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# CONSTRUCTION



April, 1916

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## CONTENTS

A NOTABLE EXAMPLE OF FACTORY CONSTRUCTION .....	105
A REINFORCED CONCRETE STRUCTURE OF MERIT .....	112
A MODERN FACTORY OF STEEL AND CONCRETE .....	116
ONE OF MONTREAL'S MOST MODERN FACTORIES .....	121
A REINFORCED CONCRETE WAREHOUSE .....	126
ARCHITECTURAL DIGEST .....	128
CONSTRUCTION NEWS .....	131

## Full Page Illustrations

FRONTISPIECE .....	104
ARTISTIC INTERIOR SHOWROOM FIXTURES .....	127

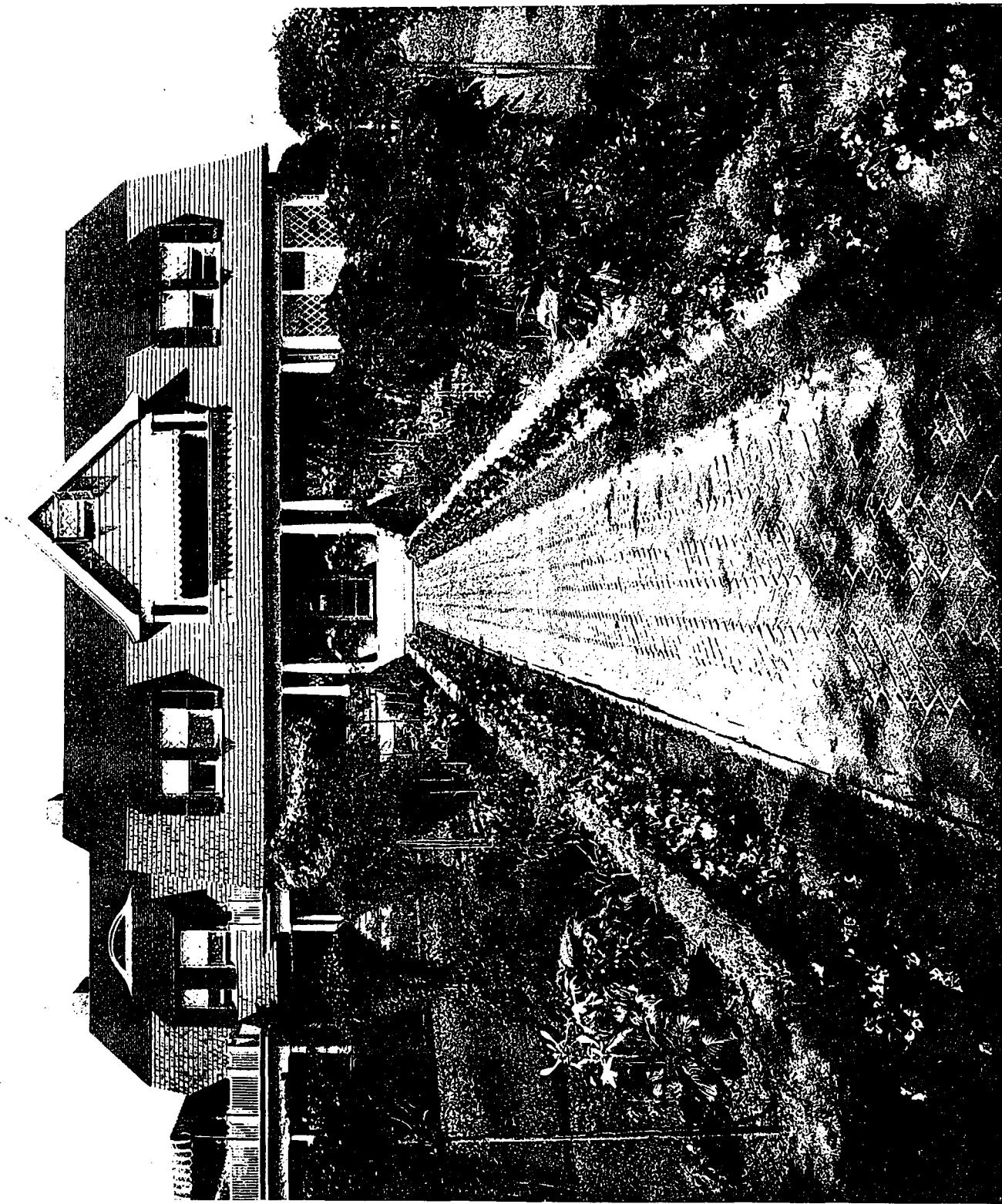
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BRANCH OFFICES

MONTREAL

NEW YORK



**HAMPTON HOUSE IS STRONGLY CHARACTERIZED BY AN APPEALING AIR OF THE COMFORT WHICH MAKES FOR LIVABILITY.**  
The flower-lined brick walk leading up to the house is very inviting. For the ribbon effect dwarf begonia is used. The clipped shrubs are altheas.



# A Notable Example of Factory Construction

Abundant Daylight, Improved Sanitation and Comfort of Employees  
Are Features of This Building

THE new reinforced concrete factory building erected by the McCormick Manufacturing Company at London, Ontario, is an example of the ideal attained in factory construction in Canada. In it a pleasing architectural effect has been combined with utility, strength and durability. The main portion of the building is approximately three hundred and fifty-four feet long by ninety-one feet in depth, with the wings in the rear. Exclusive of the basement, the building is four stories in height. Provisions for extensions have been made to amply take care of the future expansion of the business.

The whole exterior is of white terra cotta tile, attached to the reinforced concrete structural frame, and steel sash. The combination of reinforced concrete with steel sash affords maximum daylight, proper ventilation and greatest permanency. The arrangement of the panes harmonizes with the general architectural features, and at the same time gives the maximum available area for lighting. A large amount of ventilation is secured by means of specially designed pivoted ventilators.

The floor construction is of what is known as flat slab design, and consists of solid reinforced concrete slabs, with no beams projecting underneath to cut off the daylight. The floor slabs are seven inches in thickness, and are designed for a live load of one hundred and fifty pounds per square foot. In the packing room, where heavier loads are anticipated, the floor slab is nine inches in depth and designed to carry two hundred and fifty pounds per square foot. Circular, spirally-wound, hooped columns, with flaring capitals,

have been used throughout the interior of the building. Casting a twelve-inch flue in the core of a number of these columns in the north-west wing of the building was an interesting feature in reinforced concrete column design.

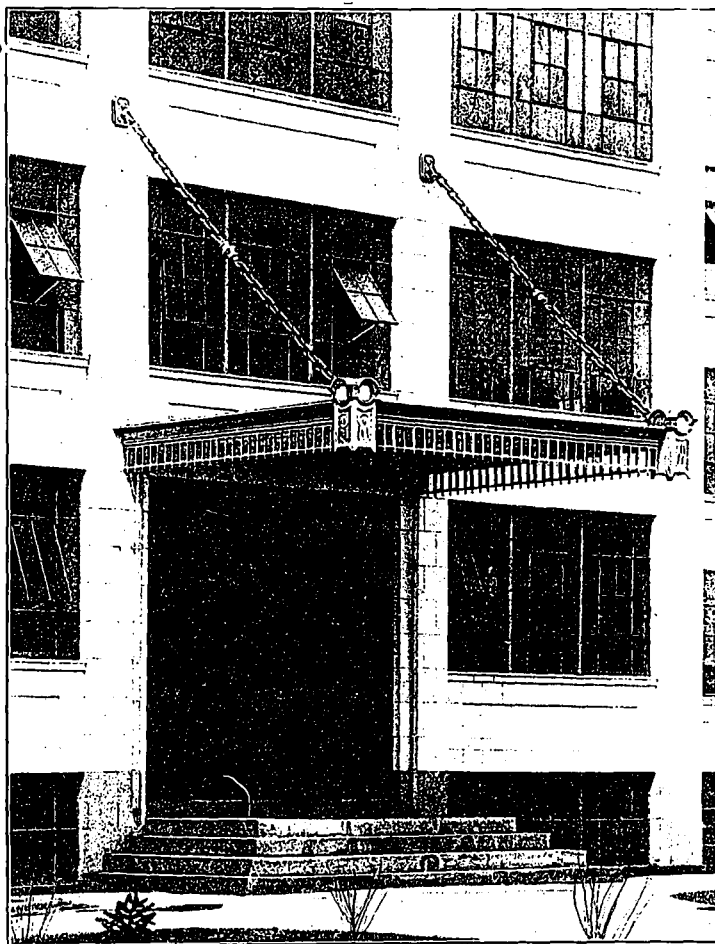
The fireproof qualities have been carried out in all parts of the building, even to the interior partitions, which are of metal lath plastered to the required thickness with cement mortar. Metal lath is also used in the suspended ceiling

over the oven room. The stairs also are of solid concrete construction, with the concrete steps being moulded in place. Kahn system standard design was employed throughout in the reinforced concrete work.

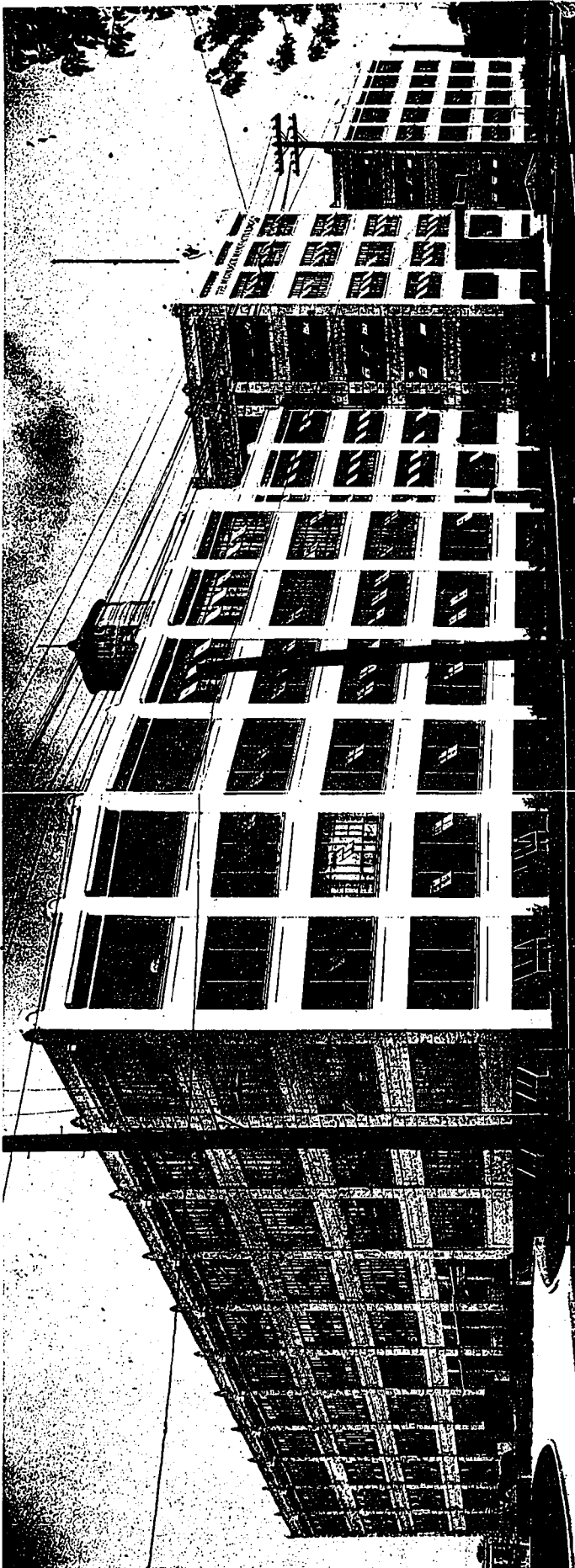
When planning this new building, perfection was the aim, and apparently the architects have attained their ideal. The design shows study and a careful placing of any ornamentation, and showing a strong vertical feeling, and presents an unusual and attractive appearance; the main entrance being accented by the tower portion.

Passing into the main entrance, one is confronted with a most attractive lobby.

with tile floor, oak trim; ranged around this lobby are built-in showcases, of leaded glass design, displaying all the different brands of the firm's confections. On either side of this lobby are placed the private and general business offices, all finished in quarter-cut oak, and on either side of these are placed the employees' entrances. The remainder of the first floor is utilized for shipping rooms, mixed candy department, cold storage and stock rooms, while at the rear is the oven room. This portion is

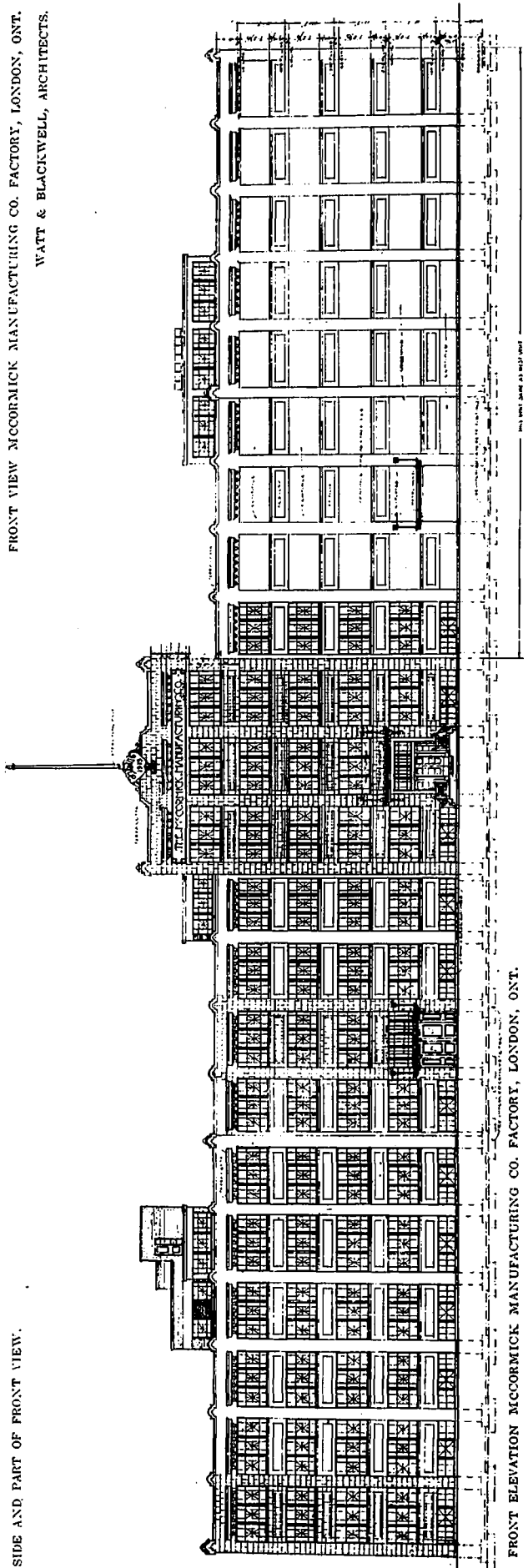


MAIN ENTRANCE, SHOWING MARQUISE, MCCORMICK CO., LTD., LONDON, ONT.  
WATT & BLACKWELL, ARCHITECTS, LONDON, ONT.



SIDE AND PART OF FRONT VIEW.

FRONT VIEW MCCORMICK MANUFACTURING CO. FACTORY, LONDON, ONT.  
WATT & BLACKWELL, ARCHITECTS.



FRONT ELEVATION MCCORMICK MANUFACTURING CO. FACTORY, LONDON, ONT.



VIEW OF RECEPTION ROOM.

but one story in height, and is lighted by skylights. In this room the biscuits are carried, after leaving the ovens, by travelling conveyors to the packing rooms on the fourth floor, and thence by conveyors to the final destination in the shipping rooms on the first floor, where they are placed on the freight cars, which come in on the two sidings between the rear wings of the building.

Another feature of the plant is the long corridors from one end of the building to the other, whereby visitors may view the different processes through glass partitions without going directly into the rooms, and also the oven room from a balcony on the second floor.

From the employees' point of view, this factory compares favorably with anything of its kind in Canada; not only is the health well cared for by the proper ventilation and light, but there is a large serve-self dining-room, with a seating capacity of six hundred, a modern gymnasium, shower baths, locker rooms, library, and a most complete Red Cross room for emergency accident cases.

In the room on the fifth floor of the tower is the reception room, which is fitted in a restful manner with wicker furniture.

The power plant is situated in a separate building at the rear end, and here also is to be found the most modern machinery, both in the way of electrical and steam equipment, and also the same cleanly surroundings.

This large plant has eight acres of floor space, and is so planned that additions may be added without disturbing business in the present one.

### Mechanical and Electrical Equipment

H. P. Elliott, Consulting Engineer.

The equipment of these buildings, that is, the parts that came under the supervision of the engineer, consisted of the following:—

- Power plant, buildings and equipment.
- Heating system.
- Ventilating system.
- Refrigeration system.
- Electric power transmission and motors.

- Illuminating system.
- Hot blast apparatus for drying rooms.
- Temperature regulation.
- High pressure steam system.
- Elevators and conveyors.
- Ovens, etc., etc.
- Placing of all machinery, shafting, etc.
- Pumping systems for syrups, etc.

The most interesting features, from the standpoint of an engineer, are that the owners placed no restriction in regard to expense in purchasing the best equipment, and spared no engineering expense in making complete plans. All parts of the buildings were laid out on a scale of three-eighths inch to the foot. These plans showed the location of all motors, shafting, pulleys, pipe work, machines, etc., etc. In consequence of this all the equipment went into place without interference, and the machines, used in manufacturing, were transferred from the old factory and manufacturing started in the new factory without any loss of production.

The owners' instructions were to provide every possible device to ensure the safety and comfort of the employees and the sanitary handling of raw materials and finished products.

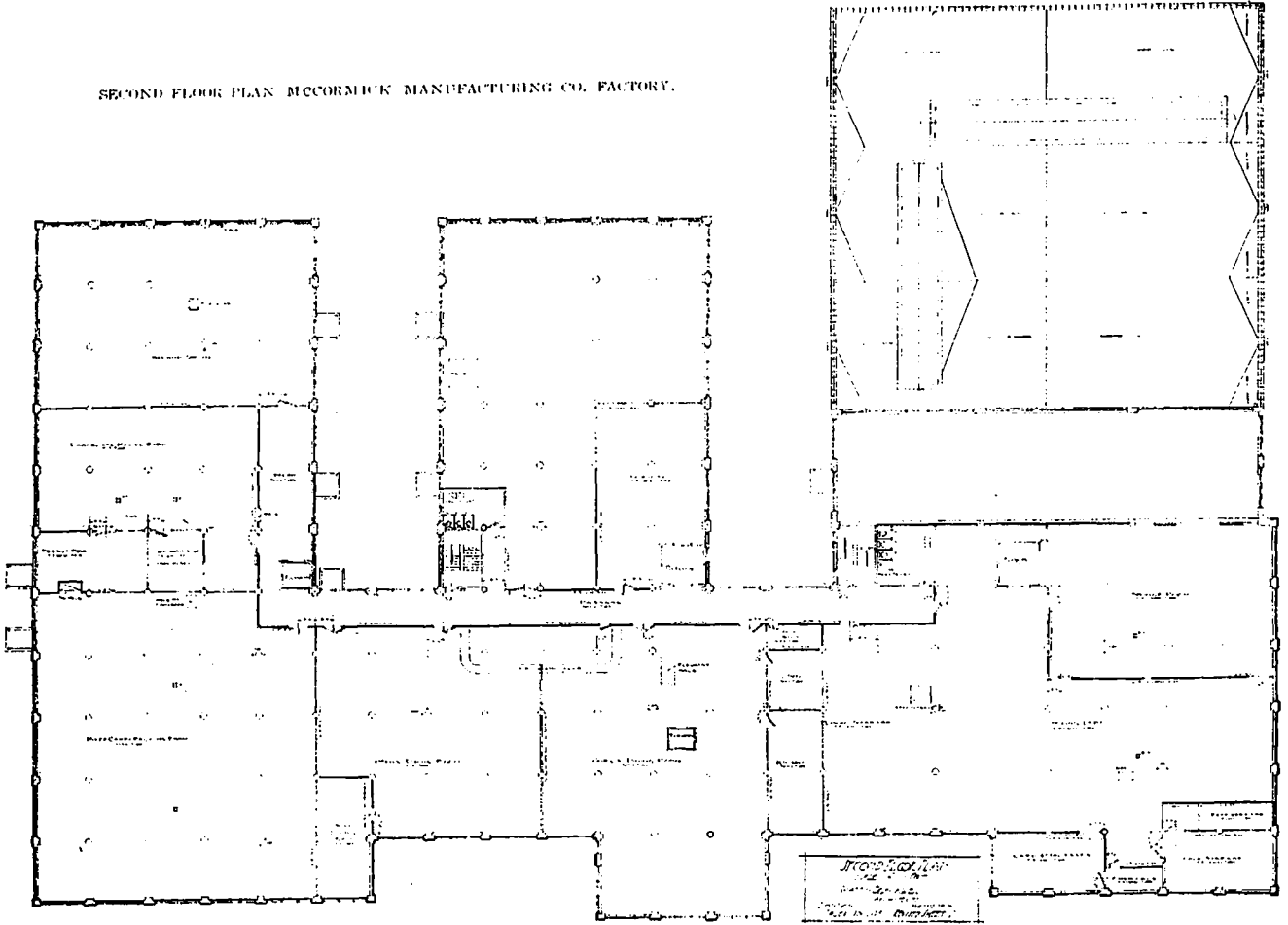
The power plant is placed about one hundred and fifty feet from the main buildings and connected to them by a well-lighted tunnel. All the steam and water pipes are carried at one side of this tunnel, and the electric cables are carried in conduit buried in the reinforced concrete roof.

The floor of the boiler house is eight feet below grade, which allows a gravity return of all condensed steam and at the same time brings the coal hoppers of the stokers level with the ground, so that coal can be brought in on a track without handling. The chimney is one hundred and twenty-five feet high, five feet six inches inside, built of reinforced concrete "coniform" section. Provision is made for five boilers, one hundred and twenty-five horsepower each. These are return tubular, sixteen feet by seventy-two inches, and each has a self-feeding,



TILED ENTRANCE LOBBY.

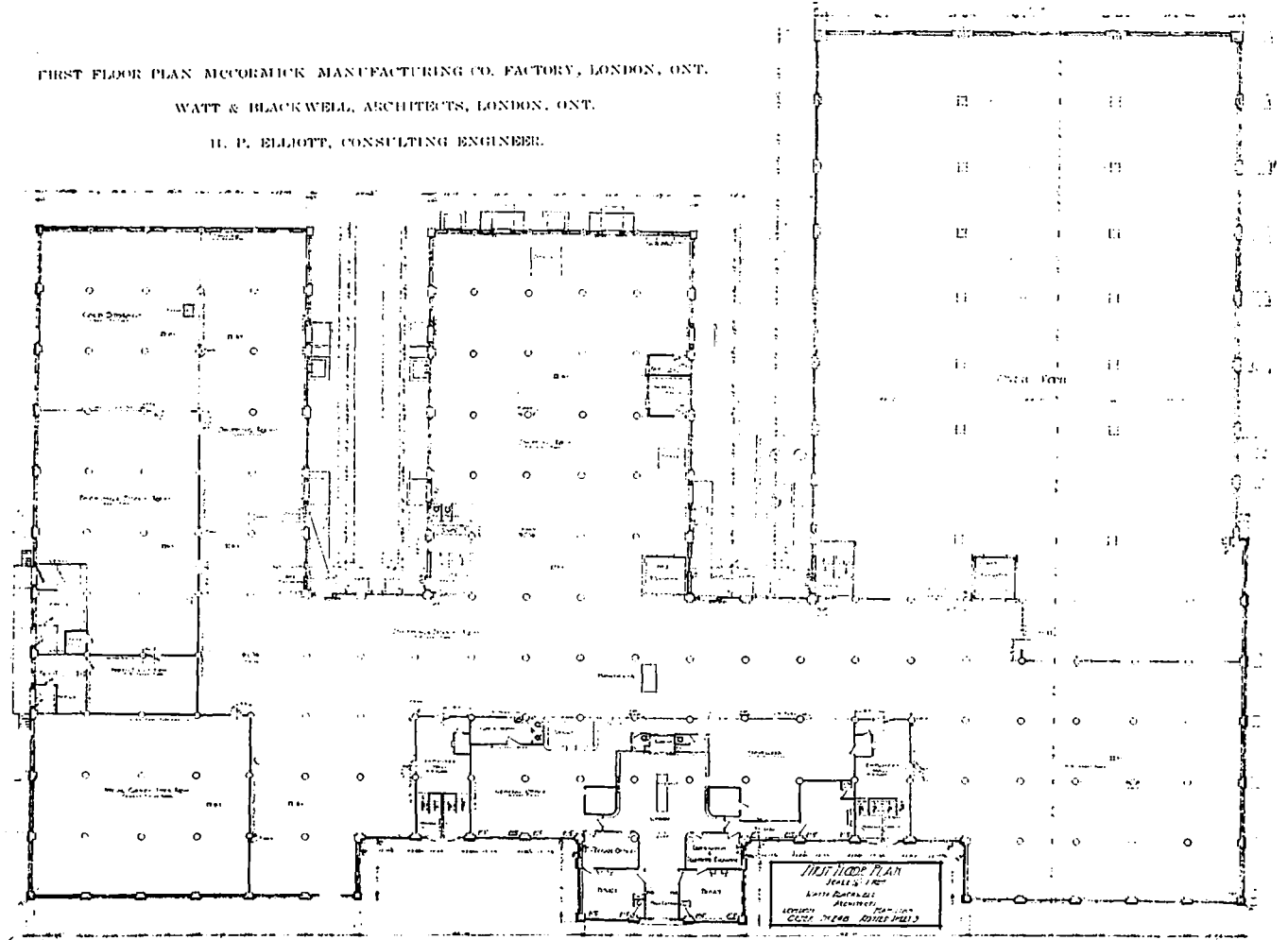
SECOND FLOOR PLAN MCCORMICK MANUFACTURING CO. FACTORY.

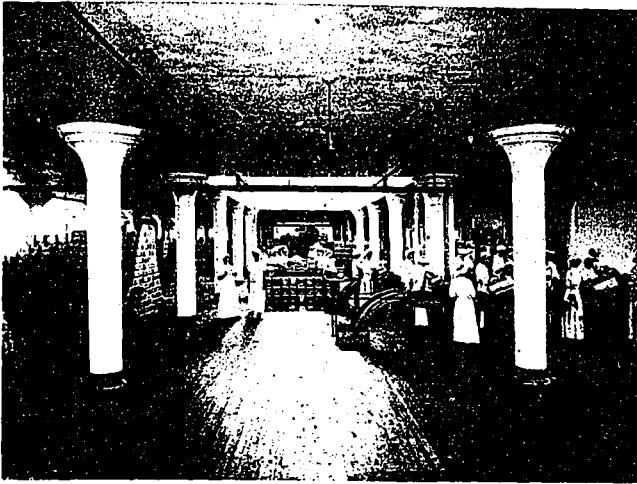


FIRST FLOOR PLAN MCCORMICK MANUFACTURING CO. FACTORY, LONDON, ONT.

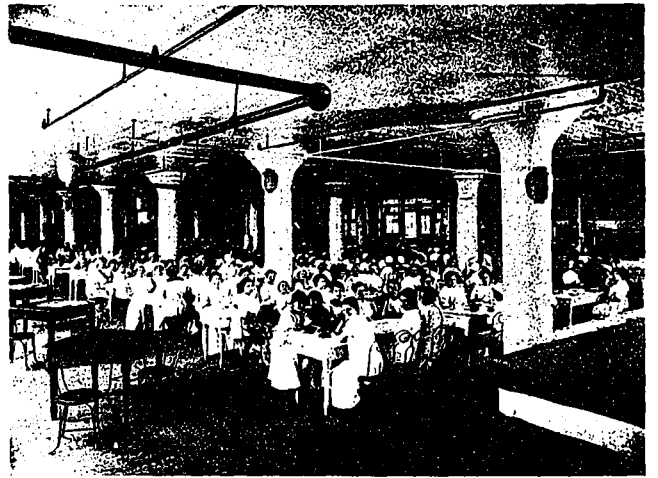
WATT & BLACKWELL, ARCHITECTS, LONDON, ONT.

H. P. ELLIOTT, CONSULTING ENGINEER.





VIEW OF WRAPPING ROOM, SHOWING SPACING OF COLUMNS.



VIEW OF LUNCH ROOM, SHOWING EXTENSIVE INTERIOR.

smokeless furnace. A full equipment of pumps, traps and heaters are provided, all in duplicate.

