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# CONSTRUCTION

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



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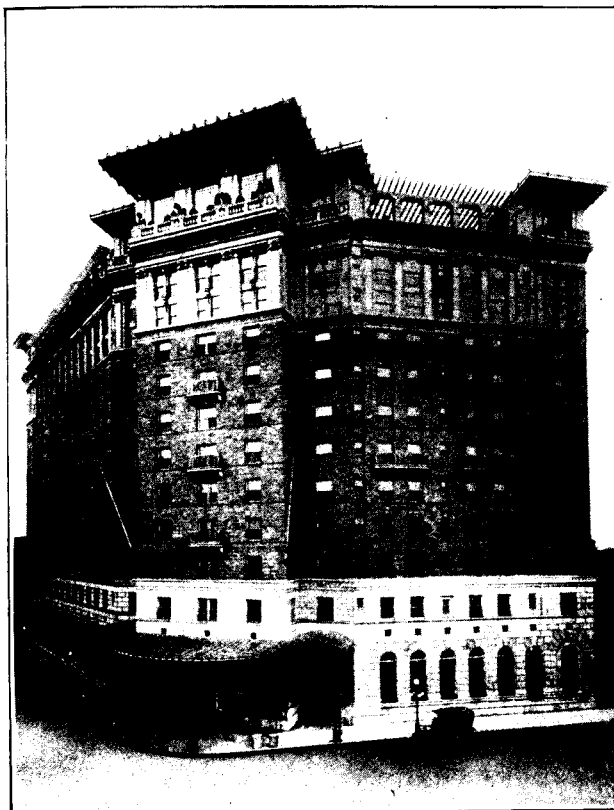
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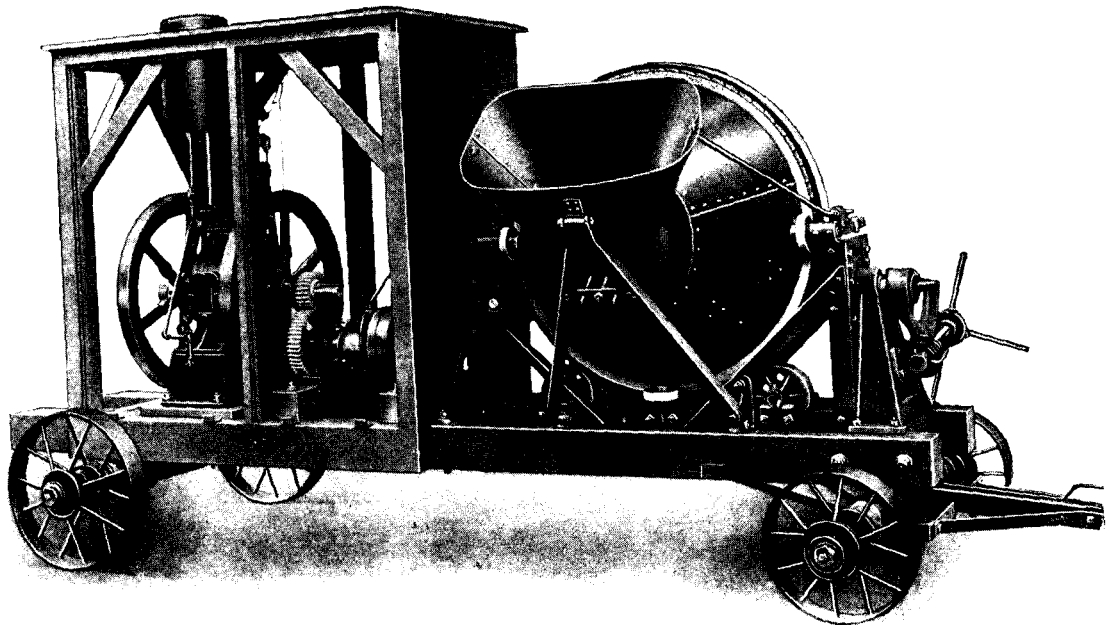
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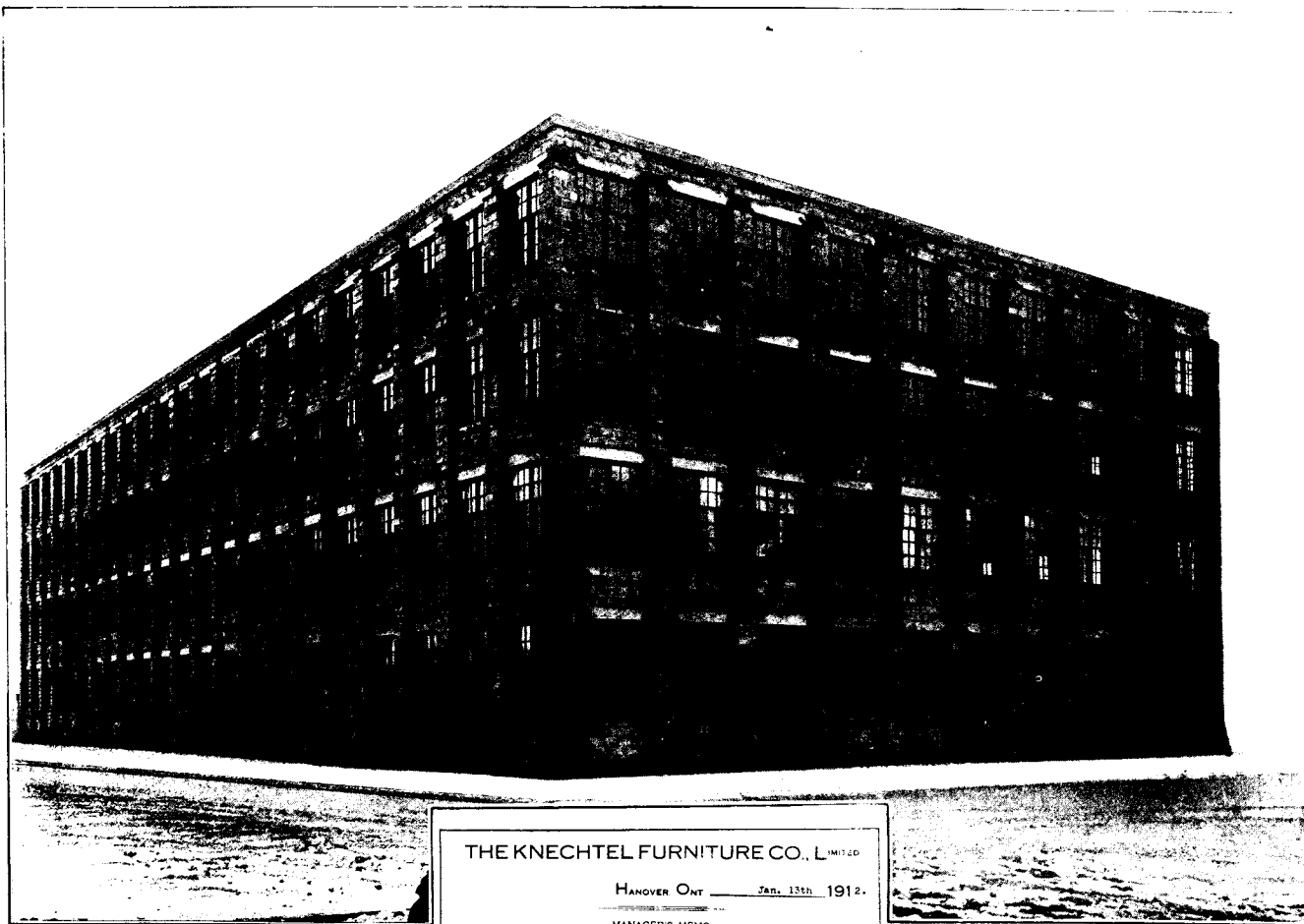
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MANAGER'S MEMO

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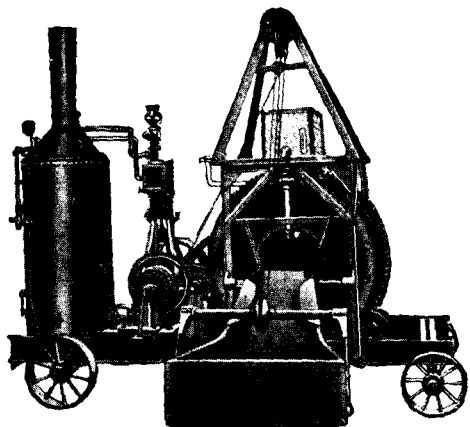
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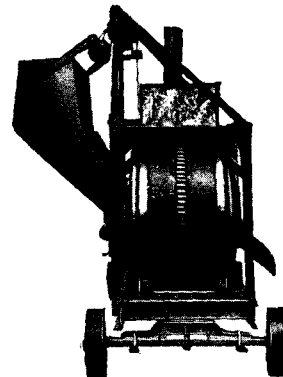
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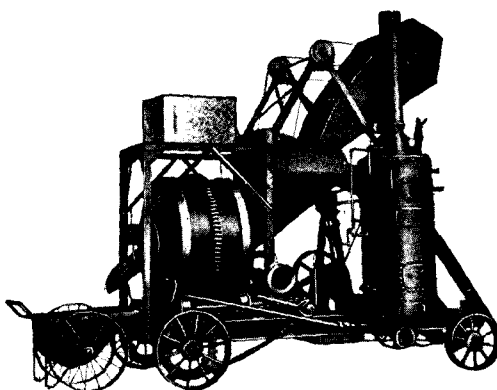
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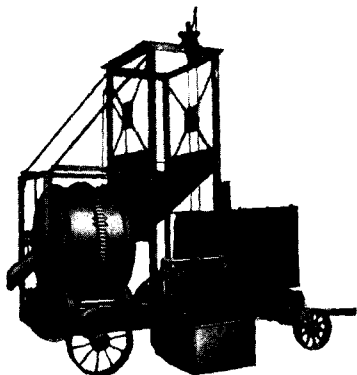
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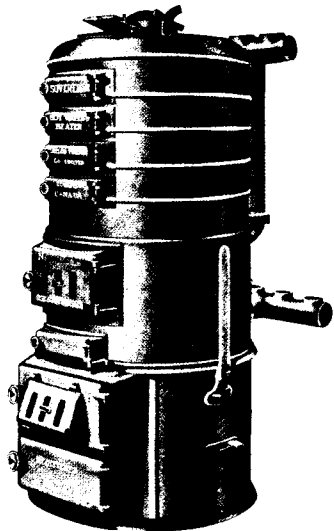
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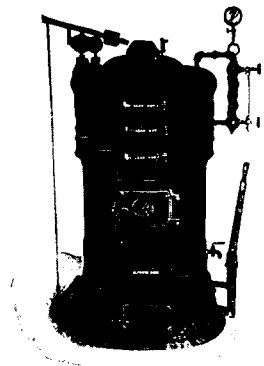
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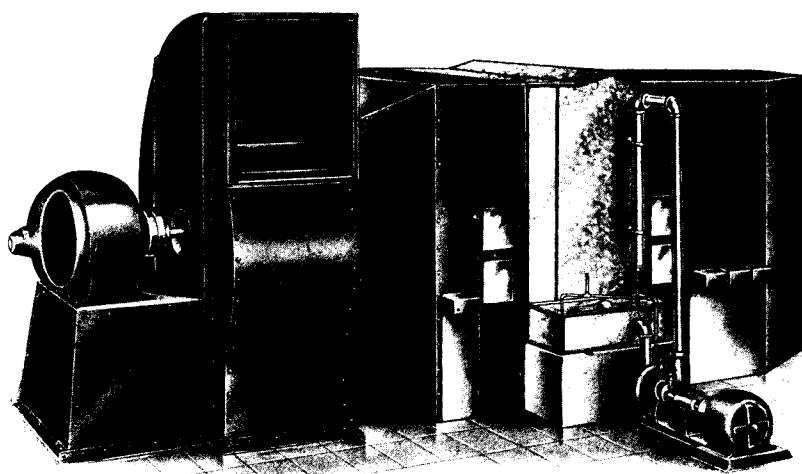
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**CANADA CEMENT COMPANY,**



