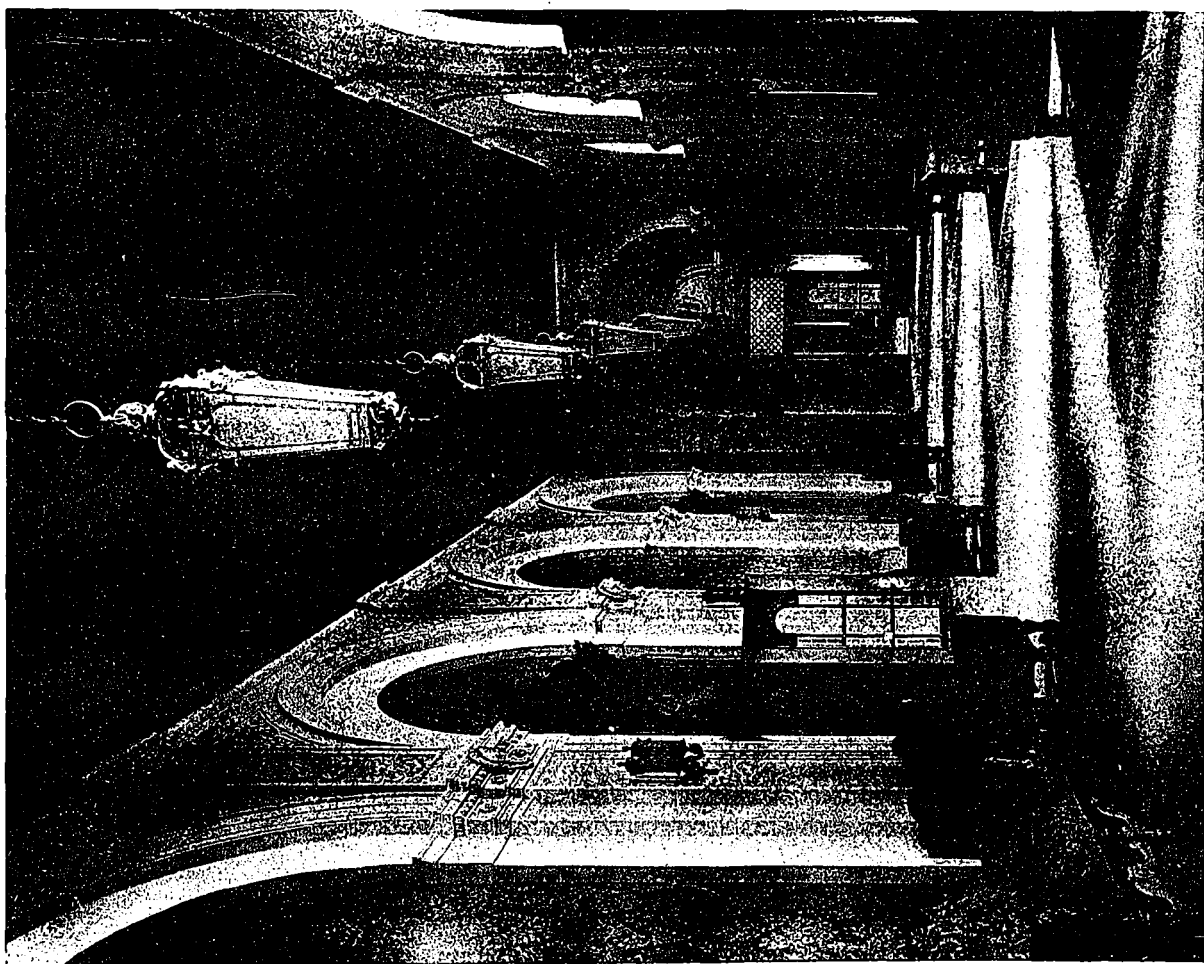
STATE APARTMENTS,
FORT GARRY HOTEL,
WINNIPEG, MAN.



BED ROOM.



LOGGIA.



FORT GARRY HOTEL, WINNIPEG, MAN.

FOYER.



PALM ROOM.

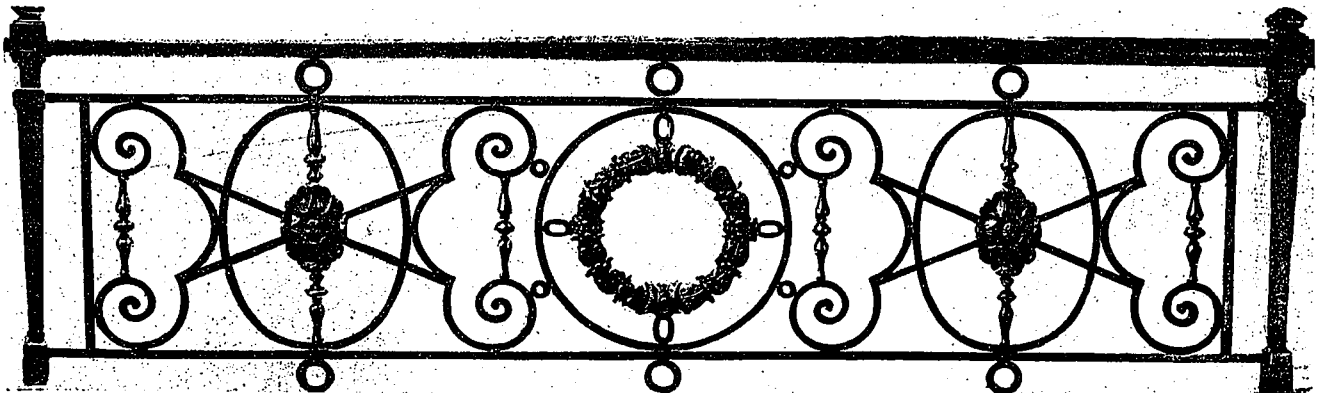
No room is more inviting than the bar, which measures forty-three by fifty feet, effective in its good taste rather than elaborate and gaudy treatment. Above the high red oak wainscot panelled in low mouldings runs a decorative hand-painted frieze of a deep reddish tone with neutralizing colors. Every six feet is a small circle containing a sheaf of wheat, lion, cross, etc., which lend a subdued interest. Massive beams divide the ceiling and are supported with heavy brackets containing the carved likeness of the ancient gods and goddesses who guarded over the Bacchanalian interests. The tables and chairs of red oak, the windows of stained glass, and the Swedish iron lighting fix-

tures attached to heavy chains all add to the rich and refined atmosphere. The pavement of deep red tiling gives a finishing touch to this creation of subdued coloring and richness.

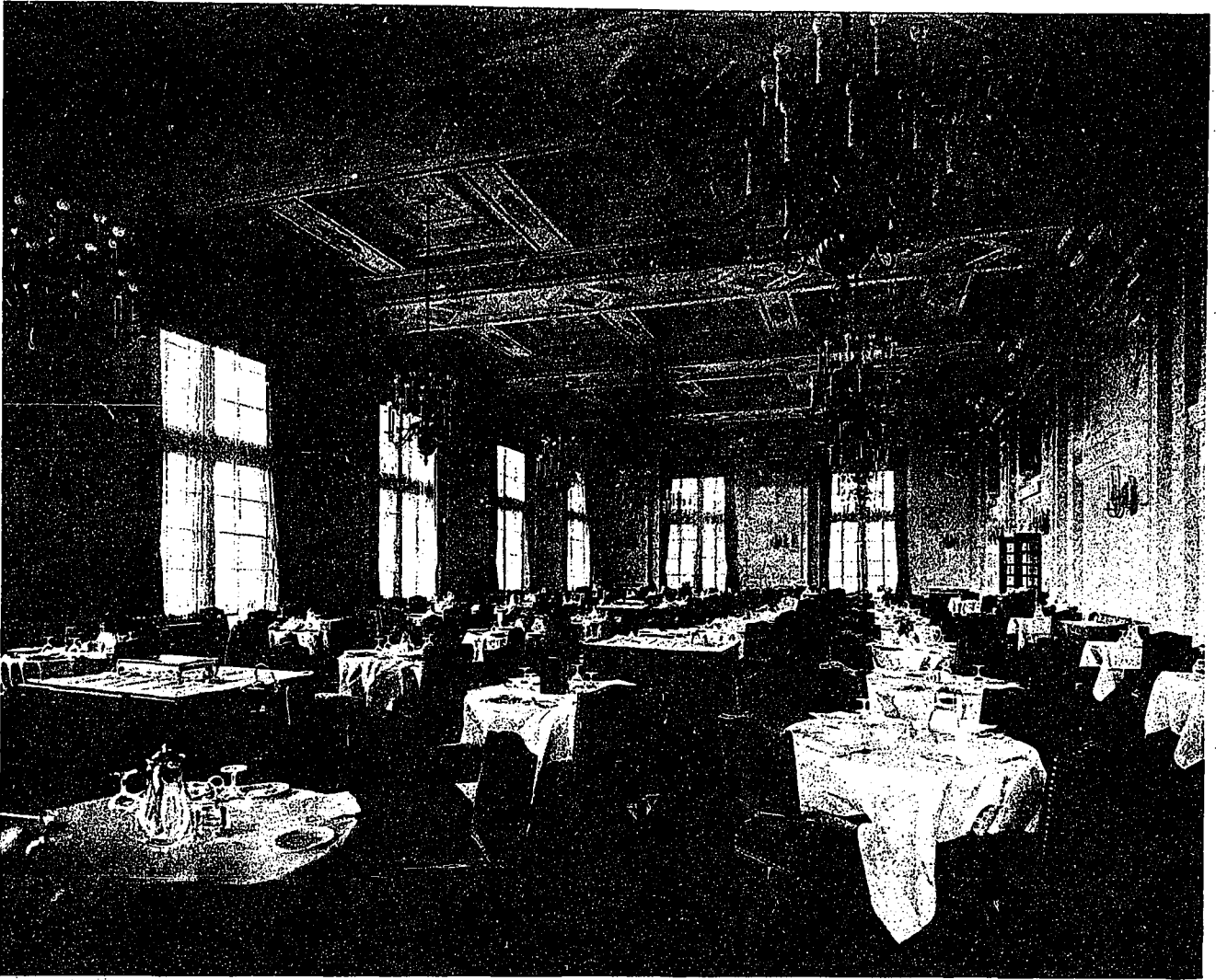
In the basement is the grill room, forty-five by fifty feet, with a double panelled wainscot of Flemish oak seven feet high and a reddish brown rough plaster frieze above. The large ceiling beams have hand painted floral patterns of subdued coloring, between which are plain buff plaster spaces. This room also possesses a warm æsthetic atmosphere heightened by the use of deep red tiling on the floor, stained glass windows with dull colored patterns, and hammered wrought iron fixtures. Near by are the barber shop and public toilet finished in marble floors and walls with alba glass in the indirect lighting fixtures.

The only feature of interest aside from the State apartments between the mezzanine and the seventh floor are the private dining rooms on the first floor. These rooms are located so as to afford the strictest privacy and at the same time most accessible to the elevator service. They vary in size from fifteen feet square to fourteen by forty-five and designed after the Jacobean period in respect to the wall treatment as well as

the furnishings. Two have oak panelling extending to a frieze of appropriate fruit and floral design, one of which is artistically handled in lavender and dull yellow, while the other is in harmonious shades of gray, greens and red. The third room is decorated in mahogany with large panels extending to the ceiling—a simple but ornate ceiling. The carpet and upholstery are in a rich blue, the hardware in dull gold, with the buffalo emblem at the top of the lock and the monogram of the hotel on the knobs. The fourth room, treated in maple, contains tapestry panels encased in gold and cream mouldings, with curtains and carpet of varying shades which give to the ensemble a rich wine color. In connection



BRONZE RAILING.



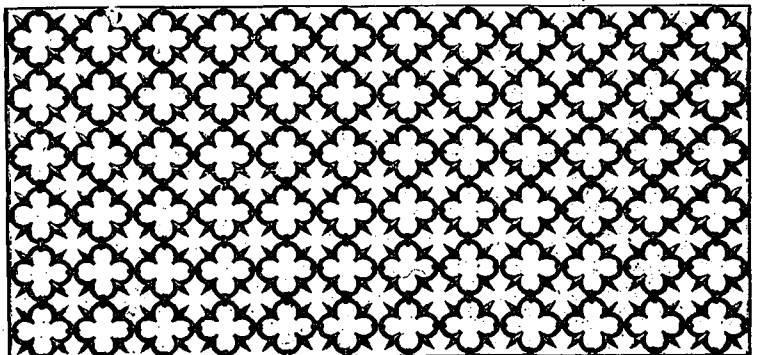
MAIN DINING ROOM.

with the private dining rooms is a kitchen containing two steel dish warmers with plate shelf and doors opening on both sides; a refrigerator; glass and silver washing sinks, and rinsing apparatus. It is reached from the main kitchen by service waiter and freight elevator. The space permits of ample accommodations for the four rooms at one time and regulated in such a manner as to permit of no change in the food served.

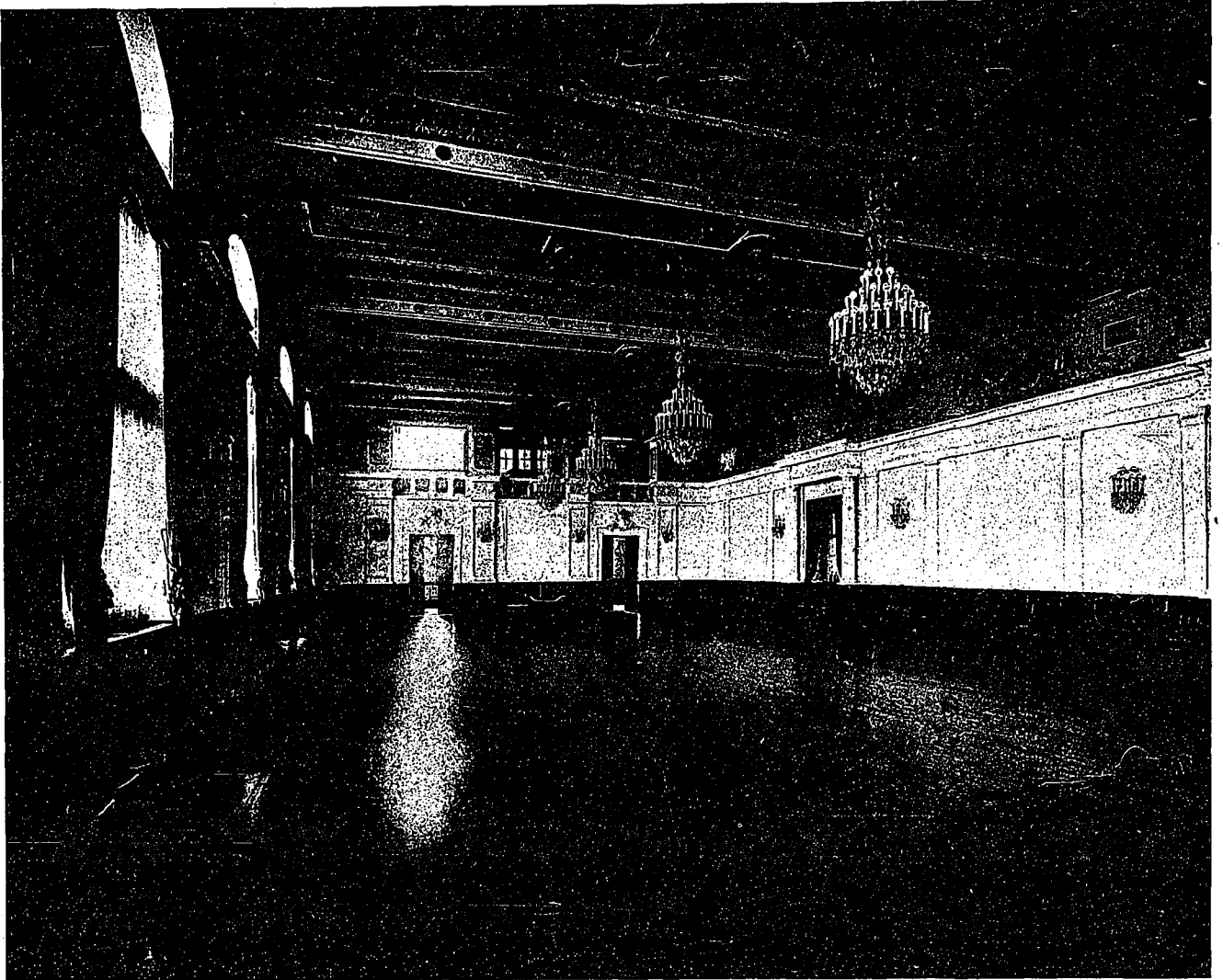
A modern hotel in cities the size of Winnipeg must cater to the social life, and in order to meet this exacting demand the whole seventh floor has been planned accordingly. The banquet hall, which occupies the entire end of the building, will accommodate six hundred diners. A genuine warmth is felt in the architectural handling, the walls being treated in oak panelling fourteen feet high with a rough plaster above stained in harmonizing tones of brown. The large ceiling beams are painted in such a manner as to reveal the texture of the woodwork through the decorations; at the top of the large windows are leaded glass effects containing landscape

views, emblematic shields, etc. From the ceiling are suspended ten chandeliers with Dutch fittings of antique brass hung from chains and each having twenty-four lights. The furniture of the William and Mary period has high backs with tapestry coverings depicting the sports and pastimes of that period. This room is used also for a concert hall and is especially noted for the acoustic properties. A stage eighteen by twenty-three feet and dressing rooms have been arranged at one end for the reproduction of plays.

The ball room, which occupies a corresponding position to that of the banquet hall at the



BRONZE GRILLE IN FOYER.



BALL ROOM.