The plant is laid out with the idea of using "Hydro" power, and a very complete switch-board is installed, having a capacity of four hundred kilowatts. There is a one hundred and twenty-five K.V.A. generator, five hundred and fifty volts, three-phase, twenty-five cycles, direct connected to a high-speed vertical engine. This outfit has a large overload capacity, and is used chiefly at times of peak load or to keep important parts of the plant in operation during a temporary failure of "Hydro" power. On account of a number of large motors in this factory, which run intermittently, it is impossible to maintain a good power factor without the use of synchronous motors. This generator is, therefore, arranged so that it can be floated upon the circuit, and the power factor can easily be brought to one hundred per cent. Provision is made for future units if found advisable.

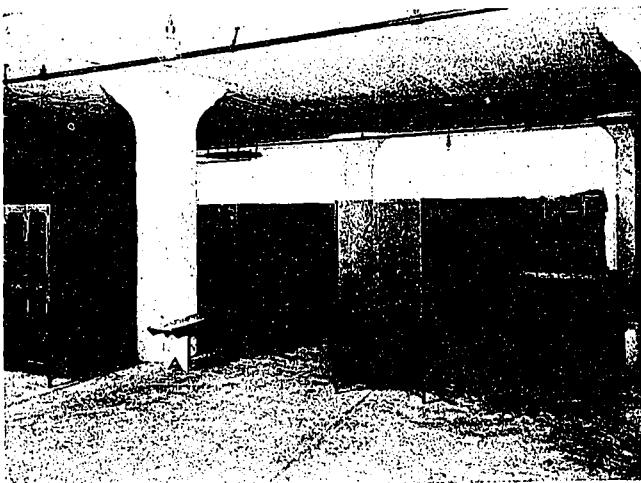
The buildings, in general, are heated by direct radiation under a pressure of one pound or less. It is a one-vacuum system, complete in every detail.

In a factory of this nature, the floor space is

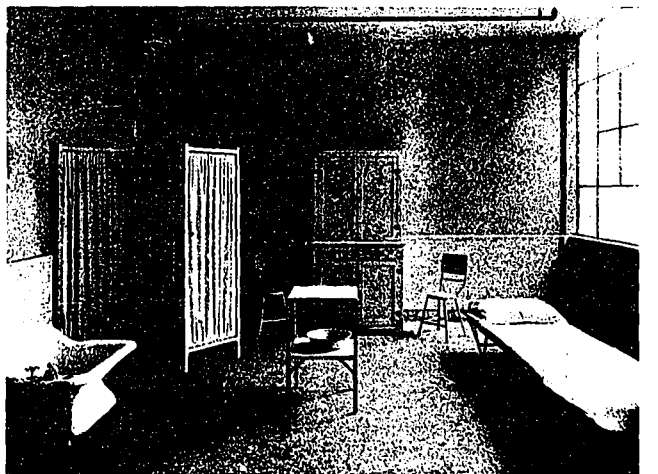
large compared to the number of employees, and no general system of ventilation is required. Very complete ventilation systems are provided for the officers, however, and for all departments where the nature of the work requires it. The oven rooms, chocolate dipping rooms, boiling rooms, etc., are perfectly ventilated, winter and summer, by special multivane fans. In the winter the air is tempered by pipe coil heaters. The air for the chocolate dipping rooms and several of the storage rooms is passed through an air washer, and in the summer is cooled by the refrigerating plant.

The ammonia compressor, for the refrigeration system, is a sixty-ton machine, driven by a ninety horsepower variable-speed motor. It is placed in the engine room, and a brine system used, so that no ammonia gas is used in the factory. An interesting feature of this installation is the method of carrying cooled and washed air to various departments without disfiguring the rooms with large air pipes. Certain columns of the building are made hollow, and the air is introduced into these at the basement, and thus carried to the rooms above.

All the steam and return pipes, water, gas, electric cables, etc., are carried up in accessible places beside the elevator shafts. The wiring

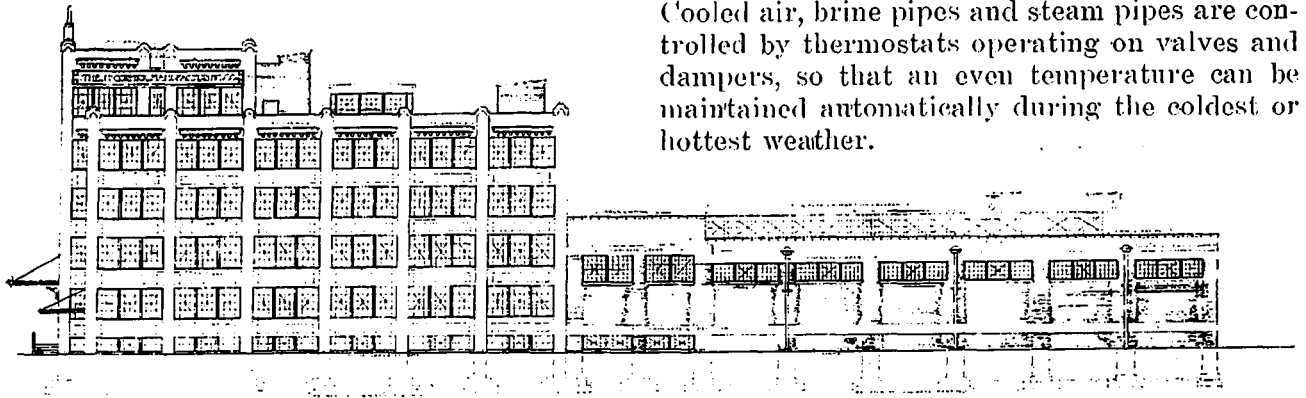


CLOAK ROOM, SHOWING METAL INDIVIDUAL LOCKERS.



FULLY EQUIPPED HOSPITAL ROOM.





SIDE ELEVATION MCCORMICK MANUFACTURING CO. FACTORY, LONDON, ONT.

Cooled air, brine pipes and steam pipes are controlled by thermostats operating on valves and dampers, so that an even temperature can be maintained automatically during the coldest or hottest weather.

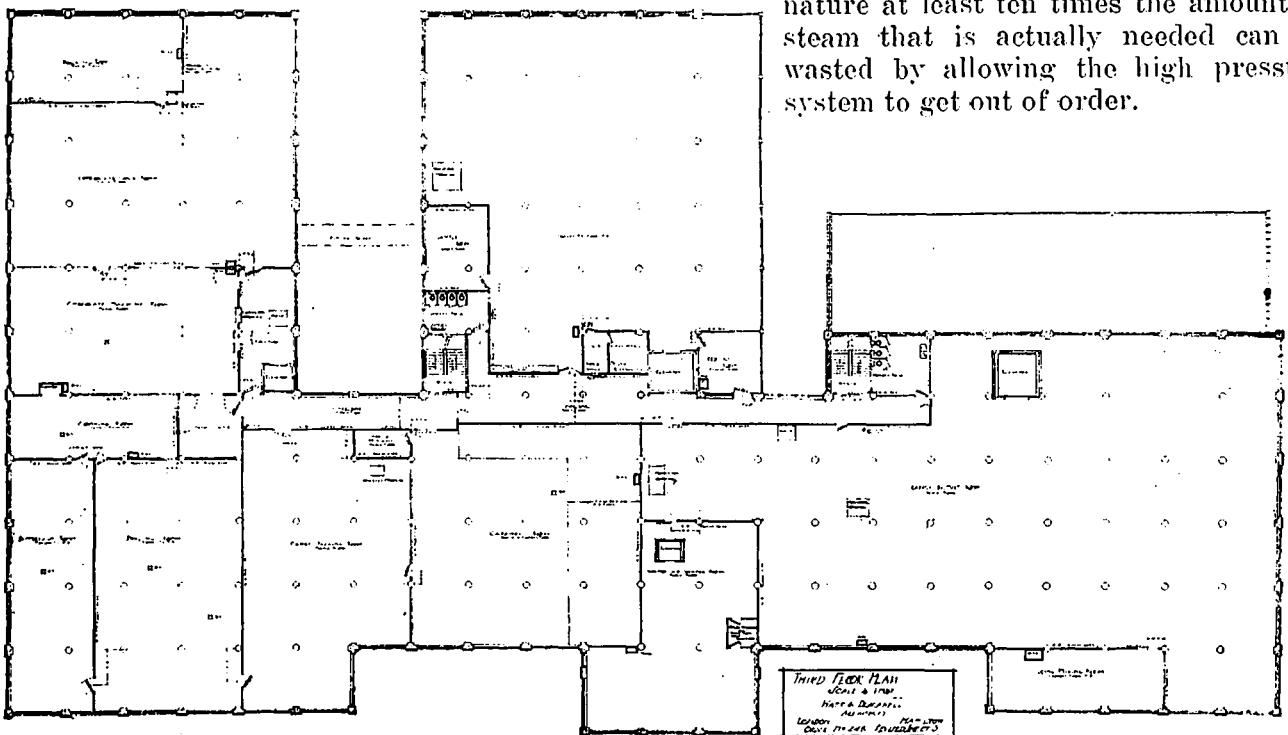
is all in conduit. All the lighting circuits are buried in the concrete floors. The power wiring, from the junction boxes, is carried in conduit on the ceiling. The motors are all carried on special steel cradles suspended from the ceilings. Individual drives are general, and group drives are used where more economical.

The illuminating system is thoroughly worked out, and consists of a system of general illumination over the whole factory, the intensity being varied to suit conditions. The offices are lighted by a system of total indirect illumination, which has found great favor with the employees.

Various large drying rooms are provided, in which the temperature can be carried up to one hundred and eighty degrees Fahrenheit. They are heated by pipe coil heaters and multivane fans, and provision made for thorough circulation and close regulation.

A special system of temperature regulation is provided in various departments, notably the sponge room (where the biscuit dough is allowed to rise) and in the chocolate rooms.

High pressure steam is used for various manufacturing purposes. The boiler pressure is kept at about one hundred and twenty pounds. This is passed through a regulating valve reduced to eighty pounds, and carried from the power house through an eight-inch main. All apparatus is trapped with tilt traps or continuous flow traps. Various tell-tale devices are installed, which indicate the failure of any trap, and the whole system has proved very effective and economical. A feature of this is a special return pipe carried to most of the steam-using apparatus. A special drip is provided on each machine, independent of the trap. This drip opens above a funnel leading into the special return. In this way, if a trap gets out of order and the machine operator uses the drip, it is at once noticed by the foreman. Vents are also lead out above the elevator towers, and if any steam is being wasted, it is quite evident and can be seen by the manager or superintendents. The importance of this can be readily recognized from the fact that in factories of this nature at least ten times the amount of steam that is actually needed can be wasted by allowing the high pressure system to get out of order.



THIRD FLOOR PLAN MCCORMICK MANUFACTURING CO. FACTORY.

WATT & BLACKWELL, ARCHITECTS.

Complete systems of automatic carriers have been provided for taking the biscuits from the oven room to the packing rooms and from the packing rooms to the shipping rooms. The flour is automatically weighed, sifted, blended and delivered to the dough mixers. A mono-rail conveyor enables one man to handle a tub containing nearly two tons of dough. Sugar syrups and all raw materials are taken from the cars and placed in the desired locations without manual labor.

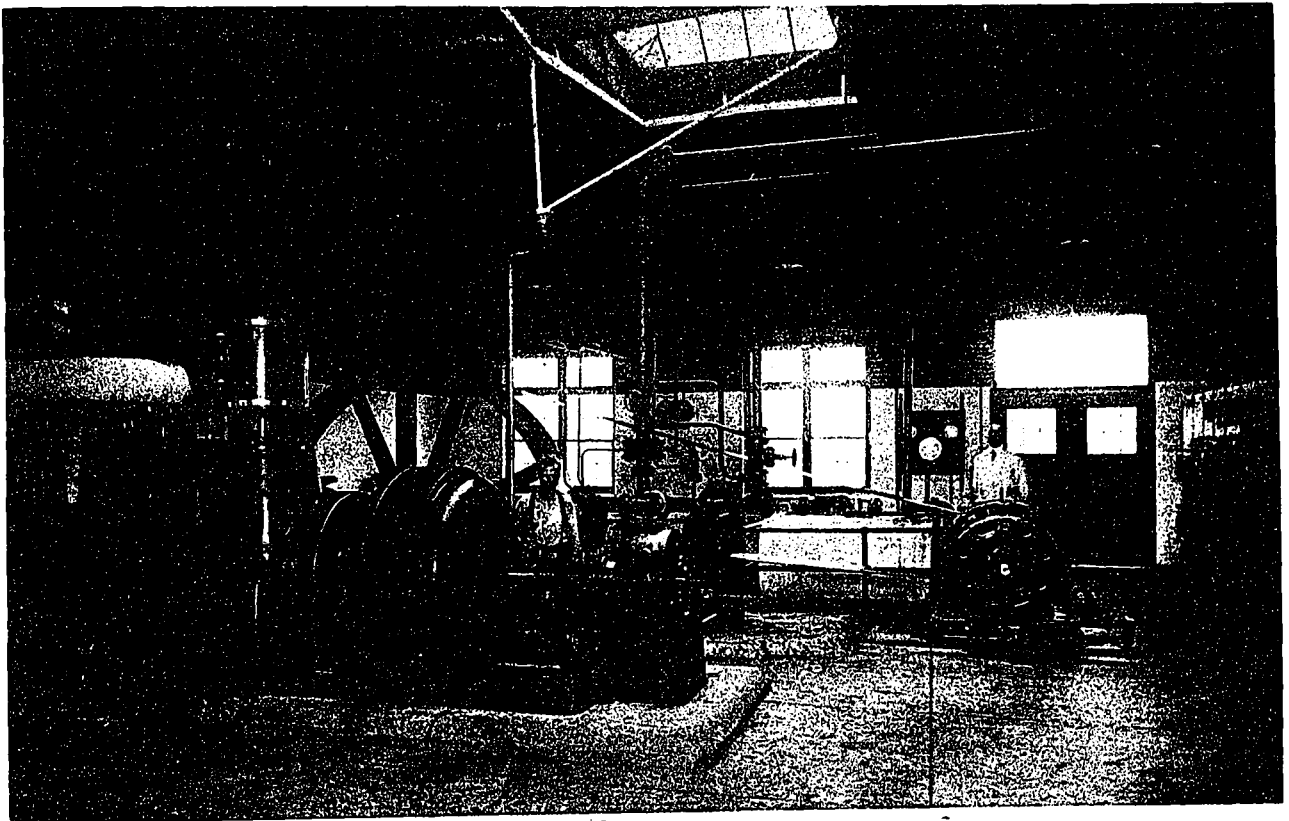
The large freight elevators and passenger elevators are operated by induction motors with special high resistance end rings. No controllers are used with these motors, and there is consequently very little apparatus to get out of order.

modern as Perret's plans; 12-foot walls were none too thick to support 11 stories. Here, again, however, the ingenuity of the architect showed itself, for he found a way to make use of the walls without weakening their strength.

"In the thickness of the walls," he wrote, "are little stairways, cabinets and cupboards, from the bottom floor to the top floor. Thus there is no space wasted."

Evidently the building was designed for a dwelling—perhaps an apartment house—for in describing his project Perret wrote: "This great and excellent edifice can accommodate comfortably 500 people."

Considering the date of the design, the project of Jacques Perret was, in many ways, a remarkable prophetic vision. In ornateness of



POWER PLANT, MCCORMICK MANUFACTURING CO. FACTORY, LONDON, ONT.

H. P. ELLIOTT, B.A.S.C., M.E., E.E., CONSULTING ENGINEER.

## ANCESTOR OF SKYSCRAPERS

In 1601 Jacques Perret, an architect living in Chambray, Savoy, designed a building that, although it was never erected, may properly claim to be the ancestor of the modern skyscraper. What a visionary dreamer must have been the architect who 300 years ago, planned an 11-storey building, 361 feet in height—almost half as tall as the tallest building in New York.

According to Perret's measurements the building was to be 166 feet long and 140 feet broad. And the walls were to have been more than 12 feet thick. But in 1601 the methods of building construction were by no means so

detail and in fanciful exaggeration, the building suggests the 16th century, but in its general lines it represents a much later period in architecture. Like the modern skyscrapers, it has a tower above the main building. And when he designed the terraced roof, did Jacques Perret dream of a roof garden?

## FOREST PLANTING

Forest planting has been carried on by the Japanese for probably a much greater period than 400 years, and it is this work that gives Japan credit for having practised forestry before any other nation. As a matter of fact, however, the forests of Japan have been under real forest management less than thirty years.

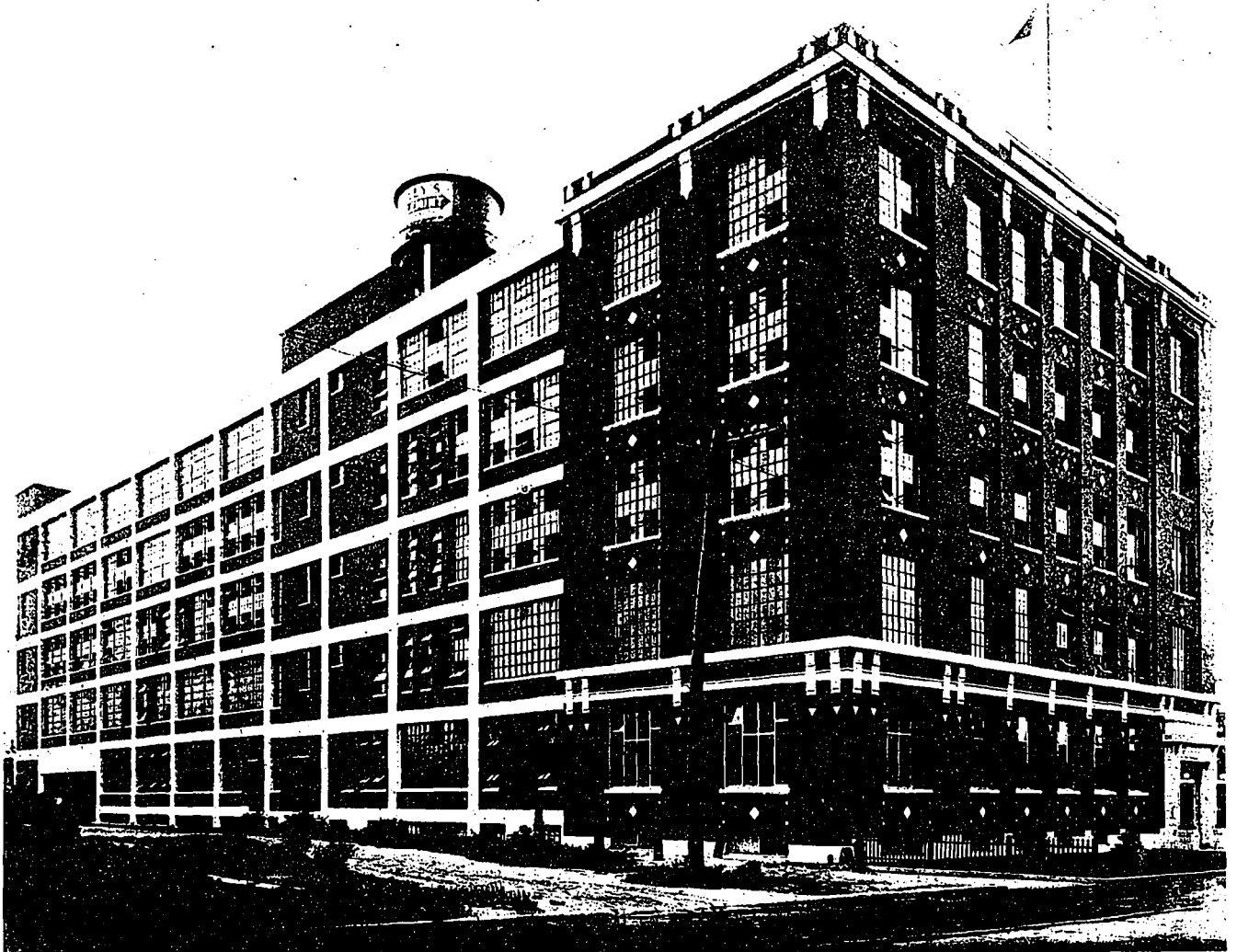
# A Reinforced Concrete Structure of Merit

Modelled From The Firm's Parent Factory, The Canadian Building  
Contains Improved Ideas

THE Wm. Wrigley, Jr., building is five storey and basement of reinforced concrete construction of the most modern fireproof type, with a width of 90 feet on Carlaw avenue, and a depth of 260 feet.

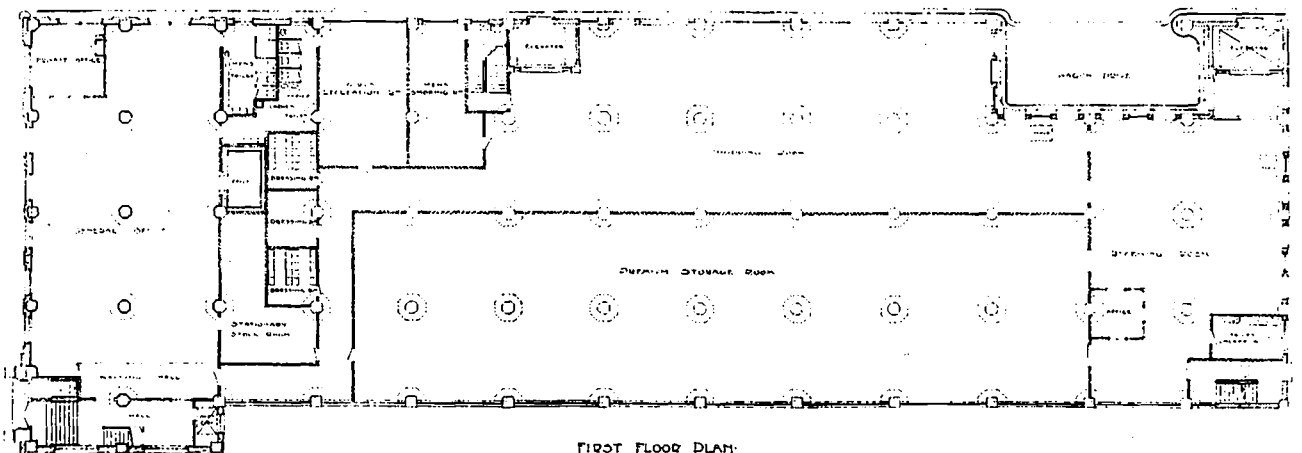
The exterior windows of the building are of wire glass with rolled steel frame extending from column to column, and giving a maximum of light for manufacturing purposes.

All elevator shafts and stairwells are entirely



FRONT AND SIDE EXTERIOR, WM. WRIGLEY, JR., FACTORY, TORONTO.

PRACK & PERRINE, ARCHITECTS.



FIRST FLOOR PLAN

enclosed with fireproof partitions and fire doors from basement to roof, so as to afford absolutely safe means of egress to the occupants in case of fire.

In giving orders for the building, the owners required that it should be designed for manufacturing purposes, with a maximum of light, should be as fireproof as practical to make it, and that special attention should be paid to the sanitary arrangements, and ample provision made for the accommodation of the employee, as in their manufacturing processes cleanliness was the first consideration, so no expense was spared in the building to realize the highest ideals in this regard.

The building construction is patterned to to some extent after the owner's Chicago factory, and sanitary arrangements found successful there, adopted for use in this building. The plumbing fixtures are of the best throughout with flushometer valves and syphon jet bowls, easily flushed and cleaned at all times.

The toilet room floors throughout are of terrazzo, with waterproof walls and ceilings, and with cove molds at all corners, so as to leave no awkward corners for the accumulation of dirt and rubbish. A novel feature is the arrangement of the wash basins throughout the factory, which, instead of being placed inside the toilet rooms in the usual manner, are placed just outside the door in the factory with a white terrazzo floor under them. This enables the foreman to keep a watchful eye on the employees and make sure that their ablutions are properly attended to.

Ample dressing rooms and locker rooms have been provided also, and rest rooms for the women and smoking rooms for the men, with magazines, gramophone and other amusements for the noon hour. Shower baths are also provided, and sanitary bubbling drinking fountains so as to encourage the employee to cleanliness and self respect.

For the main structure of the building *Flat Slab* reinforced concrete construction was adopted with columns spaced 20 feet apart in each direction. This construction gives an absolutely flat ceiling without any projecting beams or girders, and as the side windows are run clear up to the ceiling, the distribution of light through the interior is as near perfect as it is possible to be. This construction also allows the greatest economy in the installation of all sprinklers and heating pipes, shafting hangers and other equipment, eliminating all awkward bends, and also increases the available head room and storage heights materially. The great stiffness of this construction also renders imperceptible the vibration from moving machines so that all delicate machines register accurately, and all shifting and other moving parts once

properly set keep their alignment indefinitely.

This construction also with round columns has been proved by the Edison fire at Orange, New Jersey, to be the most perfect type from the standpoint of fireproofness, as there are no projecting corners anywhere for the fire to attack, and no sprawling off of corners due to unequal expansion, such as happens in buildings with square columns and beams. This fact has been recognized by the "Fire Underwriters," so that it is now possible to secure a lower insurance rate with this construction than with any other type, as has been proved by the rates offered on this building, and on others of similar design.

This building was designed for a floor load of 200 pounds per square foot, and at the time it



MAIN ENTRANCE, SHOWING MARBLE STAIRWAY, WM. WRIGLEY, JR., FACTORY, TORONTO.

was built was the first large building of this type that had been constructed in Toronto, and the first one of this type under the new Toronto building code; although this construction is widely used in the States and rapidly superseding other types.

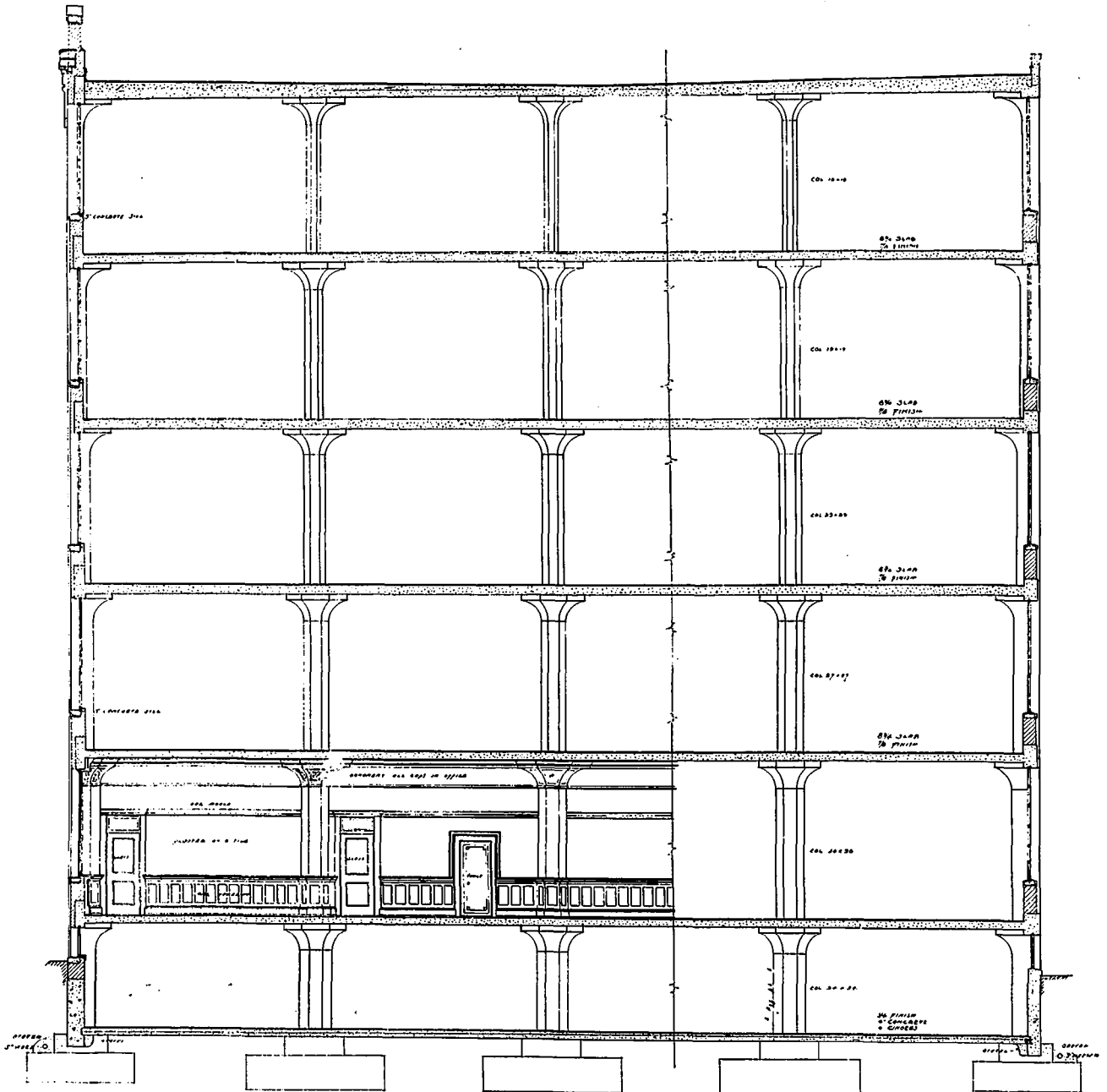
The Toronto code being somewhat conservative, owing to the newness of this type, the building is somewhat heavier in proportion than a building of the same capacity would be in Chicago and other large American cities. During construction and before the concrete was sufficiently aged to attain its full strength, the floor was tested over two panels, an area of

about 1,500 square feet with a test load of 514 pounds per square foot, or about 341 tons, in accordance with the city requirements. The deflection for this load was only 5/16 inch at the 20 foot panel without any signs of distress in the concrete at any point.