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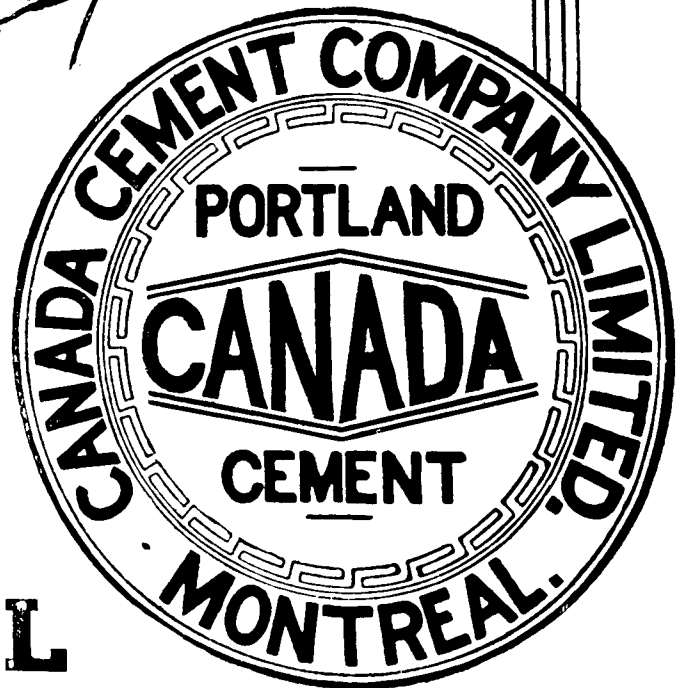
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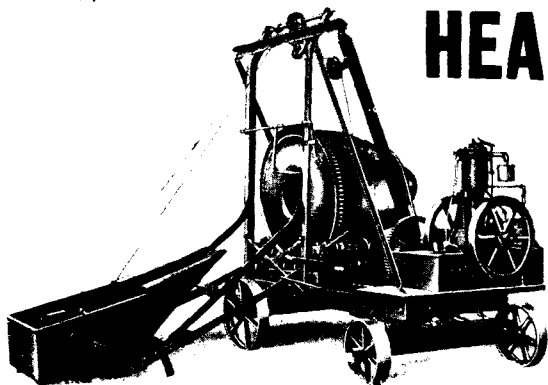
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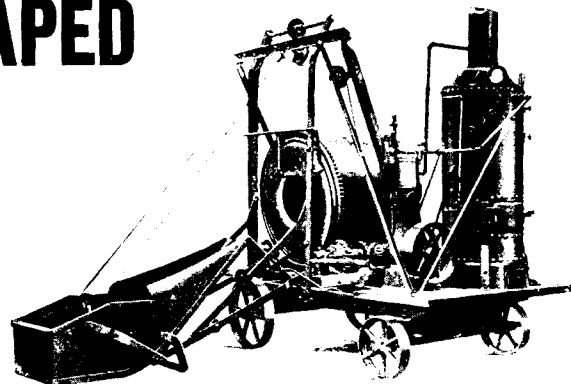
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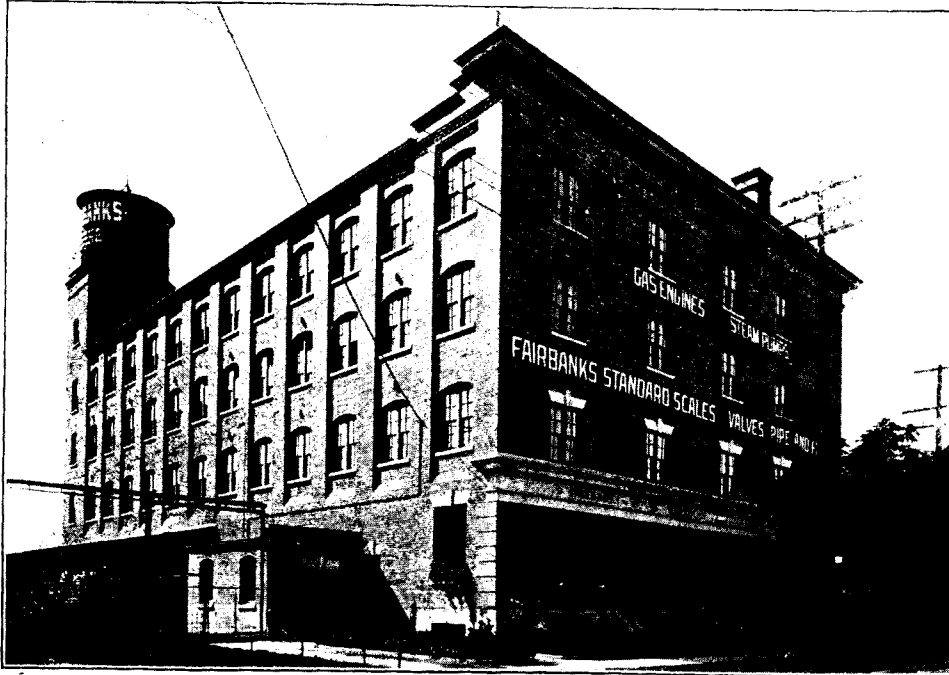
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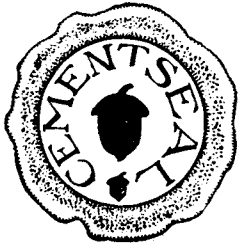
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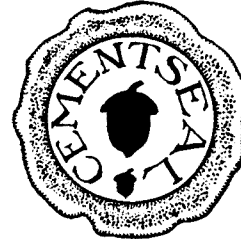
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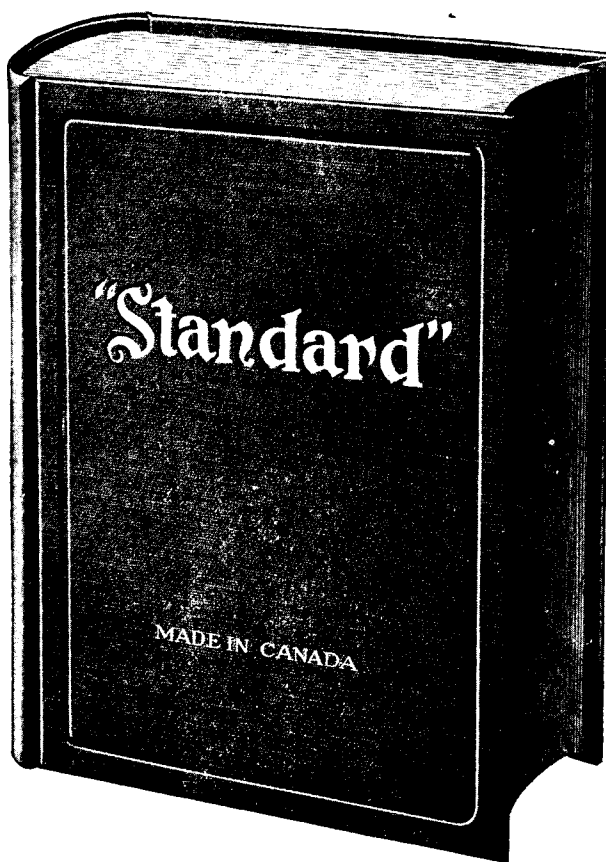
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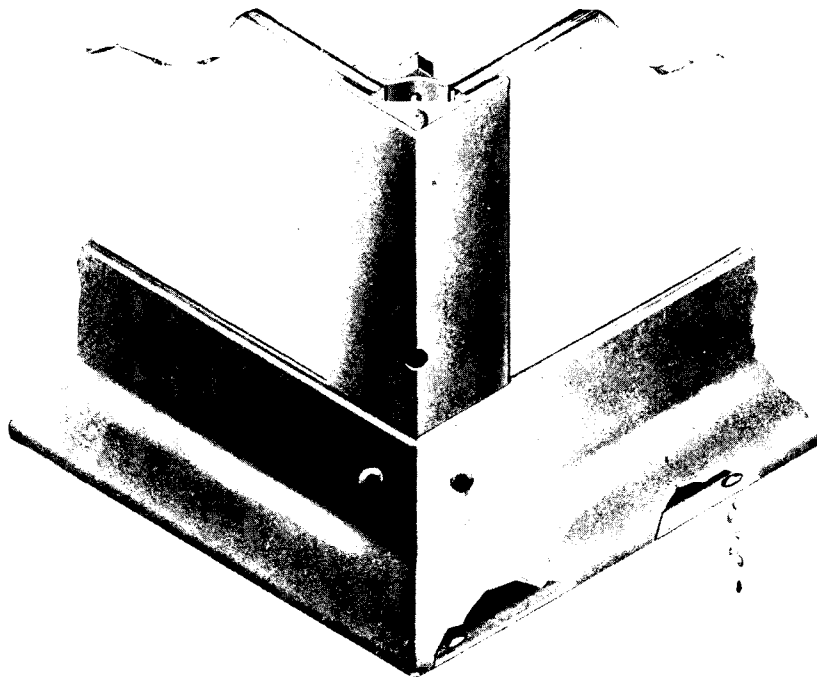
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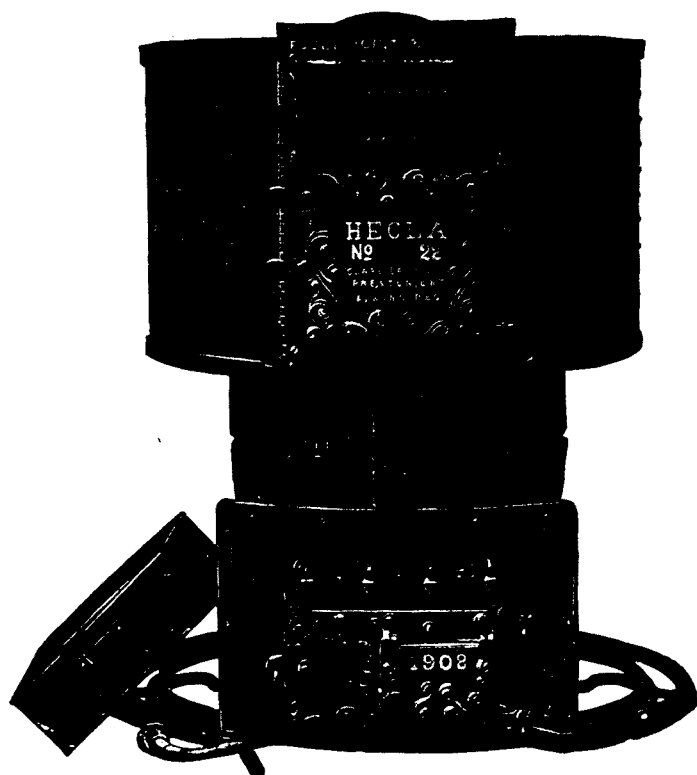
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The requisite for a successful Warm-Air Heating System is a good furnace; one that will not only supply an abundant quantity of pure warm air; but will, in addition, be economical in the consumption of fuel, easy to operate, safe from dust and smoke,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

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- Double Feed Door for convenience when burning wood.
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- Double Tin and Asbestos Lined Case to prevent the loss of heat in the cellar.