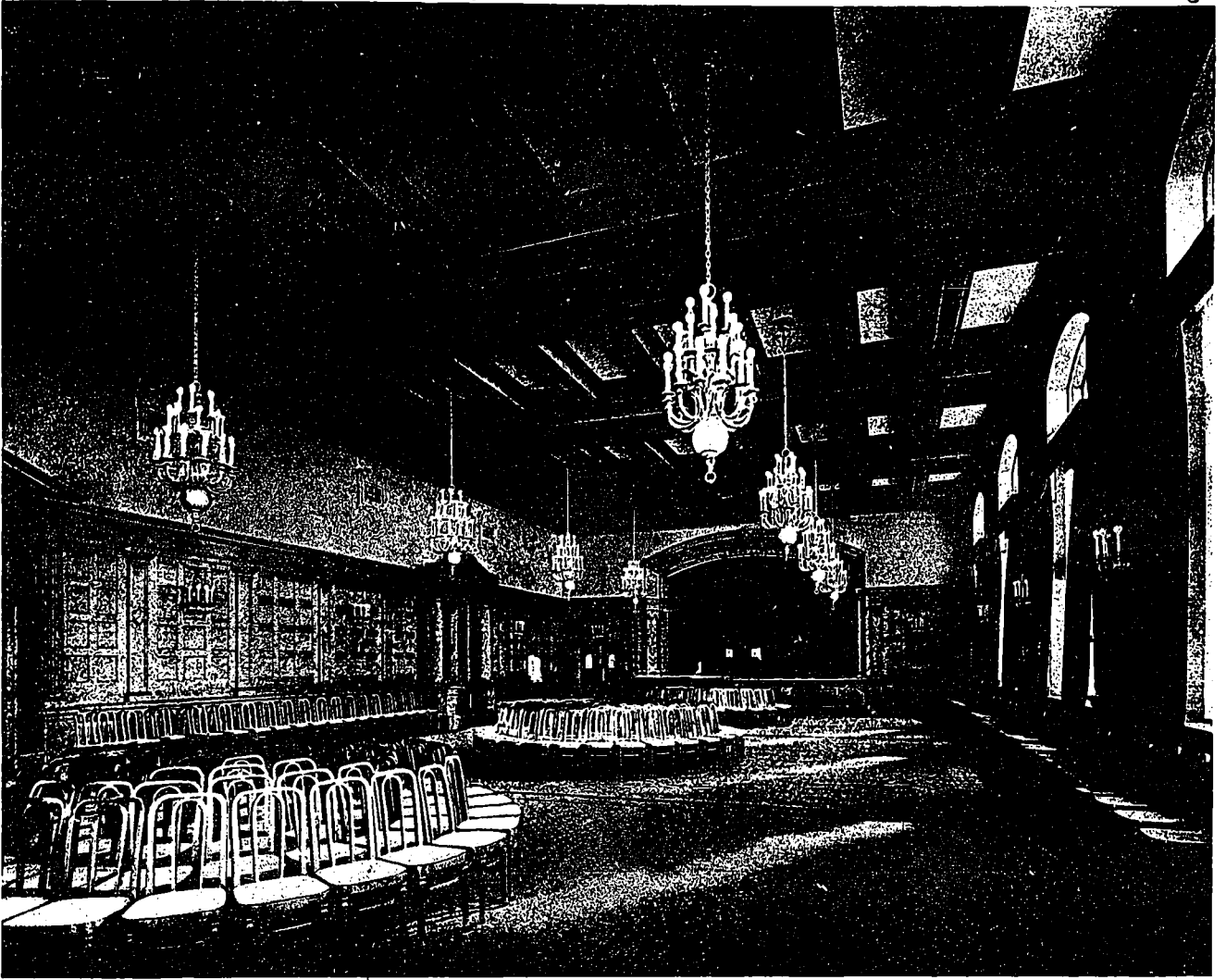


ENTRANCE TO BALL ROOM.

other end of the seventh floor is especially pleasing in its chasteness, there being a lack of the usual gaudiness displayed in rooms of this character. Above the wood wainscot three and one-half feet high the walls are treated in Caen stone to the decorative frieze of blue field with patterned displays typifying the life of the Province. The room is well lighted in day time by the large windows, which are brought into harmony with the general effect through a stained glass, each window containing the heads of two prominent musicians; at night time the large space, forty by eighty feet, is flooded with light from the large crystal fixtures in the ceiling and wall brackets finished in old gold. The wood-work is of birch stained gray; the curtains and upholstery of blue silk velour.

At the rear is a musicians' gallery located between two card rooms, all overlooking the ball room and protected by means of an elaborate bronze screen.

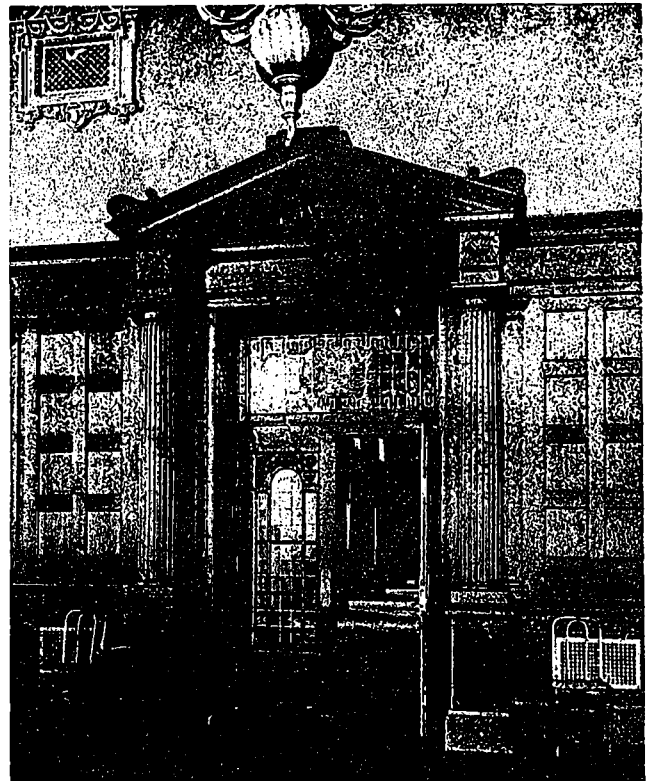
Joining the banquet to the ball room and serving as a promenade and refreshment salon, are the foyer and loggia, running parallel with the main facade and connected by means of six large openings with carved oak doorways and bronze screen work above. The loggia gives the impression of an ancient cloister, being finished above



BANQUET HALL.

the marble floor in Indiana limestone with a vaulted ceiling. The windows have been constructed so that the large openings can be made clear of glass, frames, etc., in the summer time, affording an unobstructed view over the city and prairie land beyond, an interesting feature to the guests as they promenade back and forth. The electric fixtures are of wrought iron resembling a lantern of the middle ages; the furniture of carved oak after the style of Louis XIV; the carpet an Axminster of two toned brown and green. Passing into the foyer, the walls are panelled in brocatelle of flower clusters; the draperies of silk velour with French corded beadings; the floor covered with an amber Axminster carpet. Between the oak beams in the ceiling are floral paintings from which are hung artistic lights casting a rich subdued illumination over the decorative spandrels moulded in low relief and suggestive of music.

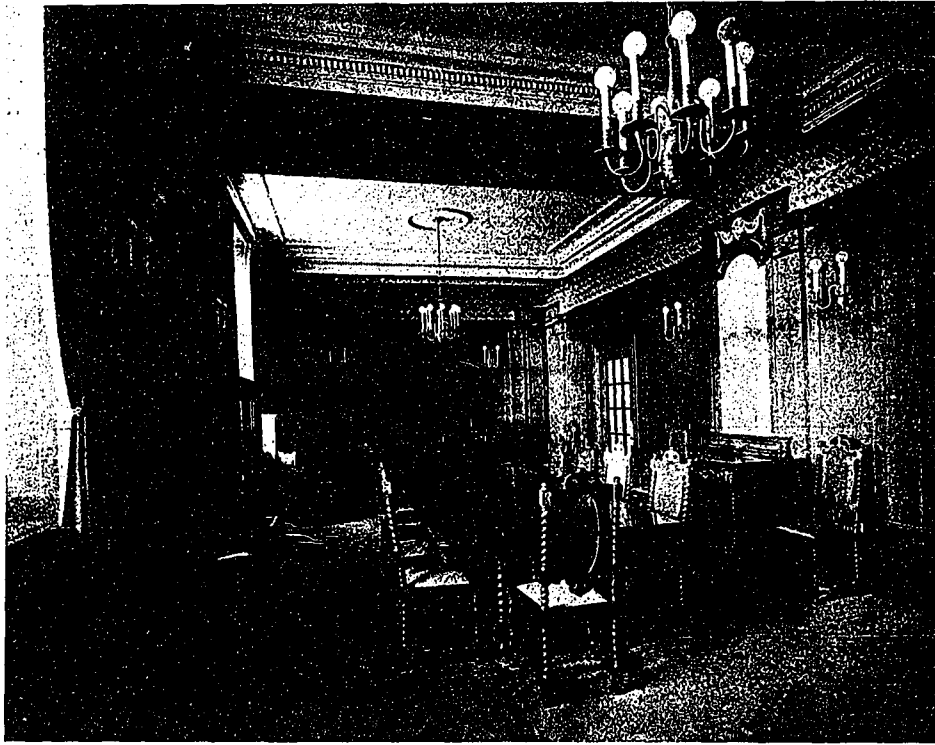
Leading from the foyer to the ladies' lounge on the floor above is a stairway whose walls are of Caen stone; the balustrade of carved oak; ceiling in panelled oak; carpet of Axminster in three shades of green. The lounge is warm and attractive in its decorative effect; the walls being panelled in Flemish oak, which material is used throughout, excepting pilasters and piers



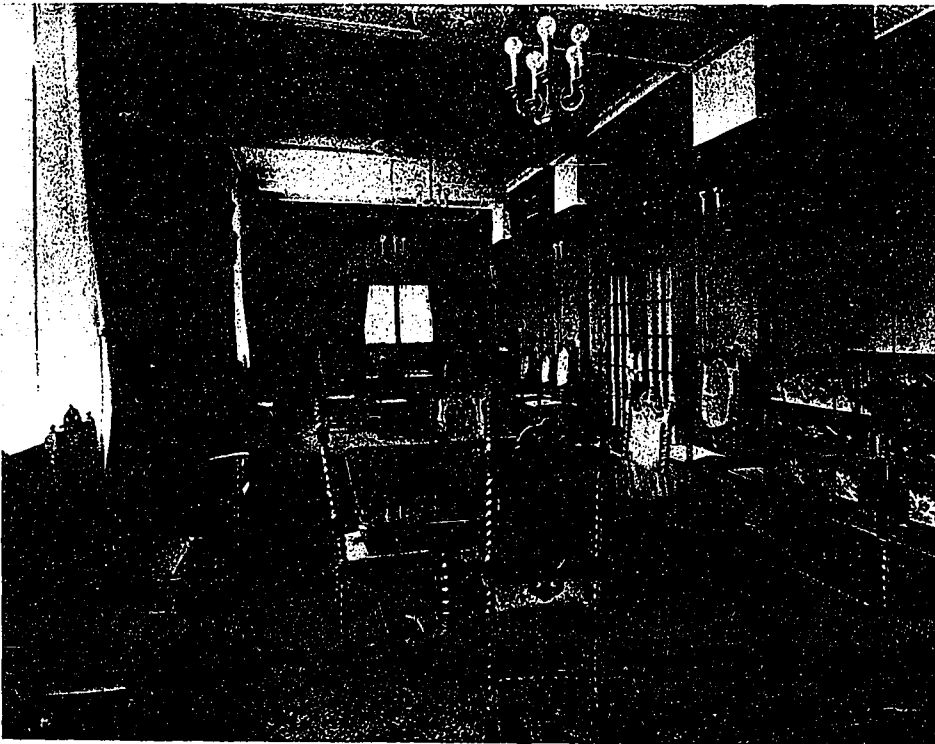
ENTRANCE TO BANQUET HALL.

of Caen stone; the ceiling in ribbed cream plaster treatment between the oak beams; floor covered with Wilton carpet in the greenish tones; frieze above the dado in deep colored tapestry depicting the customs and costumes of the Eliza-

ing with the room lend an additional charm to the ensemble. Adjacent is the ladies' retiring room, containing French prints in mirror frames against stippled plaster walls with oak trimming.



TWO PRIVATE DINING ROOMS.



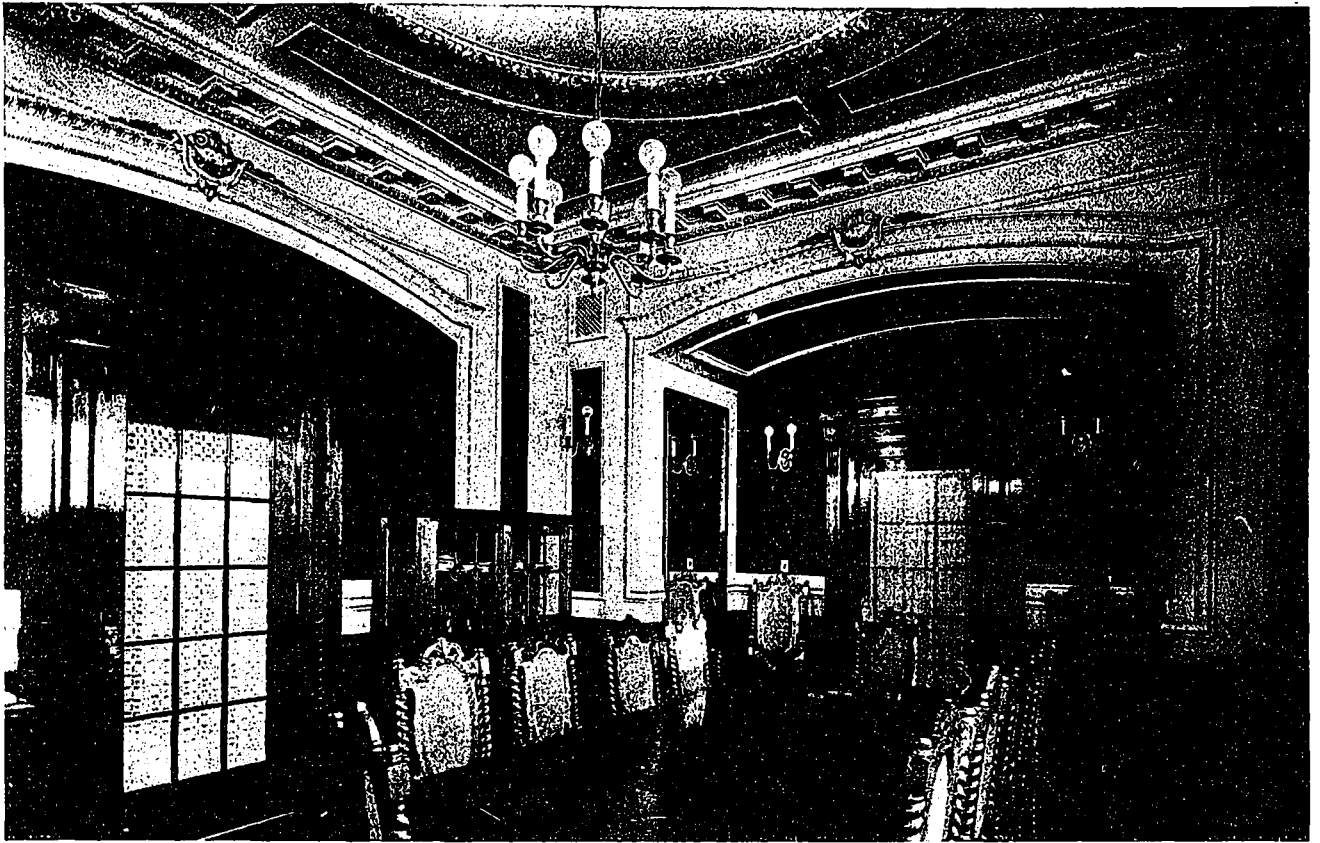
bethan period. The doors are finished with linen folds, while the capitals have Gothic trefoils issuing forth from the Tudor rose. Alabaster disks and wall brackets designed in keep-

covered with heavy carpet; the stair landings having terrazzo floors of white Italian marble.

In addition to the state rooms, the first floor has twenty-three bed-rooms with private bath;

The kitchen arrangement for the seventh floor is quite complete, consisting of two ten-foot iron sinks; three warming compartments with shelf surrounding; plate warmer with marble top and battery of five urns operated by steam; two polished steel cup warmers; dish washing apparatus with scraping table and canopy of monel metal; plate steel service table; three gas ranges; pancake and gas toaster. Direct communication to the main kitchen is furnished through the service and freight elevators.

In the railway hotel the typical or bed-room plan differs from other buildings of a similar nature in the number and arrangement of rooms for public and private accommodations and the bathroom facilities. Here the traveler demands the private bath and rooms of ample space. Accordingly considerable study was given to their size and shape, inter-communication, access to elevators and fire-escapes, and constant supervision by the proper persons over every room. Each floor has a clerk's desk stationed in close proximity to the elevator and main stairs, where business matters relating to that floor are transacted, and from where the entree and exit of all persons may be carefully observed. The corridors are wide, having a cement floor and mosaic border



PRIVATE DINING ROOM.

the typical floor—2, 3, 4, 5 and 6—thirty-two with and three without private bath; eighth floor, thirty-three with bath; ninth floor, six with and twenty-six without bath; tenth floor, twenty-seven without bath. This makes a total of two hundred and twenty-two with and sixty-eight without private bath. Each floor is also provided with at least two public toilets. Each bed-room is decorated in Louis XV style with carved walnut furnishings, also printed linen curtains and slip covers. A warmth is given to the delicately tinted walls and ceilings by the heavy carpet which is of a red, blue or green shade in harmony with the prevailing color scheme for that floor.

Appreciating the need of proper toilet and bath facilities wherever it was impossible to give each room a private bath, one was placed so as to be directly accessible to two



DETAIL OF DOORWAY.

rooms. Each bath has a mosaic floor and dado four feet six inches in height, composed of three-quarter inch squares of vitrified ceramic mosaic with a gray body and blue border on both the floor and walls. The furnishings consist of a vitreous water closet with white acid-proof seats and cover; cast iron enamelled bathtub and lavatory equipped with porcelain enameled ware and nickel fittings; glass towel bars and shelves; nickel plated sponge and soap holders, hand rails for bath and hanging baskets. Many of the bath rooms are inside, but it has been scientifically proven that they are as good as, if not better than, those placed on the outside when properly ventilated. Louvers are cut in the door leading from the bed-room and an exhaust register placed in the ceiling, so that the current of air is always positive from the room through the bath and up the vent shaft. This

not only guarantees pure air in the toilet but also furnishes a means of keeping the bedroom in the same sanitary condition. The state apartments are decorated in the Adams style, the sitting room done in mauve with mahogany furniture and lighting fixtures of silver finish; the bedrooms in old rose and green with antique ivory trimmings.

On each floor is a fully equipped service kitchen for private use having a direct connection with the service and freight elevators. In addition to a polished steel warmer and four-gallon hot water tank there is a refrigerator cooled by brine coils receiving its circulation from the main plant in the sub-basement.



DETAIL OF ROTUNDA.

In designing the kitchen, cleanliness and efficiency are of extreme importance. The proper location of the dining-space in relation to the accessibility of the kitchen and service departments have great bearing on the economical aspect as well as the entire satisfaction to the guest. Its size and position at the Fort Garry was carefully considered from the first, as a result an extremely satisfactory scheme has been planned for the complete service throughout the hotel. The communication between the kitchen and the dining-rooms are arranged so that there is no interference between waiters or noise to disturb the patrons; in regard to the main dining-room, there is a flight of stairs leading direct to a small serving room adjacent. The ceiling is high, giving plenty of light; the walls are of white glazed tile; the floor of large red tiling with ample floor drains for cleansing purposes. The kitchen is practically divided into the clerk's checking space in which are located the three rooms for silver, glass and dish washing, the service bar and the still room; the main kitchen where the roasting, broiling, etc., is done; the baking department for bread, pastries, etc.; the butcher shop; the general liquor store-room.

The dish washing department is separated from the kitchen proper, and located in the space between the waiters' entrances from the dining-rooms; the silver and glass each having a room aside from the china, all equipped with sinks, sterilizers, tables and shelves, the china division having in addition a dish-washing apparatus with canopy over and scraping table with recessed top. Facing these with a direct command of every waiter is the checking desk. To one side is the still warmer with marble table and five urns, gas toaster, automatic egg cooker, refrigerator, racks, etc.