Great care was given to the floor finish of the building, most of the factory floor having a cement topping and carefully graded silica gravel and sand was used in mixing the cement

used, applied directly on the concrete and has made a splendid, pleasing floor both to walk on and for appearance.

The artificial lighting is supplied by means of one large outlet in the centre of each 20 x 20 foot panel, which makes a permissible arrangement due to the flat ceilings which reflect the light uniformly in all directions, and the interior of the building and all ceilings being painted with white paint, greatly adds to this result. The



SECTION THROUGH FACTORY OF WM. WRIGLEY, JR., TORONTO.

PRACK & PERRINE, ARCHITECTS.

topping laid rather dry and afterward cured by being kept covered with damp sawdust for several weeks. The result has been a splendid hard topping that stands up under trucking and without the dusting of the surface so objectionable with most cement factory floors. Floor hardener was used in the topping for the stairs and landings with good results, while in the offices, battleship linoleum 1/2 inch thick has been

paint for the factory portion being of the brand of cold water paint, an excellent cheap paint with waterproof qualities.

The heating of the building is by steam of a combination gravity and vacuum steam heating system, steam being supplied by two efficient C. I. sectional boilers of 100 H.P. each.

The elevator service of the building is furnished by two freight and one push button pas-

senger elevators, which amply provide the transportation service in the building.

As an aid to the receiving and shipping facilities, a siding runs close to the building in the rear, and loading and unloading is done directly from car into first floor of building, while for wagon shipments a loading dock has been provided as shown by the first floor plan, where wagons can drive under a portion of the building at the rear and load and unload under cover.

The front portion of the building is devoted to offices, and has for that reason been made more elaborate than the factory construction, being veneered with pressed brick over the concrete work and ornamented with terra cotta.

The interior of the main offices have been finished in an ornate and harmonious though simple manner.

The walls and ceilings are plastered and ornamented with a few simple plaster molds, while the wainscoting and trim is panelled in quartered oak. The walls are beautifully tinted with soft colors restful to the eyes, the lighting fixtures are bronze of the indirect type of an elegant graceful design; the furniture is all new and of quartered oak especially finished to match the wood trim, the floor of green linoleum, the entrance halls and toilet rooms finished with marble wainscotings and floors, and the whole effect is quite artistic.

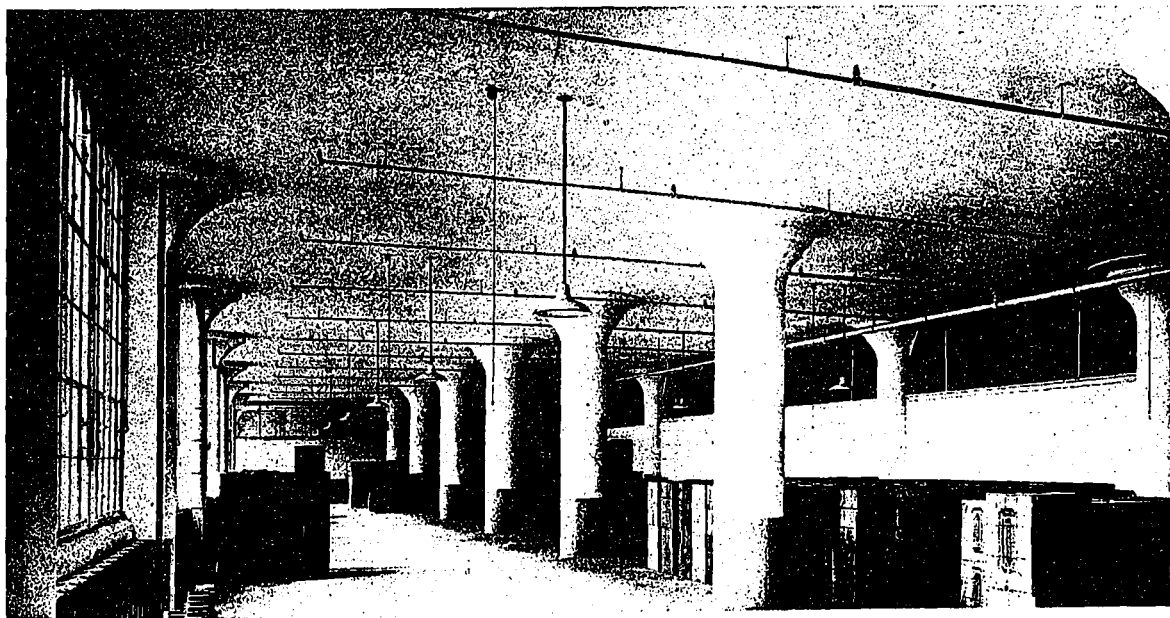
This building has been pronounced by those who have seen it, to be one of the finest and best type of modern factory buildings in Canada, embodying as it does all the late developments and improvements in factory construction, due to the remarkable development of reinforced concrete during the last ten years, and is well worth a visit by anyone interested in new building construction.

## PRACTICAL RESULTS OF TOWN PLANNING

In giving his experience as a resident of a town-planning garden suburb, Mr. George Phelps, now of Toronto, at the preliminary conference to form a Civic Improvement League, said:—I had the privilege of living in a garden suburb a few years ago, and from having lived in it and taking part in the life there, that very fact has fired me with an enthusiasm for town-planning and housing I cannot get rid of. I know the project from the inside, and I also know that the place where I lived was one of the most beautiful places anywhere—the Hampstead garden suburb in England. Anything I can do to forward a movement to improve conditions in the way that the town-planning movement has been carried on there I will do to my very utmost ability, simply because I know, from living in it and being connected with the movement, what a tremendous benefit it is, not only in beautifying the town but in uplifting the people who live there.

## BUILDING MATERIALS WANTED IN RUSSIA

The British Vice-Consul at Moscow (Mr. E. B. St. Clair), in calling attention to the great demand that will arise in Russia after the war for manufactured goods of every description, points out that the following goods were formerly imported from Germany and Austria-Hungary on a large scale:—Building materials and requisites: Tiles, majolica, terra cotta, locks, and sanitary goods and fittings. Machinery and tools: Power plants, pumps of every description, motor-cars and spare parts, etc. Scientific instruments, etc. Scientific instruments, etc.



W.M. WRIGLEY, JR., FACTORY. INTERIOR VIEW, SHOWING COLUMNS AND FLAT SLAB CONSTRUCTION, ALSO SPRINKLER SYSTEM.

# A Modern Factory of Steel and Concrete

Former Experience in Factory Construction Utilized to Advantage

SITUATED on Christie street, Toronto, just north of the Canadian Pacific Railway tracks, in the city's newer factory section, is located one of the most up-to-date and best-equipped manufacturing plants on the continent, recently completed to provide a home for the manufacturing and executive staff of the National Cash Register Co., of Canada, Ltd.

The four buildings of the group arranged in the form of an "L," are placed in the south-east corner of the property which comprises some seven and one-half acres, and provides for plenty of air and light, as well as making provision for necessary extensions expected in the near future. The recent elevation of the railway tracks and the depression of the street on which the main portion of the building fronts, made necessary a retaining wall of concrete, so that the structure has an imposing appearance on the elevated surrounding ground.

Brick and steel were the materials used, the lintels and sills are finished in stone, and the interior steel columns are encased in concrete, so that a building of fireproof construction is obtained, and further security is secured by the installation of a sprinkler system throughout. The floors of the factory are of concrete, while the foundry floor is of brick and the windows are of the metal sash type.

The main building is set back some fifty feet from the street line, the intervening space being grass covered, with flower beds well arranged, the whole providing a pleasant view from within or without, and adding to the gen-

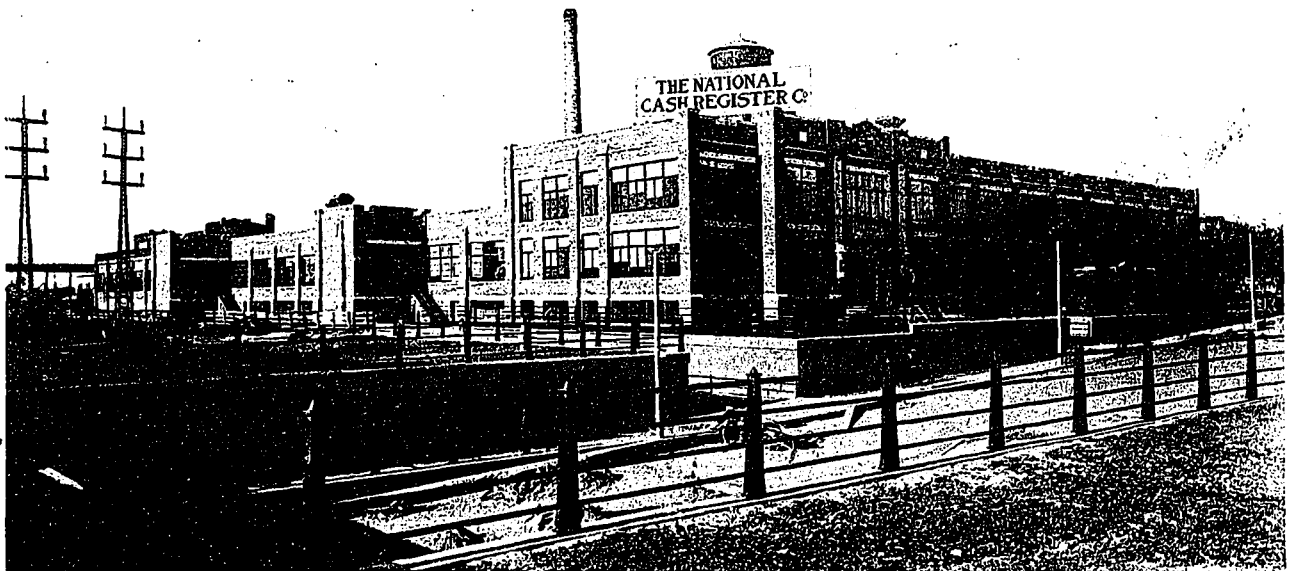
eral appearance of the plant as seen from the street. Entrance to the main building is through a large doorway designed in the Gothic style, the beauty of which will be noted by referring to the reproduction in detail, which we show herewith.

Facing on Christie street, the main building



MAIN ENTRANCE, NATIONAL CASH REGISTER FACTORY, TORONTO.

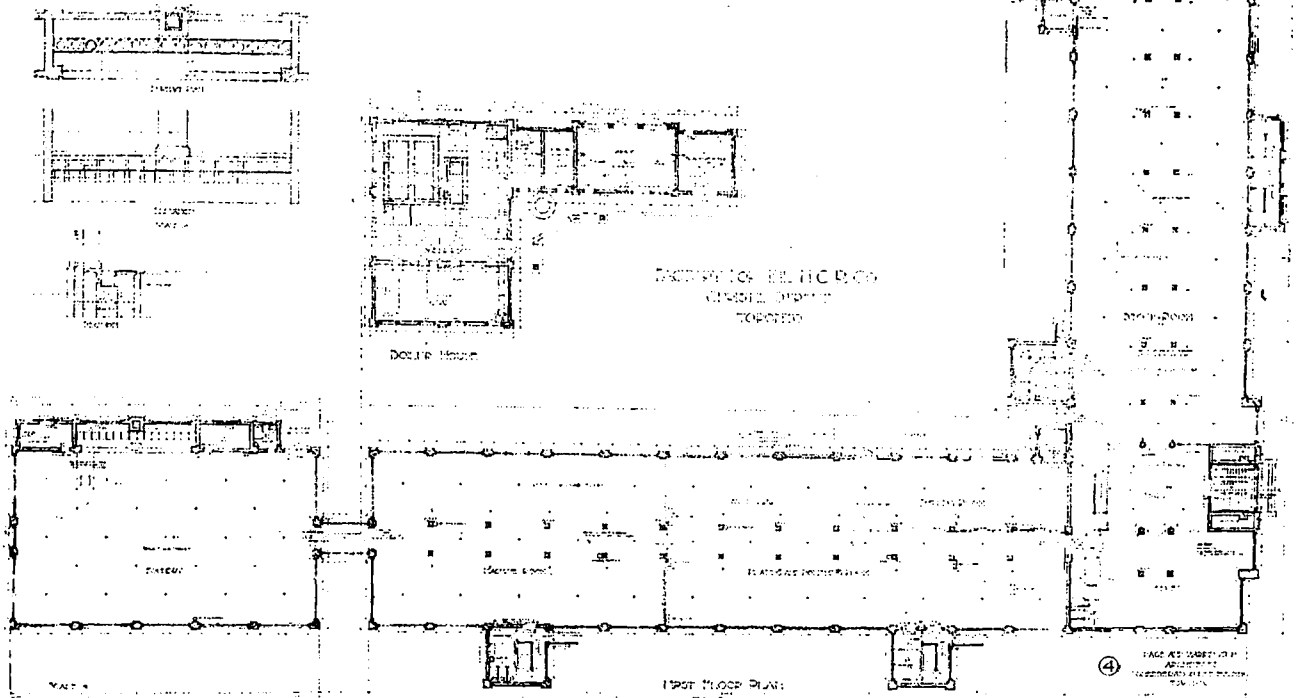
has a frontage of two hundred and forty feet by sixty feet deep, and is two storeys in height, with a full size basement. The frontage of the manufacturing buildings on the south is also two hundred and forty feet by sixty feet, and contains one storey and basement, while the foundry connected at the extreme end by an enclosed passageway is eighty by sixty feet.



SOUTH AND EAST ELEVATION, NATIONAL CASH REGISTER FACTORY, TORONTO.

PAGE & WARRINGTON, ARCHITECTS, TORONTO.

Midway of the southern portion of the basement is an underground tunnel leading to the



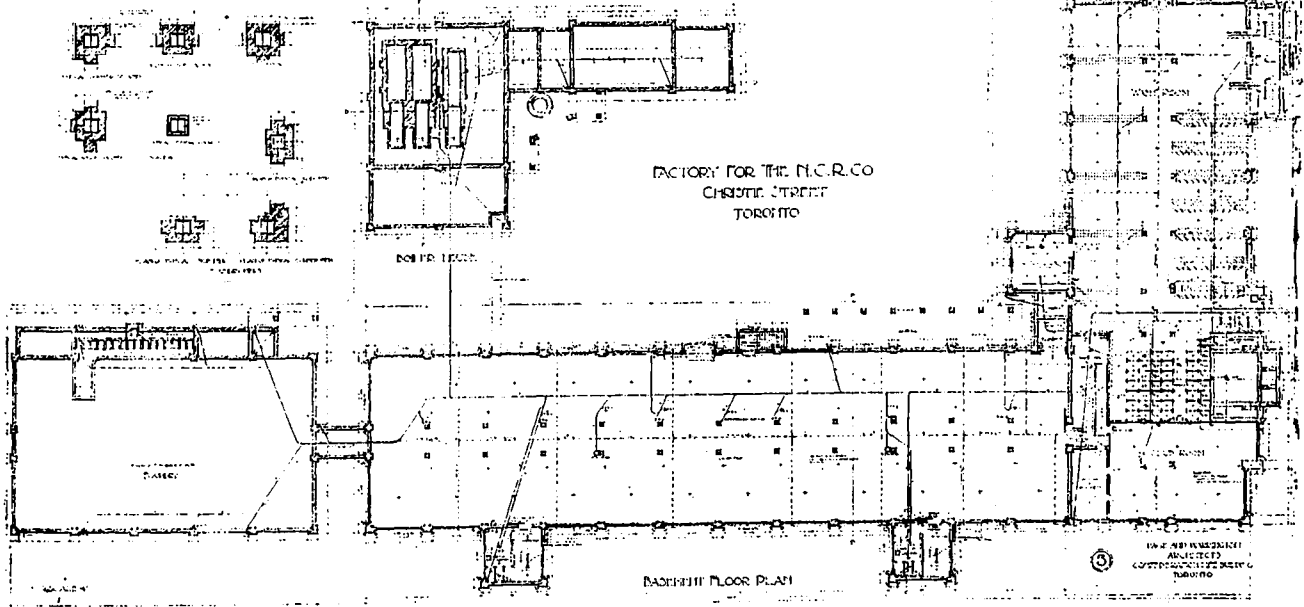
GROUND FLOOR PLAN, NATIONAL CASH REGISTER FACTORY, TORONTO.

power house, garage and blacksmith shop, situated about sixty feet from the factory buildings. This tunnel serves as well for the heating mains and live steam lines to the plating and finishing rooms.

The power-house contains three boilers of the tubular type, together with the same number of smokeless furnaces, coal being carried to same by overhead conveyors. Niagara electric power is used throughout in manufacturing, making unnecessary any installation of power-producing equipment. The boilers provide steam for the plating process, as well as heat-

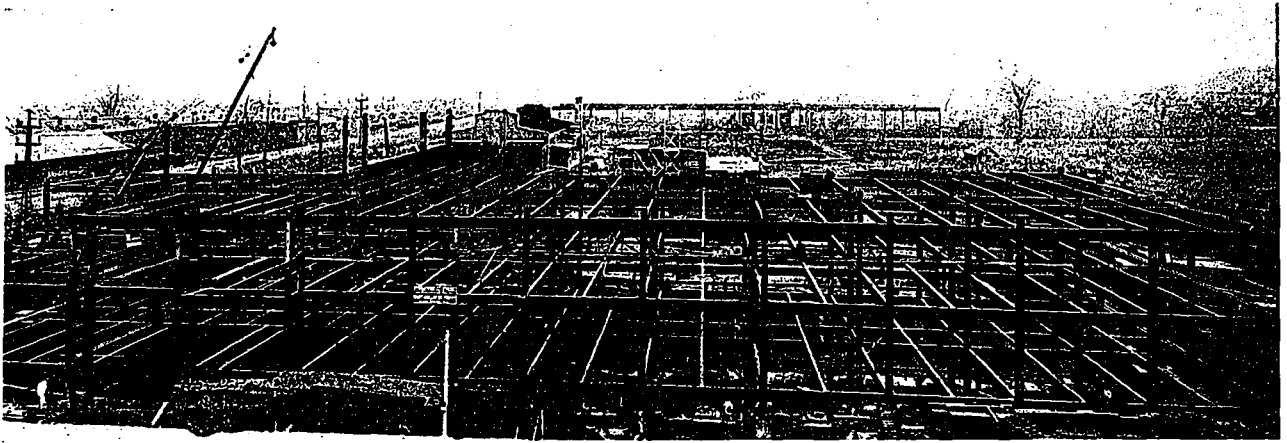
ing the water which circulates as a heating medium to all parts of the building.

While the forced hot water system of heating is installed in some of the larger institutions in Canada, its use has been uncommon, due to the greater cost of installation largely, so that its adoption for use in a building of the factory



BASEMENT PLAN, NATIONAL CASH REGISTER FACTORY, TORONTO.





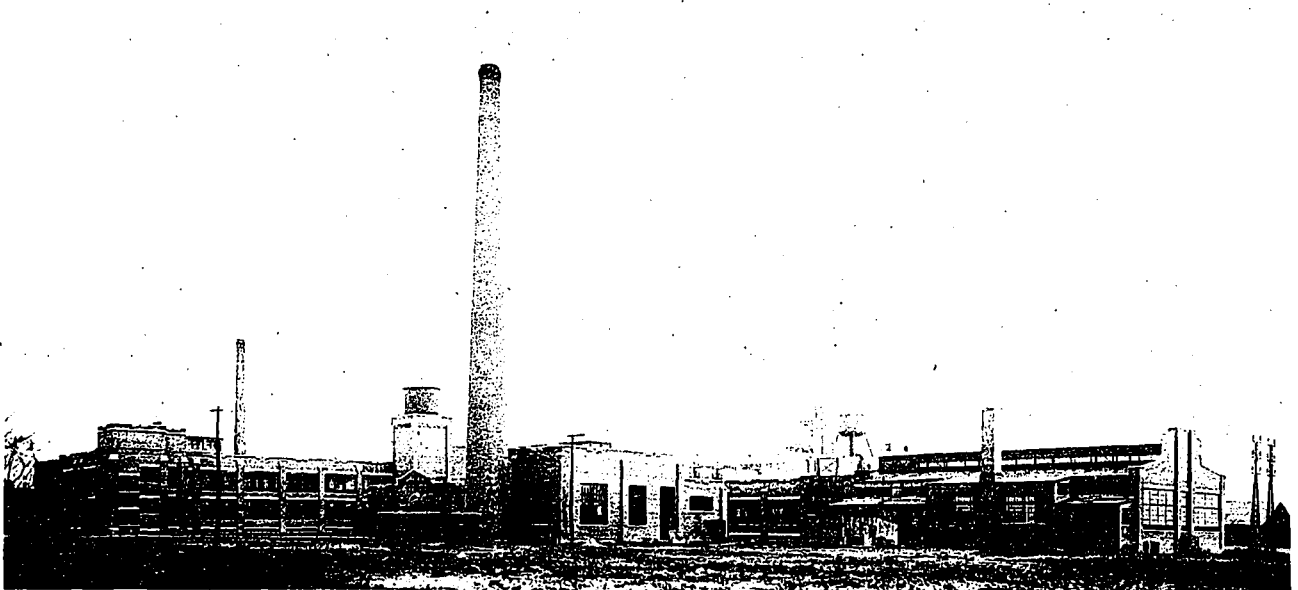
STEEL FRAME WORK, NATIONAL CASH REGISTER FACTORY.

type is worthy of note. The claim is made for this system that it does not give the dry and more intense heat of steam, which absorbs the natural humidity of the air, and as a result a more healthy atmosphere is provided for the occupants. The water is heated by steam in two duplicate converters, and is circulated by means of two electrically driven rotary pumps.

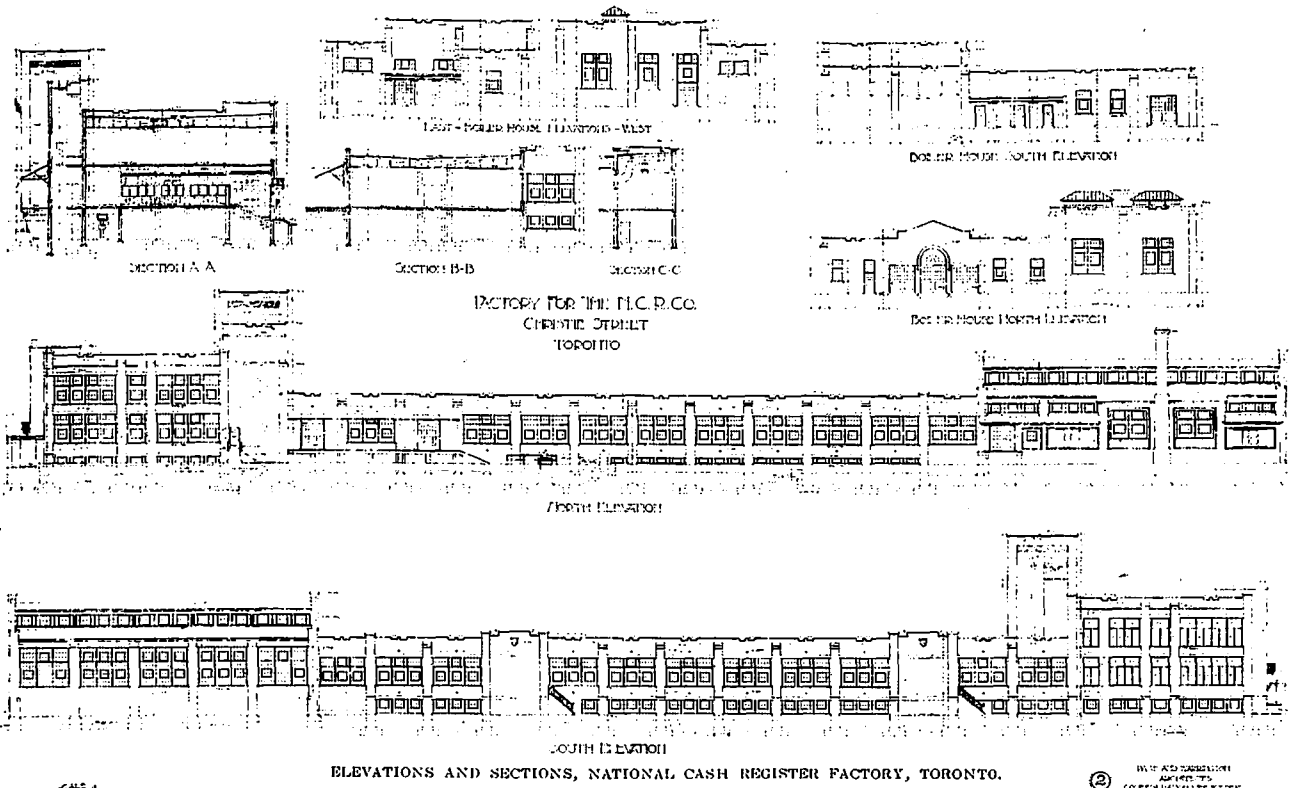
An important feature of the equipment of this plant is the ventilation, fresh air heated is circulated to the manufacturing departments and the foul air drawn off, and a separate system draws all dust direct from the buffing and grinding machines to the basement without unsightly overhead ducts, which take up so great a space. Power is supplied to the machines on the ground floor by shafting placed on the ceiling of the basement which does away with overhead driving force and dangerous transmission belts of peril to the operators. In the foundry are installed sixteen crucible furnaces of the usual sunken type, and a sub-basement space provides for the necessary cleaning of same.

The floors of the factory are of concrete, laid

on steel "I" beams, supported by two columns in the centre placed ten feet apart, and at intervals of twenty feet. It will be noted that the buildings being sixty feet wide, a clear aisle ten feet wide is allowed for trucking and handling goods, leaving twenty-five feet of clear working space on either side of this centre aisle or passageway. All the foundations and steel structure work was designed for future extensions in the height of the plant, and the roof of felt and gravel can be readily removed. The stairs, elevators, lavatories and bathrooms are in outside towers, which also provide fireproof exits protected by automatic fire doors, the daily use in entering and leaving by the employees familiarizing them with same in case of need. The basement of the main building is divided into many rooms, all fitted for their industrial uses. In the main room at the employees' entrance locker and wash rooms are located, each employee having a separate steel locker, and provided with soap and clean towels daily. At the south end of this room large shower baths are placed, and at the north end a dining-room



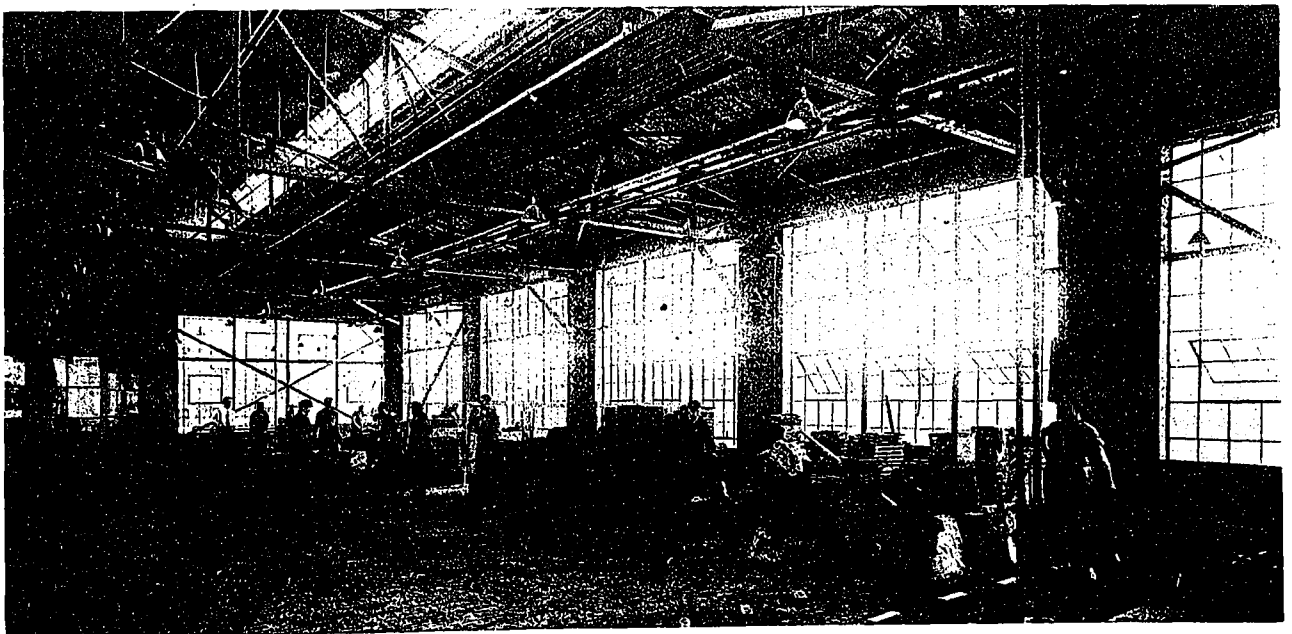
REAR VIEW, NATIONAL CASH REGISTER FACTORY.