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**INDIVIDUAL GRATE BARS**

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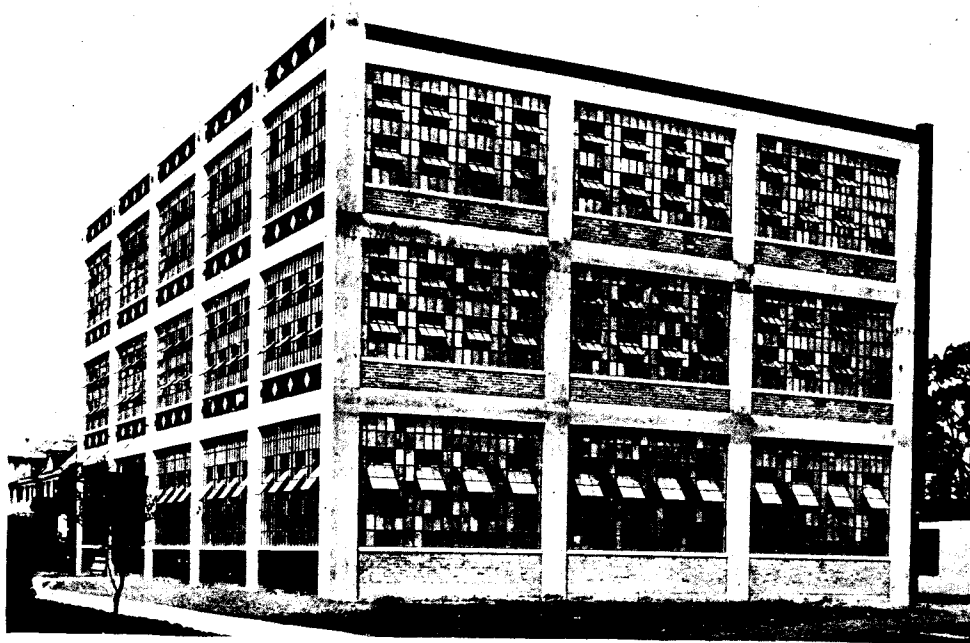
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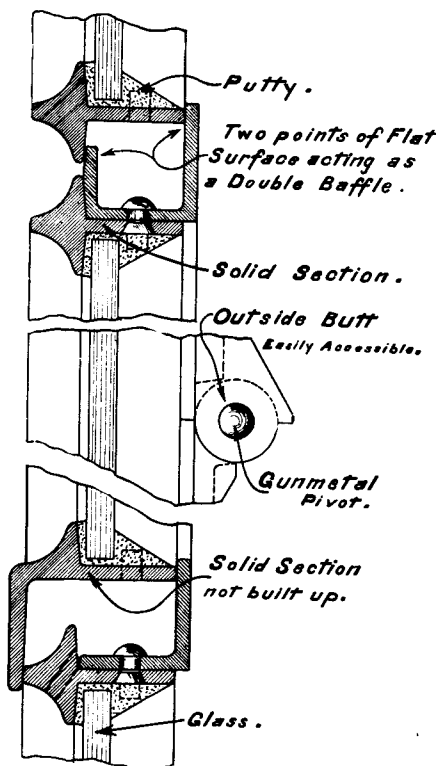
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S. F. M. SMITH, Eastern Townships Bank Building, Montreal. D. J. MACKENZIE, Ottawa, Ont.

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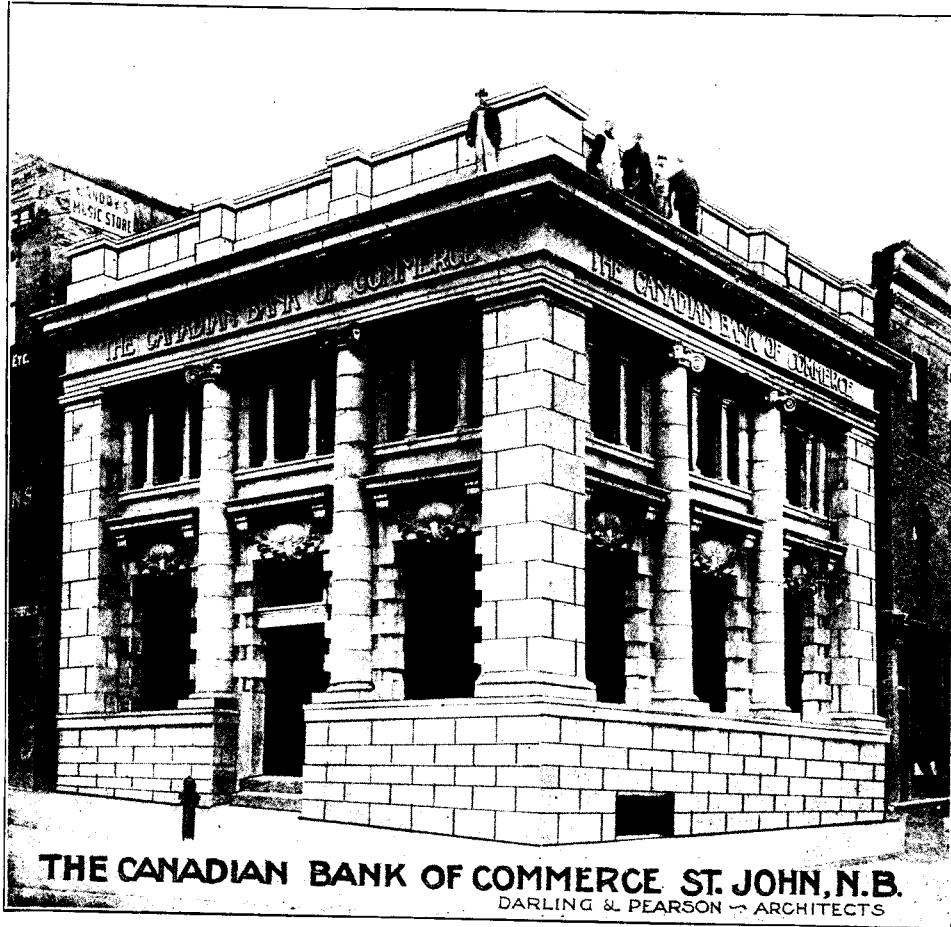
A business proposition, because healthy workmen, contented with their surroundings, and plentifully supplied with oxygen and daylight, can do more and better work for you, can earn more interest on your investment in your plant and payroll. That's all there is to it.

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Real Strength the Way the Wind Blows  
Straight Line Effect of Joint Construction  
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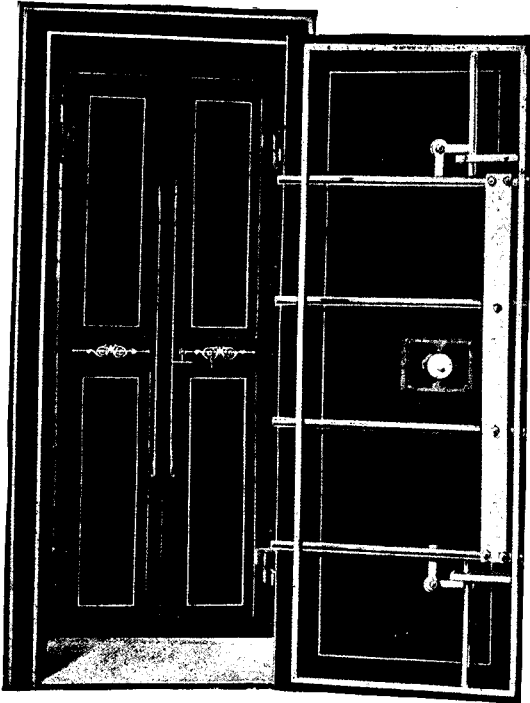
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has been allotted to us for Bitumastic Enamel and Solution, at a cost of

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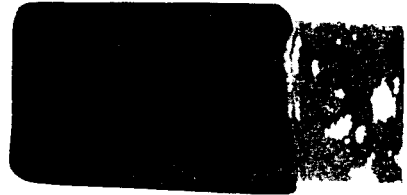
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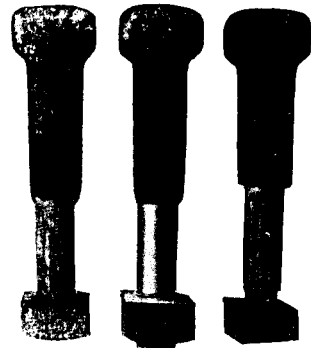
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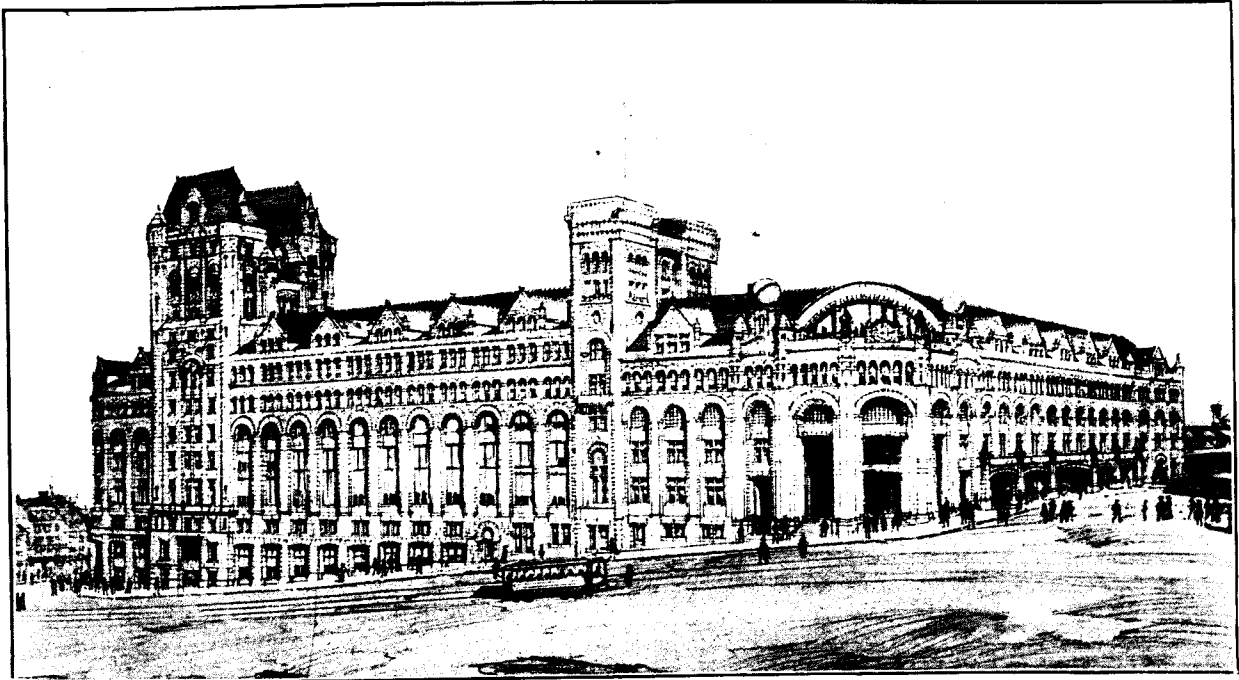


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Architectural  
Character

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John M. Lyle, Architect. C. A. Scott, Mason Contractor.

A GLANCE over this group of photographs of recently erected branch bank buildings will show to what good advantages the decorative possibilities of Don Valley Bricks can be utilized. Here an effect at once distinctive and very attractive has been obtained by simply featuring the brickwork, and relying on its beauty of color, texture, and form to give the dignity and character that this class of building requires.



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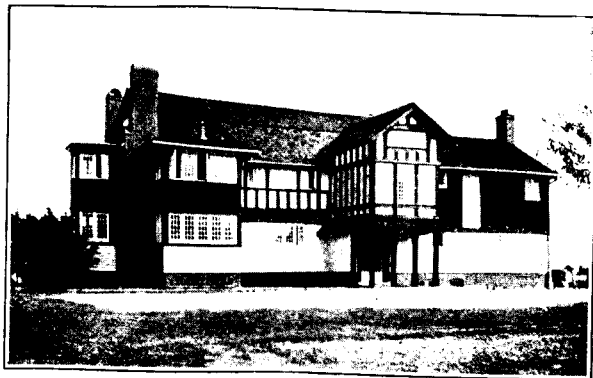
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Waterproofed to Last.

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Sproatt & Rolph, Architects, Toronto.