In the kitchen proper is a series of ranges and broilers standing free from the wall with ample room on all sides. A low partition of white tile separates them into two rows, over which is a ten by forty-five foot monel metal canopy with a row of lights inside of the hood at the lower end. On one side are seven fire and oven ranges of extra heavy steel, fire boxes and ovens lined with Scotch fire clay over which is a double plate shelf; three gas salamanders; two charcoal and one gas broiler. On the other side set in steel drip pans are three aluminum steam jacket kettles and one upright steam cooker weighing thirteen hundred pounds; also two vegetable cookers, a forty-gallon cast iron grease kettle, an electric driven sauce machine and a section oven for special work. Along the wall next to the range are stationed a fourteen inch deep heavy galvanized iron sink, a vegetable peeler with motor and water connection, a twelve foot pot sink of wrought iron containing



GALLERY OF BALL ROOM, SEVENTH FLOOR.

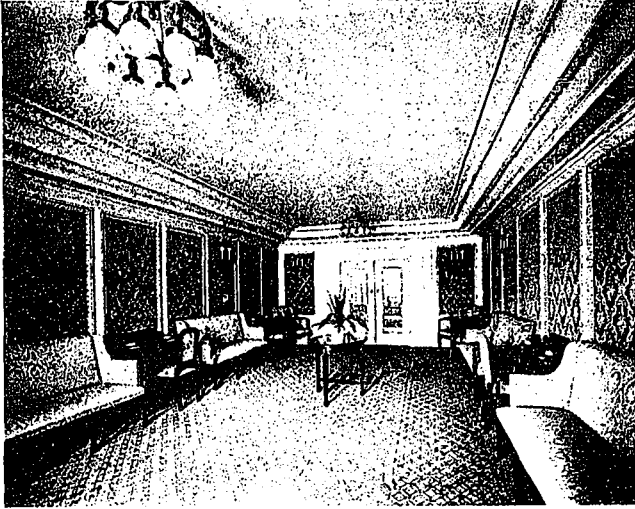
two compartments, and an iron sink for milk cans four feet square. Facing the opposite side of the range are placed a polished steel top cook's table five feet wide with shelves, two bain marie and a hot and cold water sink, carving tables with pot rack above, two steel top plate warmers with steaming shelf and tray warmers at the end.

To the side of the main kitchen is the garde manger's department equipped with serving and working counters, sinks and refrigerators; adjacent to this is the butcher shop containing six tables, block, electric driven mincing and sausage machines, enamelled sinks and refrigerators for meats, fish, etc. In front of these and in close touch with the kitchen are the pastry and bake shops. The pastry room is furnished with two marble top tables, combined gas pan cake, waffle and cup warmer with canopy above, candy furnace, fifteen gallon copper jacketed kettle, bake oven, ice cream freezers, icing mortar of solid marble, sauce mixer, sinks, tables, shelves, etc. The bake shop contains two work tables, cast iron dough mixer, steam oven, flour tins, thirty-gallon copper pastry kettle and polished steel steam proving oven. The oven is constructed of thick brick walls capable of distributing and retaining an even amount of heat. Over hermetically sealed tubes of three thousand pound pressure test is sprayed steam from perforated pipes which makes a dry steam for French rolls and bread. All wooden tables of ash and oak; all salamanders lined with brick

to retain heat. An oyster pantry is also provided with cookers, steamer, baker, sinks, refrigerators and plate warmer.

Throughout the kitchen are large refrigerators for meats, fish, oysters, creamery products, fruit, vegetables and liquors connected with a cold storage system. The refrigeration plant consists of two fifteen ton double-acting ammonia compressors, each one driven by an automatic valve steam engine, having a cooling capacity of fifteen tons of ice per day, fitted with double pipe condenser, hot gas entering at one end and cold water at the other. The brine coolers are twelve pipes high, each pipe being two and three inches. This plant furnishes a continuous supply of cold brine throughout the hotel and in each quarter the temperature can be regulated to suit the various needs. On the roof is placed a five-ton condenser piped through the building to charcoal filters placed in series and double pipe-cooling coil.

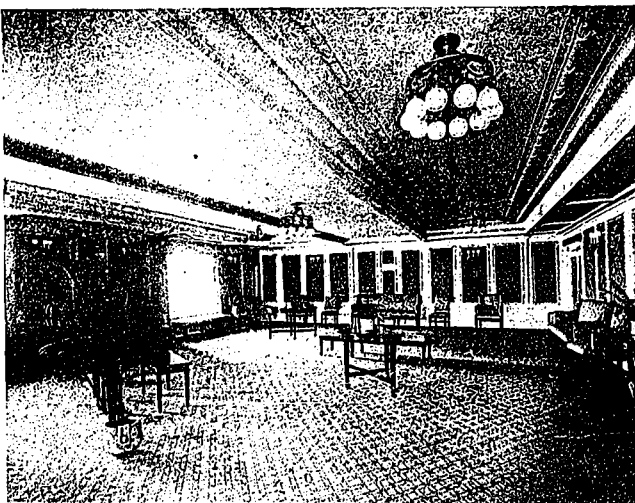
The cold water is supplied from an artesian well three hundred and fifty feet deep and from the city supply. Both services are connected with a water softening plant and can be used in conjunction with each other or separately. After being discharged into an auxiliary tank located in the basement it passes into a water softener of six thousand gallons capacity per hour with settling tanks ten feet in diameter and twenty-two feet high. From here it is pumped to two cold water storage tanks of 6,500 gallons capacity each, equipped with a six-inch connec-



LADIES' WRITING ROOM.

tion for house supply, the outlet being some inches above the bottom in order to prevent any sediment from entering the system. Further arrangements have been made through cross connecting valve lines to use soft water for boiler room and laundry in addition to hot water service, and hard water throughout the rest of the hotel. The piping consists of galvanized cast iron protected with sectional asbestos one inch thick and a canvas duck cover.

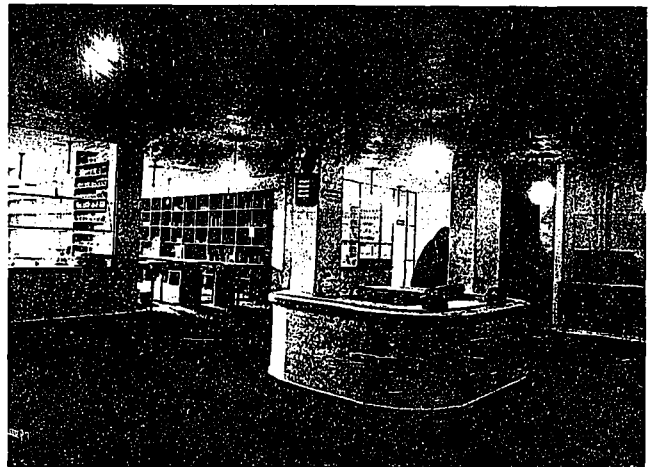
The hot water is supplied at a pressure maintained by the house tanks and generated by three hot water heaters made to withstand a pressure of two hundred pounds to the inch and sufficient copper tubing to heat the water 180 degrees F. The house supply is forced to the ninth floor ceiling where it connects to a horizontal system of piping; the risers are extended down to sub-basement ceiling and carried to main heater, forming a complete circulation. The kitchen and laundry supply as well as that for the barber shop and main lavatories is installed on the ceiling of the sub-basement, one of four thousand gallons capacity per hour, the



LADIES' DRAWING ROOM.

other five hundred gallons. All three systems cross connected to allow of one or all operating at the same time. The piping is of seamless drawn brass covered with eighty-five per cent. sectional magnesia one inch thick; the heaters are protected by two inch magnesia wired on and coated with a hard plastic substance.

Five supply and nine exhaust fans are installed for the indirect heating and ventilation system. Two fans, each of 25,000 cubic feet capacity per minute take care of the ground floor, mezzanine, grille, barber shop and public toilets. The air enters through copper louvers with one-half inch wire mesh, tempered by passing over cast iron steam heaters, filtered through cheese cloth screens, and reheated by coils of sectional heaters to the desired temperature by thermostatic control. The air enters the rooms near the ceiling and is drawn out through ventilators at the floor by two exhaust fans at the roof. The seventh floor has a supply fan of 25,000 cubic ft. capacity and exhaust of two fans, 10,000 ca-



CLERK'S DESK IN KITCHEN.

capacity each, all of which are located on the roof. Two fans, located at engine mezzanine floor, supply kitchen, laundry, bar, engine, boiler, wine and pump rooms; air admitted as already described, except in the boiler, where it is discharged so as to blow directly on the firemen. A special exhaust fan in sub-basement discharges the foul air from ceiling of boiler and engine rooms; two fans on the roof take the remaining portion of the kitchen service, while two fans are used in the toilets and private baths on all floors as mentioned above.

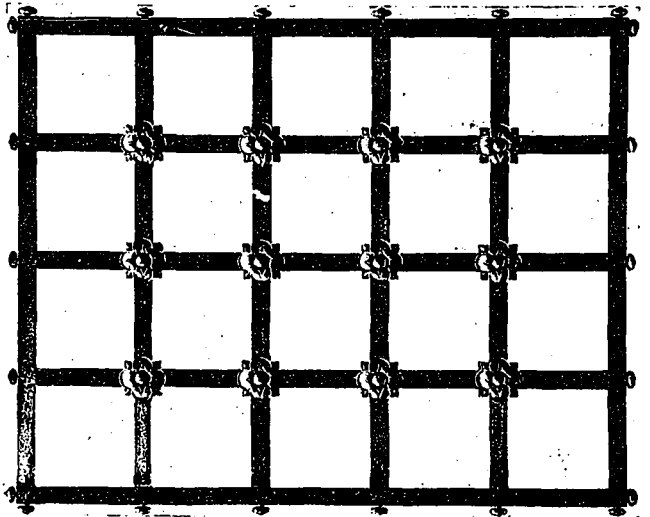
In the main rooms the air is changed every eight minutes, although the fans permit of a twenty per cent. increase of speed which in turn produces better ventilating facilities. Galvanized ducts lead to the registers which are equipped with a damper controlling the amount of air supplied or exhausted. The condensation from the radiators and heating coils passes to a tank three feet in diameter and ten long, where the

air is separated from the water which is forced by a vacuum pump into a feed water heater, from where it is sent to the boilers by feed pumps. The vacuum pumps also maintain a partial vacuum in the piping system connecting the radiators with the receiving tank.

Four boilers of three hundred horse power each, have been installed, which are internally fired and produce a rapid circulation by means of a plate at the front, which compels the water from the drum to pass around the shell and rise between the furnaces and among the tubes passing to the rear.

Three sewerage ejectors with a capacity of one hundred and fifty gallons per minute are located in a pit under the boiler room floor. The ejectors are connected to the compressed air tank in the boiler room and have a three-inch vent pipe extending to the roof.

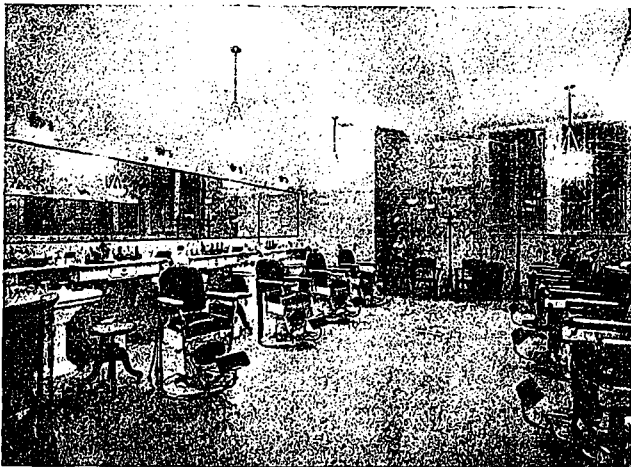
An adequate system of fire proofing has been adopted by means of a pump with four inch rising lines from which branches lead on all floors



GRILLE IN PALM ROOM.

cotta, floors of marble, tile or cement, and stairways of metal. It was erected and completed under the direction of the architects for the Grand Trunk Railway System, Ross & Macdonald. The following well-known companies furnished material for the Hotel, all of which have been instrumental in giving to Winnipeg one of the best structures in Canada, both from a practical and artistic standpoint: Cluff Bros., toilet and bath-room fixtures; Estey Bros., ornamental bronze work; International Varnish Co., Ltd., elastica varnishes and kleartone stains; Linde Canadian Refrigeration Co., refrigerating machinery and cork insulation; McNulty Bros., Ltd., plain and ornamental plastering, imitation caen stone, metal furring and lathing; Otis Fensom Elevator Co., passenger and freight elevators; Pedlar People, Ltd., lath and corner beads; Stinson-Reeb Builders' Supply Company, Ltd., medusa waterproofing; Tiffany Studios, decorations and lighting fixtures; Tuttle & Bailey, registers and grilles.

While many architects place emphasis on the exterior design and others neglect the general appearance for the plan, it is extremely satisfying to see a building handled with proper attention paid to both. Much credit is due the Grand Trunk Pacific Railway for securing a hotel that is not only imposing but which embodies the essentials of a modern, up-to-date home, catering to the needs of a fickle public.



BARBER SHOP.

to a hose rack having one hundred feet of linen hose with nickel-plated nozzle.

A set of spherical nickle plated copper sterilizers have been provided, the upper one being sixteen inches in diameter, the lower one twenty. They are equipped with steam connections and furnished with pressure gauges, safety valves, etc.

The building is thoroughly fireproof, the steelwork non-expansive, the partitions of terra



BRONZE RAILING IN MUSICIANS' GALLERY.

CONSTRUCTION

A JOURNAL FOR THE ARCHITECTURAL
ENGINEERING AND CONTRACTING
INTERESTS OF CANADA



FREDERICK REED, Editor

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Vol. VII Toronto, June, 1914 No. 6

CURRENT TOPICS

CHADWICK & BECKETT, architects, formerly located at 18 Toronto street, have moved their offices to 132 Church street, Toronto.

* * *

IN discussing the lift bridge at Kamloops, B.C., in the March issue of CONSTRUCTION, reference was made to the supervision of same by H. L. Johnston, Divisional Engineer, C.N.P.R.R. Mr. Johnston did not have charge of the construction work, excepting the grading adjacent to the bridge.

* * *

IT has been decided to transport the two giant statues of Rameses II from ancient Memphis to Cairo, where they will be erected in the new Station Square that has recently been made. Considerable repairs will have to be done to one, if not both, of the statues, as it is feared that the legs will not be strong enough to support the bodies. Special arrangements are being made for the transport to Cairo, and the State railways are constructing special trucks and adjust-

ing the line at various points, such as the stations, where it is not wide enough. The total cost of erection and transport is at present estimated at \$50,000. There is no doubt that Lord Kitchener's idea was to move them to the Station Square, and that it is far better to erect these statues on a site where they can be appreciated than to leave them lying at Memphis, which is not the original site, and where one of them, at any rate, is at present on its back.

* * *

UNDER the auspices of the Government of Alberta, the Alberta Town Planning and Housing Association will hold a convention in Calgary, June 16-18. The feature of the conference will be the consideration of a proposed Housing Bill for the Province of Alberta along with the exhibition of the Mawson plans for Calgary and civic schemes for various cities in the Dominion.

* * *

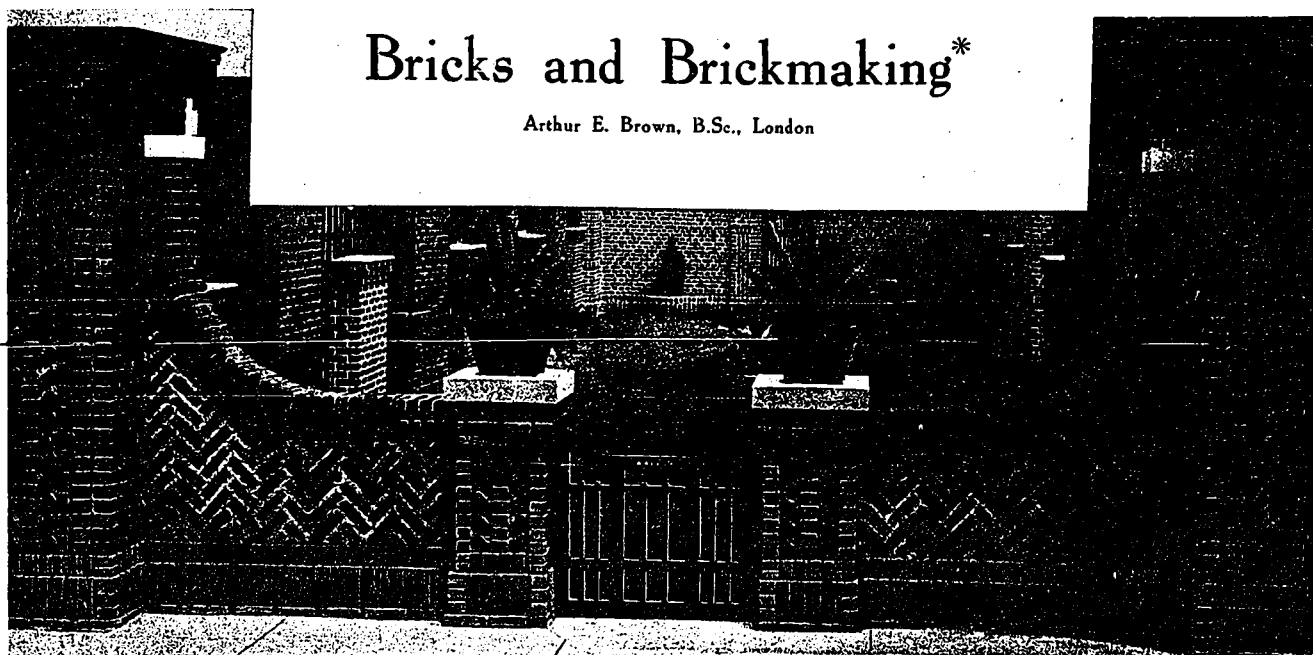
CONSTRUCTION work on the \$300,000 Canadian pavilion at the Panama-Pacific Exposition was started in February. Colonel William Hutchinson, Commissioner-General of the Dominion of Canada, announced that the building will be completed by October 1. The \$300,000 to be expended upon the building is one-half of the total appropriation of Canada, but a large amount will be raised by the various divisions of the Dominion. British Columbia is now subscribing a large fund for the purpose of sending an individual exhibit to the Exposition.

* * *

THE ONE unnavigable link in the chain of lakes and rivers between the Northwest and the East occurs at Sault Ste. Marie, Michigan, where, in the rapids of the St. Mary's River, the waters of Lake Superior drop eighteen feet to flow into Lakes Michigan and Huron. At the present time there are three locks for lowering ships from Lake Superior to the Lake Huron level or elevating upbound vessels. On an average, one hour and fifty-nine minutes are required to "lock" a boat, including passage through the canal. But there is often considerable delay owing to congestion arising from fogs and other nonpreventable causes. Immediately after the severe fogs clear away sufficiently for safe navigation, ships hasten to the locks in such large numbers from both directions that the three available locks, although operating at their utmost capacity, cannot meet the sudden rush, and late arrivals must often wait eight to ten hours for their turns. When it is mentioned that each minute a loaded ore-carrier lies idle costs the better part of a dollar, one can readily appreciate the incentive which has actuated the United States Government to relieve this congestion and, incidentally, facilitate the normal handling of Great Lakes traffic by building the two largest locks in the world.