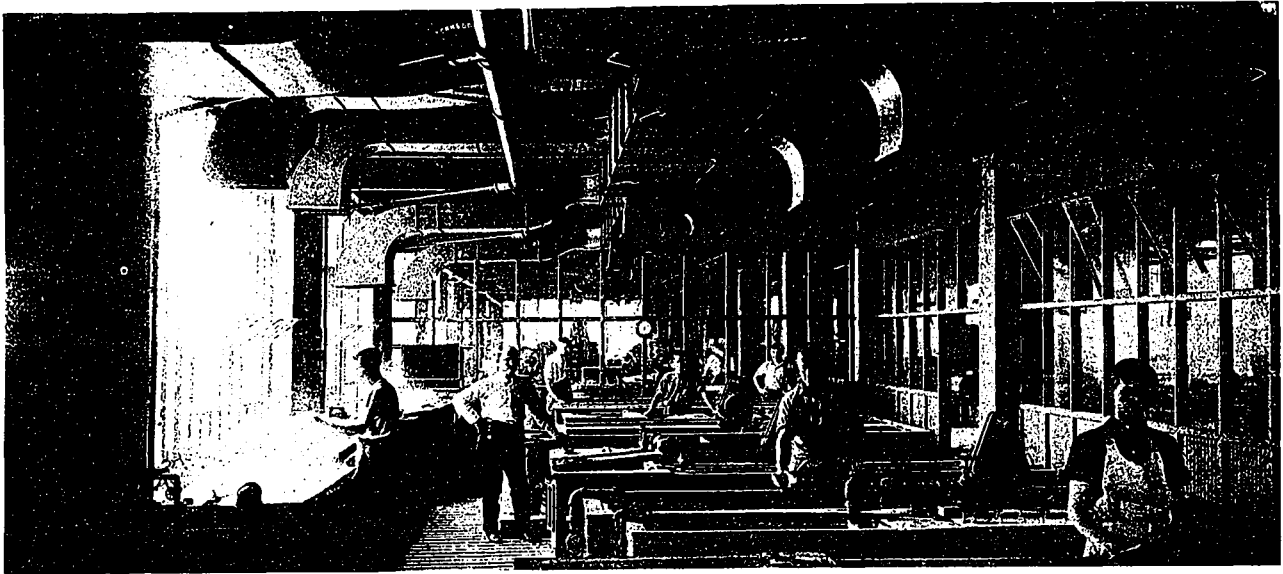
and well-equipped kitchen are located for the use of the employees. An employees' recreation room is provided, equipped with gymnasium apparatus, which is readily removed when the space is required for general purposes. At the south end of the basement, with direct stairway to the offices, is located the officers' and office staff dining hall and assembly room. Here at lunch the executive force of the company meet to partake of the good things provided by the efficient culinary department, and to indulge in impromptu discussion, while once a month a general meeting is held in the assembly hall by the staff and representatives. A plat-

form is at one end in front of a wall blackboard used for illustrated lectures.

On the ground floor entry is made from the main entrance into a large and roomy reception hall, furnished with chairs, tables, etc., with papers and magazines for the use of those waiting for interviews. A telephone operator in this room receives and answers all enquiries. A display of the various types of cash registers is contained here also. On the left of the entrance in the southeast corner the office of the manager and his assistants are located, separated by a corridor from the general office, which in common with all parts of the building is



MOULDING ROOM, SHOWING STEEL CONSTRUCTION. NATIONAL CASH REGISTER FACTORY, TORONTO.



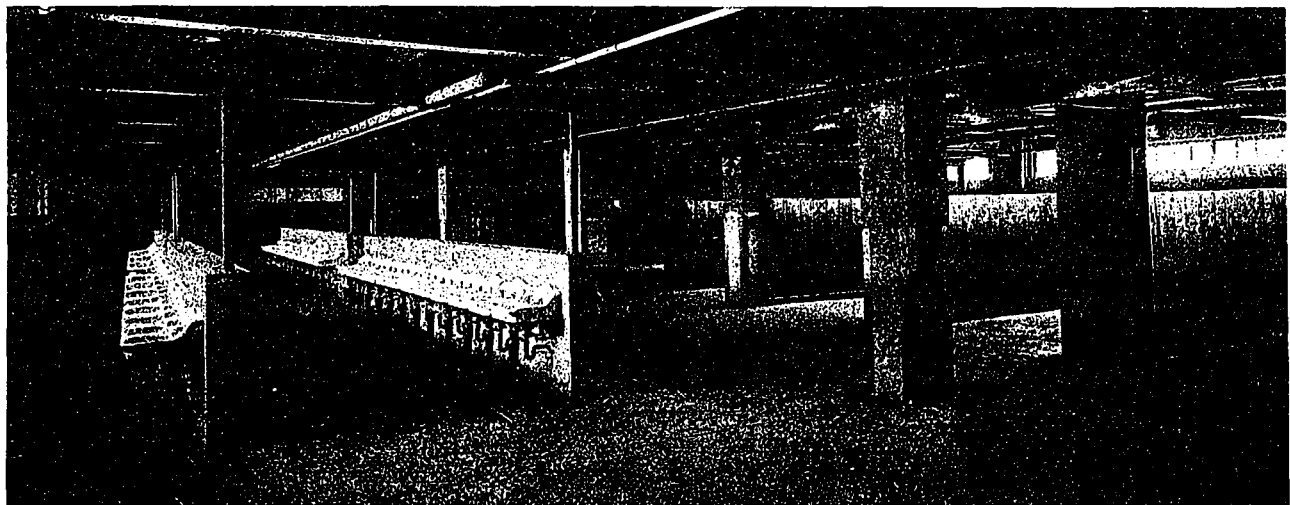
VIEW SHOWING VENTILATORS, NATIONAL CASH REGISTER FACTORY.

flooded with light from the windows, which are sixteen and one-half feet in height by ten feet wide, occupying four-fifths of the total wall space. The furnishings and interior woodwork of the entrance hall and offices are of quarter-cut oak, fumed finish, and the ceiling is of ornamental plaster. Specially designed electric fixtures in bronze with inverted shades are in harmony with the interior. On the right of the main entry is located the stock room, containing rows of steel shelves and partitions divided into sections for the many parts of the different machines produced by the company. In the south wing of the factory, back of the general office, is placed the shipping room, and in the next section is the plating and polishing department, the floor of which is raised wooden slats over concrete to protect the feet from the water and acids used. The next section includes the machine shop, and back of same and connected by an enclosed passageway, is the foundry, which is a separate building of brick, steel and glass construction, equipped with the most modern foundry and moulding apparatus. In this

building the heating coils are placed overhead and out of the way.

On the first floor of the main building is the assembling and testing rooms, where all the machines turned out are operated by power to insure smooth working and to guard against any possible defects. In the southeast corner the experimental department is placed, adjoining which is the printing office, where inside publications are produced.

In order to encourage the use of Canadian hardwoods for interior decoration, Lord Shaughnessy has issued instructions to use nothing but Canadian forest products in the sleeping, parlor, dining and observation cars, and in the offices and hotel buildings of the Canadian Pacific Railway Company. This decision was made after careful consideration and experiment. Lord Shaughnessy had samples of all Canadian hardwoods treated at the Angus shops here, where selected specimens were tested with polishes, stains, etc., and the results showed that the Canadian woods compared satisfactorily with imported varieties.



# One of Montreal's Most Modern Factories

Its Equipment is Complete in Every Detail

THE new wire and cable factory of the Northern Electric Company, Limited, occupies an area of one hundred and seventy-eight thousand square feet (over four acres), bounded by St. Patrick, Shearer and Richardson streets, in the city of Montreal. The old plant, located at the corner of Guy and St. James street being inadequate, necessitated the erection of an enormous new structure which is the largest single plant in America for the exclusive manufacture of wires and cables. The foundation for walls and columns are composed of plain and reinforced concrete. In the main building some of the one storey portions the columns rest on concrete piles, of which over four thousand have been driven with an average length of twelve feet. On each group of piles rests a reinforced concrete cap on which bases for the building columns are placed.

Six thousand five hundred tons of structural steel were required for the superstructure. Bethlehem II columns, girders and beams were used almost exclusively throughout.

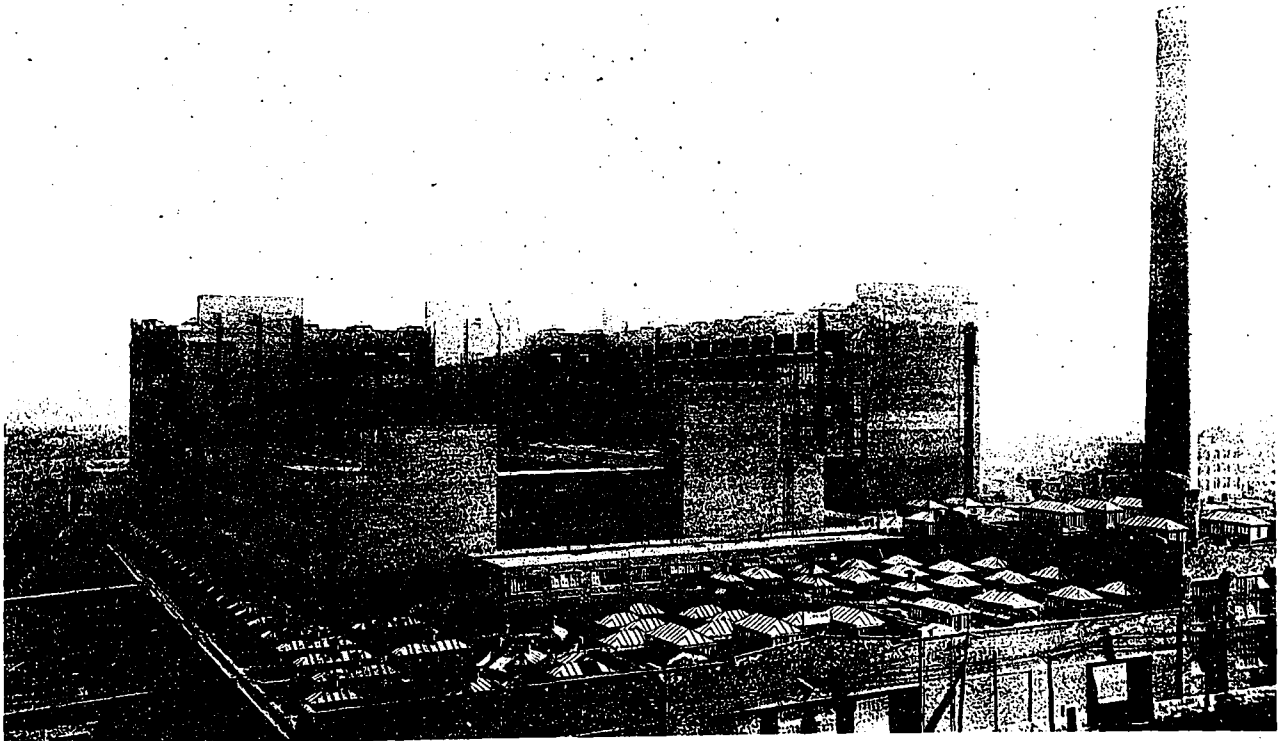
The most modern fireproof construction has been used throughout the entire building, all interior columns being incased in four and three-eighths inches of hollow terra cotta and beams in two and three-eighths inches. The floors are composed of hollow terra cotta seg-

mental arches with a span of six feet eight inches and are suitable for a live load of two hundred and eighty-eight lbs. on the second to seventh floors and one hundred and fifty lbs. on the eighth floor. A stone concrete fill is poured over the arches, in which wooden sleepers are embedded, and the underflooring is nailed to these sleepers, and over this, the final maple flooring is laid at right angles. The National Fireproofing Company supplied all the fireproofing terra cotta amounting to eleven tons.

The walls are built of plastic brick, seven millions being used. All the lintels in the courts and on the street sides, together with the architectural ornaments and copings on the street sides are of terra cotta tile.

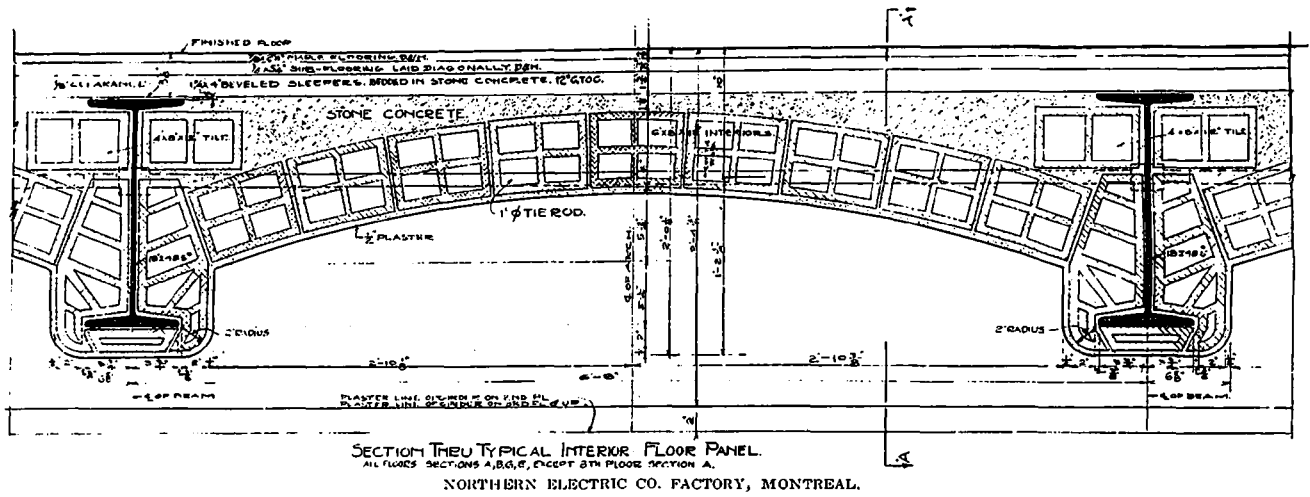
The main buildings, shaped like the letter "E" have two main courts, which serve to provide ample lighting facilities for the five hundred thousand square feet of floor space from the interior as well as the exposed sides on the streets. These courts have sloping roofs of book tile with large skylights. The G. T. R. and C. P. R. railway tracks run into one court which has large platforms for shipping and receiving purposes. Each track is provided with a one hundred and fifty ton track scale.

There are four travelling electric cranes,



REAR VIEW, NORTHERN ELECTRIC CO. FACTORY, MONTREAL.

W. J. CARMICHAEL, ARCHITECT.



SECTION THROUGH TYPICAL INTERIOR FLOOR PANEL.  
ALL FLOOR SECTIONS A, B, C, EXCEPT 8TH FLOOR SECTION A.  
NORTHERN ELECTRIC CO. FACTORY, MONTREAL.

one-fifty-ton, one-twenty-ton, one-twenty-ton with five-ton auxiliary hoist and one-ten-ton. The fifty-ton crane is used for handling reels of armored cable, the twenty-ton for the lead covering department, the twenty-ton with five-ton auxiliary for the turbine room and the ten-ton for impregnating tank room. The two twenty-ton cranes are so arranged that they can pass material to the fifty-ton, which will convey it over the railway tracks or vice versa.

Fire walls with automatic steel fire doors on both sides, divide the building into various sections. Each section has a fire and smoke proof stair tower with iron stairs, at both ends, thus providing ample and safe means of exit in case of fire on any floor. All windows throughout the building have steel frames with wire glass. Pivoted sections of these windows can be opened with operating chains equipped with fusible links, thus making them self-closing in case of fire. Ninety-five thousand square feet of steel sash were required for this factory.

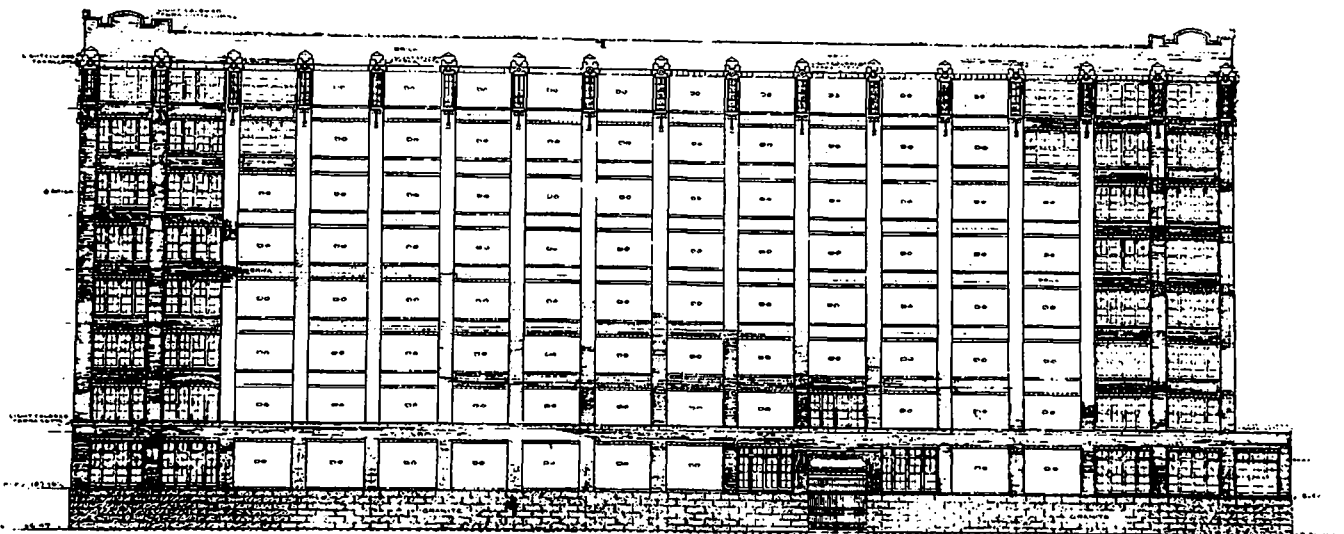
The sprinkler and fire hose systems above the first floor level consist of 6,000 sprinkler heads and fire hose located at convenient points in the building. These systems are supplied with water from the city mains, steamer connections on the street and a one thousand five

hundred gallon Underwriter's fire pump which is connected to a one hundred thousand gallon concrete reservoir and the canal.

Five six thousand and one fifteen thousand pound freight elevator with a travel of one hundred feet and twenty-five per minute respectively are used to handle the transfer of material for manufacturing, and two high-speed passenger elevators travelling at three hundred and fifty feet per minute are used to serve the general offices of the company, which are situated on the eighth floor of the building. This floor has no columns, the roof being supported by steel trusses with large skylights. The absence of columns affords splendid facilities for the laying out of offices to suit the requirements.

A unique point in the design of the building is the storage space secured on the roof of one section by means of paving bricks. The roof is served by means of one of the six thousand pound freight elevators.

Large intake pipes from the canal supply the reservoir, and the water used for condensing purposes. An automobile garage and a wagon court with platforms facing St. Patrick street are so arranged that the material can be readily loaded for city delivery without having to cross the railroad tracks.



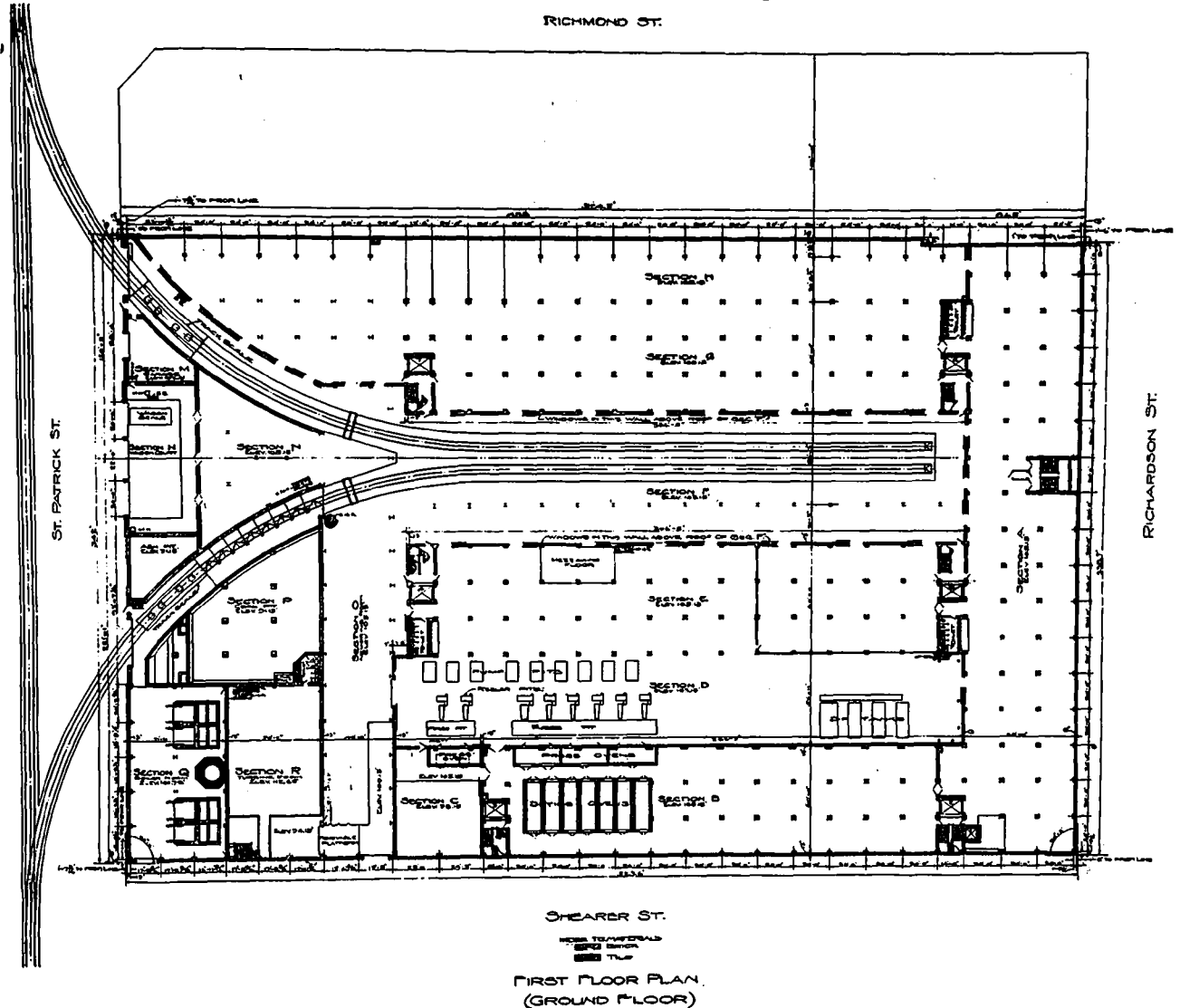
SIDE ELEVATION, NORTHERN ELECTRIC CO. FACTORY, MONTREAL.

W. J. CARMICHAEL, ARCHITECT.

The building is heated by a forced circulation hot water heating system. Exhaust steam from one of the main turbines pass through closed heaters. The water is circulated by means of a four thousand gallon single stage volute pump directly connected to steam turbine. The vapors and condensate from the exhaust steam is carried from the heaters by means of an air pump with tail pump. This makes a very flexible system to suit the changes in the outside temperature, as the vacuum can be increased in warm weather, thereby creating a lower temperature of the exhaust steam and de-

being large enough to take care of the whole system. Two steam driven air compressors, which have a combined capacity of twelve hundred cubic feet per minute are used.

The power plant is of the most modern design. Coal can be stored in large quantities and will be transferred to the storage bins over the front of the boilers by means of a Telpher car and clam shell bucket. Ash handling equipment takes the ashes direct from ash chutes under the boilers and delivers them into ash storage bins which in turn deliver them into railroad cars or carts for disposal. Ashes can also be handled



NORTHERN ELECTRIC CO. FACTORY, MONTREAL.

W. J. CARMICHAEL, ARCHITECT.

creasing the amount of steam required by the turbine as the vacuum increases. In extreme cold weather the turbine can exhaust into the heater at atmospheric pressure and thus increase the quantity and temperature of the steam. When running two turbo-generator units in parallel, one turbine can run condensing, while the other exhausts into the heating system and its load can be varied to suit the amount of steam required for heating purposes. The power plant equipment for this heating system is in duplicate, either one of the units

by means of small cars on an industrial railway running in the basement of the boiler room. The Telpher car will raise the body of each of these cars off the truck, through a hatchway in the main boiler room floor, and will carry them over to the ash storage bin, this method of ash handling only being used when it is necessary to overhaul and repair the regular ash handling equipment.

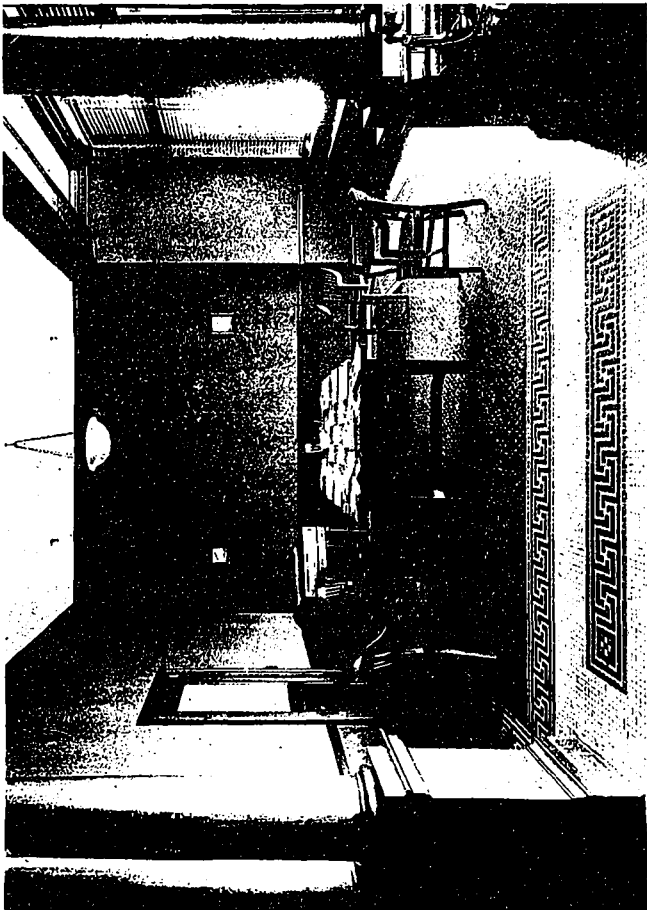
A two hundred and twenty-five foot chimney serves four B. & W. boilers nominally rated at six hundred and fifty horse power, but which



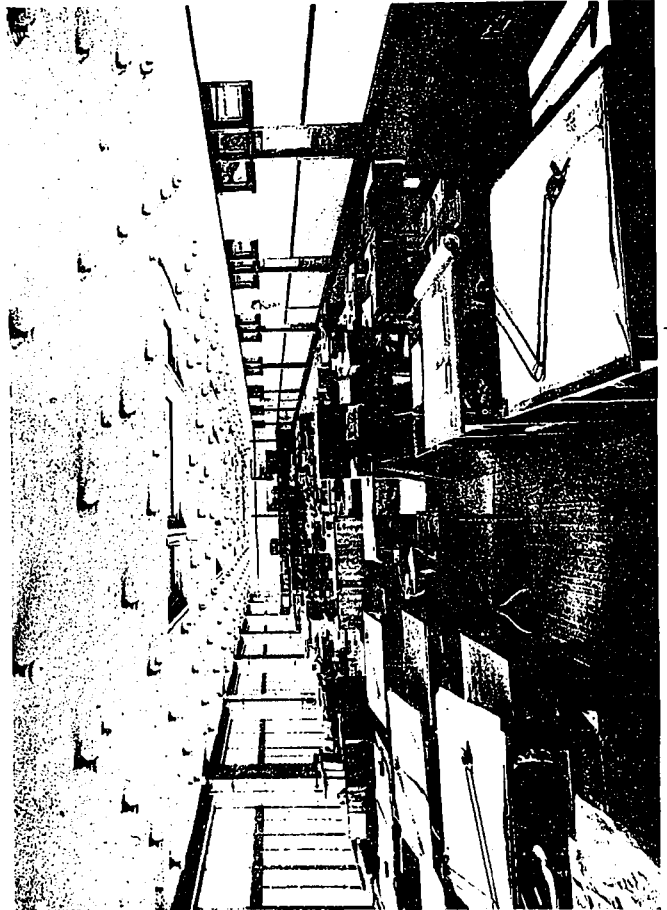
VIEW IN PRESIDENT'S OFFICE.