F. W. BIRD & Son, <sup>447</sup> Gerard Heintzman Bldg Hamilton, Ont.

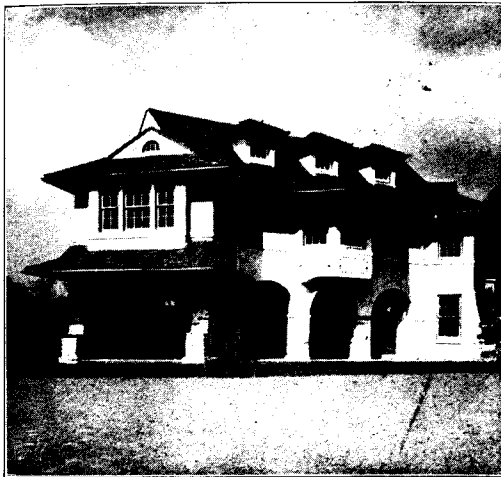
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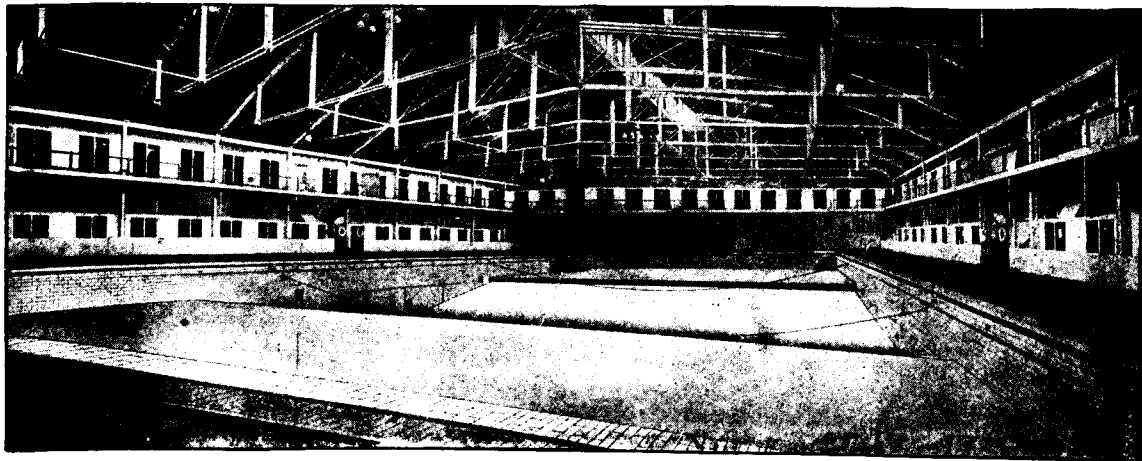


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Stuccoed and plastered with "ALCA" Lime

Alca Lime is an all round ready-to-use mortar. It can be stored without deterioration in dry places, and can be used next day after mixing by the addition of more water to keep it moist over night. The workmen like to use it because it is so smooth working, and the architect who specifies it guarantees his client a satisfactory piece of work.

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Use anywhere where durability, great binding and great adhesive powers are required.  
For interior and exterior use. Write for Booklets and Prices.



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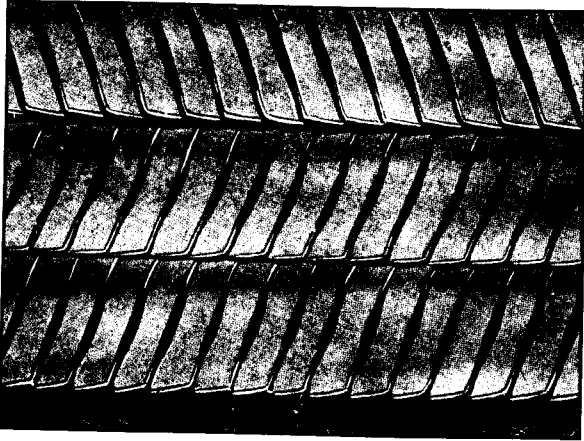
submerged in water and has been proved reliable in every respect. It does not effect the strength, color or setting of Portland Cement, and gives permanent results.

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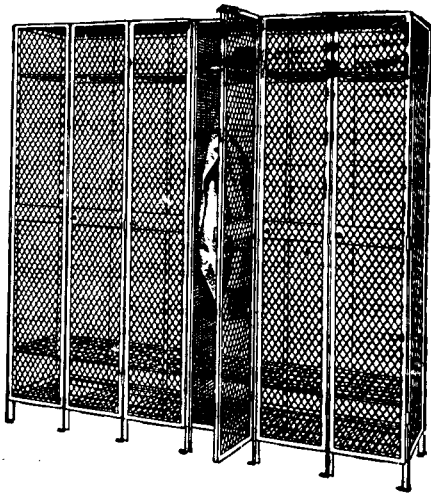
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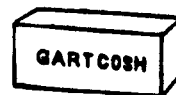
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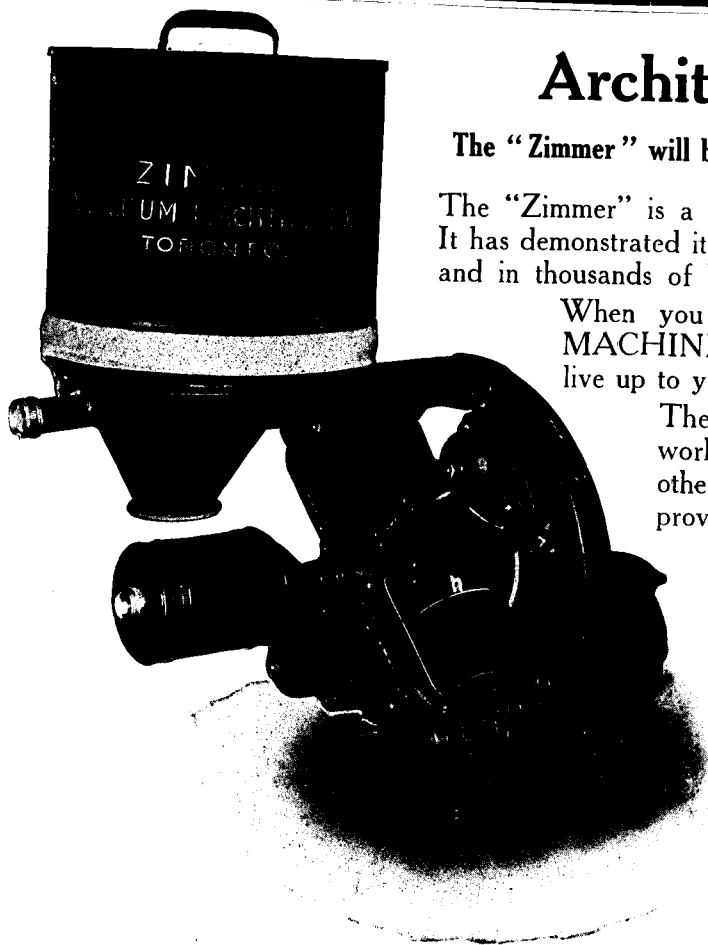
They have stood the most severe tests to which they could possibly be subjected.

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

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

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

We feel sure of your decision.

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Architects and Plumbers who specify and install Robertson's Closet Combinations have the assurance that no better can be had for quality and service. A complete line of all kinds of up-to-date fixtures can be seen at our showrooms, and we aim to absolutely satisfy all our clients. A trial will convince you.

**Unconditionally Guaranteed.**

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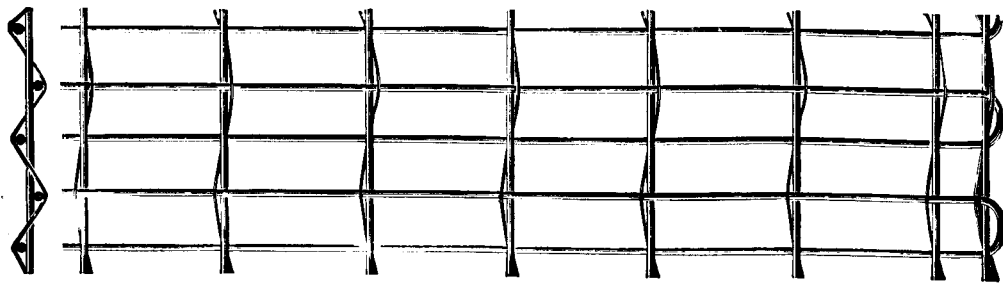
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## Patent Trussed Wire Lath



Easily applied.