Bricks and Brickmaking*

Arthur E. Brown, B.Sc., London



THE materials of which bricks are made are in every sense common and perhaps for this reason alone the trade of brickmaking is generally looked upon as a low grade and common one. The uninitiated man says and thinks bricks are easy to make. You dig a lump of common clay, put it into a heavy and ungainly looking machine made mostly of common cast-iron, the wheels go round and out come bricks, which only require baking and they are ready for use in their millions. A simple proposition, indeed! Yet, I would remind you that immense sums of money have been lost, and very few fortunes made by this apparently simple business.

Clay, the staple material (not a mineral, by the way, in the legal sense), is found in many varieties in all parts of the globe, and the most important consideration of all in manufacture is the large bulk of material used and manipulated for a small ultimate return. The many varieties have as many various characteristics, and the problems of the business consist chiefly in discovering the best methods of utilizing these characteristics to the best advantage and overcoming those that are technically objectionable.

Geology.—Clays are found in two categories geologically, surface clays and geological deposits. The first named are those of more recent formation found in all parts of the world in comparatively shallow beds which have been deposited by ice, rivers or lakes in what is called the Pleistocene period. Such prehistoric remains as are found in any of them belong chiefly to the animal kingdom. These are not frequent, and consist usually of bones of large mammals.

The geological clays are of varying age. It may be sufficient to note further that clay in general is the product of the decomposition or disintegration of granitic or other igneous rocks and that all clays possess certain chemical and physical properties in common.

Chemistry.—It is frequently supposed that chemistry must play an important role in brickmaking. This is true, obviously to a certain extent, and in some branches of clay-making its importance is great. In the more ordinary use of clay for brickmaking, chemistry is, however, of

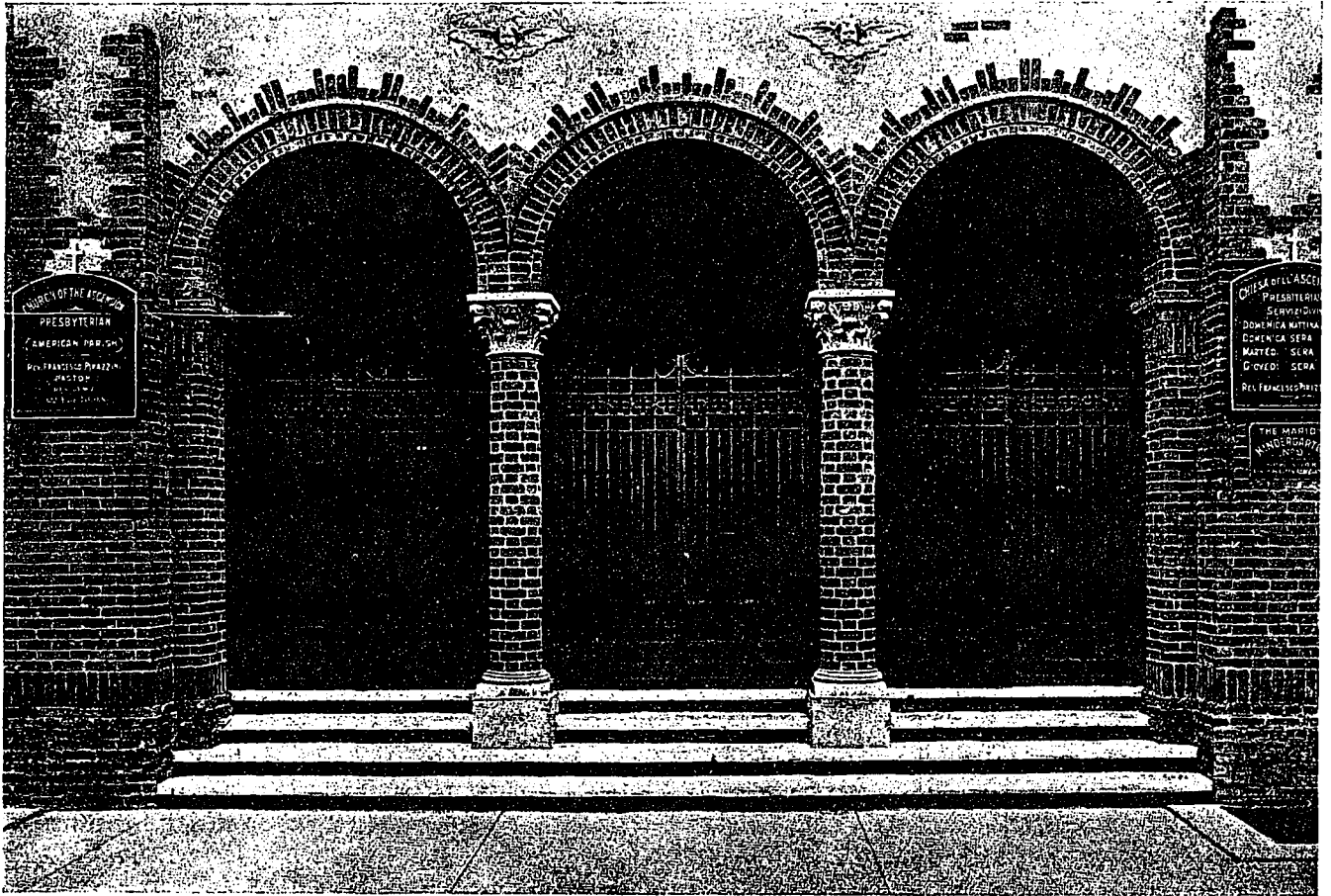


GARDEN GATE.

comparatively meagre value.

Chemistry tells us that clay is a compound of silica and alumina in fixed chemical proportions. It is what is called a hydrated silicate of alumina. Chemically, clay is this and this only, but in nature clays present almost infinite vari-

*Delivered before the Society of Architects, England. The illustrations do not refer to the text matter, but exemplify the various uses to which bricks are adapted.



ENTRANCE TO CHURCH.

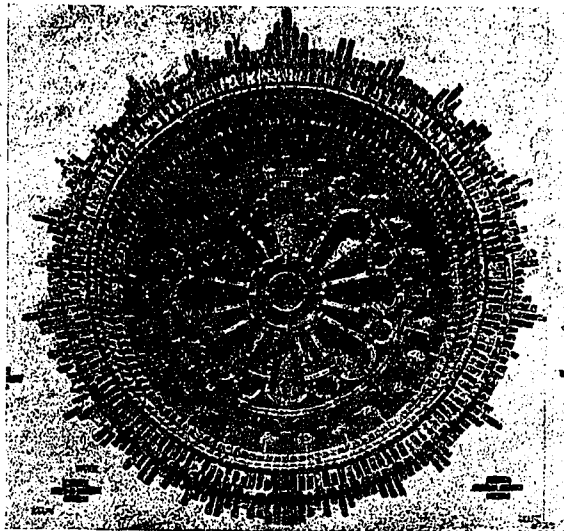
ety by reason of the presence of other substances. They contain free silica or sand in widely varying proportion. They contain also free oxide of iron, to which the red color of the Suffolk brick and the blue color of the Staffordshire blue brick are due.

They contain alkalis,—potash and soda, refractory earths,—magnesia and lime; many contain small quantities of oxide of titanium, a so-called rare earth. These are all in comparatively small proportions, and whatever plastic clay we analyze it is found to contain somewhere in the neighborhood of 85 per cent. of silica and alumina. Silica is sand. Alumina is the oxide of that peculiar light untarnishable metal aluminium, which has given chemists so much trouble to produce commercially, and metal workers so much trouble to handle and fashion for use. The few other materials found in clay have far less influence on the final product than does the varying physical condition of silica and alumina.

The presence of iron oxide has effect on the

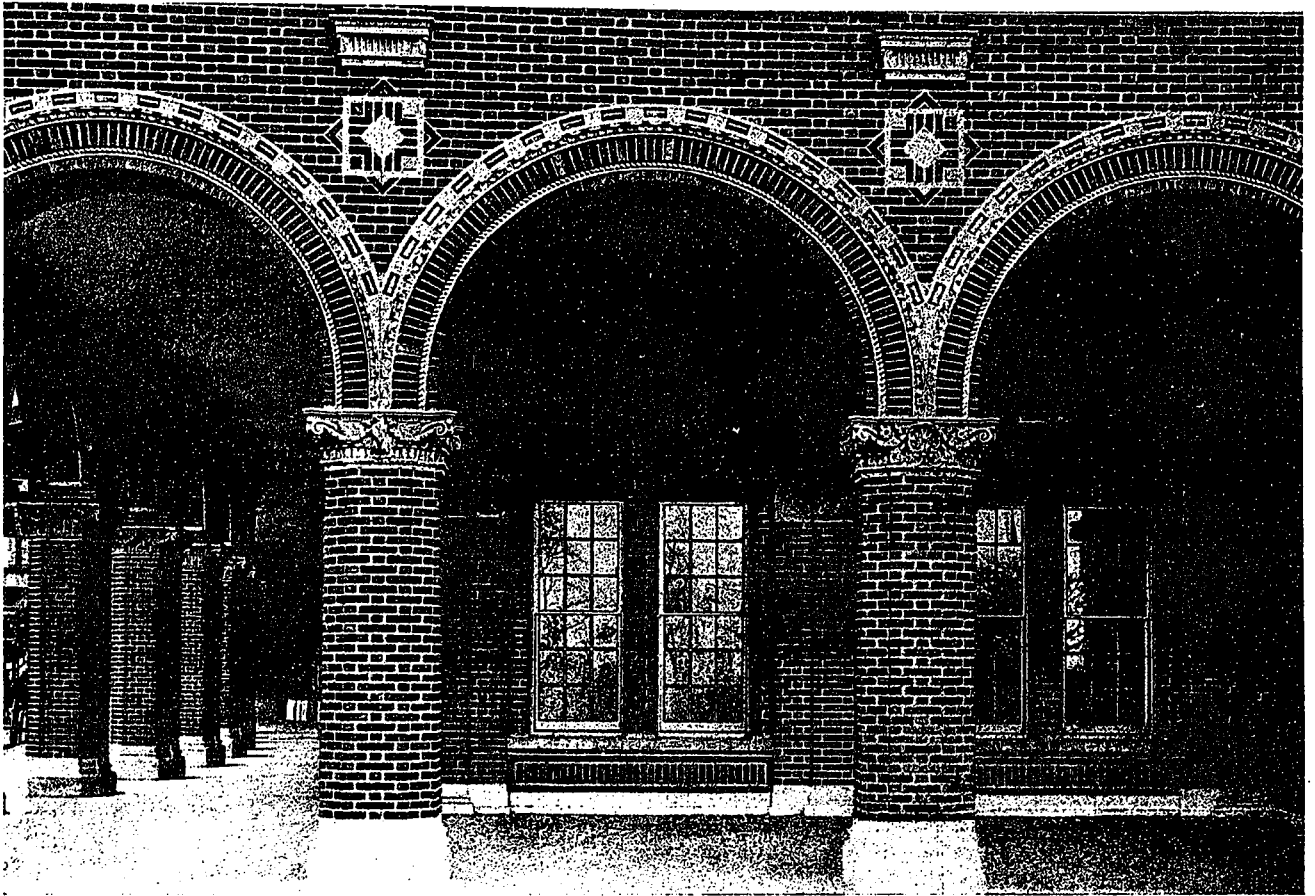
color, and the presence of lime also. The presence of lime and alkalis have marked effect on the fusibility of the clay under great heat. In these matters, chemical analysis is of assistance to us, but even so, practical examination will tell us all we need to know in these respects without analysis. The presence of water which can be measured by analysis interests us only when we turn to a physical examination of the properties of clay.

Physics.—Clay is unique, though to many it is only dirt, because it is the only substance found in nature possessing the property of plasticity, by virtue of which clay may be changed in form without breaking up or destroying its continuity, or may be joined without the use of any cementing material. In nature, most clays are only in a semi-plastic state, and become quite plastic when



ROSE WINDOW.

water is added to them. The purer the clay the more plastic it is in the natural clay beds, provided the silicate of alumina is in a state of division sufficiently fine. It would seem that this important property is due to the fact



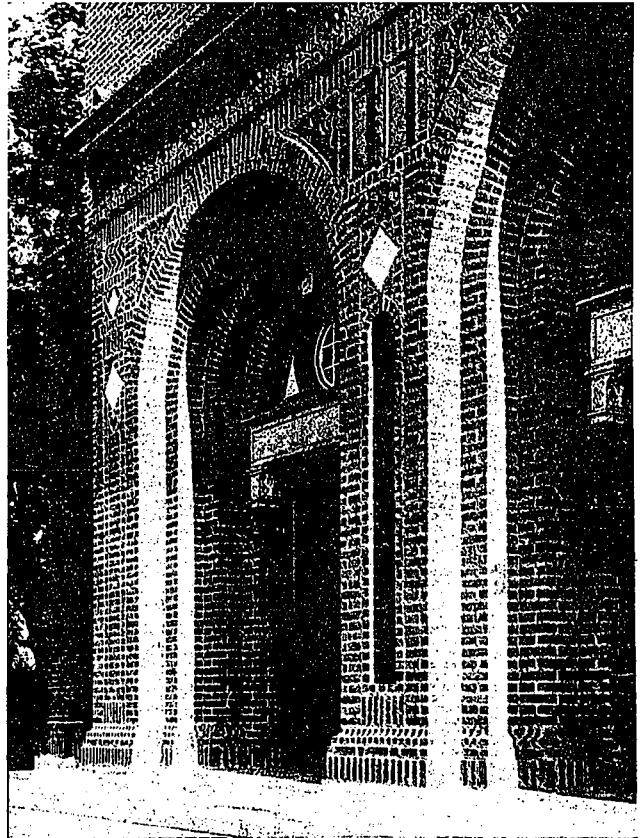
DETAIL OF BARGE OFFICE, NEW YORK.

that silicate of alumina can absorb water in large volume, at the same time becoming gelatinous and swelling up. It is this property that makes clay impermeable to water. From this explanation we can easily understand that when clay is dried and the gelatinous particles lose their water they become less in volume and shrink.

We all know that clay shrinks in drying because of the way clayey soil cracks in summer time. It is also pretty widely known that the more "sticky" the clay is the more it cracks when dried. This, it is apparent, is because it is purer and contains more of the gelatinous silicate of alumina in a given volume than a sandier clay or loam which shrinks less in drying. It will be clear, then, that a sticky or strong pipe or tile clay shrinks more in percentage than a sandy clay, but there is more in the matter than this. Given a sandy, less sticky or "milder" clay, the amount it shrinks in drying depends also on the shape and size of the sand particles. These are surrounded by the gelatinous material when wet, and at a certain stage in drying, they come so close together in the mass as to touch each other. Now, if the sand grains are rough and angular, their further movement is arrested, whereas if fine and round they can slide on one another into still closer positions, and so shrinkage continues further.

When a clay with fine round sand grains

dries, shrinkage goes on till arrested by the grains getting as close together as is possible,



ENTRANCE TO TEMPLE.

but still the gelatinous pure clay surrounding them goes on shrinking, with the result that spaces or pores begin to be formed in the mass, into which air enters. We thus arrive at another condition in which the pores formed in the clay gradually lose water throughout the whole mass. The size of these pores depending on the size and shape of the grains, we get two different states in different kinds of clay. The one is called porosity and the other permeability. They are only different degrees of the same thing, but they are interesting to the brickmaker because of the difference in quality of the brick produced and the different results obtained by different processes of manufacture.

All clays found in nature become porous when dried, but those with the larger angular grains are permeable even before drying. This peculiarity is of great importance in a building, for the striking reason that a permeable brick will



ENTRANCE TO HOUSE.

better resist the weather and will also "breathe" or allow air to pass through the walls. This is easily understood and is illustrated by a simple proposition. Take a glass tube with a bore of say one-eighth of an inch, or a straw, and one can easily blow through it. But take the broken stem of a thermometer which has a very fine bore and it is not possible. The passage of water is of corresponding ease or difficulty.

Now I can quite well believe that my arguments may convince you that the permeable brick will let more air pass than the merely porous one, but you will say that the same applies to water. This is true, but two points even in this connection still indicate that the permeable brick is best for buildings. The first is that, provided the wall is not too exposed to constant driving rains, in which case it should be built hollow, the water dries out very rapidly when the rain stops. In our variable climate, the permeable brick will usually dry out completely between the rain periods and before any water has penetrated the wall, and will again let air through. The porous brick will not, because it takes proportionately longer to dry than it does to wet. The second point is the effect of frost. It is well known that water expands just before freezing. That is why it cracks our water pipes. The same thing happens inside a brick, but when the water in a permeable brick freezes, the holes are large enough to let the ice squeeze out when formed and no harm is done. In a porous brick (that is one with extremely fine pores) the ice cannot squeeze out for the same reason as you cannot blow through a minute tube, and so it bursts the face off the brick instead.

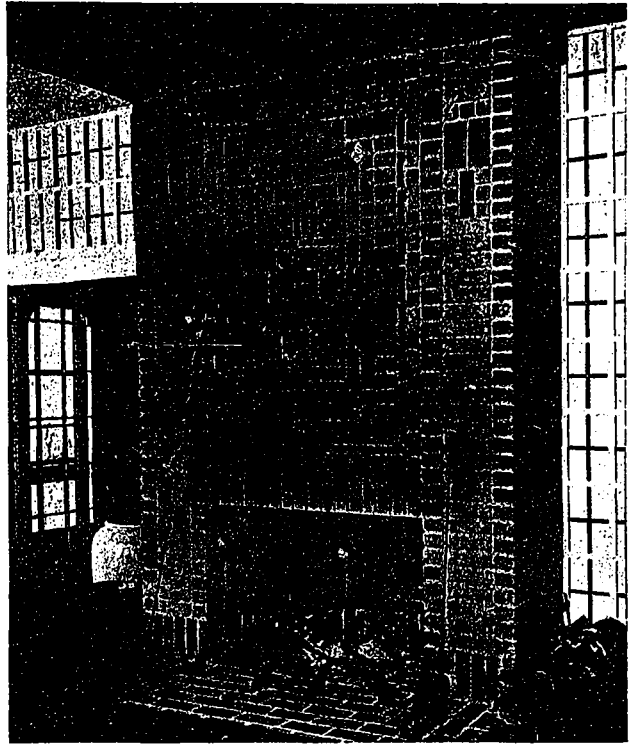
I must speak here in passing, of two



DETAIL OF LOGGIA.

kinds of brick in which the properties of porosity and permeability are of quite a different nature. These are the bricks made by the semi-dry process of manufacture, of which more later. In one type the shale is pressed into shape in a nearly dry state and plasticity is not present at any stage of the process. When burned in the kilns no change of physical condition of the clay takes place. Shale is in the form of flakes, and the interior of the brick, therefore, is in an irregular condition with no direct uniform pores or tubes in it. Yet it contains a proportion of spaces with air in them. The outside surface is more compressed than the inside, and is smoothed or polished by the action of the steel moulds in which they are pressed. When, therefore, after a long exposure to wet, the interior becomes more or less soaked or sodden with water, frost will produce the same disastrous results as with the "porous" non-permeable brick, but in a still greater degree. And once the skin is broken further disintegration is still more rapid.