GENERAL OFFICE, NORTHERN ELECTRIC MANUFACTURING COMPANY.



RECEPTION ROOM.



DRAFTING ROOM.



will be forced to deliver one thousand horse power when necessary. These boilers are fitted with B. & W. chain grate stokers and superheaters. The exhaust steam and condensate from the heaters, turbines, condensers and steam driven auxiliaries is brought to a feed water heater, which is capable of raising one hundred and seven thousand pounds of water per hour to two hundred and ten degrees. From this heater, the water is returned to the boilers by means of two boiler feed pumps, each with a capacity of six thousand Imperial gallons per hour. Horizontal turbines form the motive power for the generators and are placed on structural steel stands directly over the centrifugal condensers, thus insuring a high vacuum. The condensers are located over two-thirty-two inch pipes leading to the canal. From one of these pipes, the water is drawn by a turbo-volute turbine driven pump, and after having passed through the condenser is discharged into the other pipe. Tunnels leading from the turbine and pump room are used to run the power and lighting circuits, the flow and return pipes of the forced hot water heating system, the house service water lines and the high pressure steam lines for manufacturing purposes.

The turbine room has been laid out for two-thousand K.K., two-one thousand K.W. turbo-generators, two-four hundred and fifty K.W. rotary converters and two-seventy-five K.W. turbo-driven exciters. The generators are three phase sixty cycles, four hundred and forty volt star wound with neutral connection brought out to the switchboard. The exciters are one hundred and twenty-five volts and generator voltage is controlled by a regulator.

Air for the ventilation of the generators is taken from a duct in the foundations of the generators and forced through the windings and air passages by fans integral with rotors. Screens are provided in the pent house, of this duct to exclude dust, etc.

The horse power of connected load is approximately five hundred and fifty H.P. direct current at one hundred and fifteen volts and four thousand H.P., alternating current at four hundred and forty volts. For the supply of the former, two-four hundred and sixty K.V.A. rotary converters, with necessary transformers and starting switches, are installed. The neutral being brought out from each transformer bank for the neutral of a one hundred and fifteen-two hundred and thirty volt three wire direct current system.

The switchboard for the control and distribution of this power consists of a main board of twenty-five blue Vermont marble panels on the turbine room floor. On this board is mounted the meters for measurements of outputs of

generators and loads on the feeders, also the direct current bus-bars both for exciters and direct current factory load, and control equipment for twenty-five solenoid operated feeder switches for alternating current distribution. These switches will be mounted on slate panels on a mezzanine floor under the turbine room floor. The alternating current four hundred and forty volt bus-bars and generator switches are also located here.

Generator switches are non-automatic with bell ringing attachment and feeder switches automatic, as mentioned above. All feeders leave the turbine room in a tunnel from which they branch off to the various buildings in three inch fibre conduits. These fibre conduits lead to cable pits from which risers of three inch conduits are carried to distributing panels. All alternating current cables are three conductor paper insulated, leaded; direct current cables being single conductor leaded. For lighting factory area, four light clusters, wired series parallel, are used. As mentioned above, the neutral point of generator windings are brought out. The lead sheath of the lighting feeder cables are bonded to the neutral bus and lighting circuits connect one wire to one of the three conductors, the other to the sheath giving approximately two hundred and sixty-six volts across two lamps in series. Lighting feed cables to distributing boxes on the third floor of each section from which circuits run to the panel boxes on the third and fifth floors.

All wiring except that in the general offices is open conduit. The general offices have outlets for fans, dictographs, annunciators and telephones, all wiring concealed in conduit.

An artesian well was drilled and is used for drinking water and for manufacturing purposes.

In addition to the fire protection system, a regular watchman's service is installed so that the building is patrolled at all times outside of the regular working hours.

For the convenience of watchmen and to avoid the use of oil lanterns in the plant, a certain number of electric lights are kept burning all night to form a pilot system so that in cases of emergency the workmen in the building can easily locate the fire apparatus and also the exits.

The following features in connection with the building are of interest:—

The total excavation amounted to some fifty thousand cubic yards. Over fourteen thousand cubic yards of concrete have been used for foundations. One hundred thousand square feet of glazing glass has been used and approximately one hundred thousand square feet hot water radiation service were required to be installed.



# A Reinforced Concrete Warehouse

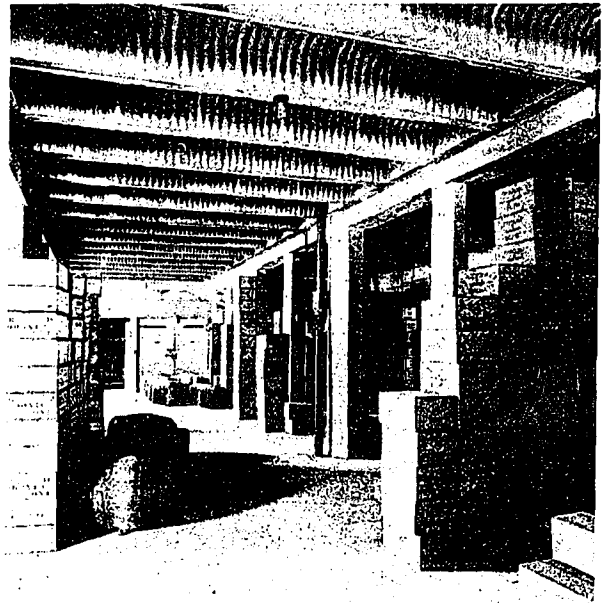
Illustrates The Latest Tendency in Warehouse Construction

A VERY modern and attractive warehouse building has recently been erected on John street, Toronto, by D. O. Roblin. This building is one hundred and ten feet in length by forty feet in width, four storeys and basement, and is of brick and reinforced concrete throughout, which make it absolutely fireproof. The front is of tapestry brick, and the side walls and rear of Don buff brick. The ceilings are of very artistic design, being of corrugated concrete.

The main floor contains the offices and a large shipping room. The office furniture is entirely of oak. The lighting is of the indirect system, the shades of a special corrugated design to match the ceiling. The remaining floors may be used as general stock rooms if necessary.

The entire basement, with the exception of a small portion bricked off for the heating plant, is devoted to a bonding room—all goods being shipped in original cases.

The warehouse carries the lowest rate of insurance, in view of the fireproof construction and the modern fire-fighting apparatus installed. Although the underwriters did not consider an automatic sprinkler system necessary there is a



FIREPROOF CONSTRUCTION FEATURES OF D. O. ROBLIN WAREHOUSE.

high pressure pipe running from basement to roof, which is capable of flooding the roof in a very short time in case of fire in the vicinity. All the doors are of fireproof type, as recommended by the underwriters, and in case of fire are automatically closed by a novel contrivance located in the front hall just above the door leading into the offices.

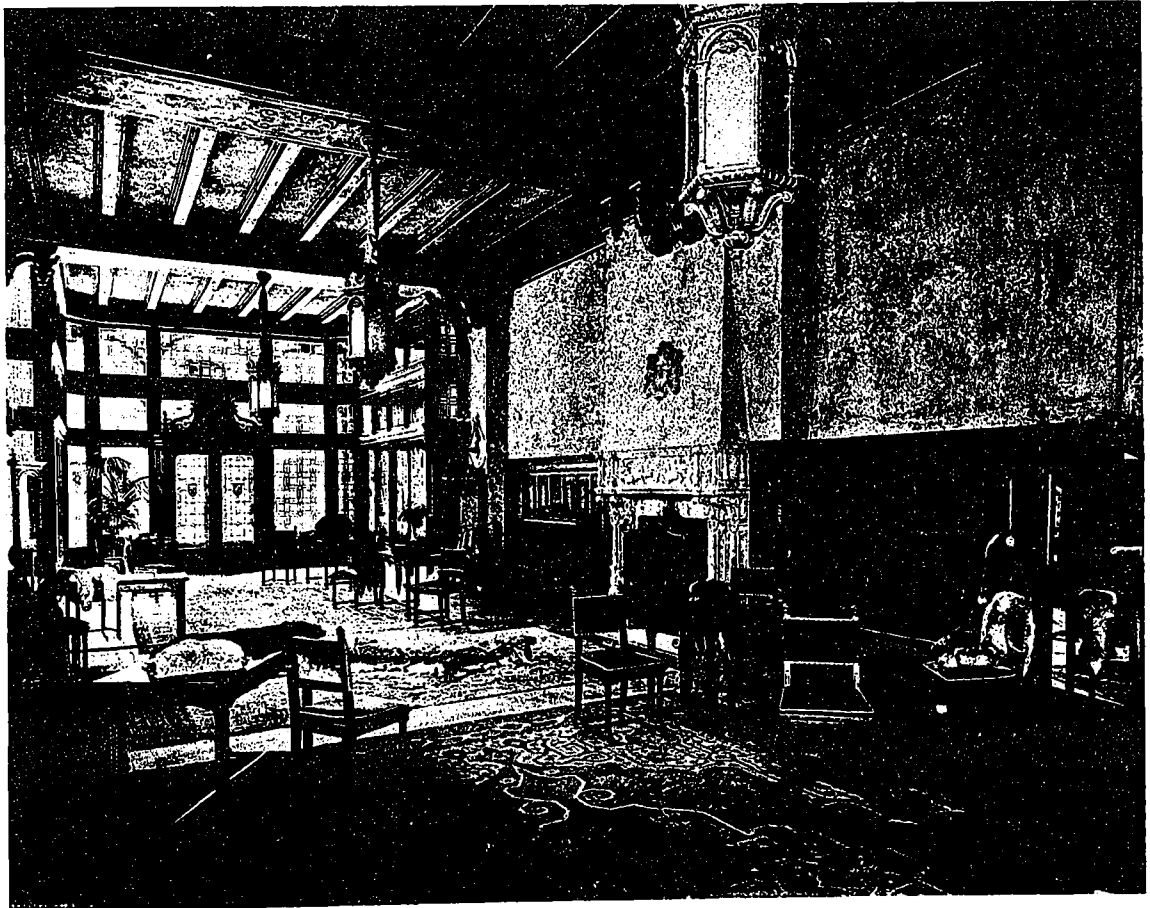
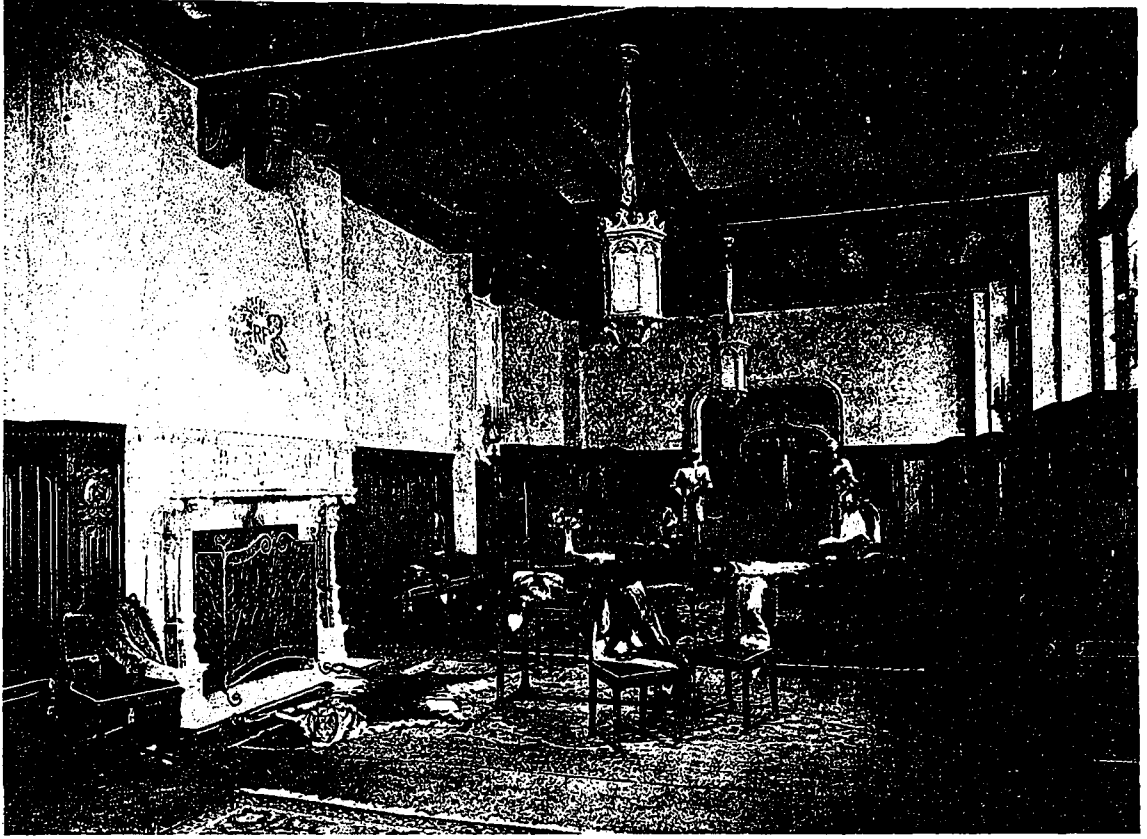
Much care was taken with the view to making this building as convenient as possible. Just inside the entrance is a winding steel staircase leading to all floors, and ample space has been left for the installation of an elevator should it ever be decided necessary. At the rear there are two electric elevators. Four large shipping lanes at the side of the warehouse.

## WASTE IN FOREST PROTECTION

Because of lack of field supervision, more money is wasted in fire protection to-day than is used economically. Fire wardens are nearly all temporary men, and if one does not give them supervision and training, and does not try to keep the good men from year to year, one cannot get the results desired. In the first fire protection services of Canada, far more wardens were wasting money than were making good use of it. Unless we have good permanent supervision of fire protection and have the same men as permanent rangers year after year we will not get the good results because we have large areas to protect with very small sums of money.—McMillan.



EXTERIOR OF D. O. ROBLIN WAREHOUSE  
EDEN SMITH & SON, ARCHITECTS.



ARTISTIC INTERIOR SHOWROOM FIXTURES

# CONSTRUCTION

A JOURNAL FOR THE ARCHITECTURAL  
ENGINEERING AND CONTRACTING  
INTERESTS OF CANADA



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

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FRASER S. KEITH . . . . . EDITOR AND MANAGER

Vol. IX Toronto, April, 1916 No. 4

## ARCHITECTURAL DIGEST

### THE FENESTRATION OF FACTORY BUILDINGS.

There is no type of building in which windows play such an important part as in factories—both in matter of practical usage, and in regards to design. For a factory building, to be successful, must, first of all, be abundantly lighted. This is an arbitrary fact that dominates all other requirements and, also, that has given to buildings of this kind a decidedly individual character—a character, of which, I fear, in times past we have not been inclined or justified to feel proud. I refer here, principally, to the well known style of factory building prevalent before the introduction of steel skeleton and reinforced concrete construction.

It has been one of the faults of our people, in times past, to devote little or no thought, much less money, to the aesthetic qualities, or development, of factory building design. Such structures have been considered from a purely utilitarian point of view, built for the most part, I believe, without the advice or guiding hand of an architect. And, as they were built for purely business reasons, cheapness of construction made an appeal to the owner that could not be denied. Being of the simplest construction, their creation could easily be entrusted to anyone with a superficial knowledge of the building trade. As for the appearance of the building, no thought was "wasted" on that. Beauty of design, that exists in relation to all other kinds of buildings, here found no part in the problem. A factory was only a factory, after all; in other words, a necessary evil, stuck off in some undesirable spot of a community that neither cared or dared to protest at the unsightly and unsanitary conditions that rendered such a portion of it an eyesore and a disgrace. Such was the condition of affairs in the not long since past, more or less contemporaneous and a counterpart of the mid-Victorian period—a period now appreciated as infamous for its bad taste and misdirected energies in matters of art.

It is gratifying that such a condition has passed and is passing; that, in a sense, we have come upon a renaissance: that business minds, of the higher intelligence, have perceived that it is to the benefit of their interests that their workshops and factories no longer be the disgraces as was formerly the case; that they be not only clean, perfectly lighted and ventilated, and truly healthy spots, where human beings can with self-

respect carry on their labors, but that these buildings should not be unpleasant to look at, as well; that a slightly appearance is a good business investment, which can be had as easily as not, and hence is in no sense an economic waste. It is good for our civilization that great industrial workers are realizing this. Whether it is the result of their own altruistic desires or whether it is their keen competition with their rivals, is beside the point. It probably could be shown to be both. In any case, the welcome stimulus is present, and is growing rapidly, and in various spheres of our industrial activities. This improved spirit in regards to factory buildings may, in a sense, be compared to that of a recently widely-read advertisement of a certain toilet preparation, in which the manufacturers state that, as it was impossible to improve the product itself, they had improved the box which contained it. Likewise, the factory building may be looked on as the container of the product manufactured within its walls, and the quality and appearance of the building taken as an indication of the excellence of that product. To have an attractive building is to be well advertised.

This idea has progressed even farther than the factory itself, as is shown by the interest now being taken by employers in providing improved living accommodations for their men and their families. Following the successful experiments that have been made in Germany and England, new model village communities are appearing occasionally throughout the country, as companion to the improved factory. Both are bound to exert an untold benefit and aid in the uplift of what it has been the custom to refer to as the "submerged tenth" of our population, and the time is at hand when these workers can rightfully take their respectful places in our industrial and social life.

Another benefit brought about by this change of attitude of our great manufacturers is one that is especially pertinent to our profession. To obtain these results, embodied in improved, more efficient and attractive building, that may serve as a business advertisement, it has been found advisable and necessary to entrust their creation into the hands of a trained specialist, namely, an architect. The builder who makes his own plans will no longer serve the purpose. This is a strong indication that the layman has taken a big step towards the just recognition of the architects' uses and talents.

All buildings are primarily utilitarian. That is their raison d'être. They are built not only for a purpose, but for a distinct purpose, and the better they fulfill the requirements of that purpose, the more successful buildings they will be. Although factory building may be of many and multifarious uses, the most important general requirements common to all are: unobstructed floor space, as far as this is possible, and maximum light with ample ventilation. The one is as obvious as the other.

Because of these paramount requirements, work-shops, as they existed in ages past and before they assumed the gigantic proportions so common to-day, remained out of doors, protected from the weather, if at all, by merely a sheltering hood. That was before the introduction of sheet glass and windows. After these were inaugurated and became cheap enough, glass being at first very prohibitive in price, they were used for work-shops, as well as for residences; and the factory building, with its numerous faults as described briefly above, was the result. Of course, in these buildings as many windows as possible were crowded into each wall. As the size of the window was limited because of its wood construction, and the walls of the building being simple masonry, which required a certain area to afford sufficient supporting strength, the facades produced a repetition of voids and solids of about equal widths,—at once uninteresting and extremely monotonous. No attempt, as I have said, was made to have them otherwise.

The appearance of steel and reinforced concrete construction has completely changed this state of things, as indeed it must. For the construction of a building, sooner or later, is bound to dominate the design. In most types of buildings, this revolution in construction, brought about by the steel column and I-beam, has proven a difficult one to adjust in regard to design, as, for instance, our modern "sky-scraper." Here the architect has found himself in a good deal of a muddle, because, having educated himself to know thoroughly the forms of architecture of the great past, that knowledge and those forms are his foundation on which he expects to build his own achievements. The loss, over night, as it might be said, of the whole system of construction as he had learned it, and an entirely new and fundamentally different one substituted for it, has not unreasonably produced a more or less chaotic state in the design of "skyscraper" buildings.

But with factory buildings, this has by no means been the case. In the first place, the ideal factory is located in open, unsettled country, or outskirts of some city where land is cheap, and air and sunlight plentiful. Therefore, unlike the "skyscraper," which must economize space, they are usually not more than four stories in height. This affords the long, low horizontal lines in the design that we have always been accustomed to in old work, and hence we are more able to handle and appreciate.

The second reason wherein they differ from other kinds of buildings is that they have no past. There are no precedents for buildings of their requirements, to be dug from the remote past, and their immediate past is only worthy of being forgotten. Therefore, their design can be undertaken with a clean conscience and a "carte blanche." One's training need not here work a hardship or be a stumbling block. Taste alone must be the guide and the criterion.

A glance at the factory buildings of this new type, that have rapidly grown up around us, is convincing proof that their designers have been quick to appreciate the advantages offered by this new form of construction, which by principle, it seems, is ideally suited to factory requirements. Because of the superior strength of steel columns over masonry, the supporting members may be smaller in volume and wall surface, both of which facts tend to enlarge the space available for the all-important light. Also the less frequent occurrence and reduction in size of interior column, and the reduction in the number required, affords an increased percentage of unobstructed floor space.

The development of the steel and concrete factory as we know it to-day in its high standard of excellence attained, could not be possible except for the successful development of one of its most vital components,—namely, steel window frames and sash. It has been the invention of these windows that has really been the turning point in factory design. Steel columns reduced the wall area that afforded more open space in the wall but the old style of wood sash and frame were inadequate. Steel frames not only meet the new demands but also add

numerous advantages not possessed by wooden ones. They are strong, slightly, durable and fire resisting. It is their strength that is probably the most remarkable. Compared to wood sash, they can be used in much larger units, and form uninterrupted surfaces of glass area to almost any limit. The space between supporting piers, no matter if twenty feet in width, can be spanned as easily and as securely by their light and graceful steel webs, as was possible formerly with wood sash for only about four feet. Also, steel sash may much more easily be manipulated and adjusted, whereas wood sash are awkward and beset by many limitations, such as expansion from dampness, etc. The ease and convenience of action of steel sash enable the worker to have light and ventilation always under control. It is probable that the dirty, cobwebbed factory of the past was in a great measure due to inability in these respects of wood sash.

As the ideas governing these steel frames and windows are patented, there is keen competition in their manufacture, which naturally is a very great factor in attaining and sustaining their high standard of efficiency.

The slender supporting column and broad glass surfaces of a factory building are limitations that must be unconditionally accepted by its designer. The shell of the structure, by necessity, contains a great deal more glass than solid substance. But, while it is this latter which is usually understood by the term "architecture," its presence in but such a relatively small degree by no means removes this type of building out of the architect's sphere. These vast flat surfaces of window area, interspaced by slender bands of masonry where required by the supporting frame only, are affected by the governing laws of design as truly as is a State Capitol building or a public library. Material and expense are, in a sense, irrelevant. The important idea is that the building be suited in appearance to its purpose and be designed and constructed according to the sense of the proper fitness of things; which is really a sense of proportion. Unless a building presents to the eye the true character of its purpose it is insincere and cannot attain beauty. It would doubtless seem strange to hear a factory building referred to as beautiful. Yet, I cannot see why this should not be possible if it has true character, is simple and well proportioned as to form.—Jerauld Dahler in "Architecture."

#### THE EFFECT OF REINFORCED CONCRETE UPON ARCHITECTURAL DESIGN.

The influence of reinforced concrete upon architectural design can be traced in the design of any building of size or importance by comparing first, its plan in the spacing and size of the points of support of superincumbent loads; and second, its elevation in the setting out of horizontal and vertical proportions, fenestration, projections, ornamental and constructional, and general outline.

The use of steel in beams and stanchions left its mark in the greater spacing of the points of support in buildings in which the free use of the floor area was a consideration, and the same difference can be traced, but in a greater degree, to the use of reinforced concrete. Before the steel and concrete ages the transmission of loads over voids was effected by wood beams (plain and trussed) and arches of brick or stone, but their use limited the distances between points of vertical support to very small spans indeed, and these vertical supports were comparatively close together, of very large superficial area, and took up a large proportion of the available floor space.

With the advent of steel as a constructional material the areas of these points of support were reduced, and they were capable of being placed at greater distances apart owing to the further use of steel in girders to carry the loads over larger spans.

The objections to the use of steel in architectural design is that it is almost impossible to make it harmonize, in its plain constructional form, to aesthetic treatment. It has to be cased up in brick, stone, terra-cotta, wood, or other material. But for the fact that this covering up of the steel excludes it from atmospheric action, to which it is very susceptible, its use as a constructional member when cased up would be a sham and without a place in true architecture.

The introduction of reinforced concrete, however, has brought to hand a material which can be used in its original form without any covering, except perhaps paint or color when necessary for its decorative treatment. This combination of steel and concrete is sound construction, for here we have the concrete, which has a very high compressive resistance (600 lbs. per sq. in.), offering resistance to the crushing effect of the load, and the steel, having a tensional resistance of 16,000 lbs. per sq. in., embedded in the concrete, to take the tensional strain caused by the same loading. The embedding of the steel in the concrete effectively protects it from atmospheric action, and further, it can be so placed to advantage as to reduce to a minimum the quantity necessary effectively to resist the load to which the member may be subjected. Therefore the employment of these two materials, with opposite relative values, has resulted in a saving of metal as compared with the steel beam and stanchion, and also a saving of space, because the necessary covering for the steel is found in the construction of the member itself. The effect this has had upon architectural design is further to increase the spans of openings and distances between points of support by the introduction of reinforced concrete beams, and also to reduce the superficial area of vertical supports by the use of reinforced concrete pillars.

It is usual to design reinforced concrete beams so that there is a sufficient sectional area in the member to resist the crushing stress and to reinforce with steel, only for resistance to tensional strain; although steel reinforcement may be inserted into the compressive side where sufficient area of concrete is not provided. It is not, however, considered good design to reduce the size of a member so as to necessitate reinforcement on the compressive side, except where the exigencies of the design demand that the size of any beam must be kept within certain limits.

In vertical supports the steel is inserted into the position where it can most effectively resist the compressive load placed upon it, strengthen the pillar against buckling or lateral flexure, and at the same time reduce the superficial area of the pillar to a minimum.

The convenient forms with which the steel reinforcement can be obtained, i.e., in rods or bars, chiefly circular and of diameters varying in sixteenths of an inch from 3-16 in. to 2 in., and the comparative ease with which the steel can be embedded and made to assume its proper position in the work, and also the economic cost at which the work can be carried out, has given reinforced concrete its place as a constructive ma-

terial which must be considered by every architect in the design of buildings where it can be employed to advantage.

The general effect of reinforced concrete upon elevational design is to be seen in the tendency to breadth of treatment, due to the vertical lines of support being less in number than previously, as pointed out above, and also to the widening of spans of openings and an almost entire elimination of the arch as a constructive feature. The heads of openings are now almost always flat by reason of the use of reinforced concrete lintels. Previously, where flat-headed openings had been desired, they were of limited span, owing to the very small resistance of wood or stone to bending or tensional strain. Now they can be made as wide as necessary without in any way impairing the strength of the building.

Fenestration has also been modified by the same influence. Larger glass areas can be obtained with a minimum amount of walling; in fact, the infilling between the piers and beams of a modern reinforced concrete building might be all glass, should the necessity arise for such a consideration. The improvement in this direction is mainly to be observed in factories, schools, and buildings where the essential feature is the provision of ample light; but even in purely architectural building the influence is to be traced in a greater use of the flat-headed opening as compared with arched openings. True, some vitality of design may be lost by its employment, but with careful treatment the flat-headed opening may be equally an aid to beauty as the arch, and will certainly be an indication of the progress of thought in material.

It may be thought, perhaps, that reinforced concrete can have little or no influence upon the architectural ornament of a building, but its employment might greatly add to the grace of our building by producing a greater degree of light and shade upon elevational design by giving a large projection to strings, cornices, etc. The limits of stone or other granular material when in projection are well known, but ornamental reinforced concrete work could be employed to advantage where other materials fail. The Greek temples of old owe a great deal of their charm to the effects of light and shade cast by their projections. The sun, however, does not treat all lands alike. In southern Italy the proportioned cornice of the Orders produced the desired effect by reason of the high altitude of the sun, but the use of the same projection in England has an altogether different effect, due to the lower angle at which the light from the sun can produce shadows. Many of our monumental buildings are almost shadowless for that very reason. The architects of the Renaissance in Northern Italy recognized this fact and crowned their Palazzi with great overhanging cornices. The Americans, too, have seen the necessity for a deep shadow to give repose to their large scale buildings and obtain the same by the use of zinc or iron cornices of great projection, painted to imitate the material in which they are working. The use of reinforced concrete in decorative cornices would be legitimate construction if we recognize the material and give the member its true value in relation to the whole design, and the deeper shadow cast by greater projections on our building would be appreciated.

Reinforced concrete has helped to perpetuate the flat roof and its deadly effect upon the general outline and mass of architectural building. The use of the stately pitched roof, so beloved for its reposeful and sub-conscious effect upon architecture, has been usurped by the use of the flat roof; not but that a flat roof is sound construction, and essential in some instances, but it is not a natural product of the climatic conditions of this country. The real reason for its use may be found in its fire-resisting qualities; but an equal safety may be obtained by constructing pitched roofs with a shell of reinforced concrete, in place of the usual timber framing, and covering it with the slates or tiles most suitable to the district for which the building is designed. To gain this security from fire the architects of the Middle Ages carried up the stone barrel vaults of their churches in solid masonry to the rake of the gable ends and bedded slates or stone slabs thereon as a protection from the weather.