Wire  
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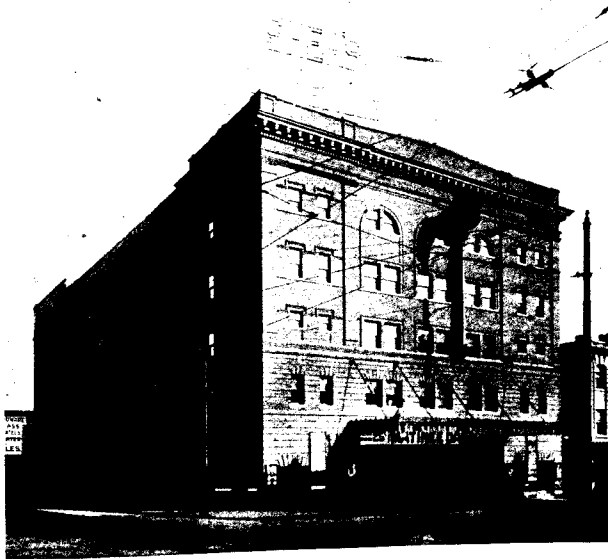
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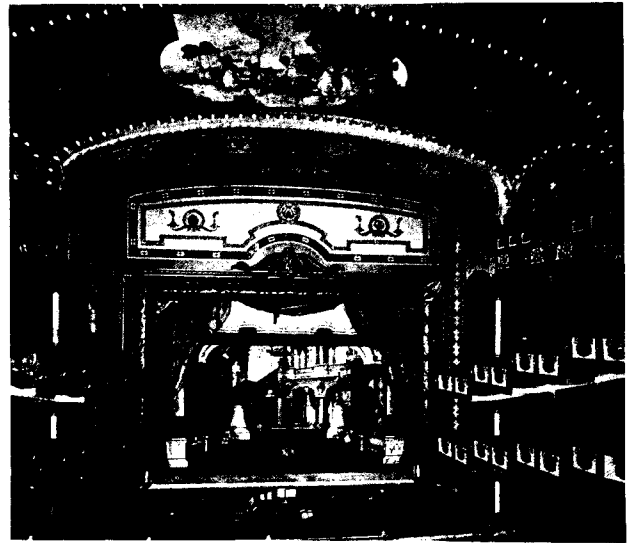
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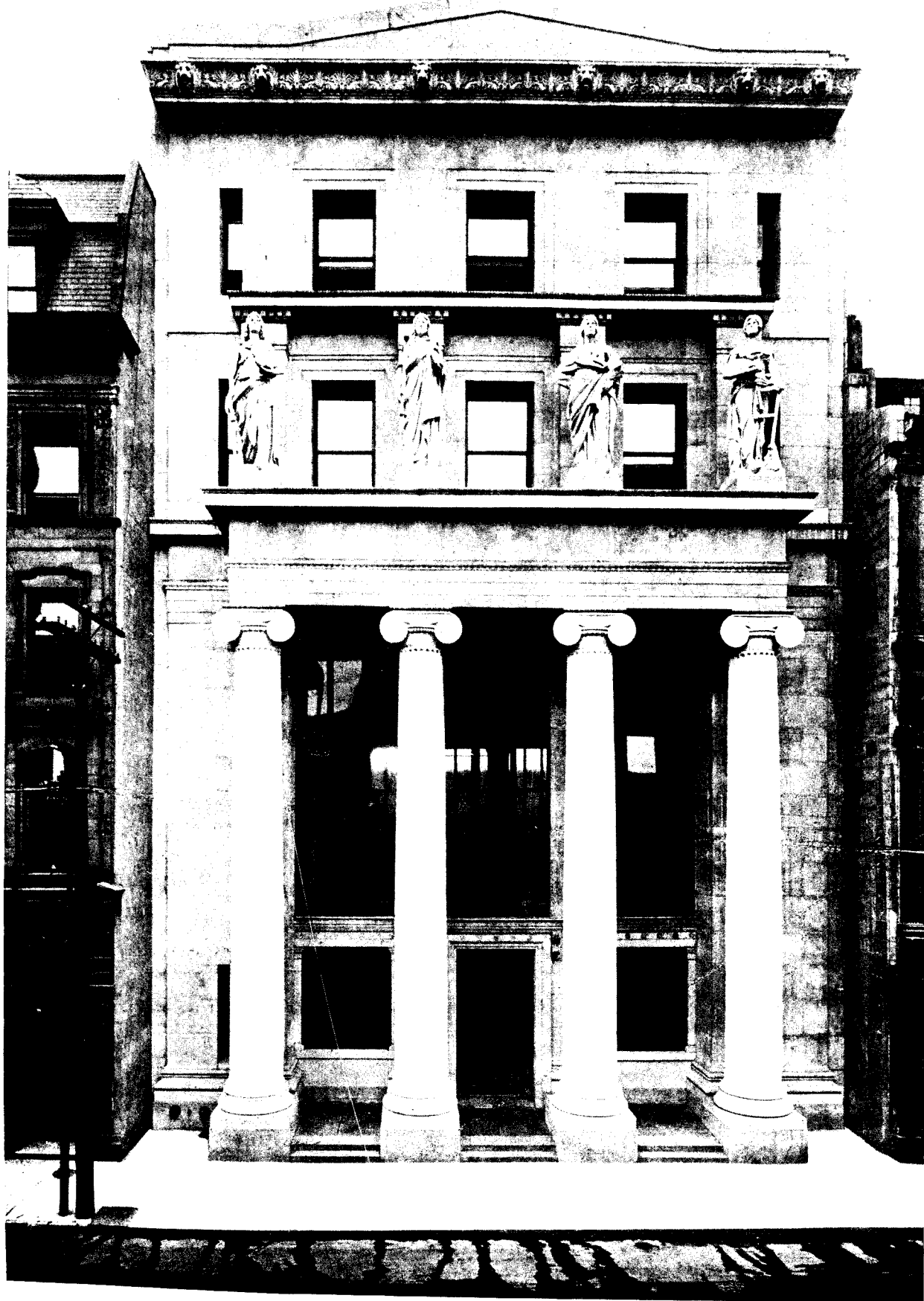
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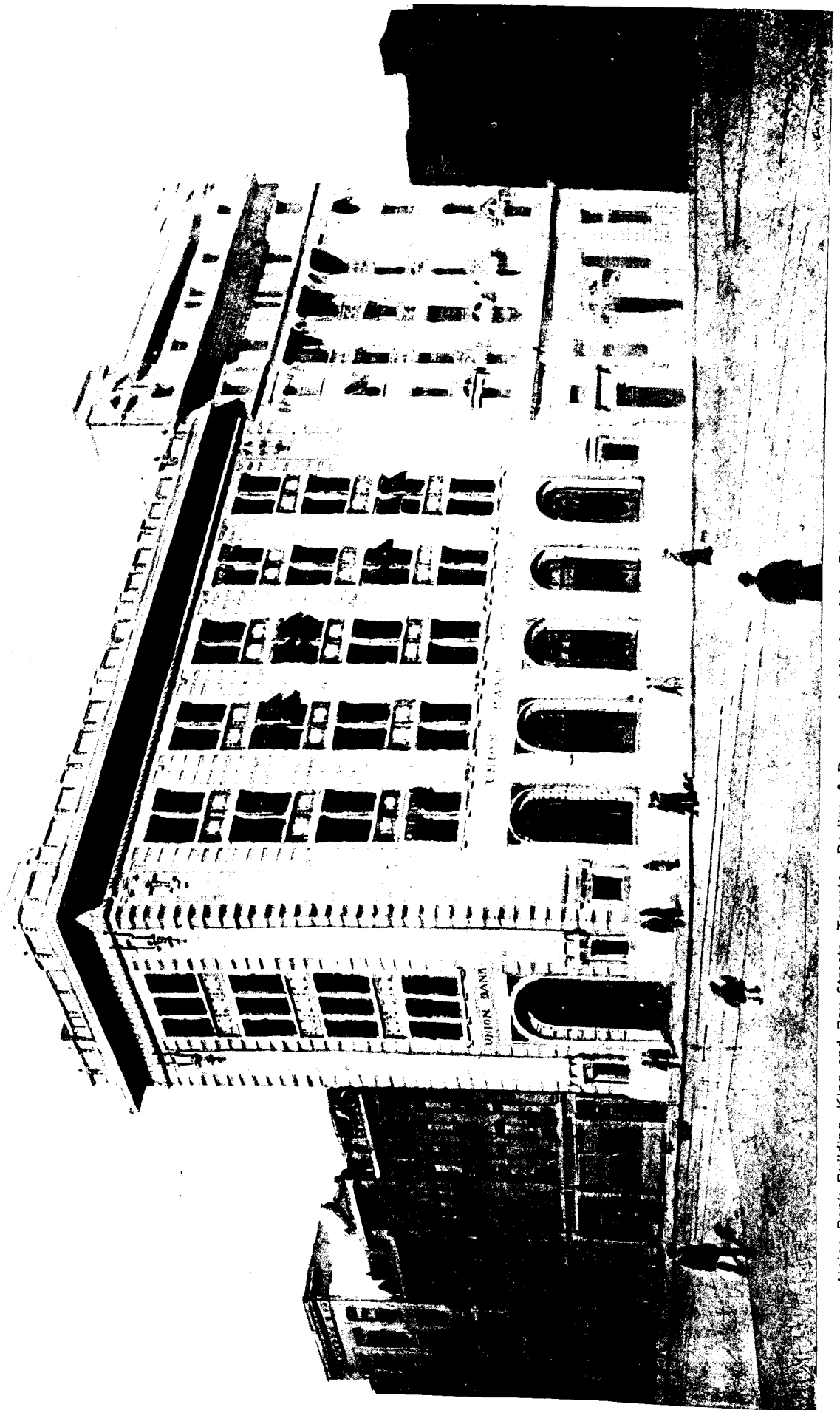
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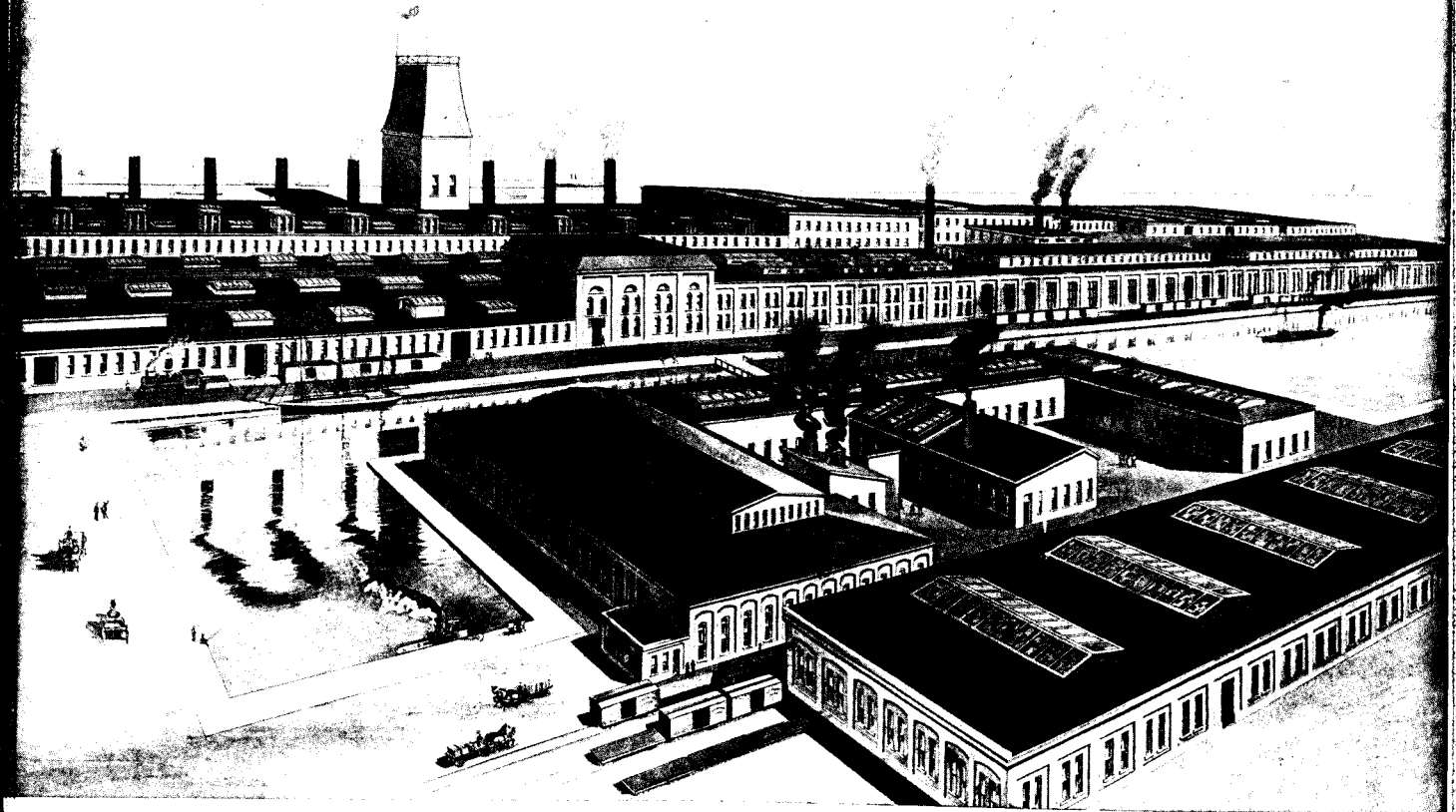


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ALEXANDRA WARE

CONSTRUCTION, JUNE, 1912.



# CONSTRUCTION

VOL. V

NO. 7

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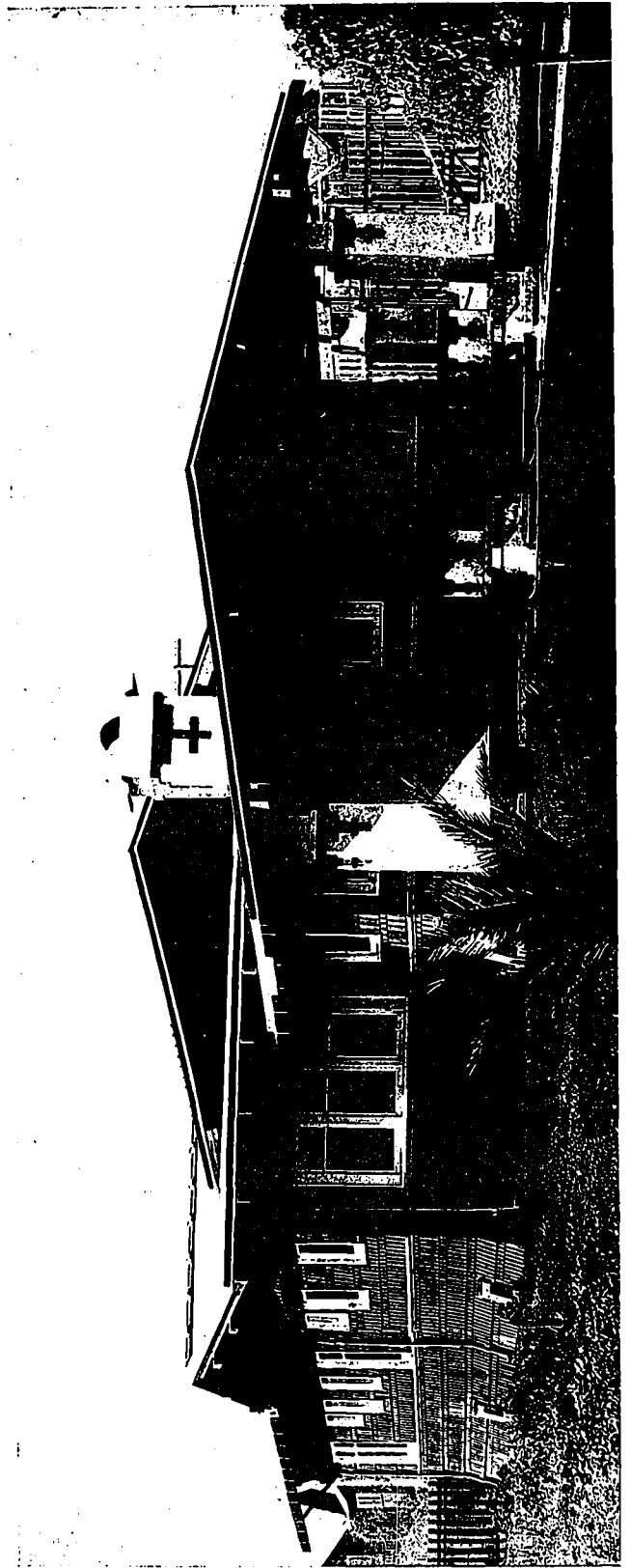
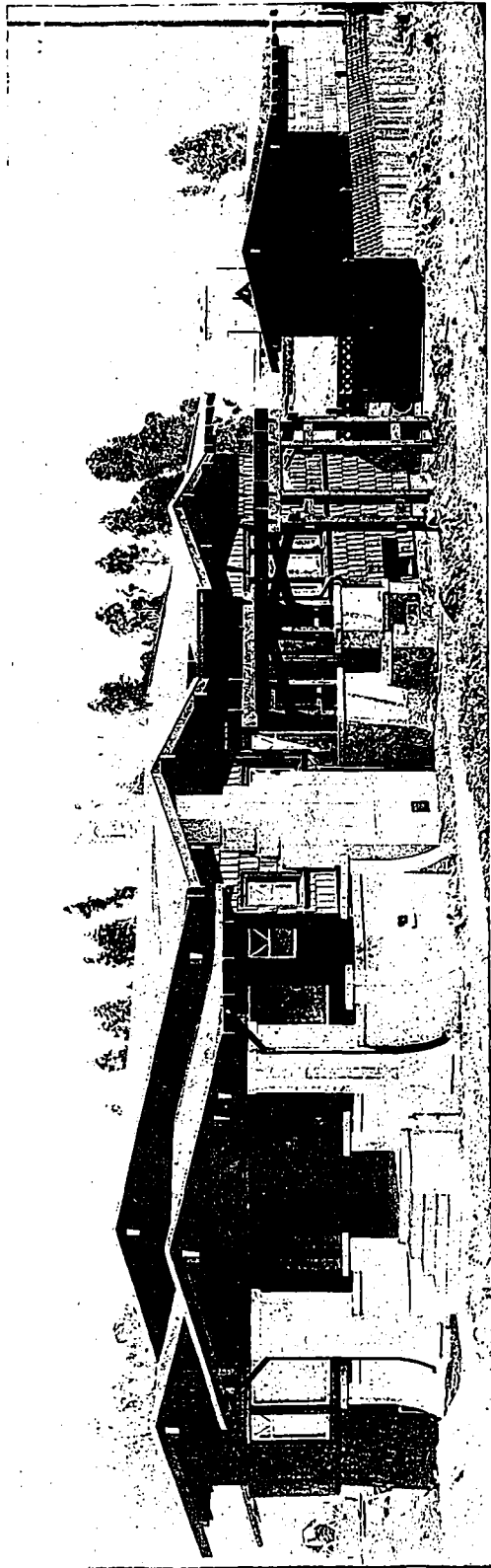
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**Q** *The restoration of the Campanile of St. Mark's an example in art appreciation creditable to the Italian people and a lesson to all.*