The second type is generally made by the semi-dry process, but on burning in the kiln the



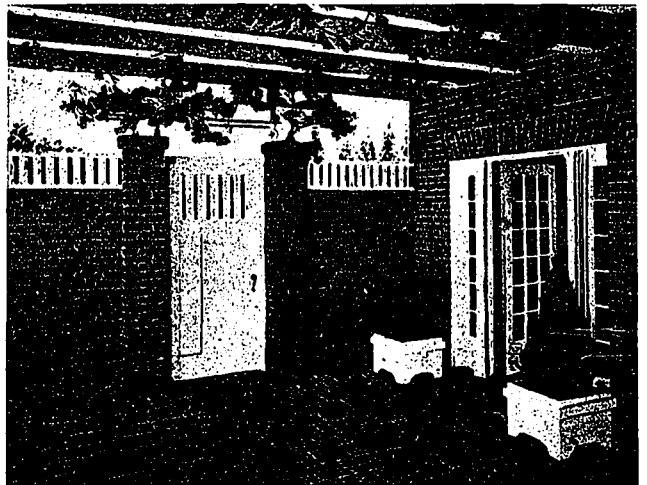
FIREPLACE.



HOUSE AT GREAT NECK, N.Y.

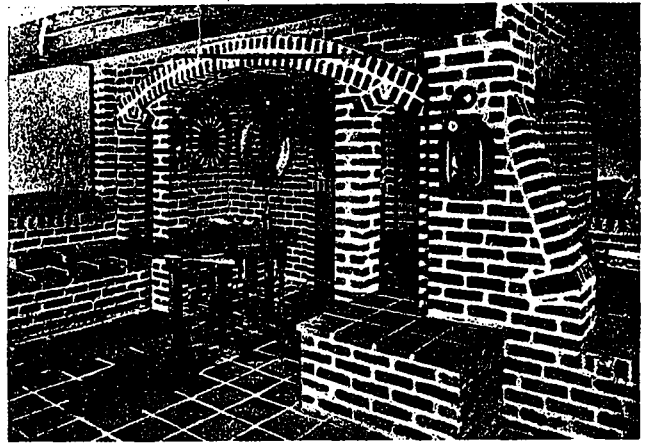
clay begins to melt and becomes vitrified. It is then practically impervious to water and suffers no harm in frosty weather. It is a good sound brick, but it does not breathe at all, and therefore possesses only one of the two important virtues of the brick that is perfect from the hygienic point of view. The permeable brick has a further virtue as it does not conduct heat and cold as much as the hard impermeable brick, and for all these reasons I venture to express the opinion that a sandy hand-made brick, besides being more artistic, is more lasting and more hygienic than any other type made.

Continuing my remarks on the physical properties of clay, I would call your attention to the fact that in the practice of brick drying and burning many technical difficulties arise and



PERGOLA.

many interesting scientific principles are involved. In the use of the plastic method of making, a curious feature is seen in the difference of behaviour of surface clays and geological clays. The aim of manufacturers is to dry the newly made brick with the least possible injury to shape by twisting or cracking. It is found that a surface clay presents little difficulty in the early stages of drying, but it is very apt to crack suddenly when about two-thirds dry. On the other hand, many geological clays are very liable to crack in the early stages, and yet give no trouble when about one-third dried. A similar difference exists in burning the different classes of clays. The surface clays do not shrink in burning unless over burned, but many geological clays shrink little in drying, and a great deal in burning. Some of these when burned behave curiously, in that you may get them up to full temperature in the kiln, and for twelve hours or so they do not contract. Then they begin to do so, and for forty-eight hours continue to shrink in a regular manner. Practice teaches the burners to measure this contraction, and when it reaches a certain amount they stop firing, because they know the goods will prove correctly fired. With the surface clays this does



WINE CELLAR.

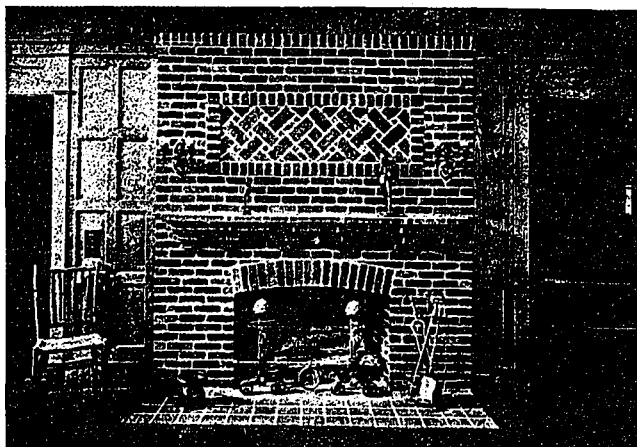
not occur, but the color of the goods is influenced by the length of time the full heat is kept up.

The burning of bricks presents many other interesting features, chiefly in relation to the production of the final color required, but I must begin at the beginning of this branch of the subject. Clay contains a great deal of water, and speaking chemically, this water is present in three distinct conditions or states. A wirecut or handmade wet brick contains "water of manufacture," which is evaporated completely in the drying process. The brick is then no longer plastic, but is hard and solid. If now it is heated up to the boiling point of water, 212° F., it loses more water called hygroscopic water. The water of manufacture may be from 33 to 50 per cent. of the total weight of the wet brick. The hygroscopic water is about 5 per cent. The driving off of the hygroscopic water in the kiln is called steaming. If the brick which has been steamed is taken out of the kiln it will absorb water from the air until all the 5 per cent. is back again in the brick, but it will not absorb any water of manufacture.

Up to this stage the clay can be made plastic again by wetting it. On continuing to heat up the kiln till it reaches about 900° F., more water again is driven off. This is the water chemically combined with the silicate of alumina. It amounts to about 10 per cent. of the weight of the dry brick, and when once it is driven off the plasticity of the clay is finally lost and cannot be restored. The clay has become brick, although at that temperature it is not sufficiently changed in chemical nature to remain permanent and solid. The heat must be raised to about 1,800° F., to produce a well burned red brick, and still further for other types such as firebrick, which



SUTTON PLACE, ENGLAND.



FIREPLACE.

requires about 2,250° F. temperature. Having considered the action of heat in burning clay we are still confronted with a number of other features of the process of burning.

Burning Processes.—There are roughly speaking, five distinct processes, each with special variations according to the qualities of the goods, and with a number of different types of kilns for use. The first and oldest process is clamp burning. The process is characterized by the mixing of the fuel with the clay before moulding the bricks. The fuel is usually sifted house dust, that is the contents of house dustbins freed from their old tins, cabbage leaves and other refuse till only the cinders are left. This fuel contains about 35 per cent. of coke proper. The huge stacks of bricks containing this fuel intimately mixed with the clay have two or three layers of large cinders at the bottom, which are fired and serve to ignite the mass. The bricks are stacked closely and air gets access to them so gradually that the heat is generated slowly and more or less regularly throughout. A clamp may take from six weeks to three months to burn through and requires a great deal of expert attention to get good results. The air supply is so restricted that no more reaches the bricks than suffices to burn the fuel. None, therefore, is left over for the oxidation of the iron in the clay so that a yellow color instead of red results.

The burning of common bricks, red bricks, tiles and firebricks is carried on in kilns of a great variety of types, either fired with coal or gas. This I call the second process. A brick structure is built to contain the goods and fire grates are constructed below or by the side of them on which coal is burned. The stages of the process of kiln burn-

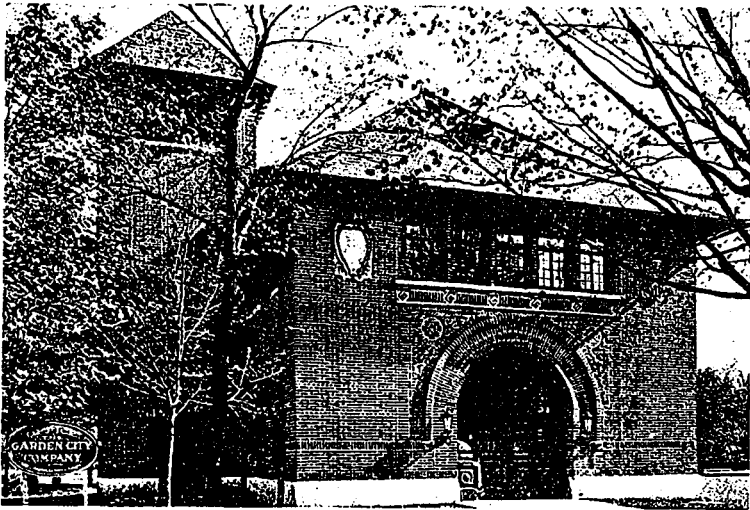
ing are as follows:—Steaming, raising the heat, soaking and cooling. The first two are the same in all the types of kiln and all processes of burning. The soaking, however, is effected in two different ways. With red and most common bricks the soaking is done with a free burning fire and ample draught, so that a large volume of heated air plays on the bricks and oxidizes them thoroughly. With certain blue bricks the soaking process takes another form called smoking. An excess of coal is put on the fire and the air supply is reduced so that smoke fills the kiln.

In this, the third process of burning, we see a reproduction of what occurs in clamps. The air supply is insufficient to burn up the smoke in the kiln and the bricks are finished in an atmosphere that does not oxidize the goods but on the other hand, “reduces” the iron in them and produces a blue instead of a red color.

The fourth process is salting. This may be used for three different effects—fuming the brick and producing a silvery grey color, reducing the brick and so in another way getting the blue color, or salt-glazing the bricks or sanitary pipes. Salting is a simple operation and is done during the last few hours of full firing by



DETAIL OF PALACE OF FONTAINEBLEAU, FRANCE.



FIRE STATION.

throwing common salt into the fires. It becomes volatilized and the fumes pass over the goods in the kiln and form chemical compounds with the silica and alumina, which, in sufficient heat, fuse and form a more or less pronounced glaze.

The fifth burning process is that employed for high-class goods of various kinds, chiefly pottery and expensive tiles. They are placed in closed receptacles, either muffles or saggars, so that the flames and gases of the fuel do not come in contact with them. This process is the only one that can be called baking in the ordinary sense of the word, the muffle or sagger being a true oven with a fire playing round it. It is not used in brickmaking.

One of the remarkable features of brick burning is that though much heat is expended on the process very little is actually used. It is nearly all thrown away. Raising the temperature of the bricks and driving off the hygroscopic and chemically combined water, uses heat in well-known quantities, but the process of turning clay into brick by heat uses none. This is a physical fact hard to understand, because as I have hinted earlier in my lecture, the coal consumed in the process is considerable in quantity. For red bricks it is from 15 to 20 per cent. of the weight of the burned goods in intermittent kilns. The way in which the heat produced by the coal is used is mainly in keeping the bricks at a high temperature till the necessary chemical action has taken place.

The principle of the continuous kiln is the using over again as much as practically possible of the heat wasted. Even in these the loss of heat by warm gases going up the chimney and more notably still the loss by conduction through the massive walls of the kiln is enor-

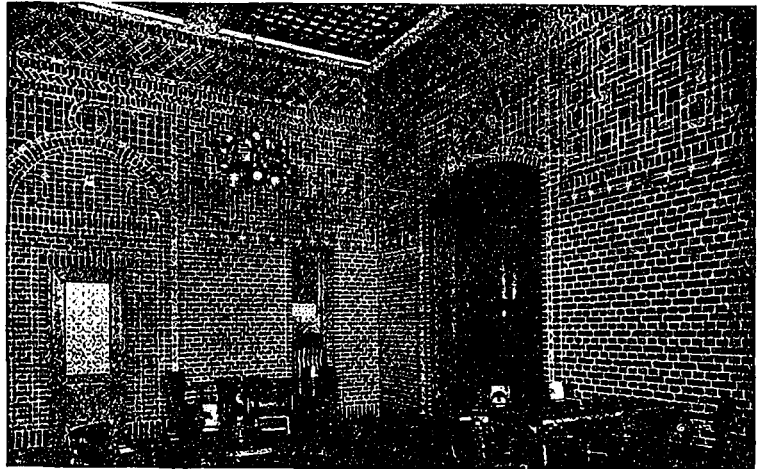
mous and cannot economically be prevented.

Types of Clay.—The clays that interest the brickmaker chiefly are the shales, marls and surface clays.

Shale.—Shales are almost always made into bricks by the semi-dry process, although the plastic process may be used. In Peterborough, where bricks are made from an oily shale, even the excavation of the shale is done with steam diggers on the largest works. The shale is brought straight from the bank to the machine, there to be ground to a granular condition. It is screened mechanically to the required fineness, mixed mechanically with a small amount of water if necessary, and then passed au-

tomatically into presses with rectangular cast-iron moulds for fashioning the brick. The pressing into brick form may be completed in one operation or the brick may be pressed a second time to improve its finish. Water in small proportion is necessary in order to obtain the cohesion of the fine particles or grains of shale. From the presses the bricks are taken straight to the kiln in which they are dried and burned in one continuous operation.

It is often stated that they are made dry and do not require drying. This is not true, but the amount of water in them is much less than in those made by plastic process, and they are

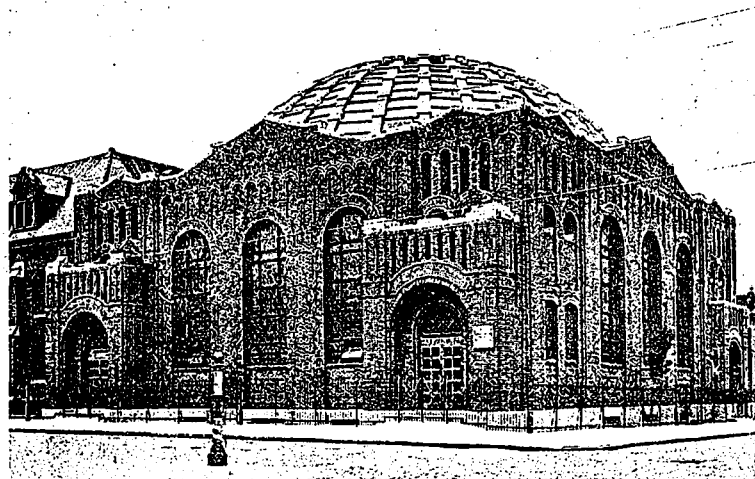


TAP ROOM IN HOTEL.

sufficiently hard and strong to stack in position for burning direct from the presses. In the kiln they are dried first and burned afterwards continuously. In contrast to this, bricks made on the plastic system are too soft to be stacked in the kiln and must be dried first by one of the various means employed in the trade.

Marls.—They are so called because of the presence of carbonate of lime in varying quan-

tity. Carbonate of lime or chalk has this peculiarity in connection with brickmaking, that when present in lumps or nodules it is exceedingly dangerous and destructive, unless effectively ground up or eliminated, but when in a fine state of division it is harmless. Marls rarely contain more than 5 per cent., but they require very careful selection and treatment, even when the proportion is much less. The



CHURCH AT CAMDEN, N.J.

carbonate of lime when not finely divided becomes converted in burning into quick lime, which slacks when the bricks absorb moisture from the air with the result that the face becomes pitted through the lime blowing pieces off the face. Yet clay exists containing as much as 40 per cent. of carbonate of lime that may be made into sound bricks.

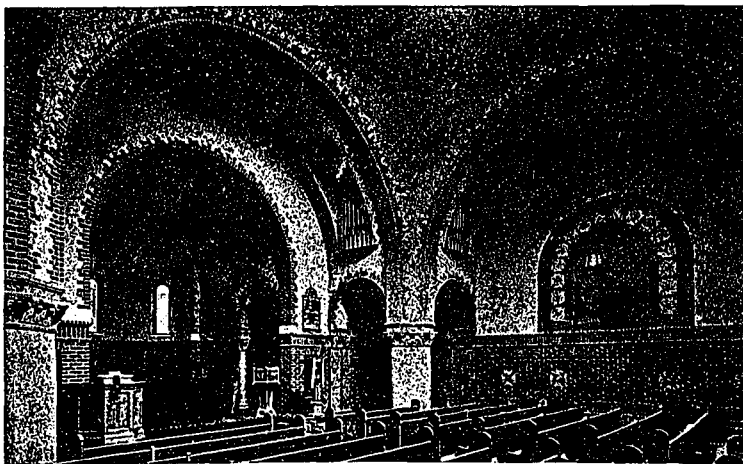
Marls are plastic clays and in common with gault and surface clays, when made into common bricks are treated by the wirecut system of brickmaking. The clay is dug and conveyed in wagons usually by a suitable hoist direct to the machinery. This may consist of a brickmaking machine only, or preferably a train of machinery which gives a thorough preparation to the clay before it is finally pugged. This machinery may consist of all or either of three types. The grinding pan resembling a mortar mill is useful in working up a sandy non-cohesive clay to a more plastic condition than it possesses in its natural condition. The bottom of the pan is perforated in parts and the rollers squeeze the clay through the perforations causing it to drop into the next machine.

Again, the clay may instead be passed through one or more pairs of rollers running at different speeds. These crush the clay, and any stones or lime contained in it, and at the same time tear it slightly by reason of their different

speeds of running. From the pan or the rollers the clay may pass to a third type of machine, the mixer. This may be open or closed and have one or two revolving shafts. On the shafts are knives so inclined as to push the clay forward and mix it at the same time. The mixer may be about 6 feet long and horizontal in position. From the orifice at the end the clay drops into the hopper of the brickmaking machine. If required, water is added to the clay either in the pan or the mixer, but never in the rollers, as it would cause the clay to slip.

The brickmaking machine usually has a small pair of rollers mounted on it through which the clay is forced into the barrel. This again is horizontal and is furnished with a single shaft, and pugging knives similar to those in the mixer. These knead and compress the clay and press it towards the mouth of the machine. At the end of the shaft a worm is placed which pushes the clay through the mouthpiece and die, and forms it into a continuous rectangular column of the correct cross section. The dimensions of the cross section correspond with the length and width of the brick allowance being made for the shrinkage in drying and burning about which I have already told you. The column of clay is now finally cut off by wires drawn transversely through it, the wires being spaced the necessary distance apart to give the correct thickness of brick. From the cutting table the bricks are wheeled to the drying ground, shed or other apparatus in order to be thoroughly dried before being stacked in the kiln for burning.