The almost perfect resistance offered by reinforced concrete to the effects of fire has had a great deal to do with its more general use in the design of buildings. It is essential that every architect should be well acquainted with all the properties of the many building materials at hand, so that he may be better able to make the best use of same.—Concrete and Constructional Engineering."

#### GERMAN DESIGNS.

Our September editorial was directed against the vice of restoration, under any conditions—and especially and particularly the adding of insult to injury in the press notices announcing that Germany was proposing to lay profane hands on those architectural memorials of past ages of civilization, already violated by her barbarian hordes, by presuming to "restore" Belgium's architectural landmarks under the direction of an official "city architect" of little fame, and still more doubtful taste. Apparently color is lent to that statement by another recent "atrocitv," chronicled in the following despatch:

"At St. Quentin, France, in the presence of the Emperor, the French municipal authorities, and the principal officers of the second army, there was dedicated a monument to German and French (?) warriors. The monument, built by Professor Wand-schneider after the Emperor's own design, stands in the new military cemetery."

This astonishing bit of "press-agentry" is dated as emanating from Berlin on October 27, 1915.

The overweening ambition of the Kaiser already has presumed to rule the art of his nation with a rod no more flexible than that he now extends over other and more thoroughly aesthetical lands. He has laid down the rules on which the Royal Opera was to be conducted; he has censored the operas of composers, both present and past; he has approved some dramas and disapproved others; he is even supposed himself to have written certain performances, whose presentation he has then enforced. The architectural "committee" has been equally at his mercy. Those designs accented by the official judges have been arbitrarily set aside, and the execution of designs by his "court architect," or preferred favorite, has been "commanded" instead. Nevertheless, the effrontery of the action registered in this despatch will leave other and freer nations somewhat aghast. Is it not one of those straws showing which way the winds bloweth? We know not how many monuments, built efficiently in granite and enduring cements, have been placed as Teutonic milestones in the war-torn and bleeding soils still belonging to other, and yet unconquered peoples. How many of these Kaiserentwerfen memorials will be found in existence a few years hence?—"Architectural Review."

## AN ANALYSIS OF NINETEENTH CENTURY ARCHITECTURE.

In attempting this discussion we have in view a twofold purpose: first to state in simple terms the fluctuations of taste which a century of history called forth; and, secondly, to explain what is partially obscure to the generality of our readers, namely, the attitude of the architects of that period towards the great sources of inspiration with which they were familiar.

The lessons of the nineteenth century should be understood by everyone whose calling is connected with the art of building; for without some clear understanding of the period that directly precedes our own it is almost impossible to understand the position architecture occupies to-day; neither can we without some such reference determine future policy regarding design. The chief factors which arrested the refined formality of the eighteenth century were the Romantic Revival in literature and the phenomenal development of a vast industrial population; or, to be more precise, books and machinery. Architecture, of course, begets architecture, and from the convenient standpoint of to-day we are in a more advantageous position than our predecessors to criticize and appreciate the good qualities of the eighteenth century. Precisely where eighteenth-century ideals merge with those of the early nineteenth it is difficult to ascertain, but the period of George IV. forms a distinctive hiatus from which to begin our discussion.

Yet it is an established fact that the classic tradition lingered on through many dull and insipid years; that the spirit and scholarship of the "golden age of architecture" never quite lost its hold over the imagination of a few architects; and in the present tendency of the rising generation is to be seen the rekindling of the once despised Classic lamp. From 1830 to 1900 is fair ground for retrospect. We shall find a medley of conflicting theories, some men turning for inspiration to late models in their own language, other investigating the chapters of the Middle Ages, which had been neglected and despised in the march of time, and others studying the contemporary architecture of the Continent. The wonder is that with such an apparent confusion of tongues any extensive building development was accomplished at all. But architecture collectively is always wiser than any of its votaries, and, despite the division of architects into rival camps, new theories and buildings of original character sprang up on every side. For seventy years civic architecture was continued in the Classic spirit, whether drawn from Greek, Roman or Italian sources. Ecclesiastical architecture favored the whole gamut of mediæval taste, including the French scale; and domestic building, left practically to itself, fluctuated between awful Gothic and worse Classic. Gradually the pre-eminence accorded to civic architecture in the eighteenth century was banished; the outlook of the Gothic school was limited to the study of individual buildings in which isolated and picturesque settings alone received consideration. In time even the fervor of the Gothic coteries ceased to hold popular attention, and by 1830 domestic architecture became the universal idol which all were supposed to worship. There were many minor deviations from the dictates of sound taste and common sense, which were brought about by increased travelling facilities and the sketch-book habit.

On the Classic side we find the scholars, such as Professor Cockerell and his talented son, F. P. Cockerell, the two Smirkers, Sir Charles Barry, Elmes, and Sir William Tite, with a host of men of lesser repute who were influenced by these leaders. At Kensington, Captain Foyke's staff produced the Royal Albert Hall, the most remarkable building of the second half of the century, and the Royal College of Science. Professor Cockerell's attitude in particular to the development of Classic architecture presents a very interesting study. In addition to his profound knowledge of antique art, he held in great veneration the works of Sir Christopher Wren; he was in intimate touch with the contemporary French school, and thoroughly sympathized with the Italian Renaissance. All these influences appear in his own works. Cockerell's style stands head and shoulders above that of his contemporaries as regards finish and detail, but it sometimes reveals traits of over-complexity which show the conflicting influences of the period rather than the innate taste of this architect.

Barry, on the other hand, in his design for the Travellers' and Reform Clubs worked on the motif principle, and, seeking for a type best fitted to express club life, he selected the Palazzo model. His reconstruction of Soane's building in Whitehall and the Town Hall at Halifax show an impression of Italian work as seen through a Victorian magnifying-glass; and in the matter of elaborate and rich confusion of surface he was only rivaled by the exuberances of his pupil, John Gibson. The Gothic school of the Victorian Age was shaped by Rickman, educated by Pugin and Brandon, and exploited by Sir Gilbert Scott. In its decline Street was the poet of the movement, and Pearson and Bodley were the last of the race of minstrels. It is somewhat strange that the best works of the Gothic school should have been produced partly under the direction of Classic architects. But it is more remarkable that the best results were achieved by studying fifteenth-century architecture, as, for example, Pugin's contribution to Barry's Palace of Westminster, and the Library at Lincoln's Inn, which was erected by Hardwick, of Euston fame.

With the advent of Eden Nesfield and Norman Shaw, domestic architecture was rescued from the slough in which the Early Victorians had left it. In this, however, the sudden revision of taste against sober pomposity led the mass of the profession astray. At first the new school affected a parody of Queen Anne and Tudor features, which led to a virulent outbreak of gauged brickwork, picturesque gables, and contorted architraves; for the brickly shades of Queen Anne's reign were evoked with a vengeance. Experience proved to the enthusiasts how much their own work differed from the simple character of the models which they professed to follow. Hence the reaction which set in and the just praise bestowed on Norman Shaw's later work. Although architects at this time were among themselves satisfied as to the limitations of the Gothic Revival, the great bulk of the public still read Fergusson and Ruskin; but a few men, endowed with clarity of vision, saw through the fallacies of the pseudo-classic school and cautiously set to work to change current opinion. This explains why the work of the nineties carries with it such a timid note; the major portion of it was designed with hope overshadowed by fear. From 1890 to 1915 the domestic school has been in the ascendant; it stands for the highest expression of English taste. It has been acclaimed for its insular character, its suitability and charm. In reality it is not to be compared with its great forerunner of the eighteenth century, and its best examples merely represent a potpourri of seventeenth and eighteenth century taste, with a pinch of the Regency thrown in for seasoning. The architects of the nineteenth century worked in a period of artistic confusion: criticism and controversy were rife, the decline was

rapid; but there was at least a general standard of taste which the public understood, and the best of the buildings were, apart from the question of style, both satisfactory in the disposition of mass and the scale of their minor attributes. In the continuance of the Classic tradition under Cockerell and Barry and in the Romantic Revival of Pugin and Street the best taste of the Victorian epoch is reflected; architecture was still directed by men of scholarship and attainment, and it had not yet fallen into the hands of those whose commercial instincts were greater than their professional ability.

The present teaching of the universities and schools is directed towards a broader conception of architecture, quite logical and distinct from the trammels of fashion and style. The theory is now accepted that the study of town planning and civil architecture must be given the first place, and that domestic architecture is, after all, a matter of purely secondary importance. So complicated has the practice of architecture become to-day that engineers now carry out works formerly entrusted to architects, firms of decorators cater for the interior treatment and furnishing of houses; while specialists of every sort prepare schemes for various fittings, the architect being left to plan the brick walls and design the elevations to meet the changing whims of his client.

Were it not for the buildings of the past, this vast metropolis, and even vaster empire, would lose the greater part of its character.—"The Builder."

## DAYLIGHTING THE FACTORY.

How many owners and architects consider a full measure of daylight in the factory in the same way as they do the convenience and purpose of the building, its architectural appearance, or its fire-proofness? Apparently not the majority of them, for one can visit plant after plant without finding this feature sufficiently studied and developed.

Light acts on the sensitized plate instantaneously with the exposure, the impression registered depending upon the amount of light available at the moment, while the result absolutely depends upon the light quality.

So in factory production the work and workmanship depends upon the light quality even more than upon the skill of the man, for whatever may be his experience, the amount of work and workmanship decreases or increases according to the light available at the time of the task. This also affects the workman. Eyestrain is one of the serious evils attending poor or bad lighting and should be prevented by all means.

Accidents are very often due to improper lighting and the reports of many investigating committees prove conclusively the value of good natural light from every viewpoint. Compensation commissioners' reports on accidents will do much to bring out this fact and no doubt will be the means of hastening the remedy in the form of laws.

It is important to bear in mind, when planning for sufficient daylight, the fact that only that portion of window or roof openings through which the sky is visible admits the proper light.

Skylights (overhead or direct light) probably provide the most direct means of daylighting, and by the use of ribbed glass, the glare from the sun which is objectionable can be minimized, and it is further reduced in buildings with unusual heights.

Therefore, why not be ahead of time when it will be a legal requirement, and be prepared. Let your factory be well daylighted.

Natural lights costs nothing, the problem presented is only that of selection, with an eye not to the first cost, but the weather-proof qualities and future maintenance factor.

The viewpoint of the practical man should, of course, be given due weight when considering the proper daylight of buildings, yet how often do we see the most elemental phases of light and its values ignored. How often is the shop superintendent or foreman called upon to suggest what, in accordance with his experience, would be the most practical solution in such and such a case, and find him recommending solutions that have long since been superseded by better methods. Sawtooth design, for example, is very fine indeed when used in the right way and place, but if wrongly applied can be made to defeat its purpose.

Adjacent buildings shutting off sky light must be taken into consideration; dark surfaces which absorb light are especially important to consider. A monitor with windows in the side and solid roof will well illustrate the point.

How often, where machines are in operation, even in the modern building, artificial light must be depended on to provide the necessary working light and particularly to avoid eyestrain at only reasonable distances from the windows. Doesn't this suggest limited output, less expert workmanship, which means less profits? Light diffusion oftentimes misleads one to think there is plenty of working light. Try taking photographs with these varying degrees of light and note the results. The further away, the longer the exposure. Does not this prove the argument from the workman standpoint, the eyestrain theory?

How to overcome this disadvantage is the problem confronting each building designer. Of course it depends somewhat on the amount and class of work to be performed. Some of the thoughts suggest windows carried to the height of the ceiling, ribbed glass for the extra diffusion of the light, shades operating from the bottom, instead of the top, light-colored walls above the eye vision and ceilings of a mat dullness, rather than a glary nature, skylights where possible, and, if necessary, artificial lighting of the proper sort. And don't forget (although this is a chief concern of the owner, it should be covered by the engineer or architect), that windows must be cleaned at regular intervals, else what avails the daylight provided. Dust and dirt, sediment settlements, deposits from operations inside or from neighboring works, quickly accumulate, and unless promptly cleared off adhere to the glass surface and decrease the illuminating value and the rate of glass deterioration.

Rules concerning lighting are set down in the report of the committees of the Illuminating Engineering Society in their "Code of Lighting," and again in an interesting study and report of Messrs. Marks and Woodwell, "Planning for Daylight and Sunlight in Buildings," which are forerunners of the new daylight era. Another evidence of the value of daylight, in addition to the number of daylighted factories constructed and now being built, was the recent action of the city of Cleveland in adopting Eastern time, in order to give its citizens one hour more of daylight throughout the greater part of the year, and which was followed by others doing likewise.—American Architect.



# Construction News

The following information is obtained from our correspondents, from architects, engineers and local newspapers. These items are published in our Daily Report Service, and are herein compiled for the use of subscribers to the monthly issue of "Construction." Should any of our readers desire this information daily we will be pleased to submit prices upon request

## BUSINESS BUILDINGS.

**MONTREAL, QUE.**—Bell Telephone Company have plans completed for a new building to cost \$53,000.

**WELLAND, ONT.**—Architect T. L. Nickolas, 18 Main street, is preparing plans for a business building for Elio Sogavac.

**TORONTO, ONT.**—Canadian Bank of Commerce are having plans prepared by Dominion Realty Co., for a new building to be erected corner of Vaughan road and St. Clair avenue.

## CIVIL ENGINEERING.

**BERLIN, ONT.**—City of Berlin have called for tenders on pavements and engineering equipment.

**CHARLOTTENBURG TWP.**—Tenders have been called for bridge over the Beaudette River, clerk, G. Watson, Williams-town, Ont.

**COLLINGWOOD, ONT.**—Town Council have called for tenders on water works and equipment.

**COOKSTOWN, ONT.**—County of Simcoe have called for tenders on steel bridge on plans prepared by Engineer F. Barber, 57 Adelaide street east, who is also preparing plans for a concrete bridge to be erected later.

**ELMO TOWNSHIP.**—The town council have called for tenders on drains, clerk, Geo. Lockhead, Elmo, Ont.

**GRANTHAM TOWNSHIP.**—Town council have called for tenders on new culverts, Sec., L. S. Bessey.

**HAMILTON, ONT.**—City of Hamilton have plans completed for a steel viaduct.

**NIAGARA FALLS, ONT.**—A company composed of E. R. Wood, Toronto; A. Fraser, S. G. Sheppard and A. J. Sheppard, Niagara Falls, propose erecting a new bridge over Niagara River.

**NEW BRUNSWICK PROV.**—Contracts for bridges have been awarded as follows, by the Provincial Board of Works, York County Bridge, Canadian Steel Bridge Co., Haweig Bridge, Canadian Steel Bridge Co., Brook Mouth Bridge, Victoria County, W. R. Fawcett, Temperance Vale.

**PEEL COUNTY, ONT.**—Engineers Bowman and Connor, 31 Queen street west, have called for tenders on a bridge of reinforced concrete.

**PORT HOPE, ONT.**—Town Council have called for tenders on a bridge on Peter street from plans prepared by Bowman & Connor, 31 Queen street west.

**RENFREW, ONT.**—County of Renfrew have awarded contract for bridge over Indian River to J. M. Kennedy, Alice township.

**TORONTO, ONT.**—City of Toronto are having plans prepared for new subway on Ashdals avenue and G. T. R. Commissioner of Works, R. C. Harris.

**VANCOUVER, B.C.**—Richmond Council, B.C., have awarded contract for bridge over the Fraser River to Fraser River Pile Driving Co.

**WARDSVILLE, ONT.**—Elgin County have awarded contract for new bridge over the Thames River to the Petrolia Bridge Co.

**WINNIPEG, MAN.**—City of Winnipeg have called for tenders on cast iron pipe.

## CLUBS, HOSPITALS, THEATRES AND HOTELS.

**CALGARY, ALTA.**—City of Calgary will build club building in connection with the golf links.

**HAMILTON, ONT.**—Architects Stewart & Witton have called for tenders on equipment for Barton street hospital.

**HAMILTON, ONT.**—Centre Mount Club will erect a new building.

**HAMILTON, ONT.**—Architect W. P. Witton is preparing plans for a new nurses' home in connection with Mount Hamilton hospital.

**KINGSTON, ONT.**—Dominion Government will build convalescent home on Fetter Cairn Island from plans prepared by Power & Son, Kingston.

**LONDON, ONT.**—F. R. Heakes, Provincial Architect, is preparing plans for the rebuilding of the local asylum. Architects McBride & Gilbert, Edge Block, are preparing plans for the erection of a club house on St. George street.

**LONDON, ONT.**—Architects Messrs. Watt & Blackwell are preparing estimates on cost of erecting a new theatre for C. E. Bernard on Wellington street.

**OTTAWA, ONT.**—J. P. MacLaren, 104 Sparks street, has plans for a new gymnasium.

**QUEBEC, QUE.**—Plans have been completed for new building of the Jeffrey Hale hospital, to cost \$70,000. Y.W.C.A. will erect a new building on Ann street; plans prepared. J. M. Bedard Grande, Allee Gardens, has purchased a site for a new theatre to be built on St. John street.

**SAULT STE. MARIE, ONT.**—S. W. Faucett has plans completed for new theatre.

**TIMMINS, ONT.**—Charles Pierce will erect a theatre; tenders called for.

**TORONTO, ONT.**—W. B. Charlton, 412 Indian road, has

secured general contract for alterations to building on Spadina avenue to be used as a hospital. Owners, Knox College.

**TORONTO, ONT.**—Plans for the rebuilding of the Princess Theatre in reinforced concrete are now being submitted by Architect E. C. Whitney, Detroit, and C. H. Read, Confederation Life Building.

**UNION ON THE LAKE, ONT.**—Architect J. C. Pennington, Windsor, is preparing plans for hospital addition to Essex Tuberculosis Hospital.

**VANCOUVER, B.C.**—National Amusement Co. have called for tenders on a new theatre to be erected on Broadway and Main streets.

**VANCOUVER, B.C.**—Architect W. F. Gardner has awarded contract (general) to Atkinson & Dill for new theatre of the National Amusement Co.

**WINNIPEG, MAN.**—Architect Paul M. Clements has completed plans for Royal Templars' lodge building, to be erected on Young street.

## ELECTRICAL CONSTRUCTION.

**CALGARY, ALTA.**—City of Calgary have awarded contract for electrical equipment to Canadian Westinghouse Co., Hamilton.

**DAVIN, SASK.**—Davin Rural Telephone Co. will construct new lines; secretary, J. F. Parsons.

**KINDERSLEY, ONT.**—Toronto Suburban Railway will erect sub-station, to cost \$10,000. Toronto Hydro Electric Co. will erect sub-station on Ruskin avenue.

**TORONTO, ONT.**—Toronto Hydro Electric Commission have called for tenders on cableducts, transformer vaults and meters. Specifications may be obtained from the purchasing agent, 15 Wilton avenue.

## FIRE LOSSES.

**ARDEN, MAN.**—Warehouse of Western Canada Flour Mills destroyed.

**BLENHEIM, ONT.**—Springsteen Co. garage and apartments destroyed; loss \$16,000.

**BRANTFORD, ONT.**—Warehouse of B. Bell & Son Co., damaged by fire; loss \$10,000.

**CALGARY, ALTA.**—West End Incinerator destroyed; loss \$50,000.

**CAMPBELLTON, N.B.**—Waverley Hotel was destroyed by fire; loss \$75,000.

**COLLIDGE BRIDGE, N.B.**—Residence of P. D. Viennéau destroyed; loss \$5,000.

**DAUPHIN, MAN.**—Town hall damaged by fire; loss \$5,000.

**DILKA, SASK.**—Meat Market destroyed; loss \$22,000.

**ELMIRA, ONT.**—Bauman & Leason planing mill destroyed; loss \$15,000.

**FORT WILLIAM, ONT.**—Grain Growers' elevator, Hardesty street, destroyed; loss \$60,000.

**GALT, ONT.**—Imperial Hotel destroyed; loss \$40,000.

**GLEICHEU, ONT.**—Stores destroyed of Bray's, Beache's, Cosgrave's, Farmers' Supply and Masonic lodge rooms; loss \$100,000.

**HALIFAX, N.S.**—J. Rowe, 121 Lower street, soda water factory destroyed; loss \$14,000.

**L. HAMPSTEAD, N.B.**—School destroyed; loss \$1,000.

**MAPLEHURST, MUSKOKA.**—Hotel destroyed, of Mrs. Brown; loss \$30,000.

**MARKHAM, ONT.**—Rink and Fair building destroyed by fire; loss \$15,000.

**MILL VALLEY, ONT.**—D. H. Graham's mill destroyed; loss \$10,000.

**MOOSE JAW, SASK.**—J. Griffith residence destroyed; loss \$5,000.

**MOOSE JAW, SASK.**—Gordon Ironsides, packing plant damaged; loss \$50,000.

**MONTREAL, QUE.**—Canadian Rubber Co. plant damaged; loss \$15,000.

**MONTREAL, P.Q.**—Pauze & Goshier, sash factory destroyed by fire; loss \$10,000.

**NAPANEE, ONT.**—Curling Club building destroyed; loss \$20,000.

**NEEFAWA, ONT.**—John Brown's department store destroyed; loss \$10,000.

**NIAGARA FALLS, ONT.**—Marshall's, Ltd., candy factory destroyed; loss \$25,000.

**OTTAWA, ONT.**—Planing Mill of A. Charpentier, 141 Main street, destroyed; loss \$3,000.

**OTTAWA, ONT.**—Daughters of Wisdom Convent, destroyed; loss \$8,000.

**PORT LAMBERTON, ONT.**—Residence of D. Hinnegan destroyed; loss \$3,000.

**REGINA, SASK.**—C. N. R. Roundhouse destroyed; loss \$14,000.

**RENFREW, ONT.**—O'Brien Mfg. Co., burnt out; loss \$30,000.

RENFREW, ONT.—Renfrew Machinery plant destroyed; loss \$100,000.

REVELSTOCK, B.C.—Taylor block and Metrae Building destroyed by fire; loss \$40,000.

ROSE PLAINS, SASK.—Methodist Church destroyed by fire; loss \$12,000.

STRATFORD, ONT.—Office of MacDonald Thresher Co., destroyed; loss \$5,000.

STRATHROY, ONT.—Residence of J. Arrard, Albert street, destroyed; loss \$2,000.

ST. JOHN, N.B.—St. John Isolation Hospital destroyed.

ST. JOHN, N.B.—McLean Estate office damaged; loss \$5,000.

ST. JOHN, N.B.—Warehouse of Dearborn & Co., damaged; loss \$40,000.

ST. JOHN, N.B.—Jas. Griffiths' residence destroyed by fire; loss \$5,000.

ST. GEORGE, ONT.—H. Bell & Son's munition plant destroyed; loss \$10,000.

ST. THOMAS, ONT.—D. Wrightman residence destroyed; loss \$3,500.

SWIFT CURRENT, SASK.—Roller rink, owned by T. A. Roberts, destroyed; loss \$3,000.

TORONTO, ONT.—Brown & Stanton store damaged by fire; loss \$50,000.

TORONTO, ONT.—Residence of J. Whitehead, Stracona ave., destroyed; loss \$2,000.

TRENTON, ONT.—King George Hotel destroyed; loss \$40,000.

TRENTON, ONT.—Graydon & Clegg's Garage destroyed, and Ireland & McCaul machine shop damaged; loss \$10,000.

VANCOUVER, B.C.—R. V. Palmer, 2020 Fifth avenue, two hay sheds destroyed; loss \$10,000.

WELLAND, ONT.—Two houses on Deer street destroyed; loss \$4,000.

WESTVILLE, N.S.—Court House and Jail destroyed.

WHEATLEY, ONT.—Barn of Mr. Heatherington destroyed; loss \$3,500.

WINNIPEG, MAN.—Manitoba Photo Supply Co., burnt out; loss \$4,000.

#### PLANTS, FACTORIES AND WAREHOUSES.

BAY BULLS, NFD.—Newfoundland American Packing Co. are having plans prepared for a new plant to be erected here.

BERLIN, ONT.—Regal Auto Co. will erect a building.

BRANTFORD, ONT.—Waddell Preserving Co. will erect a factory. Architects Taylor & Bodley are preparing plans for warehouse to be erected for C. J. Mitchell.

DARTMOUTH, N.S.—Williston Steel Foundry Co. have called for tenders on new building.

HAMILTON, ONT.—Stanley Steel Co. will erect a new plant to cost \$200,000.

HAMILTON, ONT.—Steel Co. of Canada are having plans prepared for plant addition.

HAMILTON, ONT.—E. T. Wright Co. will make additions to their factory on Cathcart street.

HAMILTON, ONT.—Frost, Steel & Wire Co. are having plans prepared for a new steel plant to cost \$6,000,000. Directors, H. A. Frost, A. L. Page and C. A. Smith.

HAMILTON, ONT.—Mercury Mills, Ltd., 80 Park street, will make addition to factory. Peerless Weaving & Belting Co. will erect factory, interested Stephen & McKenney, Hamilton.

KINGSTON, ONT.—Newell Mfg. Co. will make addition to plant.

LINDSAY, ONT.—Hodgson & Hodgson Chemical Co. are erecting building.

LINDSAY, ONT.—F. R. Wilford & Co. have awarded contract for factory addition to R. Williams.

LONDON, ONT.—London Foundry Co. will erect a new factory plant.

LONDON, ONT.—A. A. Langford contemplates the erection of a new factory on King and Clarence streets to cost \$25,000.

MONTREAL, QUE.—Lyal Munition Co., to make extensions to plant.

MONTREAL, QUE.—The Steel Company of Canada will erect a new building to cost \$24,000.

MONTREAL, QUE.—Darling Bros., 120 Prince street, have started the erection of a new factory addition.

NIAGARA FALLS, ONT.—Perfection Tire and Motor Co. will erect a large factory.

NIAGARA FALLS, ONT.—Niagara Power Co. will erect new buildings and make additions.

ORILLIA, ONT.—Canada Builders' Ltd., will prepare plans for a new factory to be erected on Matchedash street.

OTTAWA, ONT.—Grant, Holden & Graham, 147 Albert street, have awarded contract for factory addition to C. Holbrook & Son.

PETERBORO, ONT.—Bonner Worth Co. have awarded contract for addition to W. Langford.

REGINA, SASK.—Prairie Biscuit and Confectionery Co. have been incorporated and will erect a plant.

SASKATOON, SASK.—Alaska Beddington Co. will have plans prepared for their new factory.

ST. JOHN, N.B.—H. L. McGowan has purchased site for a plant factory.

TORONTO, ONT.—Robertson Bros. will make addition to plant, 103 Queen street east.

TORONTO, ONT.—The Ontario Motor Car Co., 20 Bloor street east, will make alterations to premises.

TORONTO, ONT.—Hydro Electric Commission have plans prepared for building corner of Front and Jefferson streets.

TORONTO, ONT.—Architect J. F. Brown has awarded contracts on new buildings for the York Knitting Mills, 993 Queen street west.

TORONTO, ONT.—"5 in 1" Envelope Co., Hayter street, will build factory. Neilsons, Ltd., Gladstone avenue, are making additions, plans prepared by Sprout & Rolph, 34 North street.

TORONTO, ONT.—Whitfield & Co., 33 Sherbourne street, will erect buildings. A. R. Clark, 633 Eastern avenue, will erect new shops to cost \$35,000. Comfort Soap Co. will make factory additions at West Toronto.

TORONTO, ONT.—A. W. Wolfe, 163 Adelaide street west, contemplates the erection of a factory building corner Wellington and Spadina. A. S. Dunbar, architect, 883 Shaw street, is preparing plans. Architect F. S. Baker has awarded the following contracts on new business premises being erected on Church street: Mason, Orr Bros; electric work, Bennett & Wright; plaster work, Sparks Co.; steel work, Dominion Bridge Co.; plumbing, R. Jordan; roofing, R. Rennie.

VANCOUVER, B.C.—E. C. Fir and Cedar Mills will erect buildings.

VANCOUVER, B.C.—Vancouver Cresoting Co. are making additions.

WINNIPEG, MAN.—T. Eaton Co. have awarded contract for steel to Dominion Bridge Co.

WINNIPEG, MAN.—T. Eaton Co. have started the excavation work for their new store building. Architects, Gray & Burnham, Chicago.

WYOMING, ONT.—Wm. Travis will erect planing mill.

#### PUBLIC BUILDINGS AND STATIONS.

HALIFAX, N.S.—The County Council, Halifax, N.S., are considering the erection of a new court house. Clerk, E. E. Smith, Halifax, N.S.

MONTREAL, QUE.—Grand Trunk Railway Co. will rebuild Bonaventure Station recently destroyed by fire.

WINNIPEG, MAN.—Department of Public Works, Winnipeg, has called for tenders on the completion of the Parliament Buildings.