**I**T HAS BEEN said by some one, it matters not who, because aphorisms are usually misleading, that "Art only flourishes during national decadence." If this new country could have some of the decadent spirit of the old what a different sentiment regarding things artistic would exist, and a whole people instead of a commercially submerged few would demand that art be placed first in the ranks of human endeavor. At this writing, April 25, the art world turns toward the great square of St. Mark's Cathedral in Venice, where prelate and civic official, tourists of every nationality and province in the world appears, meeting to dedicate the restored Campanile, that old bell tower that after standing for over nine hundred years, a white marble column three hundred and twenty-five feet high, the most remarkable example of Italian renaissance extant, an architectural wonder of the world, collapsed on July 12, 1902, and fell in broken fragments upon the historic square. As the art veneration of Italy was shocked by the disaster, her art spirit was aroused for the restoration. The magnitude of the task which confronted architects, sculptors and other artists called for the highest skill, the deepest devotion and the greatest patience. After nine years of unceasing labor each stone has been reset, each artistic embellishment pieced together, each bell recast and tested for tone. The work is completed. Sansovino's terra cotta Madonna was broken into one thousand six hundred pieces. All these pieces were carefully sifted out of the ruins and laid aside and the arduous task of fitting them together was undertaken by a sculptor of high repute. It took him thirteen months to solve the puzzle, part of the time being spent in finding the small fragments which he found to be missing in the progress of his work. Another feat, almost equally remarkable, and difficult, was the restoration of the bronze gate of the Logetta of Sansovino, which was twisted and broken almost beyond conceivable repair. One of the lions that adorned it was smashed into a thousand pieces. Although it took months of hard and patient work, the gate and its embellishments have now been

completely rebuilt. But it was not only in the statutory and the decorations of the Campanile that these jig-saw puzzle methods were necessary. The big tower itself was put together again in the same manner, the original bricks being used. Even the gilded copper angel with outstretched wings, that adorned the top of the old Campanile, has been restored and will once more crown the shaft of masonry. From the rebuilding of the foundations to the restoration of the bell tower devoted care and religious fidelity marked the progress of the work, and St. Mark's stands to-day a monument to the art appreciation of the Italian people, and through their example the world will recognize with a more serious and more vital force the importance of artistic form in everything that is erected for use as well as for beauty.

**Q** *Engineers avoid municipal employment because of the certainty of interference that nullifies their best efforts.*

**T**HE RESIGNATION of City Engineer Rust of Toronto, which took place recently, points a moral that it is well for not only Toronto but other cities to take a lesson from. That Mr. Rust held to the position as long as he did speaks well for his tenacity of purpose and also his optimism. It is well understood by engineers of all classes that a city position is one to be avoided. No engineer, whether it be civil in the works department, or electrical in the power or transportation division, will recommend another to take a position under a civic board of control except as a last resort, and then with a knowledge that he risks his reputation and wastes his time and energies in so doing. This fact can be ascertained by asking any engineer of the first class. The history of Mr. Rust is typical. He never had control of his work. A politically installed board of control, that even with the best intentions and a general knowledge of civic affairs, but with no technical knowledge, continually questioned his acts, ignored his recommendations, looked with suspicion upon his reports, and in general, as in the intake investigation, where it brought in the diver to check up or annul the engineer's report on that gigantic fake that was never approved of by the city engineer. CONSTRUCTION holds no brief for Mr. Rust, but simply

uses the ill-treatment he received as a typical example. He stood it as long as he could and then got out. Probably the attitude of the board was not intentionally unjust. He was a hired servant and therefore should do as he was told. The Board of Control, as all such officials, no matter in what they may be engaged, wishes to appear capable before the people. The engineer that would sink his individuality and tell the newspapers when an important piece of work was planned or accomplished, that "it was the plan of the Board of Control," would always be popular and could retain his position indefinitely. Unfortunately, engineers are not made that way, the capable ones, and so municipalities are having a hard time in getting capable engineers. There is too much demand for their services by private corporations who leave the engineer to accomplish his work without interference and only look to results. The public works system of Toronto is the same to-day as it was twenty-five years ago, when the city had less than one hundred thousand population scattered over practically the city area as four or five times as many are condensed into to-day. That is the answer. In the colloquialism of the street, "Can you beat it?"

**Q** *The ephemeral character of this side Atlantic residences illustrated in the razing of the Marquand house in New York.*

**T**HE PASSING of the Marquand residence in New York is indicative of the ephemeral character of all residences on this continent. It is rare that the second generation occupies the home established by the first, even when it was built with all the stability, permanence and attractiveness of the manor houses of England. Henry G. Marquand was a distinguished patron of art. He not only contributed largely to the Metropolitan Museum of Art, but in his own residence illustrated how the best art can be worked into the surroundings so that it becomes part of the daily life of the occupants. Of all the residences of the wealthy in New York this gave the visitor a feeling of welcome, and that each room was part of a home and in daily use by a congenial family. While the white and gold reception hall of the Vanderbilt mansion, with its Louis XVI. furniture, looked like an elegant furniture exhibition room, the library of the Marquand house with an hundred thousand dollars worth of Japanese carvings on its walls was unobtrusive and restful, giving a library used every day impression, and the same could be said of every room of the house. This structure which cost a million has been sold to the wrecker for a thousand dollars, its place to be taken by an eleven-story apartment house. It is hoped and is probable that the rare mantels, panels, staircases, etc., that made this interior a joy to the architect have been removed and their preservation secure. It is sufficient loss to the ethical growth of the city to have the house abandoned by apprecia-

tive occupants and razed to meet commercial necessities, while other aberrations remain to disfigure the landscape and shock the art appreciative visitor.

**Q** *The necessity for good roads an inherent factor in business progress and its recognition indicative of a community's progressive spirit.*

**T**HE APPOINTMENT of J. C. Gardner, B.A.Sc., a graduate of the University of Toronto, as chief engineer of the County of Welland, for the main purpose of establishing a road system and building one hundred and fifty miles of roads the coming season at an expenditure of \$400,000, indicates why the Niagara peninsula, of which St. Catharines is the centre, is securing the manufacturing that otherwise might be located about Toronto in the County of York. This latter county can only spend \$300,000 on one hundred and ten miles of roads though the second city in population in Canada is located within its boundaries. Because of its general formation as well as its location the County of York requires improved roads more than any other county in southern Ontario. An automobile or wagon from the surrounding towns find fairly good roads until they come within the environs of Toronto, and then at times they are impassable and always bad. The haste to charter the large number of new subdivisions ahead of the law passed bringing the suburbs within the control of the city seems useless in the light of actual conditions.

**Q** *Systematic sanitary regulation and inspection and proper housing now the hope of expansion in cities.*

**C**ITIES have found that the housing problem was in reality the basic element of the entire sanitary inspection and regulation. Where the problem has been worked out it has been found to be a work important enough for a business management and a system under the direction and control, not of municipal boards but of business organizations such as the Boards of Trade. When cities reach the three hundred thousand population grade in their advancement they find that the former hit or miss arrangement becomes not only dangerous but extravagant in that the operation of general utilities cost more and the revenue is decreased through waste. It is the boast of most Canadian cities that they are "cities of homes." To maintain this position the situation has to be faced frankly, and those whose property interests are at stake set about making these homes what they should be. When this public conscience is finally awakened, by the pressure upon the pocket book, for it is the only practical incentive, no matter what theoretical philanthropists may say, a careful plan through a scientific study of conditions in these homes is made. Typical districts sheltering dif-

ferent nationalities are inspected by paid rather than volunteer workers and investigations scheduled under a trained chief inspector. From this tabulation the entire city is reviewed, housing and sanitation committees given charge, and subdivisions for public buildings, workshops, bakeries, restaurants, and tenements, inspected by a large force of active workers. This portion of the work is best in the hands of trained women, and it is often found best to place a woman in charge of the whole work. By this inspection sanitary violations are corrected, earth closets are replaced with sanitary plumbing, old houses are condemned and torn down and repairs made in others, with the courts behind the movement, though it is seldom necessary to evoke the aid of the court to enforce the repair or abandonment of makeshift tenements. Real estate boards usually welcome these activities because their members readily recognize the eventual effect on property values. This machinery with even limited powers works to the financial advantage of any city, and corrects the tendency to boast of the city's beauty, cleanliness or increasing population until the work is accomplished. No city at this date can afford to neglect its systematic renovation and to provide other adequate housing for its people. No matter how seemingly prosperous it may be, the city that uses money and brains will draw away its business and population, and like most reputations once acquired, it is difficult to change the popular impression.

**Q** *A dearth of woman architects an indication of social conditions rather than an incapacity for the details of design and construction.*

**T**HERE SEEMS to be no logical reason for a dearth of woman architects, for there are many who have as draftsmen given evidence of exceptional artistic and constructive talents. Russia now comes to the front with nine certificated architects. Each has passed examinations in design, construction and engineering, served apprenticeships as superintendents on steel buildings, railway bridges and house building, under private architects of reputation. Most of them have enough private work to start independently, and one has been specially successful in the planning of school buildings, and another has been invited to Germany—a distinction that has never come to a male Russian architect. Law limitations may step in and debar them from some forms of practice, such as competitions for Government work, but they are not debarred from private practice. St. Petersburg officialdom looks with interest upon the innovation, the success of which is not opposed by male architects. With talent, physical strength and mental acumen that will stand the test of safe construction and practical superintendence outside the office, and a talent as well for the details of office work, there is no reason why sex of itself should debar any woman from architectural practice.