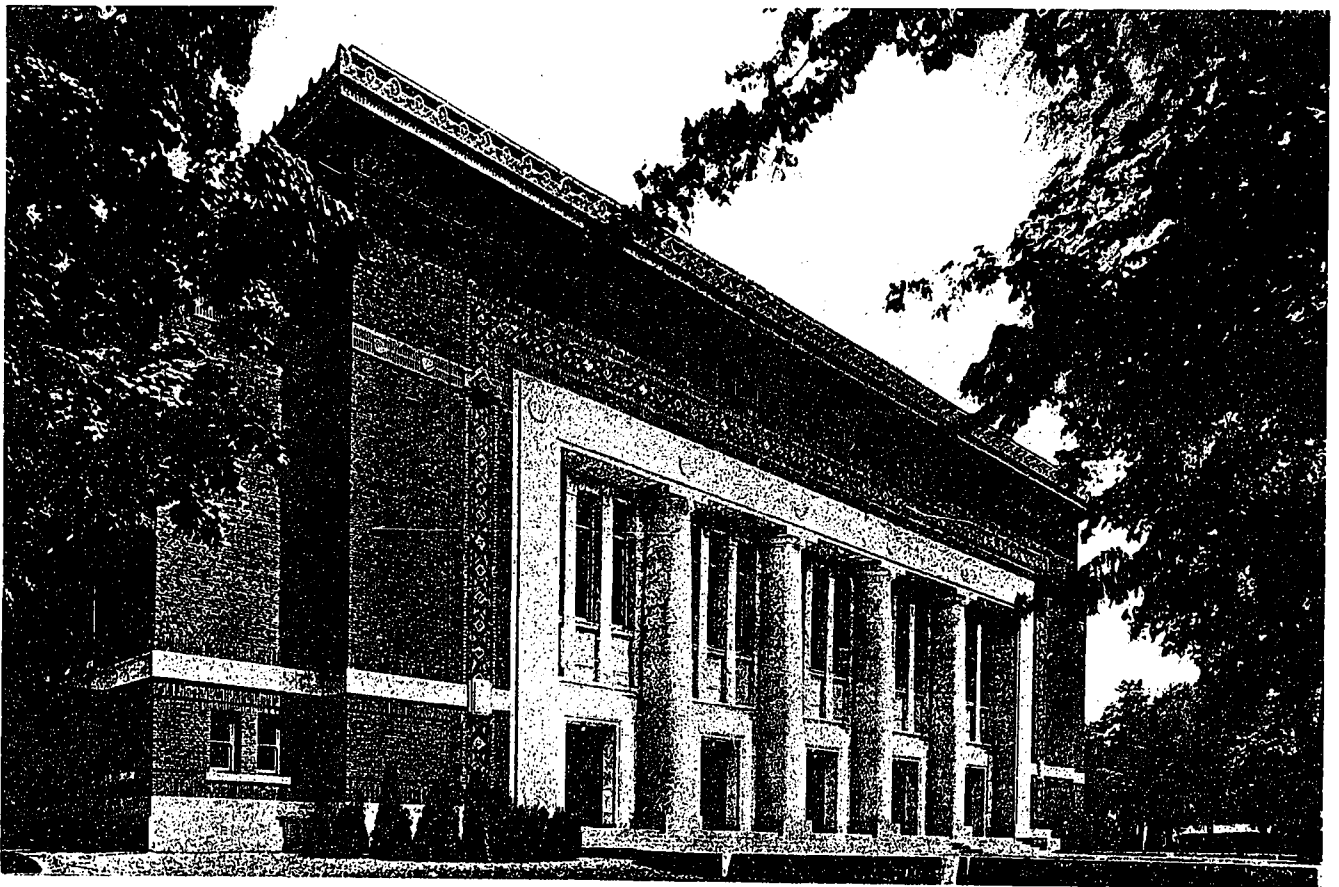
Hand Brickmaking.—I now have, therefore, to give you finally some description of the older process of hand brickmaking, which holds its own in certain parts of this country, England, in spite of the great improvement of machines in the last thirty years. It is the process used in the days of the Babylonians, Egyptians and



INTERIOR OF CHURCH AUDITORIUM.

Romans, and was that used by the first brick-makers in England up to the middle of the 19th century. It is to all intents and purposes the process used for all artistic terra cotta making in which mechanical aids are almost useless. Yet, strange to say, it is looked down upon with scorn by the countries far advanced in mechanical appliances, Germany and America, while it is practised almost exclusively in Belgium and Holland, and largely in France. The hand brickmaking process is used for making stock bricks and red facings. The clay is usually prepared for making by weathering, that is, by being spread out in layers in the open air, so that air, rain and frost may in turn act upon it and loosen it after its long confinement in the

Steel or wood moulds of the required size are wetted and rolled in fine dry sand and placed in position on the moulder's table. A "walk" of clay, as it is called, is then made by the moulder and rolled into a shape suitable for throwing into the mould. This walk is dexterously rolled in dry sand and, when ready, thrown with some force into the mould. The excess of clay is then struck off and the finished brick dropped carefully from the mould on to a pallet. The final result and effect depends on a variety of circumstances. The surfaces of the brick may be fine and uniform, or they may be wrinkled and coarse. The brick may be true and square or out of shape and deformed. These defects are due to the idiosyncracies



HILL MEMORIAL AUDITORIUM, ANN ARBOR, MICH.

natural bed. Weathering is practised, as well as what is termed resting, on other clays, and although the effects of it are apparent and the causes guessed at, no definite knowledge has been obtained as to the reason it is so efficacious. Stoney clays for hand-making are also washed, but those found free of stones do not usually need it. The weathered clay is pugged or ground, usually in vertical pugmills driven by horse or steam power. These mills are essentially the same as the horizontal ones previously described and serve to mix the clay and incorporate the water and finally expel the mass in a condition fit for moulding.

of the moulder, who requires training carefully in the way he is wanted to go. The final color and appearance depend on the quality of the clay and sand used, the kind of kiln, the method of firing, and the final temperature and soaking; all matters requiring constant care and much technical knowledge. The drying is an operation also requiring unremitting attention, and all the various materials, operations and skill combine to yield the final product, which may or may not produce adequate returns according to the demand and the success of the master in supplying it.

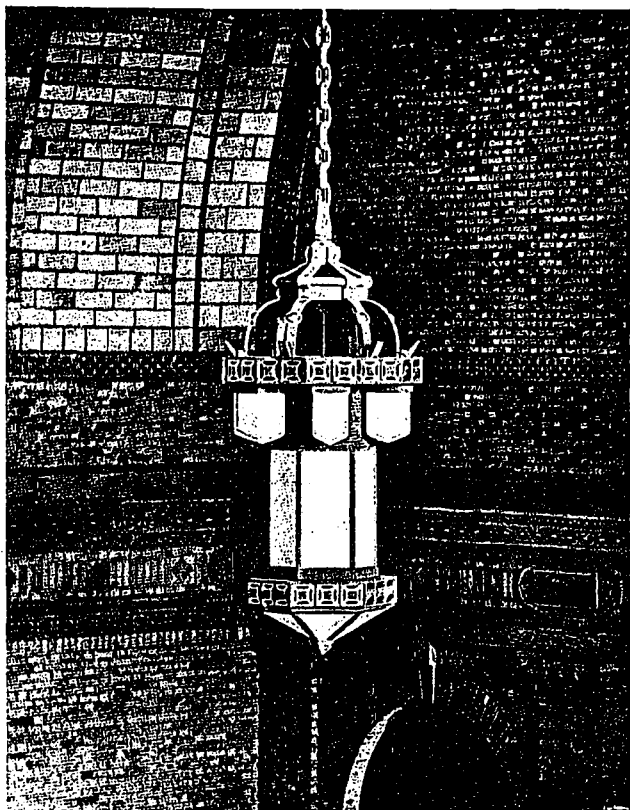
The processes used in hand brickmaking are

such as to afford to the clay the most perfect treatment from a physical point of view. The weathering, the slow pugging, the lengthy and complete drying, all tend to assist the clay molecules to adapt themselves to the altered conditions they encounter in their drastic change of state. At the same time, the ultimate result is not only sound physically, but it is in the highest degree artistic and durable, provided the processes of manufacture are all properly carried out. It is durable under all circumstances of environment; water, frost, sun, and fire all alike, leaving it unharmed and unchanged. That this is so, the old examples of brickwork in East Anglia and elsewhere eloquently testify.

History.—We all know that brickmaking as an art is ancient and even prehistoric. The earliest bricks found in Egypt are said to be 12,000 years old, and we are often reminded that the Children of Israel had to make bricks for Pharaoh and find their own straw. These bricks were made of Nile mud mixed with chopped straw and the clay was trodden by men, much as it was up to quite recent times in this country. The bricks were moulded and sundried, but not baked and would have been of little use in our climate. They were hard and served to build lasting monuments in that arid country. The well-known Step pyramid of Sak-kara is built of such bricks and was cased externally with marble slabs, now removed. It is the oldest pyramid in Egypt.

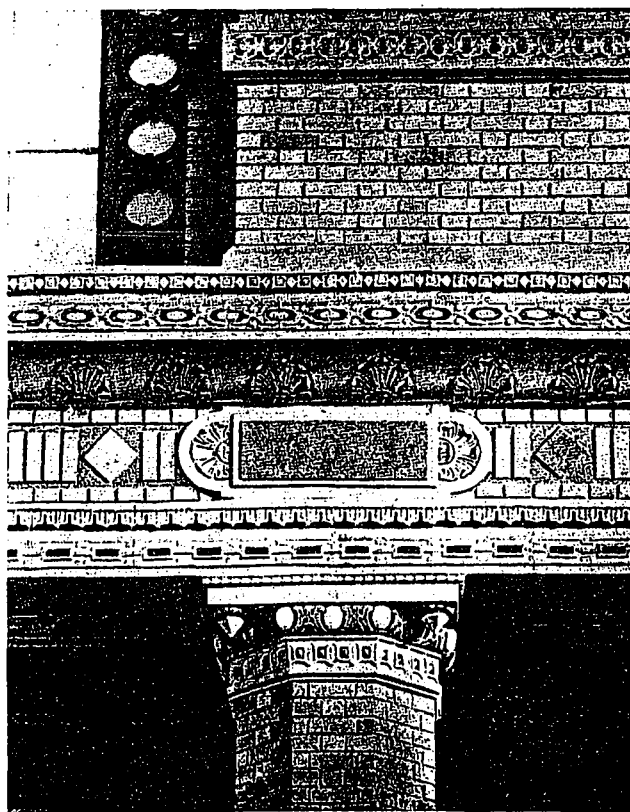
It is said that the Tower of Babel was built of brick, the record being that the builders said, "Go to, let us make bricks and burn them thoroughly." The walls of Babylon were built of bricks, and from the ruins the bricks have been carted away in modern days to build new cities. The burned ones were 13 inches square and 3 inches thick and the unburned ones of various sizes and they were set in bitumen. The great wall of China was built of burned and unburned bricks 2,000 years ago. It was 1,250 miles long and about 22 feet high. The walls of Athens on the side of Mount Hymettus were of brick, but the Greeks did not use them so much as the Romans, who were probably the first to burn them in kilns and improve their quality. In the first century A.D., they were of better quality than at any subsequent time, being then made about 2 feet square and 1 inch thick. Later they were made smaller and thicker, but by the end of the 4th century the art was practically lost until about the 13th century.

In England, as you well know, the Romans introduced bricks and brickwork in the 5th century, an example still remaining in Holy Trinity, Colchester. Colchester Castle, built in 1078, is largely of Roman bricks and also St. Botolph's Priory, built in 1116. The British people did not find the need of building in brick until

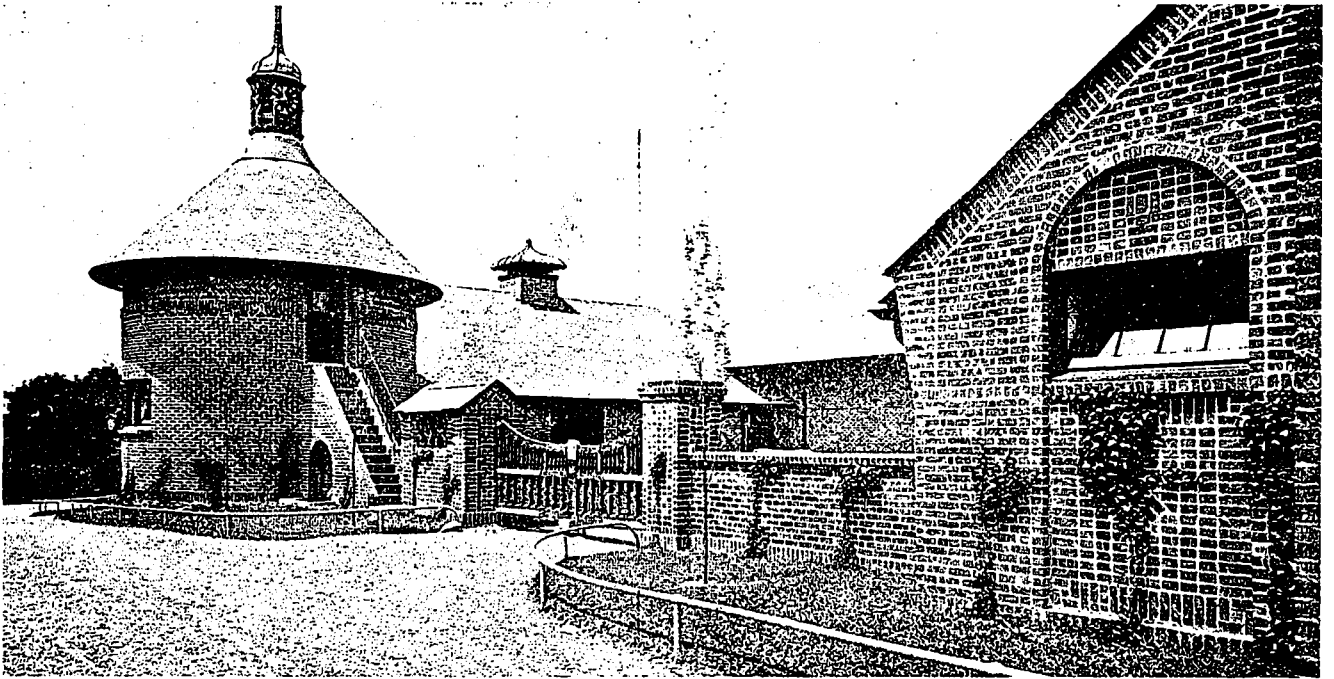


DETAIL OF RAILWAY STATION.

the late 13th and early 14th century, because of the immense forests and abundance of wood, but they used clay as a filling between wooden external walls and board linings. Little Wenham Hall, built in 1260, is the earliest British build-



DETAIL OF RAILWAY STATION.



FARM BUILDINGS AT BERNARDSVILLE, N.J.

ing, the bricks being $9\frac{3}{4}$ by $2\frac{3}{4}$ by $2\frac{1}{4}$ inches, and mixed with courses of stone and flint. These and many of the bricks used in the Tudor period were probably imported from Holland. In late Tudor times terra cotta began to make its appearance, such as is found in Wolterton Manor House, East Barsham, built in the time of Henry VII. From Tudor times through the Renaissance period bricks continued to be used, and after the fire of London in 1666, brick was generally used in the rebuilding of the city.

A great revival, however, occurred when mechanical manufacture became prevalent, and since that time one of the greatest booms in the use of bricks was witnessed in the revival of the Queen Anne style of architecture in the seventies and eighties. This was followed by the

mushroom growth of the Fletton brick industry in the nineties, and a marvellous activity in the building trade about 1900, when bricks were in such demand that they fetched famine prices. The Transvaal War put an end to this activity, and for the last ten years such dullness has characterized the trade that I do not think more than one-third the number of bricks have been made annually.

You do not require to be told of the present vogue for the use of bricks of the Tudor type for facing buildings of all kinds. The genius of many of our greatest architects has found expression during the last few years in this ancient material in work that is characterized by greater variety and charm than is to be found in any previous style.



HOUSE AT LEATHERHEAD, SURREY, ENG.

IN commenting on the laying out of streets, G. B. Ford, city planning expert of New York city, expresses the opinion that the width of roadways, even in the newest and most progressive plans, is wasteful to a mad degree. He claims that in the residential districts of a city wide roadways are not often really advantageous. They mean much dust in summer and much opportunity for sweeping winds in winter, and at all times of year they mean danger zones for little children—the death rate from vehicular accidents on the wide avenues of the suburbs is much higher, in proportion to the density of surrounding population, than that on the narrow streets of more congested downtown districts. This error is not exclusively New York's. Most American cities demand a width of sixty feet for roadways. In residential districts, such as many in Brooklyn and Queens, there is not now and never will be any need for such a roadway width. Narrower streets would be much more desirable. Much of the cost of suburban property goes into street improvements, giving purchasers less actual value in their private holdings than they should get for their money. Imagine the money New York has invested in practically unused pavements on wide suburban streets! Study the tracks made by vehicles on the wide paved streets which you know, and see if often the tracks are not concentrated in the middle of the street, leaving the sides an unused waste.

Many regions which should be devoted principally or wholly to the detached or semi-detached homes of workingmen, are barred to such homes by the cost of street improvements and the waste of property devoted to street uses. This makes it necessary for the owners to get a high rental for what land is left to them, and in order to secure this rental they must build tenements instead of detached houses. The bad influence of such work in the past will be felt for many generations.

Too wide streets enormously increase the cost of the abutting land; they increase the dust nuisance in summer, thereby spreading disease and increasing the work of housewives; they injuriously magnify the sun's glare; in the winter they vastly multiply the aggregate cost of house heating, for, being wide, they are windswept and colder than narrower thoroughfares would be. Wide streets, too, tend to attract through traffic into residential districts, where there should be only such vehicular activity as is demanded by the necessities and the pleasures of the residents, such as the delivery waggons which supply their needs, and their own carriages and motors.

The average suburban roadway, therefore, needs to be only wide enough for three vehicles abreast, or, at the outside, twenty-four feet in

width, and often a width of eighteen to twenty-one feet is quite satisfactory.

In a number of European cities the problem of locating manufactories and warehouses has been solved through the acquisition by the municipalities at low prices of large tracts of land conveniently located for transportation, along waterfronts or railway lines, where the development of first class docking or freight handling facilities is an easy matter. This land is then sold or leased to enterprises needing such facilities. Frankfurt, Germany, offers a particularly good example of this sort of modern scientific city planning and one which Canadian cities might very well consider as they plan their future growth. There a large tract of swampy territory was acquired by the municipality at a very low price and developed with very modern docks, railways, classification yards, etc., to its own vast advantage and the protection of the balance of the community. Already enough land has been sold to manufacturers to more than pay the original cost of the entire property and improvement.

* * *

THE keen interest manifested by the *Kansas City Star* in concrete leads us to quote the following editorial, taken from a recent issue of this versatile paper: "Concrete was used by the Romans, who also invented the celebrated Roman nose, which is still used with great success. Concrete is composed of cement and broken stone, which are mixed with water by a tired man in overalls and a red flannel shirt and converted into a sort of geological Irish stew. The mess is then stuffed into a wooden mold, and when it dries it is so hard that when Time attempts to nibble it with his justly famous tooth it has to go to the dentist's with a low shriek of agony.

"The Romans wasted their concrete building bridges, coliseums and roads. Had they built their emperors of this material they would have been more durable and the empire would have lasted longer. A reinforced concrete emperor would have been less fatal to the populace, while the sight of a prætorian guard pecking away at the impenetrable crushed stone thorax of his ruler with a valuable sword in an effort to create a vacancy on the throne would have been highly diverting.

"Nowadays concrete is used with great success in building houses, sky-scrapers, bridges, baseball parks, pavements, sidewalks, wormless tombs, boats, artificial legs, telegraph poles, water tanks, artificial pipes, false teeth, cathedrals, smokestacks and eating-house sandwiches. Concrete has, in fact, become the most useful thing in the world, and many a mountain which has only been an obstruction to traffic will be

ground up in the next few years and sold in sacks to men who have cities to build.

"Thomas Edison has recently invented a method by which concrete houses can be poured to order by two strong men while the family is unpacking the furniture. This will be a great boon, and before long we may expect to buy our houses at the store by the gallon and to draw a cute little Queen Anne garage out of a faucet and take it home in a pail.