WINNIPEG, MAN.—City architect is preparing plans for addition to the city hall to cost \$200,000.

#### RESIDENCES, STORES AND FLATS.

BARRIE, ONT.—Bell Telephone Co., manager, A. G. Price, contemplates the erection of a new building.

BRANTFORD, ONT.—Royal Bank will make alterations to store for use as a bank.

BRANTFORD, ONT.—Dr. Chapin has awarded contract for new residence to N. Kew.

BRANTFORD, ONT.—Architects Barber & Tilley have plans completed for residence of E. L. Gould.

BRANTFORD, ONT.—Architects Barber & Tilley, Temple Building, have called for tenders on dwelling for R. Hutchinson.

COATSWORTH, ONT.—Levi Coatsworth will erect a new store, brick construction.

COBDEN, ONT.—J. McDermott has plans completed for a new store.

FENELON FALLS, ONT.—James Fraser will erect a block of three stores.

GALT, ONT.—C. L. Cant has awarded contract for addition to store to Thomas & Hancock.

HAMILTON, ONT.—Thompson & Thompson, 78 Garfield avenue, will erect two houses.

HAMILTON, ONT.—C. R. Roper, 249 Armoth avenue, has awarded contract for new residence to Isbister Bros. S. S. Forbes, 165 Sanford avenue, has plans for the erection of fifteen houses.

KINGSTON, ONT.—A. Andre has plans prepared for a new residence to be erected on Pine and Adelaide streets.

KINGSTON, ONT.—Wm. Newlands & Son have called for tenders on an apartment house to be erected on Burrie street.

KINGSTON, ONT.—Architects Wm. Newlands & Son have awarded contract on apartment house for Mrs. James Elder, as follows: Mason work, H. W. Watts; carpentering, H. Hunter; heating and plumbing, etc., Elliott Bros.; electric work, J. Halliday.

LONDON, ONT.—Plans have been prepared for the following dwellings: R. W. Carter, Wreay street; H. Dicey, Charles street; J. H. Nicolls, Edward street; to be erected this spring.

MCTAGGART, SASK.—McTaggart Rural Telephone Co. will erect a new office building.

MONTREAL, QUE.—Ernest De Nevers, Central Falls, Rhode Island, will erect three houses on Mount Royal avenue, East Montreal. F. L. Gagon, 6490 Lajennesse, will erect a store and residence, to cost \$5,500.

MONTREAL, QUE.—L. E. Judah, 81 Durocher street, will make repairs to an apartment house, to cost \$3,000. Miss D. Ludich, 829 St. Urbain, will erect stores and apartments, to cost \$50,000, on St. Dominique street. Alex. McKay, 498 Argyle, Westmount, will erect a new residence.

MONTREAL, QUE.—Jos. Huppe, 156 Duquesne, will build a dwelling house. A. P. Stuart, 42 St. Catherine street, will erect a residence. E. Martel, 31 Frontenac street, will erect a residence. W. C. Lawrence, 475 Second avenue, will build a residence. N. Rochon, 1011 St. Germain street, will build a residence.

MONTREAL, QUE.—A. Gaudreau, 155 Joliette street, will erect apartment house. L. Bissehop, 201 Wolfe street, will erect two dwellings, for which plans have been completed. Hector Vinet, 4615 Notre Dame east, will erect a residence, and has plans completed. A. Shapson, 1894 Papineau avenue, has plans completed for a new residence.

MONTREAL, QUE.—O. Ownstein, 276 St. Antoine, will erect a store and residence on Notre Dame street. J. M. Ponton, 29 Laval street, will erect two houses on that street. L. Gorieau, 192 Robertval street, will erect a store and flat building on Church street. Jos. Brossard, 522 Charlevoix street, will erect a store and residence on Rosede Lima. C. Brault, 3648 Casquin street, will erect a store and dwelling.

OTTAWA, ONT.—J. & P. Wilson, 8 Allan place, will erect store and apartments on Bank street.

OTTAWA, ONT.—Jackson Booth has secured a site for the erection of an office building on Bank and Slater streets.

OSHAWA, ONT.—Architects Darling & Pearson have called for tenders on the residence of S. McLaughlin, to cost \$75,000.

OTTAWA, ONT.—Architect W. E. Noffke has plans completed for addition to office building of Blackburn Bros., corner Adelaide and Sussex.

PETROLEA, ONT.—Crown Loan & Savings Co. will erect office building.

PORT ARTHUR, ONT.—L. Walsh Co. have awarded contracts on store and office building as follows: Excavating, M. Mazucca; general contract, J. L. McRae.

PORT ELGIN, ONT.—Reeve Issard will erect a bungalow on Gustavus street. Charles Gilbert will erect a frame residence.

QUEBEC, P.Q.—L. Dolbec, Hermine street, will erect dwelling. Elz. Laracher, Acqueduct, will build residence.

QUEBEC, P.Q.—J. N. Rondeau, Lachevrotiere street, will erect a building on that street. E. Bertrand, 3rd Limilou, will erect a three-family apartment.

ROCK ISLAND, P.Q.—S. Murdoch has awarded contract for a new residence to Wm. L. Smith.

SONGHEES RESERVE, B.C.—Department of Marine will erect a store, for which plans are being prepared; Marine Agent, Capt. G. E. Robertson, Victoria.

ST. CATHARINES, ONT.—W. H. McCordick, 199 St. Paul street, has called for tenders on a cottage to be erected on Woodlawn avenue.

ST. THOMAS, ONT.—T. Walley will erect a new residence on Myrtle avenue.

SUDBURY, ONT.—F. W. Woolworth Co. have awarded contract for store alterations to Evans & Co.

TORONTO, ONT.—Hon. T. Crawford, 404 Palmerston avenue, has awarded contract for addition to building to A. Wells, 48 Browning avenue.

TORONTO—R. J. Kirk, 9 Day avenue, has plans completed for addition to residence. Kilner & Eanford, 177 Hiawatha road, will erect a pair of houses on Rhodes avenue.

TORONTO, ONT.—H. W. Boles, 151 Broadview avenue, will erect a residence on Kingswood road; plans completed. J. McMaster, 97 Woodcrest avenue, will erect three houses on King Edward avenue. W. Hughes, 59 Amroth avenue, will erect eight houses on that street.

TORONTO, ONT.—A. W. Wolfe, 163 Adelaide street west, is having alterations made to old premises at 101 Spadina avenue, by A. S. Dunbar, 883 Shaw street, for use as store and apartments. Architect W. B. Galbraith has called for tenders on a new residence to be erected in Laurence Park, to cost \$6,500. L. H. Larkin, 124 Hampton avenue, has completed plans for a new residence to be erected on Donlands avenue, to cost \$3,000.

TORONTO, ONT.—W. H. Gibbs, 419A Brock avenue, will erect a residence on Symington avenue. O. R. Lewis, 132 Hope avenue, has plans prepared for a new residence to be erected on that street. T. Miller, 96 Waverley road, will erect a pair of houses on Main street. Purton & Chennels, 158 Ellsworth avenue, will erect an apartment house on Frederica street. C. Bannister, 48 Cedarvale avenue, has commenced the erection of a house on that street.

TORONTO, ONT.—G. Miller, 12 Boothroyd avenue, will erect residence on Morley avenue. Imperial Trust Co. are making alterations to 19 Richmond street west. Owner, 205 McRoberts avenue, has called for tenders on house to be erected at Stop 48, Yonge street. Haywood & Whitehorn, 6 Hallam avenue, are preparing plans for house to be erected on Lauder avenue. J. D. Naylor, 1255 Glenholme avenue, has plans completed for house to be erected on that street.

TORONTO, ONT.—Architect J. A. Thatcher, 37 Cowan avenue, has called for tenders on a store and bakery to be erected on West King street, Toronto. Architect P. H. Finney, 79 Adelaide street east, is preparing plans for a new residence for G. Ferrier, 302 Danforth avenue. Architects Ellis & Ellis, Manning Chambers, have called for tenders on a new residence for Dr. Gillmour, to be erected on Radford avenue. S. C. Lauder, 99 Ontario street, will make addition to store on Queen street east. Architect P. H. Finney has completed plans for a residence to be erected at Kew Beach for E. Elliott.

TORONTO, ONT.—P. L. Spiers, 95 Glenholme avenue, will erect a residence on Thome crescent, also one on Glenholme avenue; preparing plans. W. Walker, 51 Frederica street, is preparing plans for residence to be erected on Glenholme avenue. Arch. W. C. Hunt, Confederation Life Building, has called for tenders on new residence for J. Harvey Bone, to be erected on St. Leonards avenue. A. Donaldson, 155 Silverthorn avenue, has plans completed for a new residence. C. Lauder, 265 Queen street east, will erect a new dwelling and store. Gipe Hazard Store Service Co., 97 Ontario street, will make alterations to store. T. Robinson, 89 Elm avenue, has plans completed for addition to residence. Venn & Evans, 776 Crawford street, will erect several houses in the St. Clair district. J. Lucas, 919 Carlaw avenue, will erect six stores and apartments.

TORONTO, ONT.—J. S. Geroux, 2135 Queen street east, will erect store and dwelling. J. Harris, 531 Rhodes avenue, will erect a pair of houses on Coxwell avenue. P. Morgan, 68 Bellefair avenue, will erect a residence and garage on Williams road. City Homes, Ltd., 48 Hogarth avenue, will erect a pair of houses on Millbrook crescent. G. A. Stoddart, Lumsden Bldg., will erect a residence at Hanlan's Point. Architect W. Connery, Manning Chambers, has called for tenders on residence of H. W. Cox, 105 Arthur street. Architects Gordon & Helliwell, Confederation Life Building have awarded contracts on alterations to residence of R. T. Gooderham, 331 Sherbourne street. R. Dale, 96 Castle Frank road, has plans for a new residence. C. James, Nanton Court Apartments, will build residence on Roxboro drive. P. L. Spiers, 95 Glenholme, will build residence on Burlington crescent. J. Carroll, 223 Garden avenue will build residence.

TORONTO, ONT.—W. Long, 406 Yonge street, is having plans prepared for the erection of an office building, corner Yonge and Gerrard streets, to cost \$100,000. Kennedy & Avison,

573 Indian road, have plans prepared for a residence on Renhold avenue. Dr. Gibson, 1223 St. Clair avenue, has called for tenders on stores and flats to be erected on that street. Lucy D. Rowell, Lonsdale and Westmount, will have a residence erected on Vaughan road. Architect Wright, 535 Lansdowne avenue, has called for tenders on three pairs of houses for J. Smith, 107 William street. Walker House Drug Store, 125 Front street west, have called for tenders on a store front. T. Millen, 96 Waverley road, has awarded contract for a pair of houses to J. A. Ward, 310 Lee avenue. E. Elliott, 77 Vermont avenue, has plans for three houses to be erected at Kew Beach. C. Cornelius, 50 Walker avenue, has plans completed for the erection of stores and apartments on St. Clair avenue. Smith & Turner, 535 Lansdowne avenue, have called for tenders on three pair of houses.

THOROLD, ONT.—Mrs. Baxter will erect a new residence on Brindle street.

VANCOUVER, B.C.—R. McDonald will erect a residence on Twelfth avenue west.

VANCOUVER, B.C.—Evans, Coleman & Evans, have prepared plans for alterations to apartment of Norfolk Rooms, 372 Granville street, to cost \$8,000.

WATERLOO, ONT.—Architects E. & W. Cowan are preparing plans for an office building for the Waterloo Fire insurance Co.

WELLAND, ONT.—Architect T. L. Nickolas has prepared plans for residence of S. L. Lambert.

WINDSOR, ONT.—Architects Leybourne & Sewell have awarded contract for residence of Mrs. G. Hallett to Lambert & Braithwaite.

WINNIPEG, MAN.—P. M. Clemens, 498 Maryland street, architect, is preparing plans for hall and office building for the Royal Templars Hall Co.

WOODSTOCK, ONT.—A. Patrick and J. D. McKenzie will erect store and offices.

WOODSTOCK, ONT.—Arch. B. Nichole has called for tenders on addition to store.

ZELMA, SASK.—Architects Seater & Parnell, Saskatoon, have called for tenders on residence of C. G. Hennicksen.

#### SCHOOLS, COLLEGES AND CHURCHES.

BRAMPTON, ONT.—School trustees will erect addition to school on Alexandra street; money has been voted by the Town Council.

CALGARY, ALTA.—Alterations are proposed to the Haultain School here.

CALGARY, ALTA.—Separate School Board contemplate the erection of a new school.

CAMERON, MAN.—School trustees will erect a new school; secretary, J. W. Halpenny, Minnedosa, Alta.

CAYUGA, ONT.—Board of Education will erect addition to school; secretary of Board, E. B. Davis.

COTE DES NEIGES, P.Q.—The R.C. School Board have called for tenders on a new school, from plans prepared by Architect G. A. Monette, Power Building, Montreal, Que.

DALROY, ALTA.—School trustees, S.S. No. 2690, have called for tenders on new school; secretary, F. W. Gardner.

DELTA, B.C.—Department of Education propose the erection of a new school here.

DOMINION CITY, ONT.—Architect T. R. Evans, 1700 Pacific avenue, Winnipeg, is preparing plans for a new school, to cost \$18,000.

DOVER CENTRE, ONT.—Architect S. G. Kinsey, Chatham, has prepared plans for new Presbyterian church to be built here.

EASTVIEW, ONT.—A new school is to be erected here; secretary, J. W. Rostetter, Cummings Bridge, Ont.

ELMVALE, ONT.—School Section No. 5, Fld., secretary, W. J. McGuire, Elmvalle, Ont., will receive tenders on new school to be erected.

EMERSON, ONT.—The School Board will make additions to school.

EXETER, ONT.—James Street Methodist Church will make alterations, to cost \$4,000.

FITCH BAY, QUE.—The School Board are having plans prepared for a new school; secretary, B. H. Rider.

FLOS TOWNSHIP, ONT.—Architect J. Wilson, Collingwood, Ont., is preparing plans of a new school for S.S. No. 5, Flos Township.

HALIFAX, N.S.—Architect H. E. Gates, Queens Building, has called for tenders on a new school.

HALIFAX, N.S.—St. Johns Presbyterian Church have purchased a site for the erection of a new church, on Windsor street.

HAMILTON, ONT.—Board of Education have purchased a site for new school on Wentworth street.

HAMILTON, ONT.—Gore Street Church to be remodelled and fitted up for use of Boy Scouts; W. F. Eaton, of the T. Eaton Co., interested.

HAMILTON, ONT.—Contracts have been awarded for new school by Architect C. J. Hutton as follows: Mason, G. F. Webb; carpentering, J. Pout; plumbing, A. Clark; plastering, Sil Bros.; painting, W. Dodson; electric work, Electric Supply Co.; roofing, M. V. McLean; steel work, Hamilton Bridge Co.; hand rails, Canada Wire and Iron Goods.

HAZENMORE, SASK.—Architects Storey & Van Egmond, Regina, Sask., have completed plans for a new school containing two rooms.

HERSCHIEL, SASK.—Engen School District have called for tenders on new school; secretary, W. H. Luke.

HESPELICK, ONT.—R.C. congregation will erect a new stone church.

KINBURN, ONT.—Architect J. P. McLaren, 104 Sparks street, Ottawa, is preparing plans for a new school.

KINGSTON, ONT.—St. Mary's R.C. congregation will build a church, parish hall and boarding school.



LAMBTON COUNTY, ONT.—School trustees have called for tenders on new school; chairman of committee, C. O'Connor, Bickford, Ont.

LOUISEVILLE, QUE.—Architect Pierre Levesque, 115 St. John street, Quebec, P.Q., has called for tenders on a new R.C. church, to cost \$175,000.

LEAMINGTON, ONT.—The County Council propose the erection of a Home for the Friendless; Superintendent, Daniel Kennedy, Leamington, Ont.

MARRIOTT, SASK.—Tenders have been called on a new school for School District No. 3538 by chairman of the School Board, S. A. Richards.

MERLIN, ONT.—Architects Adams & Adams have prepared plans for a new school to be erected in Tilbury Township.

MONCTON PARISH, N.B.—McQuades S.D., Moncton parish, have awarded contract for new school to G. Morton, contractor.

MONTREAL, QUE.—Architect Marchand, 164 St. James street, has awarded contracts on R.C. schools as follows: General contract, J. Laurier, 355 Province street; heating, McGuire Co., Montreal.

MONTREAL, QUE.—Architect Monette, 83 Craig street west, is preparing plans for new school on Cote de Neiges. Architects Marchand & Haskell, 164 St. James street, have plans completed for new school on Papineau avenue. Architect Edgar Prairie, 502 St. Catherine street east, has prepared plans for a new school on St. Andrews street.

MOUNT BRYDGES, ONT.—Architect L. E. Carrothers, London, has completed plans for a new school for Union School Section No. 1. Plans may be obtained from H. A. McPhail, R.R. No. 2, Mount Brydges, Ont.

MOUNT DENNIS, ONT.—Architects S. B. Coon & Son have called for tenders on a school for S.S. 28, Mount Dennis.

MUIRKIRK, ONT.—Contract for new school has been awarded to Horton Bros., St. Thomas.

OXFORD TOWNSHIP, ONT.—School Section No. 7 have called for tenders on new school; information may be obtained from J. D. Angus, Muirkirk, Ont.

PONOKA, ALTA.—Trustees, Brooks S.D. 564, have called for tenders on a new school; secretary, T. Page Baker.

PORT COLBORNE, ONT.—Architect C. M. Borter has called for tenders on St. James Presbyterian Church.

PORTAGE LA PRAIRIE, MAN.—Architect F. E. Evans, 170 Pacific avenue, Winnipeg, is preparing plans for a new school to be erected in the east ward in this town.

QUEBEC, QUE.—Walls have been erected of St. Roch's Church.

QUEBEC, P.Q.—Architect P. Levesque, 115 St. John street, is preparing plans for new convent.

QUEBEC, QUE.—R.C. School Board will have plans prepared for a new school to be erected on St. Luc and St. Sauveur streets; secretary, J. B. Morissette.

RINFPREW, ONT.—A by-law will be voted on to provide \$125,000 for erection of new high school.

RICHMOND HILL, ONT.—School Section will erect a new school.

RIMOUSKI, QUE.—Architect Pierre Levesque, Quebec, has awarded contracts for chapel for Sisters of the Holy Rosary, as follows: General contract, A. H. Morin, Trois Pistoles, Que.

ROCKY MOUNTAIN, ALTA.—School District No. 3176 has called for tenders on a new school.

SANDWICH, ONT.—Architect Gilbert Jacques, Windsor, is preparing plans for separate school.

SEVEN PERSONS, ALTA.—Architect J. Jarrett, 455 Tenth street, Medicine Hat, is calling for tenders on a new school, to be built here.

SMITH'S FALLS, ONT.—New school will be erected in Elgin Ward, to replace building recently destroyed by fire.

STRATFORD, ONT.—Architect J. Russell has completed plans for a school to be erected on Downie street.

ST. ALPHONSE DE THEDFORD, QUE.—Plans are being prepared for new school; secretary, Achille Therrien.

ST. AUGUSTIN, P.Q.—Architect L. Auger, 39 St. Jean street, Quebec, is preparing plans for a new school to be erected here.

ST. HILAIRE DE DORSET, P.Q.—R.C. congregation are having plans prepared by Architect L. Auger, 39 St. Jean street, Quebec, for a new church.

ST. THOMAS, ONT.—Board of Education will have plans prepared for school additions.

ST. THOMAS, ONT.—Centre Baptist Church will erect a mission building; architect, J. T. Findlay.

TINY TOWNSHIP, ONT.—School Section No. 5 will erect a new school; secretary W. A. Casselman, Wyebridge, Ont.

TORONTO, ONT.—Architects Burke, Horwood & White have called for tenders on a new building for the Somers School of Physical Training.

TORONTO, ONT.—Methodist churches will be erected in Earlscourt and Oakwood districts; pastors in charge, Rev. H. Pawson and Rev. R. Richard.

TORONTO, ONT.—Architect T. Hancock, 836 Dovercourt road, has prepared plans for the erection of Bellisize Drive Presbyterian Church, Glebe Manor.

TORONTO, ONT.—Board of Education have called for tenders on plumbing, heating, tin work, electric work, cabinet work, inter-phones and ash hoists.

VANCOUVER, B.C.—The School Board will make additions to school as recommended by Inspector Gordon.

WALES, ONT.—Tenders have been called for alterations to Presbyterian church by Secretary D. H. Meikle.

WATSON, ONT.—Contract has been awarded for new school to W. D. Shaw, Sarnia, Ont.

WEST LORNE, ONT.—Aldborough Township will erect a new school; secretary, D. McPherson.

WEST LORNE, ONT.—Architect W. G. Murray has plans completed for a new school to be erected, to cost \$7,000.

WESTBORO, ONT.—Architects Richards & Abra, Booth

Building, Ottawa, have called for tenders on school to be erected here.

WINDSOR JUNCTION, N.S.—Bedford Parish contemplate erecting a new church.

WINNIPEG, MAN.—Consolidated School District will have plans prepared for a four-room brick school, to cost \$17,000.

WINNIPEG, MAN.—Contractors Grey & Division have commenced work on St. Andrew's Church; heating and plumbing not let.

WOODROW, SASK.—Architects Storey & Van Egmond, Regina, have let contract for the new school to be built here to F. Rooney, Weyburn, Sask.

YORK COUNTY, ONT.—County of York will erect new school; secretary, F. Mulholland, Eglinton P.O.

#### MISCELLANEOUS.

ATHOL, ONT.—Everett Scott has awarded contract for new barn to Alva Scott, Picton.

BARRIE, ONT.—The Town Council have called for tenders on sewer pipes, cement, lumber, coal, hardware, oil, sand and gravel. Engineer, J. S. Laing.

BRANTFORD, ONT.—Lake Erie & Northern R.R. will erect station at Lorne Bridge.

BURLINGTON, ONT.—Town Council have called for tenders on 850 feet of 30-inch concrete pipe.

CALGARY, ALTA.—Alberta Farmers' Co-operative Co. will erect sixteen elevators.

CALGARY, ALTA.—City of Calgary will erect two comfort stations, to cost \$12,000.

CALGARY, ALTA.—City Council are having plans prepared for a new incinerator plant.

CLARKSON, ONT.—Architects Sprout & Rolph, Toronto, are preparing plans for new barns to be erected for G. W. Gooderham.

DAUPHIN, MAN.—Department of Public Works, Ottawa, will erect court house; plans prepared by Architect J. H. Bossons, Dauphin.

EMMLY TOWNSHIP, ONT.—G. H. Hopkins, Lindsay, will erect a new barn; tenders asked for.

FORT WILLIAM, ONT.—Architects Barrett & McQueen are preparing plans of a new flour mill for the Ogilvie Flour Mills Co.

HALIFAX, N.S.—City of Halifax has called for tenders on supplies of granite, special casting, hardware, explosives, lumber, cement, brick, cart wheels, drain pipes, meters, oils, sand and gravel.

KEDGWICK, N.B.—Richards Manufacturing Co. have awarded contract for new lumber mill to R. McLean.

KENORA, ONT.—L.O.L. No. 1639 are having plans prepared by Architect F. A. Hudson for a new lodge building.

KINGSTON, ONT.—Architects Wm. Newlands & Son have called for tenders on city store-house.

LAKEFIELD, ONT.—H. G. Fitzgerald has called for tenders on a large quantity of lumber.

LONDON, ONT.—Architects Watt & Blackwell, Bank of Toronto Building, are preparing plans for arena to be erected on richmond street north.

MARKHAM, ONT.—Markham Agricultural Society will rebuild the buildings recently destroyed by fire.

MONCTON, N.B.—City Council have called for tenders on new pavements.

MONTROSE, ONT.—Michigan Central Railway, St. Thomas, Ont., will erect a roundhouse to accommodate 20 engines; plans completed.

MONTREAL, QUE.—City of Montreal have called for tenders on bronze and iron castings.

MONTREAL, QUE.—Wm. Scully, 320 University street, will erect shed, to cost \$1,400.

MONTREAL, QUE.—Plans are being prepared by Architect L. J. Bigonnesse, 92 Notre Dame east, for sash factory to be erected on St. Catherine street east for Westtainer & Son.

MONTREAL, QUE.—Board of Commissioners have called for tenders on cement, sand, concrete, stone, rails and angle bars; engineer, F. W. Cowie, Cavenhill Estate, 89 St. Peter street, have plans completed for a garage to be erected on St. Catherine street west.

NAPANEE, ONT.—Town Council have called for tenders on supplies; clerk, W. A. Grange.

NEWTONBROOK, ONT.—F. Summers will install hot water heating in his residence this year.

ORILLIA, ONT.—Architects Burke, Horwood & White have completed plans for town hall.

OTTAWA, ONT.—Ottawa Improvement Commission, 110 Wellington street, have called for tenders on supplies.

OTTAWA, ONT.—City of Ottawa have awarded contract for new pumping station to Thomas McLaughlin, to be erected on Leimeux Island.

OTTAWA, ONT.—City of Ottawa have awarded contract on pumping station to Doran & Devlin, 104 Spark street, who have commenced work.

PETERBORO, ONT.—Campbell Flour Mill Co., Toronto, will erect an elevator and storehouse building.

PORT ARTHUR, ONT.—Saskatchewan Co-operation Grain Association propose the erection of two elevators.

PORT ELGIN, ONT.—John Coulter will erect a new garage.

PORT WILLIAM, ONT.—Architect D. A. Gordan is preparing plans for new elevator for Guy & Co.

PORT WILLIAM, ONT.—Saskatoon, Sask., Co-operative Elevator Co., Regina, will erect an elevator.

QUEBEC, P.Q.—City of Quebec have called for tenders on supplies.

QUEBEC, P.Q.—Quebec Harbor Commission have called for tenders on freight sheds and grain galleries at Pointe a Carey wharf.

RAYMOND, ALTA.—Architect P. Van Waggoner will erect restaurant building on Broadway.

SARNIA, ONT.—Imperial Oil Co. will make additions to their refining plant. Grand Trunk Railway will erect grain elevators and freight sheds.

ST. THOMAS, ONT.—Hydro Commission have awarded contract for sub-station to A. E. Ponsford, Ltd.

STRATFORD, ONT.—City of Stratford contemplate the purchase of supplies for the fire department, consisting of signal boxes, hose, gasoline and storage tank.

TORONTO, ONT.—City of Toronto have awarded contract for 18,000 enamelled brick to the Don Valley Brick Co., Toronto. Contract has been awarded for chimney on Don Valley incinerator to Canadian Custodis Co., Toronto.

TORONTO, ONT.—City of Toronto have called for tenders on a new fire hall to be erected on Hendrick avenue. City of Toronto have called for tenders on wood blocks and crushed stone. C. C. Edwards, 24 King west, will erect a garage and boiler room on Hillington avenue, to cost \$2,500. Architect N. G. Beggs, Cosgrave Building, has plans completed for a garage to be erected on Simcoe street.

TORONTO, ONT.—City of Toronto will erect stables and sheds in connection with Island incinerator.

TORONTO, ONT.—Hydro Electric Commission, 226 Yonge street, have plans completed for addition to sub-station at West Toronto.

TABER AND DUNMORE, ALTA.—C.P.R. have called for tenders on pipe lines. Superintendent, J. M. McArthur, Lethbridge, Alta.

TORONTO, ONT.—Architect J. Mitchell, 55 Isabella street, has called for tenders on garage to be erected corner of Yonge and Baxter streets, for W. J. Fennell, 1550 Yonge street.

TORONTO, ONT.—City of Toronto have called for tenders on electrically-operated gear for 36-inch gate valve. City of Toronto have called for bulk tenders on the erection of a barn at the Industrial Farm and stables at the Island. Old Orchard Club, 375 Dovercourt road, will erect an arena. Sheet Metal Products, 199 River street, will erect garage; contract has been awarded to Brown & Cooper, 297 Carlton street.

TORONTO, ONT.—Contract for Hendrick street fire hall has been let to A. J. Penberthy, 292 Booth avenue. Empire Hippodrome Co. have purchased site bounded by Yonge, College and Terauley streets.

TORONTO, ONT.—Architect C. H. Bishop, of the Board of Education, will call for tenders on interior fittings for Administration Building shortly.

VICTORIA, B.C.—Department of Marine, Ottawa, will erect storage building.

VICTORIA, B.C.—L. E. Ross will erect a shingle mill and will purchase machinery for same.

VANCOUVER, B.C.—Our Ladies of the Sisters of Charity will erect a new laundry.

WESTON, ONT.—A. J. Baker contemplates the erection of a garage building on Main street.

WAINWRIGHT, ALTA.—The Wainwright Milling Co. will erect a flour mill, plans being prepared by Architects Bird & Co., Corn Exchange Building, Minneapolis, Minn.

WINDSOR, ONT.—The City Council will purchase motor fire apparatus, at a cost of \$15,000, for which a by-law has been passed.