**Q** *The element of chance and the uncontrollable nature of the sea a significant feature of the wreck of the greatest steamship ever built.*

**T**HAT proportion of chance that is everywhere and always present, and affects the greatest as well as the least of man's actions and creations, has never been so forcibly brought into view with more startling clearness than in the disaster that overtook the steamship Titanic off Nova Scotia on April 14, 1912. Here was the last word, the greatest triumph of naval architectural and engineering skill. In control were the most experienced navigators that have ever sailed the inconstant sea, and in a moment of shock, and after four hours of wreck this greatest triumph of man's intellect and skill goes to the bottom of the ocean and rests seventeen hundred fathoms deep, beyond all hope of recovery. Disasters on land, save from earthquake, are prevented by man's skill in design and construction or brought on by his mistakes and negligence. It is not so on the sea.

The oak leviathans, whose huge ribs make  
Their clay creator the vain title take  
Of lord of thee, and arbiter of war;  
These are thy toys, and, as the snowy flake,  
They melt into thy yeast of waves,  
Which mar alike the Armada's pride,  
Or spoils of Trafalgar.

Most accidents to structure bring a slight recompensing experience. Bridges are more stable because the Frith of Forth spans fell, and to the failures of reinforced concrete in earlier practice can be credited much of that material's constructive perfection to-day. So all new constructive methods have been improved by the mistakes that are called disasters. Here in this ocean tragedy that shook two continents there was no failure of structure, no lack of stability or of accuracy in control except that which ever attends the going down into the sea in ships. Questions from those regarding the proper number of boats for life-saving purposes to that of speed, direction, and caution in the navigator, may be raised, and something be learned from them. But in structure this last expression of the ship designer's art is not touched, for no man-created force can withstand the iceberg, the mountain wave, or the rockbound coast when the sea has its will, and pigmy man meets it in its sublime and masterful potency. Money and brains can reproduce the ship, but what of those whose lives went out with her disappearance. Hays, a dominating force in one nation's progress; Millet, a directing influence in the art development of another, and both an irreparable loss to a world that has too few units that, like the star of genius, but rests here and there and not often among the generations of men, and whose full value is not computed till they have gone from the scene of their usefulness. A common danger and a common death was a leveller of earthly talent as well as earthly position on that deck; and these potential qualities are not lost sight of, but set aside in the thought that they lent the Anglo-Saxon traditions of their race and died as they had lived, like men.



FRANCIS DAVIS MILLET

## FRANCIS DAVIS MILLET

THE death of Francis Davis Millet, A.M., artist, sculptor and author, who was lost in the Titanic disaster on April 14, 1912, took from the art world one of its most valuable members. While he was born and educated in the United States he was cosmopolitan in his outlook, and international in his work and associations. He was a drummer boy and also served as a contract surgeon in the American War of the Rebellion, and was a correspondent with *Forbes* in the Russo-Turkish War. He graduated from Harvard in belles lettres and in painting from the Royal Academy of Fine Arts at Antwerp. His name and works are as familiar to art and literary circles on the Continent and in England as in the United States.

Francis D. Millet was born at Mattapoisett, Massachusetts, November 3, 1846. His parents were Asa Millet and Hulda Byram. He married Elizabeth Greely Merrill of Boston in 1879, and leaves two sons and one daughter.

Frank Millet's public work began with the Columbian Exposition in 1902, when he was asked to take charge of the decorative and color effects of that Exposition as "Chief of Color." His large acquaintance, not only with the art of the mural painter but with artists, brought to the service of that world's fair a coterie of mural painters whose names are now more than national. After his Chicago sojourn he spent some years painting in England.

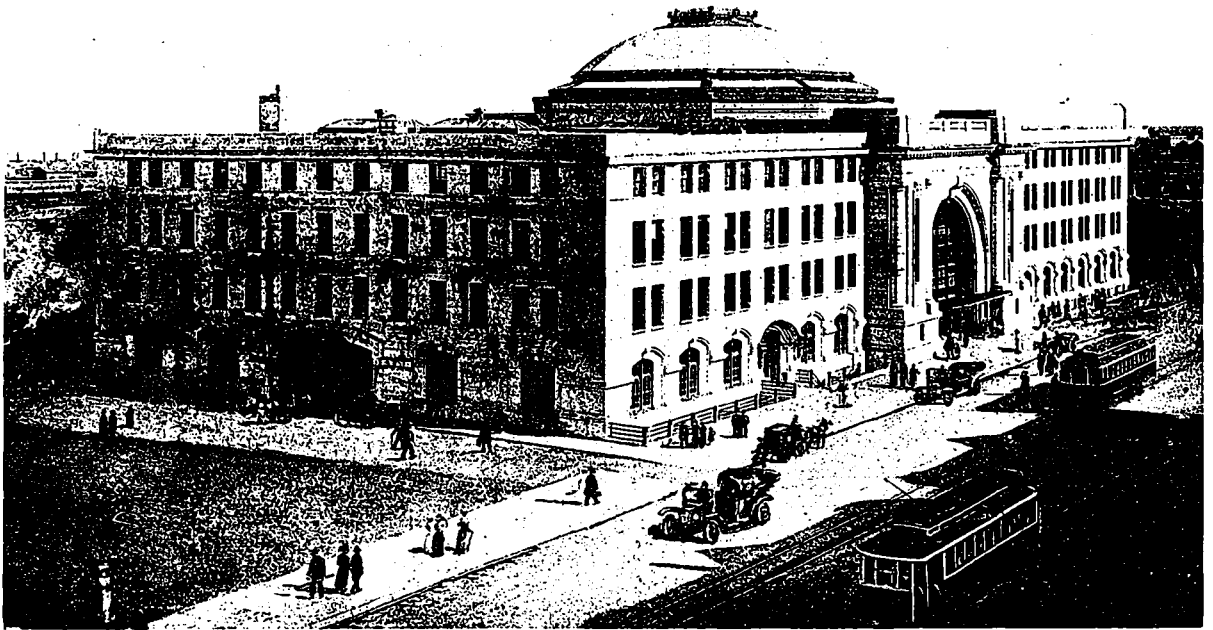
When at Broadway he bought an ancient ruined abbey which stood on ground that adjoined Russell House, his residence in England, and he restored the abbey so skilfully that a friend, a London architect, said that he had made himself perfectly competent to carry out the restoration unaided by professional counsel. It was in this abbey that Millet painted such of his important compositions as "Rook and Pigeon," "The Black Hat," "Between Two Fires," "The Love Letter," and two score others equally well known. Here he worked while his boys were being educated at Oxford.

At the breaking out of the war with Spain he again abandoned his art work and entered the newspaper service, for which he had a liking, as correspondent for the "Times" with the expedition to the Philippines, and afterwards served in the Boxer rebellion in China for Harper's Weekly. It was after this period of adventure that he settled in New York and afterwards in Washington, where he distinguished himself as a portrait painter. In 1905, upon the organization and establishment by Congress of the American Academy in Rome, he was made secretary and practical organizer of that academy established in Italy for the advancement of American art. In 1906 he executed two mural paintings, "The Treaty with the Sioux" and "The Battle of Nashville" for the Governor's reception room in the Minnesota State capitol. Among the activities in which he had an influential

part were many projects for the advancement of architectural practice and the betterment of architectural design. He aided in the establishment of the Washington Park Commission plan, was chairman of the United States Government Committee on Niagara, chairman of the Advisory Committee of the United States National Art Gallery, and vice-chairman of the United States Commission of Fine Arts. Since 1893 he has been an honorary member of the American Institute of Architects. Interspersed between these recorded works is found the writing of short stories in magazines, the translation of Tolstoi's "Sebastopol," a volume of short stories under the title of "A Capillary of Crime," "The Danube from the Black Forest to the Black Sea" and "The Expedition to the Philippines."

The resignation of the director in charge a few months ago gave the directors of the American Academy in Rome the opportunity of making him not only its secretary but chief administrator, and it is this special unit in his work for American education in art that will feel his loss most. Frank Millet would be the last to assent to a statement that the loss of himself or of any other human was irreparable, but in the sense that there are none who can exactly fill his place, with its simplicity of view point, clearness of judgment and intense humanity, his is an individuality that cannot be duplicated. In that hour of horror one tells that shortly before the ship sank he saw Frank Millet standing quietly on the deck, and the smile that always played over his face had not quite left it, but he was a sailor-man and he was there doing his work with the same unobtrusive singleness of purpose as when he decorated the last banquet hall for the American Institute of Architects' meeting, or "knocked into shape," as he expressed it, for his friend, President Roosevelt, the unstackable coins that had been modeled by the dying Saint Gaudens. He was sure to have been doing a man's work in that last hour of disaster, for he was a man who knew no distinction between persons other than their character made.

His body has been found and conveyed to Washington, where memorial services were held in the Smithsonian Institution. Cass Gilbert presided. Senators Root and Lodge, Charles Francis Adams and Professor Walcott, all intimate friends, spoke of his life and works, and were listened to by a distinguished audience. At the Century Club, Edwin Howland Blashfield, president of the Society of Mural Painters, spoke of his personality and his art. The board of trustees of the American Academy in Rome established a Francis Davis Millet Chair of the Fine Arts; and the President of the United States proposes that a memorial be erected on public grounds in Washington to the memory of the President's aide, Major Archibald W. Butt, and Francis D. Millet. This giving of a resting place with all the honor that architects, artists and the highest in wealth and political position can bestow, only attests to the influence for good represented by the life of Frank Millet.



Fort Garry Station, Grand Trunk Pacific and Canadian Northern Railway Terminal, Winnipeg, Manitoba. Warren & Wetmore, Architects, New York.

# THE FORT GARRY STATION AT WINNIPEG

*The Grand Trunk Pacific and Canadian Northern Railway Station at Winnipeg a terminal recently completed on the most approved lines of railway station planning.*

THE UNION Passenger Station at Winnipeg for the Grand Trunk Pacific and Canadian Northern Railroads, Warren & Wetmore, New York, architects, is an imposing structure, built entirely of stone, having a length of 350 feet along Main Street and a width of 140 feet. The height of the larger portion of the building is three stories and basement, with an elaborate central portion surmounted by a dome rising 100 feet above the street level. The main entrance is off Main street at the centre of the building. The main floor is at street level and will be devoted entirely to station facilities, and its arrangement is considered exceptionally good for convenience to passengers and facility of operation.

Passengers going through the main entrance pass through a vestibule and arrive directly in the ticket lobby, which is a clear, circular space 90 ft. in diameter entirely unobstructed by columns, seats or booths of any kind. This lobby is directly beneath the dome and will be exceptionally well lighted on all four sides by large arched windows. On the east and west sides these windows open through to

the front and rear walls of the building, and on the north and south sides to the large open courts. The ticket booths are arranged on the south side of the lobby, and passengers, after purchasing tickets, go directly to the baggage checking counter at the rear of the booths. They may then pass out from the lobby through the rear vestibule to the subway under the tracks, from which stairways lead up to the platforms overhead. On the north side of the ticket lobby spaces are provided in each corner for telephone and telegraph booths and newspaper and book stands.

The waiting room lies north of the ticket lobby, this arrangement being adopted so as to secure a quiet waiting room, as all passengers going to and from trains may pass directly through the unobstructed lobby without entering the waiting room.