"Concrete, reinforced with steel, is the strongest material yet invented, but science thus far is only building bridges and sky-scrapers with it, and has not yet used it in providing practical backbones for public men. When this has been accomplished the grade of statesmen available will be vastly improved and the old style office-holder with the gutta serena spinal column will wobble into oblivion along with the wooden hotel."

* * *

THE Ceresit Waterproofing Co. have arranged with the McLellan Peters Company, 305 Read Building, Montreal, to handle their interests in that city as well as Ottawa, Quebec and intermediate territory.

* * *

THE Standard Sanitary Manufacturing Co. has issued a handbook on plumbing fixtures, especially compiled and illustrated for the benefit of home builders and those desiring to improve the sanitation of their present dwellings. It is the ninth edition of "Modern Bath Rooms," and contains many features not included in former editions. Three other booklets treating of sinks, lavatories and closets furnish valuable information in respect to the various subjects handled.

* * *

THE Herbert Morris Crane and Hoist Company, Limited, has issued a bulletin, B5, devoted to the various types of travelling trolleys made by the company. These trolleys are of many patterns, to run either on a flat-bar track or on the lower flange of an ordinary steel I beam. Some of them are prepared for short, straight runways, while others, containing suitable swivels, are flexible in a horizontal direction, and thus permit of the use of curves or "bends" in the track.

* * *

THE issue of *Canada*, April 25th, contained the first of a series of portraits in color of men prominent in Canadian affairs. These plates are reproduced from portraits specially painted from life for *Canada*, and are included as supplements in the ordinary issues of the paper. The series will enable the public to become familiar with the personality of the men who stand for Canada in the eyes of the world, each portrait being accompanied by a letterpress study of its subject and the phase of Canadian life and work he represents.

AN order has just been received by the Herbert Morris Crane and Hoist Company, Limited, through their agents in Vancouver, Messrs. Waddy & Young, for a 10-ton hand operated overhead traveling crane fitted with Morris roller bearings to the main traveling motion. This order was placed by the City Engineer of Prince Rupert after considering quotations from all the leading American makers of cranes. The new power house is well under way and is expected to be in full operation before the Fall.



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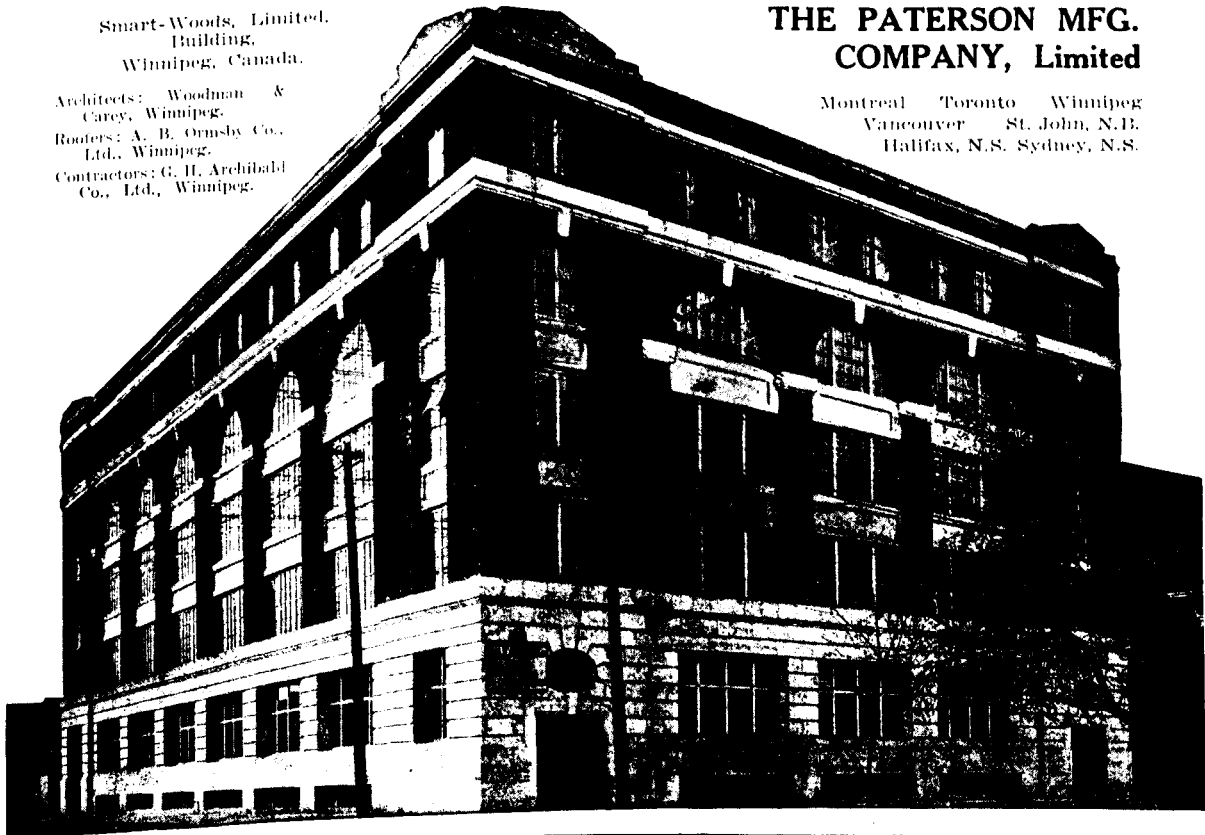
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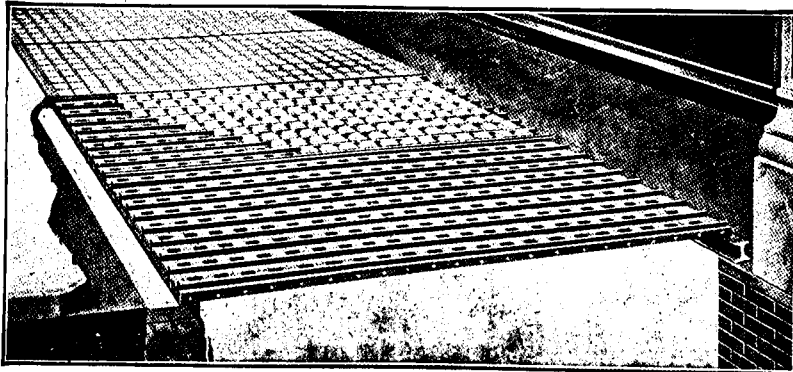
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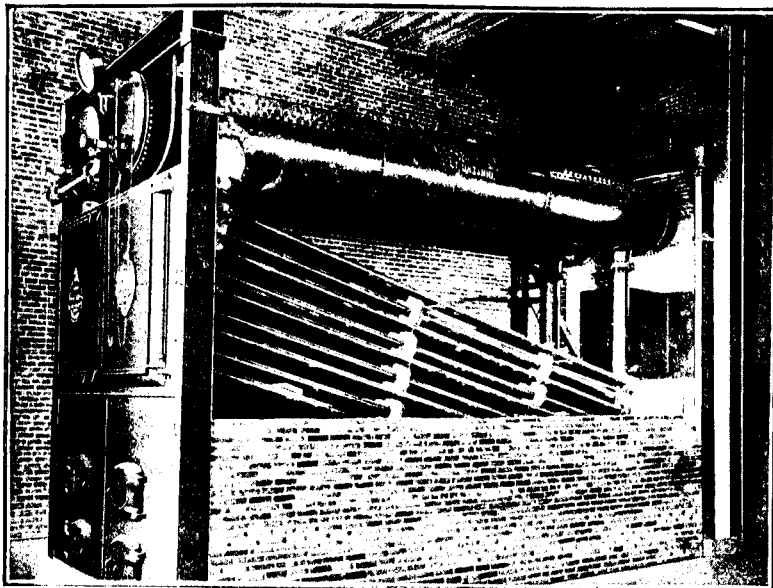