WINNIPEG, MAN.—The City Council have called for tenders on hot water heating, storage tank and piping for Cornish Baths.

WALKERVILLE, ONT.—Architect J. C. Pennington, Windsor, is preparing plans for a garage to be erected on Lincoln road for A. E. Kerr.

WESTMOUNT, QUE.—City of Westmount have called for tenders on supplies.

Consulting heating engineers, Nygren, Tenny & Ohmes. Elevators, Otis-Fensom Elevator Co., Toronto. Fire doors, A. B. Ormsby Co., Toronto. Fire escapes and ornamental iron, Eberhard-Wood Co., Toronto. Flooring, Seaman Kent Co., Meaford. Hardware, Canada Hardware Co., Toronto. Interior woodwork, Beverley Wood Specialty Co., Toronto. Marble and tile, Canada Glass Mantel and Tile Co., Toronto. Painting, J. J. O'Hearn & Sons, Toronto. Plumbing, Toronto Furnace and Crematory Co., Toronto. Plumbing fixtures, Cluff Bros., Toronto. Plaster work, Taylor & Nesbit, Toronto. Radiators, Dominion Radiator Co., Toronto. Sprinkler equipment, Keiths, Ltd., Toronto. Stone, Cement Products, Ltd., Toronto. Steel sash, Steel and Radiation Co., Ltd., Toronto. Structural iron and steel, McGregor & McIntyre Co., Toronto. Ventilation equipment, Sheldons, Ltd., Galt. Contractors (general), Jackson-Lewis Co., Ltd., Toronto.

#### MCCORMICK MANUFACTURING CO.

Architects, Watt & Blackwell, London, Ont. Brick, Chatham Brick Co., Chatham, Ont. Boilers, Leonard & Sons, London, Ont. Consulting Engineer, H. P. Elliott, London, Ont. Casements, Trussed Steel Concrete Co., Walkerville, Ont. Chimneys, Custodis Canadian Co., Toronto. Chimneys, Weber Chimney Co., Chicago, Ill. Electric fixtures, Geo. J. Beattie, Toronto. Electric fixtures, Crouse-Hinds Co. of Canada, Toronto. Electric Wiring, etc., Westinghouse Co. of Canada, Hamilton. Electric Conveyors, Thos. L. Green Co., Cincinnati, Ohio. Electric Conveyors, Canadian Mathews Co., Toronto. Elevators, Otis-Fensom Elevator Co., Toronto. Fire Doors, Richards & Wilcox, London, Ont. Fire Doors, Mecker & Co., New York City. Fire Proof Partitions, Alabastine Co., Paris, Ont. Fire Extinguishers, General Fire Extinguisher Co., Toronto. Flooring, Wm. Leslie Co., Boston, Mass. Heating Specialties, Darling Bros., Montreal, Que. Interior Fittings, Canada Office & Desk Co., London, Ont. Lockers, Denis Wire & Iron Co., London, Ont. Overhead Conveyors, Herbert Morris Crane & Holt Co., Toronto. Ovens, Walter Baker Co., New York City. Paints, Brandham-Henderson Co., Montreal, Que. Plumbing fixtures, Empire Manufacturing Co., London, Ont. Pipe Covering, H. W. Johns-Manville Co., Toronto. Roofing, D. H. Howden, London, Ont. Stokers, Murphy Iron Works, Detroit, Mich. Structural Iron, Sarnia Bridge Co., Sarnia, Ont. Terra Cotta, N. Y. Architectural Terra Cotta Co., New York City. Temperature Regulators, Power Regulator Co., Toronto.

#### NORTHERN ELECTRIC CO., LTD., MONTREAL.

Architect, W. J. Carmichael, Montreal. Artesian wells, Wallace Bell Co., Ltd., Montreal. Brick, Laprairie Brick Co., Montreal. Boilers, Babcock & Wilcox, Ltd., Montreal. Carpets and rugs, Henry Morgan & Co., Ltd., Montreal. Casements (office), Henry Hope & Sons, Peterboro, Ont.; (factory), Trussed Concrete Steel Co., Montreal. Chimneys, Custodis Canadian Co., Toronto. Conveyors (ash), Jeffrey Manufacturing Co., Montreal. Conveyors (coal), Brown Hoisting Machinery Co., Montreal. Electric wiring and apparatus, Northern Electric Co., Montreal. Elevators, Otis-Fensom Elevator Co., Toronto. Fire doors, Architectural Bronze and Iron Works, Toronto. Flooring (wood), Siemons Bros., Wiaront, Ont.; (Grueky tile), G. R. Locker Co., Montreal; (Welsh quarry tile), Robert Reid, Montreal. Glass, Pilkington Bros., Ltd., Montreal. Hardware (Corbin brand), Lariviere Incorporée, Montreal. Paint (R.I.W. brand), Dartnell, Ltd., Montreal. Plumbing, Garth Co., Montreal. Piping (underground), James Ballantyne, Montreal. Power machinery (air compressors), Canadian Ingersoll Rand Co., Ltd., Montreal; (pumps), Peacock Bros., Montreal; (pumps), Alberger Pump and Condenser Co., Montreal. Radiators, American Radiator Co., Brantford, Ont. Roofing (Barrett brand), Metal Shingle and Siding Co., Montreal. Sprinkler equipment, H. G. Vogel Co., Ltd., Montreal. Structural iron and steel, Dominion Bridge Co., Dominion Station, Lachine, Que. Stairs, John Watson & Sons, Montreal. Terra cotta, National Fire Proofing Co., Montreal; Atlantic Terra Cotta Co., New York City. Woodwork (interior), U. Pauze & Fils Co., Montreal; W. Ruth-erford & Son, Montreal.

#### D. O. ROBLIN WAREHOUSE.

Architect, Eden Smith and Sons. Boiler, Kewanee Tubular, Dominion Radiator Co., Toronto. Casements, Henry Hope & Sons, Toronto. Electric wiring, Windeler Bros., Toronto. Elevators and hoists, Turnbull Elevator Co., Toronto. Fire doors, Douglas Bros., Toronto. Hardware, Aikenhead Hardware Co., Toronto. Heating, Jos. Harrison & Co., Toronto. Plumbing, B. Willett, Toronto. Contractors (general), Jennings & Ross, Toronto.

#### MARKET FOR PLUMBING AND HEATING APPARATUS.

U.S. Consul-General Edwin S. Cunningham, Hankow, China, in a recent report stated that there was only three buildings in that city in which modern heating was installed, and that owners of many old buildings would be glad to install heating and plumbing if convinced that it could be done in a satisfactory manner. Mr. Cunningham suggests that firms desiring this business should not only establish an agency, but should employ competent European help for the purpose of making the installations in such a manner that they would be efficient. A list of buildings is given by a firm of architects in which it is believed heating could be installed if the matter were properly presented. The officials of the British Municipal Council Building are considering the installation of new sanitation, on which tenders have been invited.

## Contractors & Sub-Contractors As Supplied by The Architects of Buildings Featured in This Issue

### THE WM. WRIGLEY, JR., TORONTO.

Architects, Messrs. Prack & Perrine, Toronto.  
Brick, Canada Sand-Lime Pressed Brick Co., Toronto.  
Boilers, Gurney Foundry Co., Toronto.  
Casements, Steel and Radiation Co., Toronto; Crittall Casement Co., Toronto.  
Chimneys, Custodis Canadian Co., Toronto.  
Electric Wiring and plumbing, Keiths, Ltd., Toronto.  
Elevators, Otis-Fensom Elevator Co., Toronto.  
Fire doors, A. B. Ormsby Co., Ltd., Toronto.  
Glass, Toronto Plate Glass Importing Co., Toronto.  
Hardware (Corbin brand), Rice Lewis Co., Toronto.  
Marble, Canada Glass, Mantel and Tile Co., Toronto.  
Ornamental iron, Toronto Structural Steel Co., Weston, Ont.  
Paint, Adams & Elting Co., Toronto.  
Plumbing fixtures, Standard Ideal Co., Toronto; Mueller Manufacturing Co., Sarnia, Ont.  
Plastering, E. C. Cates, Toronto.  
Roofing, Bird & Co., Hamilton, Ont.  
Sprinkler equipment, Canadian General Fire Extinguisher Co., Toronto.  
Terra cotta (Federal brand), John Lindsay, Toronto.  
Varnish, Glidden Varnish Co., Toronto.  
Water tank, Chicago Bridge and Iron Co., Chicago, Ill.  
Contractors (general), H. G. Christman Co., Hamilton, Ont.

### NATIONAL CASH REGISTER CO., TORONTO.

Architects, Page & Warrington, Toronto.  
Boilers, Goldie-McCulloch Co., Ltd., Galt.  
Brick, Port Credit Brick Co., Toronto.  
Casements, Henry Hope & Sons, Toronto.  
Chimneys, Custodis Canadian Co., Toronto.  
Consulting structural engineers, James, London & Hertzberg, Toronto.

## PERSONALS.

Lieut.-Col. Albrechtsen, architect, of Prince Albert, Sask., is to raise a battalion of Scandinavians in Western Canada.

George T. Evans, architect, of Hamilton, Ont., has received a commission in the C.A.S.C., and will go to Quebec to qualify.

Colonel Stewart, of the 86th Machine Gun Battery, now on active service, is the senior member of Stewart & Witton, architects, of Hamilton.

Mr. George Beverley, of the Beverley Wood Specialty Co., Toronto, has enlisted for active service with the 170th Battalion, and is now in training.

Lieut.-Col. Charles H. Mitchell, C. E. M. Can. Soc. C. E., Toronto, has received from the French Government the officer's cross of the Legion of Honor.

An address was given before a good attendance of the Building Exchange by Lieutenant Keith, of the 170th Battalion, who spoke on recruiting, after which the Exchange went on record as favoring registration of Canadian manhood eligible for military service in the interests of all concerned. The Exchange desires the co-operating of the Board of Trade and the Manufacturers' and Employers' Association in efforts to assist recruiting.

Following the example set by D. Forbes Keith, Vice-President of Keiths Limited, who is now Major of the 75th Battalion, and G. Alan Keith, Secretary of the company, who is a captain in the 170th Battalion, the following employees have enlisted for overseas service: T. Froud, A. Collins, T. Roberts, J. Murray, H. Honeycombe, W. Honeycombe, H. Cockerott, J. Sherry, K. Lees, E. Marks, P. Jewer, G. Clarke, J. Dwan, F. Spain, E. H. Houldcroft, D. Adams, A. Chapman, A. Every, F. J. Pearse, W. Davis, W. Gray, M. O'Hearn, A. Clarke, J. King, N. Moore, H. Clifton, J. C. Salvaneschi, A. Wilson, S. Everett, H. Everett, W. Sterry, R. Gray, F. Cormack, F. Harrison, W. Brown, S. Richardson, J. Dent.

Lieut. Hugh Heaton, son of Ernest Heaton, 185 Balmoral avenue, prior to the war, was a student in the School of Practical Science in the 1916 class, and was serving his apprenticeship in the office of Mr. F. S. Baker. In May, 1914, he went to England to join Martin Baldwin, of the office of Sproatt & Rolph, and the two spent the early summer on a bicycle trip throughout England, sketching and studying architecture. On the day war broke out they were both in London and immediately enlisted as privates in the King Edward Horse. Early in 1915 Heaton obtained his commission in the 8th Battalion King's Own Royal Lancaster Regiment and Martin Baldwin obtained his commission in the 9th Lancashire Regiment, which is now at Salonica. Last September Lieut. Heaton went over to France and since then he has been stationed near Ypres. News has just been received giving particulars of his wounding at the Ypres Salient. His Battalion, after a long stay in the international trenches, had been relieved, and during their absence the relieving battalion lost the trenches. On their return the King's Own decided to retake the trenches and it was during these operations, on the 3rd March, that Lieut. Heaton was wounded. He was in command of a machine gun section. A memorandum has been received from a Tommy, who saw him fall. He says that he was on the edge of a dyke and fell, badly wounded, into water, which was knee deep. He offered to help him, but Heaton refused to allow him to remain and sent him on, fearing that the gun section was being cut off. He reported the accident, and Lieut. Heaton was taken to the Relieving Station at Abelle. He was badly wounded by several bullets across the stomach, in the buttocks and in the left arm, the elbow of which is fractured. For his conduct in these operations he has been awarded the Military Cross. For ten days he was reported by the War Office to be daily improving.



LIEUT. HUGH HEATON.



SUB-LIEUT. FRED ARMSTRONG.

Sub-Lieut. Fred Armstrong, a young Toronto aviator, now with the Royal Naval Aviation Corps stationed at Chingford, Essex, England. He received training at Toronto Island and Long Branch last year, and later left for England, where he is now finishing his course. He is a son of Mr. Fred Armstrong, of the Fred Armstrong Co., a prominent plumbing, heating and electrical contracting concern of this city.

A complimentary dinner was tendered Lieut.-Col. S. G. Becket and officers of the Seventy-fifth Battalion in the Carls-Rite Hotel, March 23rd, by the City of Toronto, at which Mayor Church presided. Many congratulatory addresses were made on the splendid and successful efforts of the guests of the evening in raising the battalion strength in record time. The Seventy-fifth is one of the senior regiments, and is due to leave Toronto very shortly.

The death occurred on April 4th of H. N. Dancy, President and Managing Director of H. N. Dancy & Son, Limited, at his residence, 53 Ellis avenue, Swansea. Mr. Dancy had been for many years identified with the building trade of Toronto as a mason contractor, and had to his credit many of the city's best buildings, including the new Wycliffe College, Hospital Administration Building and Knox College. Coming to Canada from England in 1846, Mr. Dancy had continued to reside here and built up the business which bears his name. He was a member of the Board of Trade and the Toronto Builders' Exchange.

## PUBLICITY CAMPAIGN PROPOSED FOR TORONTO.

The Board of Control has authorized the Mayor to arrange a conference for the purpose of reporting on a publicity campaign to obtain more industries and extend the trade of the city, which, in Mayor Church's opinion, has great possibilities.

## BUSINESS DEPENDS ON FARMERS' PROSPERITY.

Speaking at a dinner in the Ontario Club, Henry Detchon, general manager of the Canadian Credit Men's Association, stated: "There is one thing that this war has shown us, and that is that our country's business depends on the prosperity of the farmer. Banks and loan companies in the West have come to a realization of this, too, and a policy is being adopted whereby more cheap money would be available to the farmer."

## ARCHITECT OF TWO PROMINENT BUILDINGS.

Writing to the London "Times," Mr. Vesey Knox gives the following information, which is of interest on account of the recent destruction of the Canadian Parliament Building: "It is curious that two of the finest buildings in the New World should both have been designed by the same architect and should both have been burnt down. Thomas Fuller was an Englishman, born at Bath, who emigrated to Canada in 1857. His design for the Parliament Building at Ottawa was accepted in competition in 1857. In 1867 his design (jointly with Augustus Laver) for the Capitol at Albany was accepted—also in competition. It would be difficult to imagine two buildings more unlike than the lavish structure which overlooked the Hudson, and the severe and simple building on an even finer site by the Ottawa. But both had great merits and it seems a little strange that this Thomas Fuller's name is not to be found in the Dictionary of National Biography."

### PARLIAMENT BUILDINGS PLANS ARE EXHIBITED.

Draft plans of the remodelled Parliament Buildings have been completed by the architects in charge, Messrs. Pearson of Toronto and Marchand of Montreal. They have been at work steadily since the week following the fire, and to-day the resultant plans and profiles of the exterior and interior of the remodelled building were exhibited to the members of Parliament in the office of the Minister of Public Works, at the new temporary House of Parliament. The plans are, of course, more or less tentative, and have yet to receive the formal endorsement of the Cabinet and of Parliament, but it is probable that they will be carried out substantially without alteration. No definite estimate has yet been made as to cost, but it will probably be in the neighborhood of \$1,500,000, and it will probably require about a year and a half to carry out the work. Parliament will meet again next session in its present quarters.

#### Present Scheme Preserved.

The main features of the new plans are the preservation of the present architectural scheme of the whole front elevation as it now stands, the tearing down of the new west wing, which was undamaged by fire, but which did not preserve the original architectural harmony of the whole building; the construction of a new rear elevation following the lines of the original architectural scheme, but with a three-story elevation corresponding to the front; the construction of chambers for the Commons and Senate at the west and east sides respectively, of the building, instead of in the centre, as was the case before the fire; a rearrangement of the office space in the interior, which will give 33 per cent. increased accommodation without sacrificing light or ventilation, and a main entrance hall and Court of Fame extending from the main entrance beneath the central tower clear through to the Library in the rear. This latter wide corridor will give a much more imposing vista on entering, and will afford opportunity for a national gallery of statesmen in oils and in marble or bronze.

#### A Harmonious Architecture.

Externally, the new plans will provide for a harmonious architecture throughout. The front part of the building, as it stands at present with the walls intact, will be unchanged. The west wing, including the half-million-dollar addition built in 1909-10, will be almost completely replaced by a three-story wing following the lines of the original design, and eliminating the extra story which was put on, and which was out of keeping with the rest of the building. Where the Speaker's quarters were there will be a three-story instead of a two-story elevation on the Commons as well as on the Senate side.

#### New Commons Wing.

The new Commons chamber will occupy practically the whole of the new west wing. It will be considerably larger than the former chamber, being 102 x 63, and providing ample space for some 320 members. The Speaker's chair, instead of being in the centre of the west side as in the old chamber, will be at the north end, and the gallery seating will be much better arranged, both in regard to acoustics and in regard to accommodation for a much larger number of spectators.

The members' lobby and Postoffice will be along the front of the building, with a big lounging and smoking room running along the ground floor on the west side of the Commons chamber. Committee rooms and reading rooms will be situated on each side of the main entrance back of the Library.

#### The Senate Side.

On the Senate side the new chamber will be at the extreme east end, following the same line as the Commons chamber, but somewhat smaller. Fire-proof construction and an adequate system of ventilation are being provided for.

The plans will be gone over carefully by a committee of the House representing both sides before they are finally approved. It is expected that the work of reconstruction will be begun this spring.

### ANNUAL MEETING OF THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA.

The annual meeting of the Royal Architectural Institute of Canada will be held in the rooms of the Provincial Association, 96 King street west, Toronto, on April 22, 1916, when election of officers for the ensuing year will take place.

### CANADIAN BANKING SYSTEM SOUND.

The London "Times" recently contained an appreciation of the Canadian banking system. Commenting at some length on Canada's aid to the Mother Country in this hour of her trial, it states that the Dominion's strong financial condition is "largely due to the soundness of the Canadian banking system and its successful combination of prudence and enterprise."

### LUMBER TRADE ACTIVE.

Canadian lumber companies are doing a large export trade with Britain and France, particularly in spruce. Early last year the market was demoralized by the big advance in freight rates, but the continued demand has resulted in an entire change in the trend of prices, so that whereas early in 1915 selling prices were receding as freight rates increased, now quotations are advancing by leaps and bounds. The British Columbia lumber companies are enjoying the most profitable period in many years.

### MARKET FOR DOUGLAS FIR IN INDIA.

In a communication to the Department, Mr. H. R. MacMillan, Special Trade Commissioner, states that a Bombay lumber house is very desirous of opening up connections with a suitable firm of exporters of Douglas fir. They would prefer to deal with a firm of brokers rather than with saw-mills. This firm, who wish to be put in touch with Canadian sources of supply, are important importers and do a great deal of railroad and Government business throughout India. Financial references can be given and an inquirer may secure information as to their financial standing from the National Bank of India. Canadians who may be interested in exporting timber to this market may obtain the name and address of the firm in question by applying to the Department of Trade and Commerce, Ottawa. (Refer File No. A-1499).

### SANGUINE STRATFORD.

Reference to the large number of new houses and additions to the many manufacturing plants proposed or now under way in Stratford, would indicate the present as a year of activity in this city, which is one of the busiest manufacturing centres in Canada.

### TORONTO GROWS.

The Might Directories, in their review of 1915, estimate the population of Toronto to be 544,456. The city contains 100,825 buildings of all varieties, situated on some 1,740 streets. The earnings of Toronto post office for the year were \$2,905,391, as compared with Montreal's \$1,590,395.

### CANADA'S PROSPERITY.

Experts assert (says a cablegram received by the High Commissioner's Office from the Minister of the Interior, Ottawa) that Canada is on the threshold of perhaps the most prosperous era in her history. Prompt payments of interest on mortgages reflect prosperity. The unprecedented value of the factories working on munitions of war, has suddenly brought farm products for 1915, as well as the very large output of the Dominion into a financial position scarcely hoped for as a nation for years to come. Sir Robert Borden is the authority for the statement that there is less unemployment in Canada now than a year ago.

Labor conditions in Canada during December showed little change from those of November, though in some localities the last few weeks of the month were quiet owing to a number of factories closing down for the usual year-end repairs and stock-taking, says the official "Labor Gazette" for January, just received from Ottawa.

"On the whole, labor was well employed. Whilst there was a falling off in opportunities of employment in some districts due to the interruption of certain outside operations by the usual cold weather, this falling off was offset in some districts by other opportunities of employment. There was little in the way of unemployment, except in some parts of the West and in British Columbia; and even in localities where unemployment was reported the number out of work was much lower than at the same time last year.

"In parts of the country the weather continued fairly mild, and building operations were proceeded with to a considerable extent; and even in parts where severe winter weather set in, some outside building and interior work was carried on. A fair amount of business activity was reported from some country districts in the West where farmers were erecting houses and barns. Lumbering operations continued fairly brisk, with dullness in a few quarters. Activity in mining, both coal and metalliferous, continued. Manufacturing establishments were fairly busy in general lines. In some special branches exceptional activity prevailed."

### LOGIC IN ARCHITECTURE.

Mr. Harry Gill, M.S.A., the President of the Nottingham and Derby Architectural Society, in his address to the members, expressed the view that the Gothic revival was a mistake, because it revived the outward forms without having grasped the inward spirit.

Of how many modern buildings of an ecclesiastical character, more particularly those which might be classified as typical of Nonconformist architecture, might it not be said "our church at the front is as fine as an abbey, but seen from the rear 'tis remarkably shabby."

He points out the inconsistency of the practice of providing Gothic niches and leaving them vacant, and humorously suggests that after the war they might be made commemorative by placing in them representations of leading statesmen distributing rare and refreshing fruit to the English, or providing iron rations for the Germ-huns, much as the saints of old were depicted in some characteristic act.

Places of worship are nowadays a strange study, for generally speaking the more logical the creed, the less logical the architecture, whereas it should be vice versa.

His advice to the student is to study but not to copy Gothic architecture. The methods of construction and the materials now at our disposal are not so restricted as in days of old. Archaeology should not be made a fetish.—"Journal Society of Architects."

**Timber Bulletins.**—In pursuance of the policy of market expansion in the interests of the lumber industry, undertaken by the Hon. the Minister of Lands of British Columbia, two further bulletins, prepared for the information of lumber consumers, have recently been printed. They are entitled, "British Columbia Douglas Fir Dimension," and "British Columbia Western Soft Pine," respectively. The former publication deals with the qualities of Douglas fir for structural purposes, and cannot fail to be of interest to architects, contractors, and others. The bulletin is well illustrated, the claims to durability being supported by pertinent references to such buildings as the Craigflower Farm near Victoria, erected in 1851, and the Craigflower public school, built in 1853, Douglas fir having been used throughout except for the roof of red cedar shingles, and practically no parts of the buildings having had to be repaired. Modern uses of Douglas fir for structural purposes are instanced by reference to the Arcade building on Government and View streets, Victoria, erected in 1915, and the new wharf reception room, C.P.R. dock, Vancouver. Another striking reference is to the Niagara Gulch trestle on the Esquimalt and Nanaimo Railway, built in 1896. Four hundred feet long, one hundred and twenty feet high, and on a ten degree curve, containing three-quarters of a million feet of Douglas fir, the trestle was still in excellent condition and good for further years of service when it was abandoned sixteen years later, owing to the alteration in grade. The wood known variously as Western soft pine, Mountain Western pine, Arizona white pine, and California white pine, is described in a similar manner in the publication "British Columbia Western Soft Pine." This pine, which is distributed throughout the southern interior of the province, is equal in working and finishing qualities to the well known Eastern white pine, and is now being sold for the same purposes in the same markets.

## REVIEW.

Burning fuel oil by the Fess Rotary Oil Burner System is illustrated and described in a catalogue just received, which states that the many installations in Toronto and elsewhere are giving complete satisfaction, operating without smoke, ashes, dust or noise, and showing a considerable saving in cost of operation as compared with coal. This apparatus burns crude or refuse oil, a supply of which is always obtainable for delivery to a tank usually placed underground, either within or without the building, and in dispensing with the coal pile, laborious handling of coal and ashes is eliminated. Installations can be made in any boiler or furnace, and a further advantage in this system is that in mild weather the opening or closing of a valve controls the heat desired and affects a saving, impossible where coal is used. The Fess Company, 121 Carlton street, Toronto, will be glad to demonstrate their system in operation and to furnish estimates and specifications.

The Granite Concrete Block Company are issuing a new catalogue descriptive of granite veneered cement building blocks of various kinds as manufactured by them. This product provides a durable and handsome building material warm in winter and cool in summer, easily handled and laid and comparing favorably with other materials in cost. The company invite the inspection of their plant and material by architects, contractors, and others interested and will be glad to furnish information as to the many buildings where this material has been the satisfactory material used. Formerly located at the corner of Yonge and St. Clair ave., the expansion of their business has made necessary the acquiring of some thirteen acres of land on Weston Road, where a new plant has been installed and provision made for future extension.

The W. E. Clark Company have issued a catalogue illustrating and describing the specialties manufactured by them in Canada for the automatic control of water and steam heating plants. These specialties comprise the Clark Air Line Valve, Clark Vacuum Trap and the Clark "Nopack" Graduated Inlet Valve, all of which are of merit and an advantage where heating is required, as explained fully in this booklet. The Clark Temperature Booster as used on hot water heating systems, which, it is claimed, not only remedy defective installations, but will make any system of hot water heating better by increasing the circulation with no extra fuel consumption.

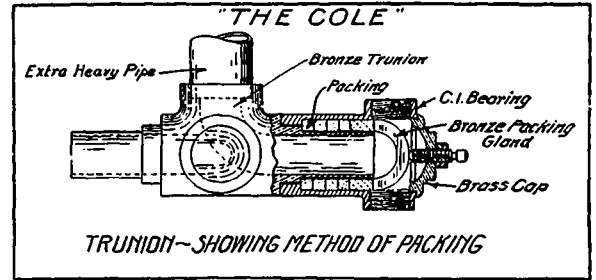
"More Hot Water for Less Gas" is the title of a neat folder issued by The James Morrison Brass Manufacturing Co., Limited, Toronto, which illustrates and describes at length the Stack Water Heater as manufactured by this company. This heater is guaranteed to give hot water in one minute from the time of lighting the gas, and to continue same as long as the gas is used, on account of the larger copper radiating surface which is placed perpendicularly in the heater causing the flame to circle around the tubes. The claim is made that for this reason also less gas is required per gallon of water heated.

The Canadian Laundry Machinery Co., Ltd., Stirling Road, Toronto, have issued for distribution to architects and those interested an extensive and well-prepared catalogue covering the wide range of laundry equipment manufactured by them, as illustrated in the 226 pages comprised in the book. Detail drawings are included with complete descriptions, and should prove a ready reference when the equipment of the laundry is being decided on. In writing for a copy, ask for catalogue "B."

The Canadian Forestry Association have issued for free distribution a booklet entitled "Boy Scouts' Forest Book," with descriptive matter concerning Canada's forests, for the purpose of interesting the youth of the country in the many and varied trees to be found here, with information as to the preservation of same.

The Powers Regulator Co. have issued for distribution to architects and engineers a most ingenious device for calculating the size of hot water tanks, etc. This calculator is made of good quality celluloid, durable, and convenient in size, and will be prized by those receiving a copy.

The Richards-Wilcox Canadian Co., Limited, of London, Ont., have issued literature illustrating and describing the "Stewart" Electric Door Opener and Closer. This attachment is a time and labor-saver, as by merely pressing a button placed in any part of a building the doors open or close to any degree as may be desired, operated by a small motor placed overhead and out of the way. Public garages will find this attachment valuable to operate the doors for incoming and outgoing traffic without requiring the time of the attendants who are at times not available, and thereby causing delay and congestion of traffic. The illustration herewith shows an installation of this type, the doors being controlled by the office clerk.



## IMPROVEMENT IN STEAM TRAP.

The accompanying cut shows a new system of packing on trunions for tilting steam traps invented by Geo. W. Cole, and used by his company on all their different types of traps. Note the offset in bronze sleeve where packing makes a joint as well as the long sleeve, and forced in place by a set screw against end of bronze gland then backed off making tight the lock nut. The steam pressure keeps it tight and allows same to expand without causing extra friction. By the use of the self-adjusting packing allows them to place a counter on the trap, therefore registering all the water returned back to boiler, or open tank. It is an ideal device for a combined metre and trap to be used on district heating plant.

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