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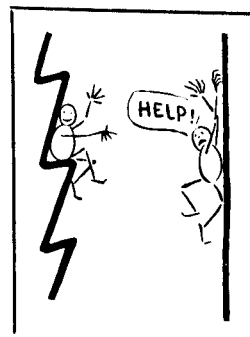
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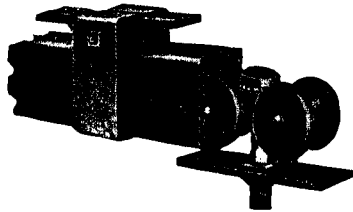
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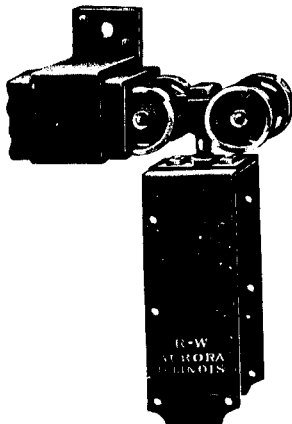
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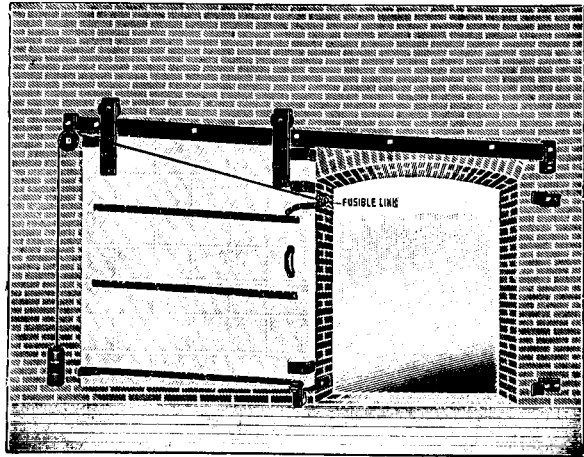
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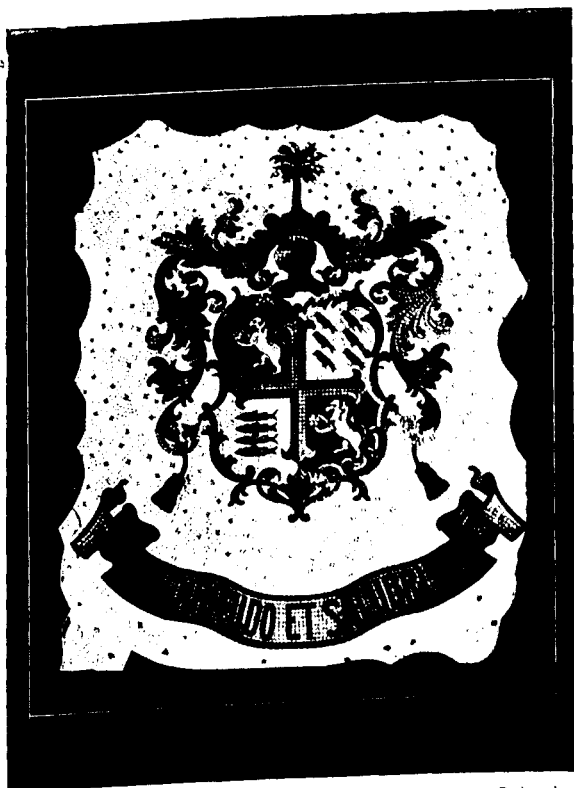
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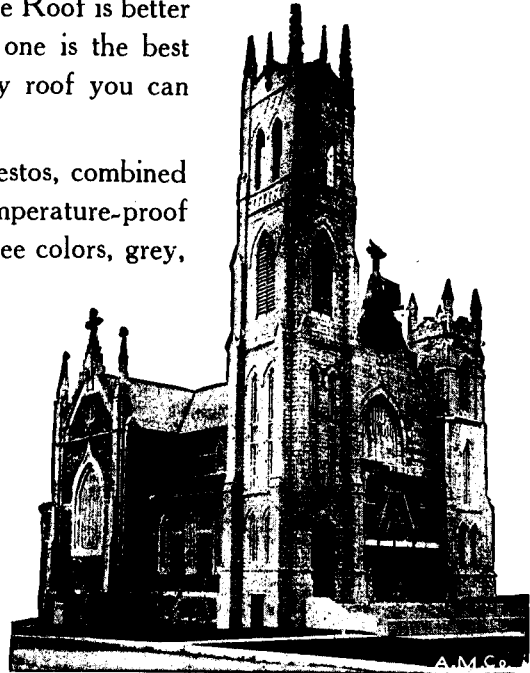
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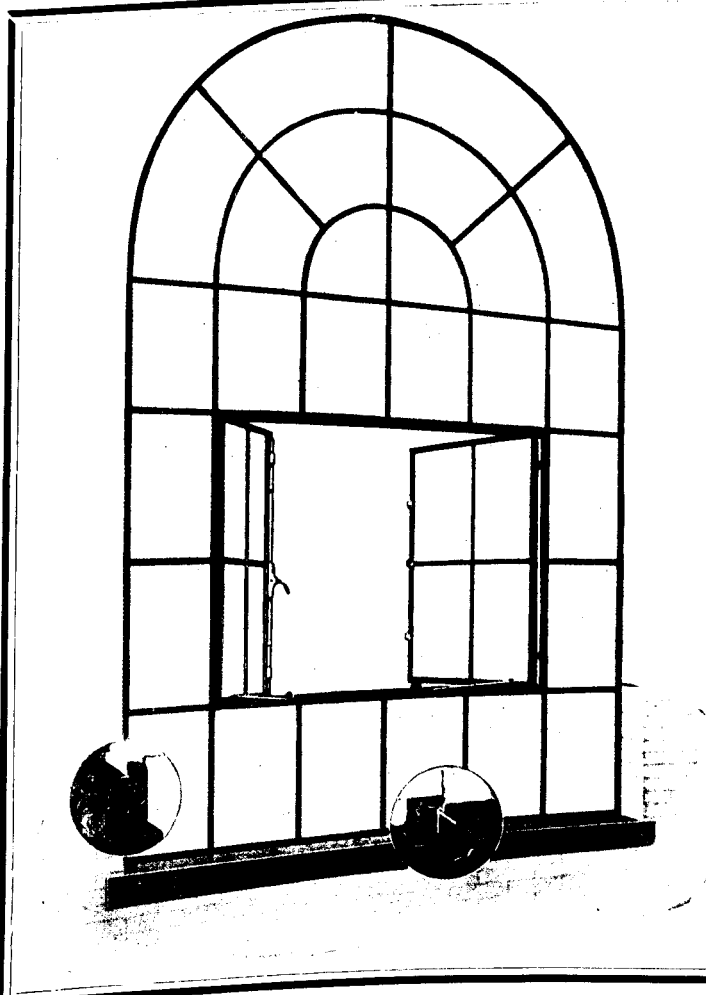
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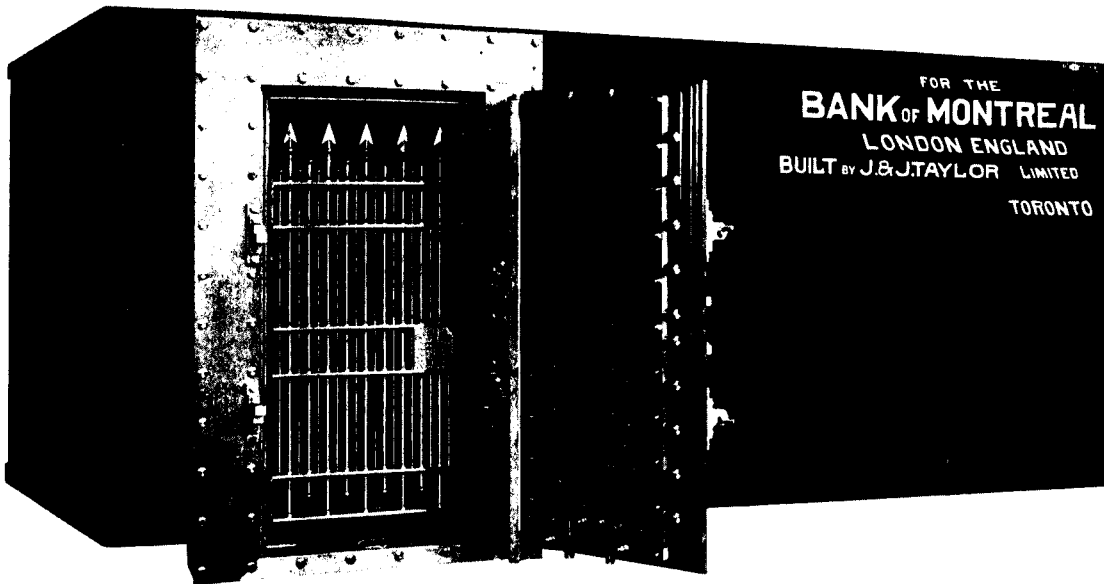
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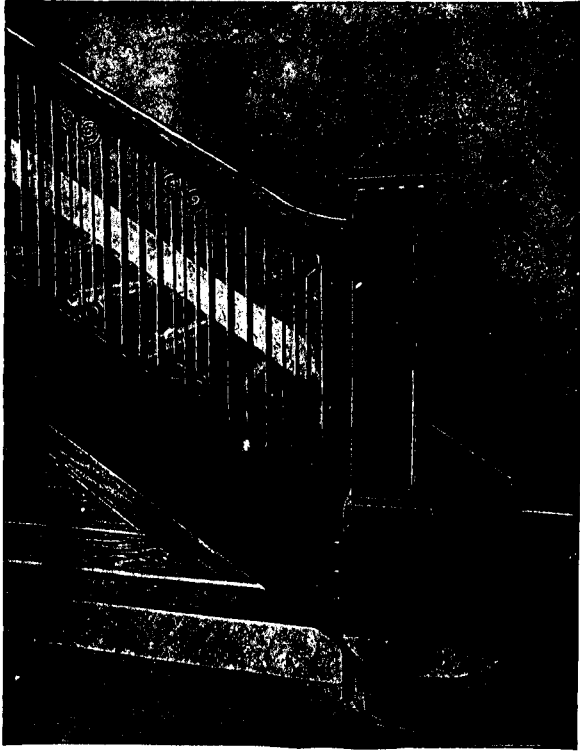
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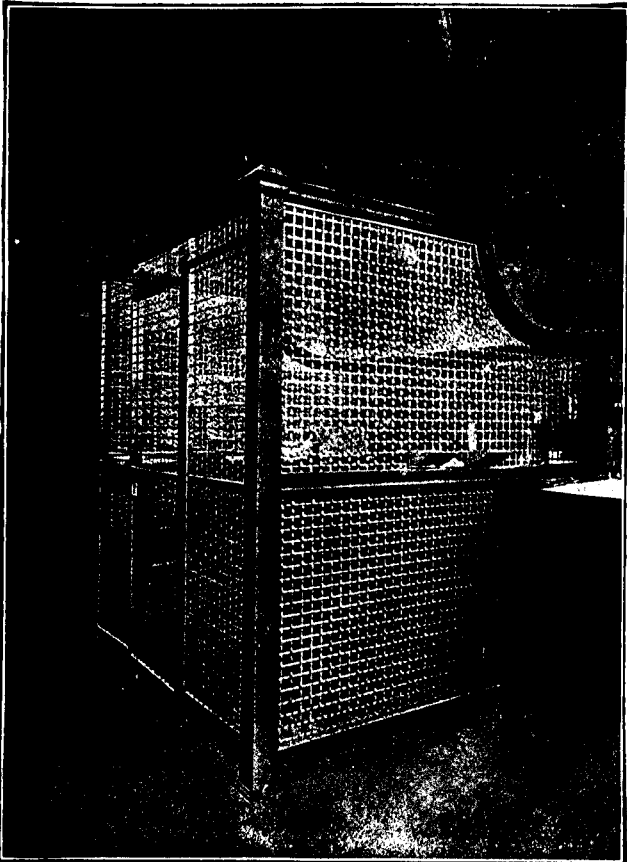
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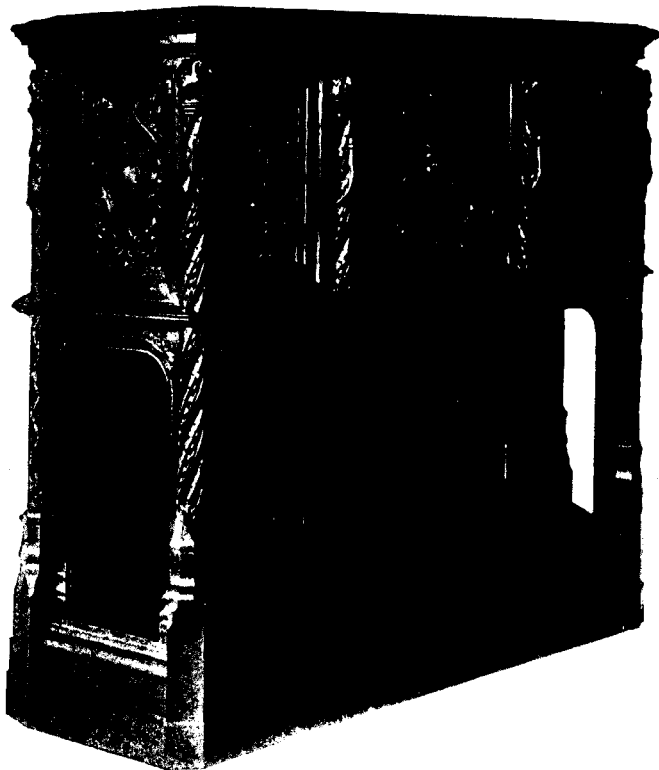
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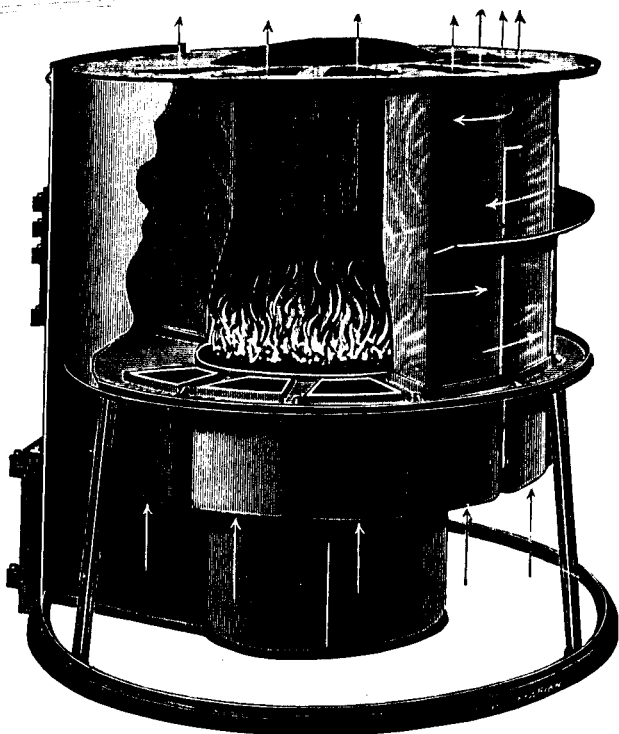
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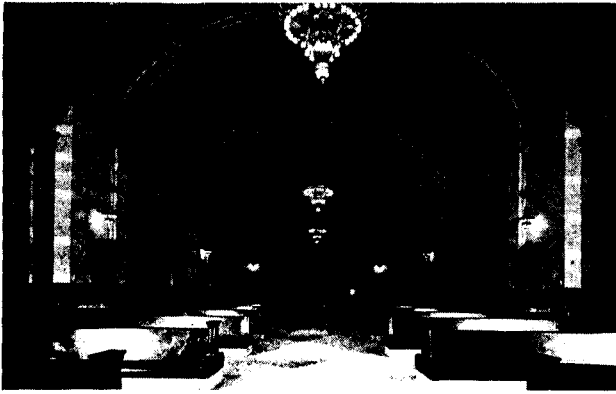
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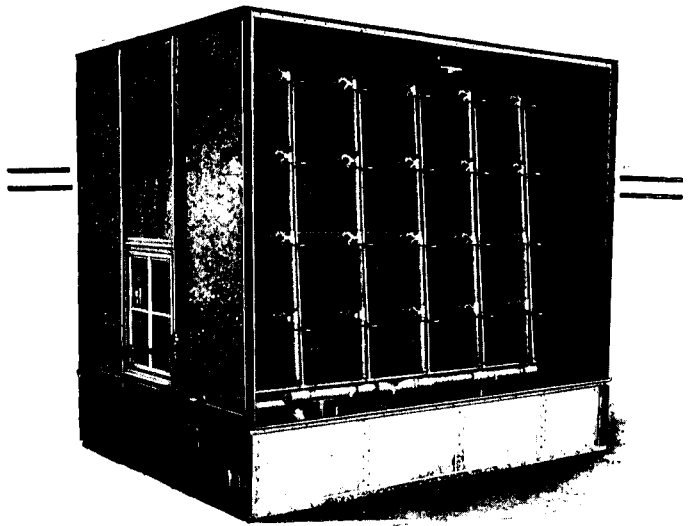
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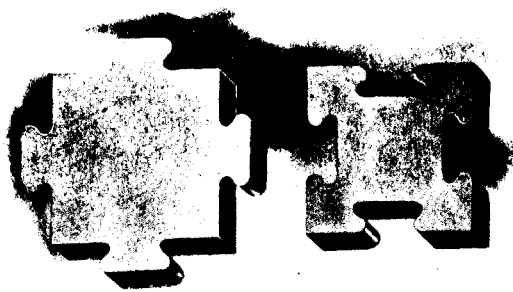
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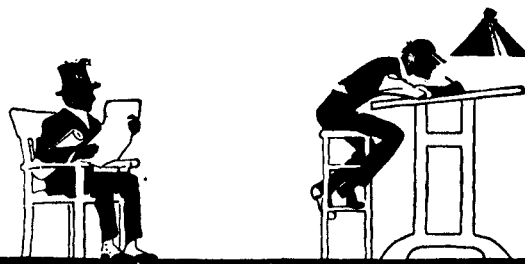
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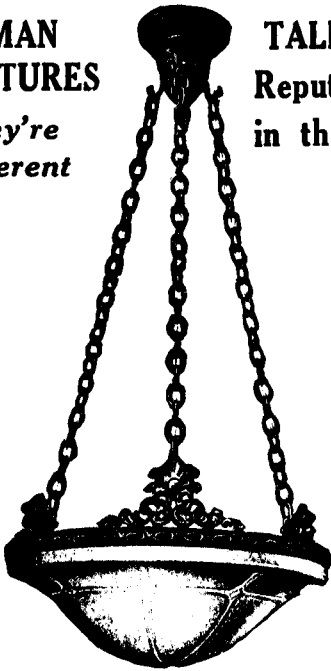
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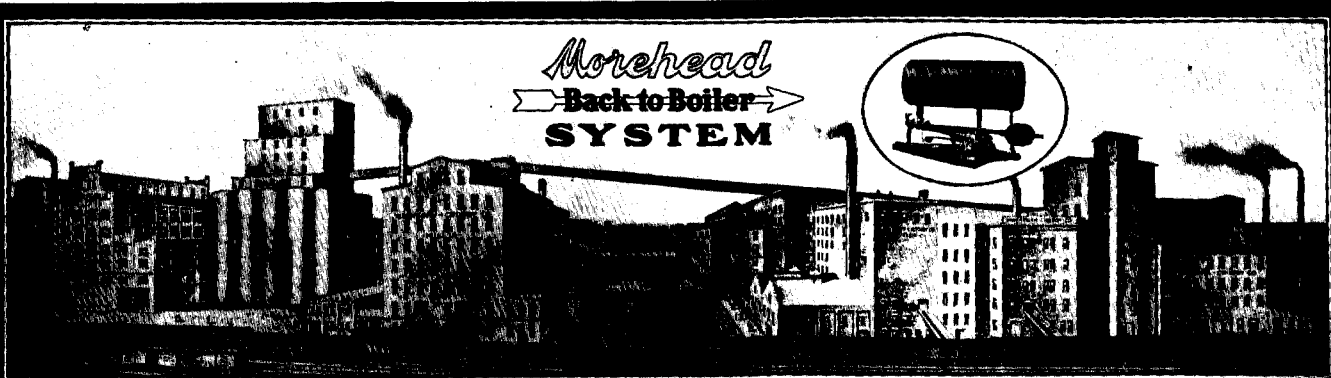
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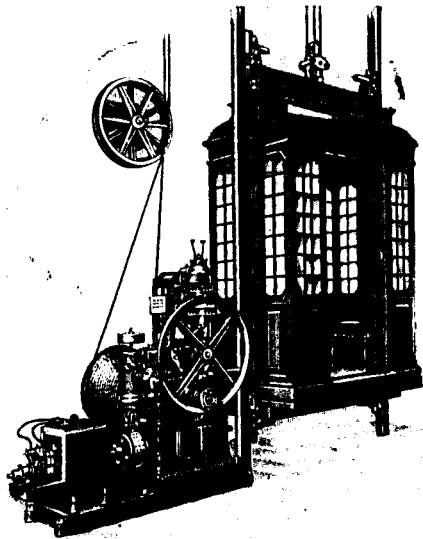
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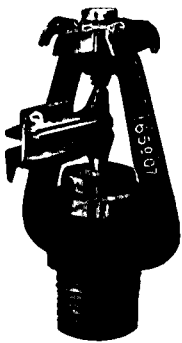
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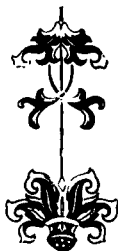
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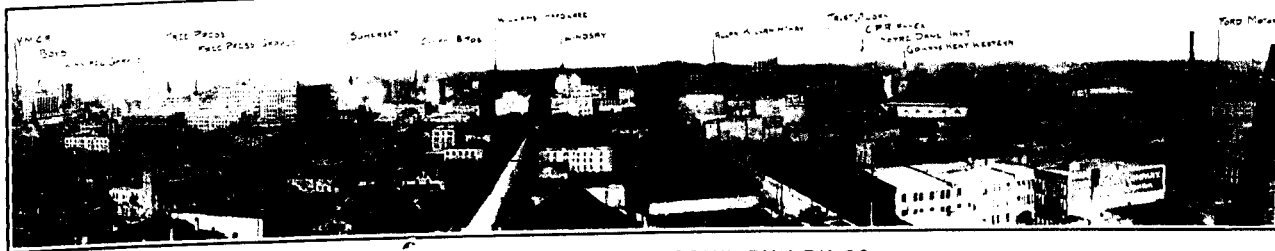
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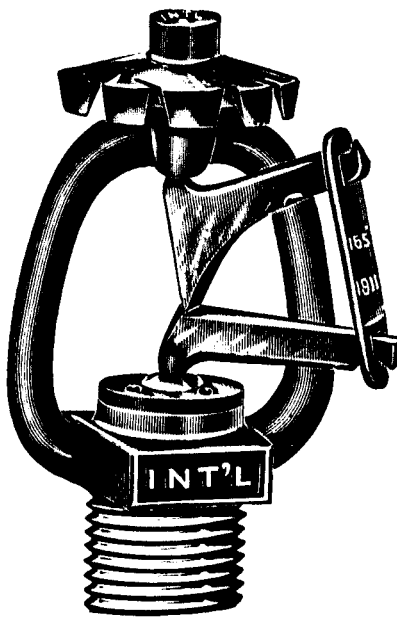
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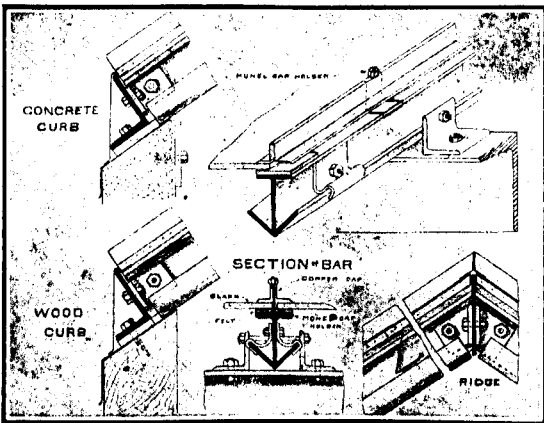
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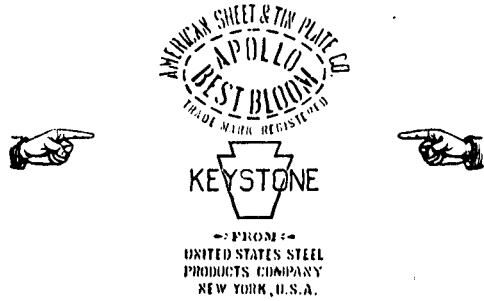
BRANCHES { Montreal
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"The press is the light of the social world, and in all light there is something of Providence. Thought is more than a right, it is the very breath of man. Who binds thought strikes at man himself. To speak, to write, to print, to publish—from the point of view of right, these are identical; these are the circles, ever enlarging, of the intelligence in action; these are the sonorous waves of thought. Of all these circles, of all these beams of the human mind, the widest is the press. The diameter of the press is the diameter of civilization itself."—*Victor Hugo.*

* * *

If you want to get an idea of how some people are bombarded with circular matter these days, take a look at the daily mail of an established architect—the man who is in the various directories and lists of architects. It seems that everybody from the hardware and paint men to the shingle and slate concern are on his trail, and the result is that some architects are using printed slips, asking manufacturers to refrain from sending advertising matter until such a time as their products are of particular interest. This seems to make out a good case for the architectural magazine that holds a position of authority. Undoubtedly it offers the most auspicious and economical way of reaching architects.—*Printers Ink.*

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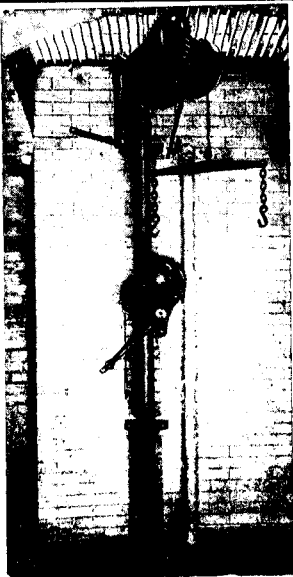
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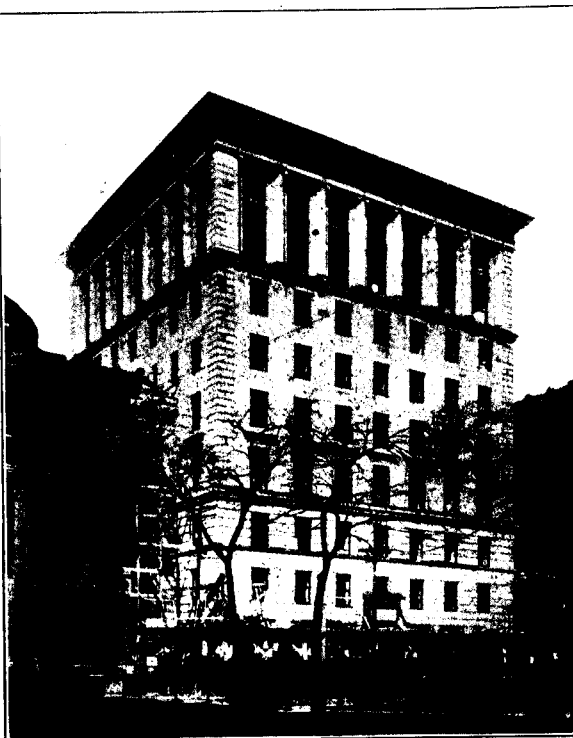
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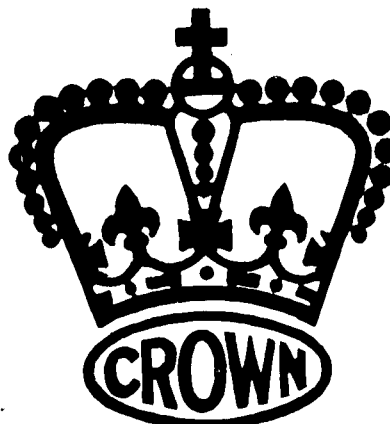
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Pedlar People, The.

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Hynes, W. J., Ltd.

Architectural Terra Cotta.
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Canadian Johns-Manville Co.
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Standard Sanitary Co.

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Wettlaufer Bros.

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Canadian Sirocco Co.
Sheldons Limited.

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Pedlar People, The.

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Clare Bros. Co.
Dominion Radiator Co., Ltd.
Goldie & McCulloch Co., Ltd.
Taylor-Forbes Co., Ltd.
Wettlaufer Bros.

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McFarlane-Douglas Co.
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Caen Stone Cement.
Hynes, W. J., Ltd.

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Galt Art Metal Co.
Hynes, W. J., Ltd.
McFarlane-Douglas Co.
Pedlar People, The.

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Sheldons Limited.
Wettlaufer Bros.

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Pedlar People, The.

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Cement Brick Machinery.
Wettlaufer Bros.

Cement Machinery.
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Dennis Wire and Iron Works.
Noble, Clarence W.
Pedlar People, The.
Trussed Concrete Steel Co.

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Conduits Co., Ltd.
Northern-Electric Mfg. Co.
Pedlar People, The.

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Contractors.
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Toronto Laundry Machinery Co.

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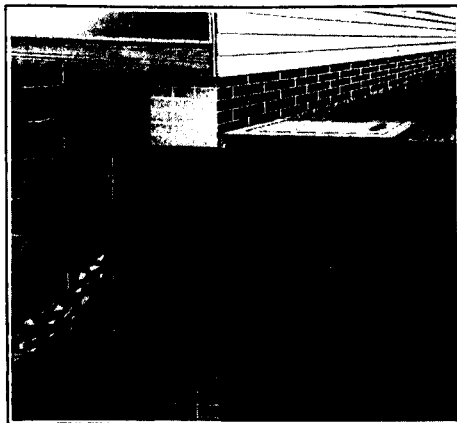
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International Varnish Co.
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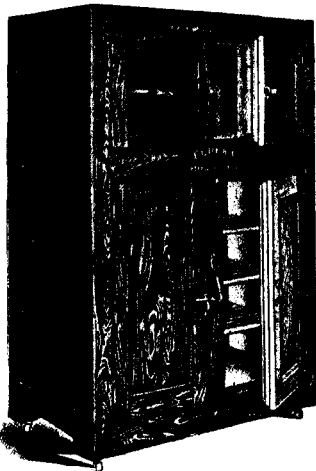
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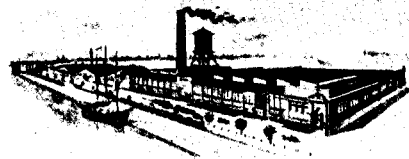
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