Adjoining the waiting room on the west side, facing Main street, are a lunch room and a restaurant, both of which have separate entrances off Main street, for handling the local business direct. A carriage entrance is located at the north end. The central portion of the waiting room is covered over by an





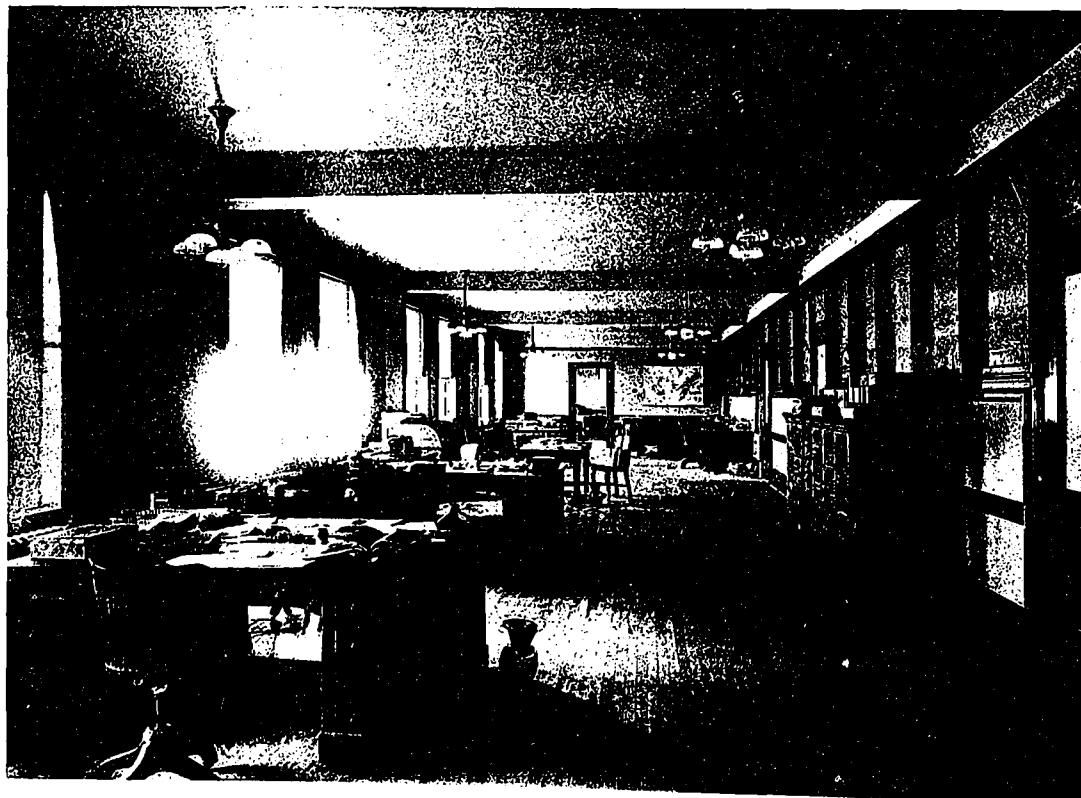
Interior View, Looking from Right.



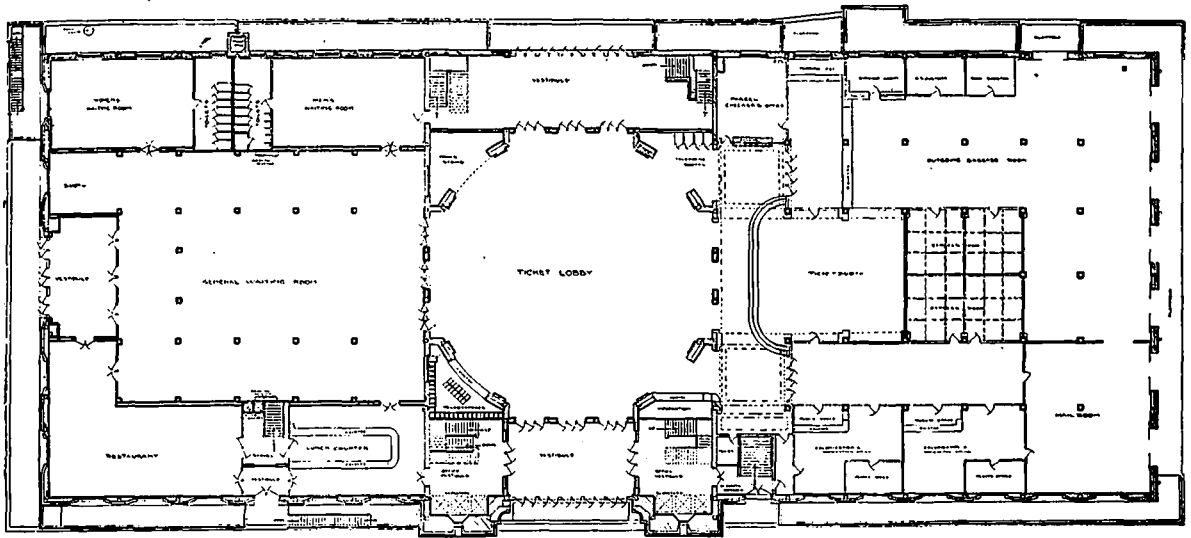
Rotunda, Showing Entrance to Trains.  
Fort Garry Station, Grand Trunk Pacific and Canadian Northern Railway Terminal, Winnipeg,  
Manitoba. Warren & Wetmore, Architects, New York.



General Freight Office.



General Passenger Department. Grand Trunk Pacific.  
Fort Garry Station, Grand Trunk Pacific and Canadian Northern Railway Terminal, Winnipeg,  
Manitoba. Warren & Wetmore, Architects, New York.



Plan of Main Floor, Fort Garry Station, Winnipeg. Warren & Wetmore, Architects, New York.

arched skylight, 40 x 100 ft., over which there is an open court, thus providing the waiting room with excellent light. The seats are heavy oak benches of the movable type. The interior of the waiting room and the ticket lobby have the effect of stone construction throughout, the wainscoting being of marble 6 ft. high, and the floors of terrazzo. All stairways are of iron with marble treads.

For the present the entire south wing of the main floor is occupied by the baggage and express rooms. In the future, when more space is required, both the baggage and express will occupy space beneath the tracks and platforms. A driveway for baggage and express wagons is provided at the south end of the building, 3 ft. 6 in. below the level of the main floor. It is reached by a short 5 per cent. grade down from Main street, and the wagons are loaded and unloaded on an 8-ft. platform outside the building wall. The baggage and express are handled by hand trucks between the building and the train platforms, using the trucking subway and the elevators. The entire north wing of the basement, the floor of which is 15 ft. below the level of Main street, is devoted to immigrants. There is a waiting room with an area of 10,000 sq. ft., a laundry and toilet and bath facilities for men and for women. The basement can be reached from the waiting room, from the trains or from Main street, by separate stairways.

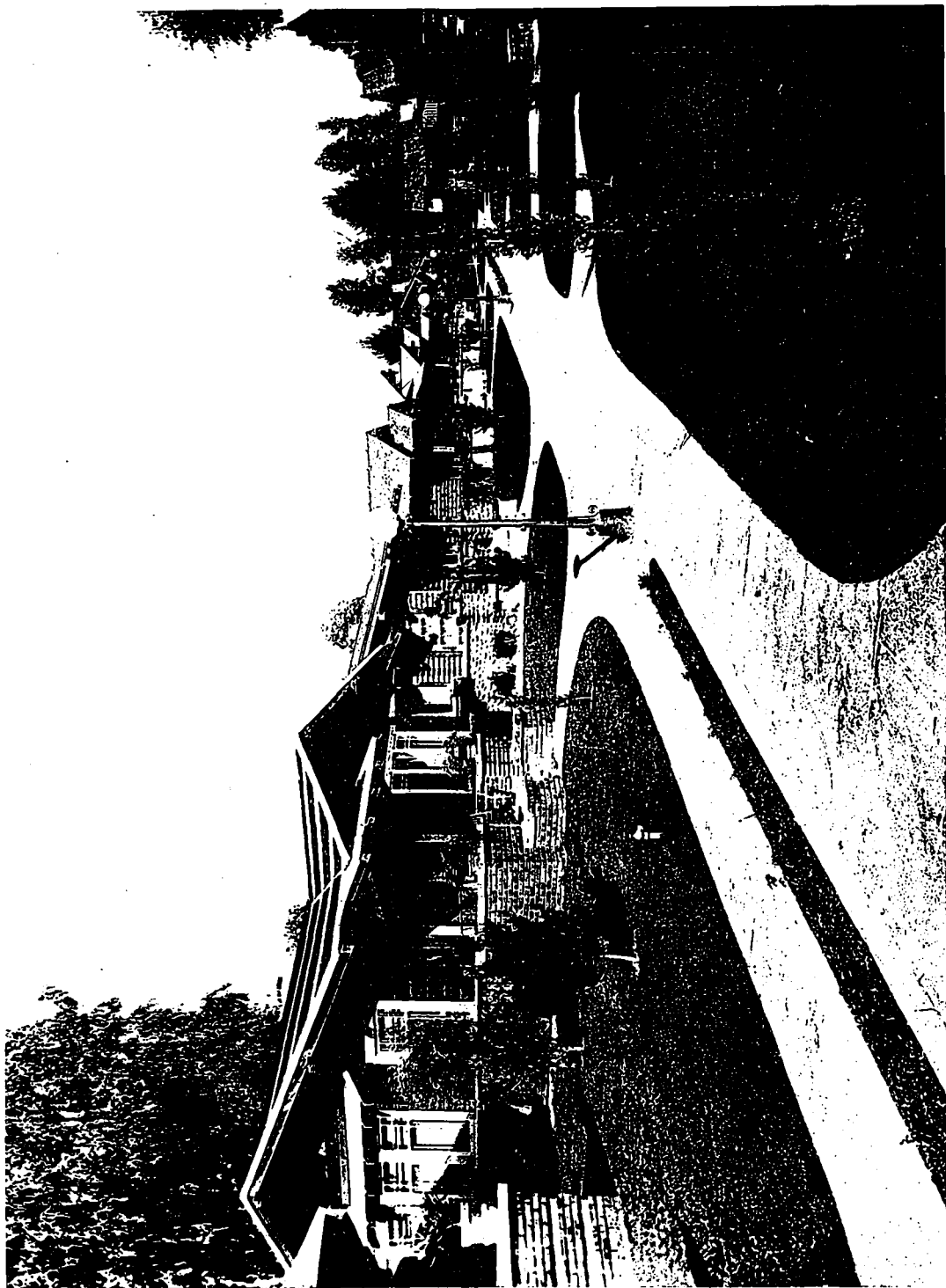
The second and third floors are occupied by the offices of the two railways and by the National Transcontinental Railway. These offices are on either side of the corridor, the interior row of offices in each wing facing the open court. Each floor provides an available office space of 25,000 sq. ft., exclusive of corridors, stairways, elevators and toilets. Provision has been made in the design of foundations and the steel structure of the building for the future addition of six office floors, so that the building will then be capable of providing 200,000 sq. ft. of office room. The building is so designed that there is no necessity of artificial lighting in any portion of the day. The heating is done by steam, indirect

system, with mechanical ventilation. The column loads are supported at the foundations by Raymond concrete piles, this being necessary on account of the blue clay underlying the city.

In the through station layout, which was the form finally adopted, the approach tracks are elevated over the intersecting streets, and are sufficiently above the main floor of the station to allow a passenger entrance subway beneath. There are eight through passenger tracks with adjacent platforms and two separate open-running tracks at the rear for through freight trains. The platforms are 20 ft. wide and can be made 1,650 ft. in length. By means of this great length and the use of the double crossovers, each track is capable of handling two trains of 11 cars each during periods of heavy traffic. The total capacity of the platforms is two hundred 70-ft. cars. The platforms are of reinforced concrete, raised 12 in. above the base of rail. Between each pair of tracks there are three lines of pipe for water, steam and gas.

Passengers going to trains pass from the rear of the ticket lobby, which is on the level of Main street, into a subway 50 ft. wide with 10-ft. headroom, having 7-ft. stairways on each side leading up to each platform. The subway is so arranged by means of railings and gates that there is no interference between passengers going to trains with those coming from trains. The elevation of tracks is 10 ft. above the level of the main floor of the station, and a slight ramp down from the rear of the ticket lobby to the floor of the subway shows the clear headroom of 10 feet.

Ten stories, or a limit of one hundred and twenty-five feet, is placed upon future constructions in Regina. The extension of the fire limits, and within which the grade of first and second is established, provides for fireproof buildings in the first, and exterior and party walls of brick or stone in the second, is a feature of Regina's new building law.



General View of Half of Bowen Court, Pasadena, California. Arthur S. Heiniman, Architect, Los Angeles, California.



Entrance to Bowen Court, Pasadena, California. Arthur S. Heiniman, Architect, Los Angeles, California.

# THE BUNGALOW FOR INVESTMENT AND RENTING

*The "Bungalow Court" idea in Los Angeles, of separate bungalows designed to take the place of apartment houses for renting purposes, gives a new and attractive solution to the investment problem.*

THE EXTENSIVE study that has been given to the bungalow type of house by architects who have sought to meet the large demand for small houses, convenient in plan and artistic in design has evolved a type that seems to meet the needs of the average citizen. This has already gone beyond the stage where the isolated bungalow is found in the suburbs of the city of Los Angeles, as the illustrations show them in groups facing both sides of the street.

The occasion for this grouping in a bungalow court is found in the desire of an investor to build attractive apartments of rental value and still avoid the apartment house idea.

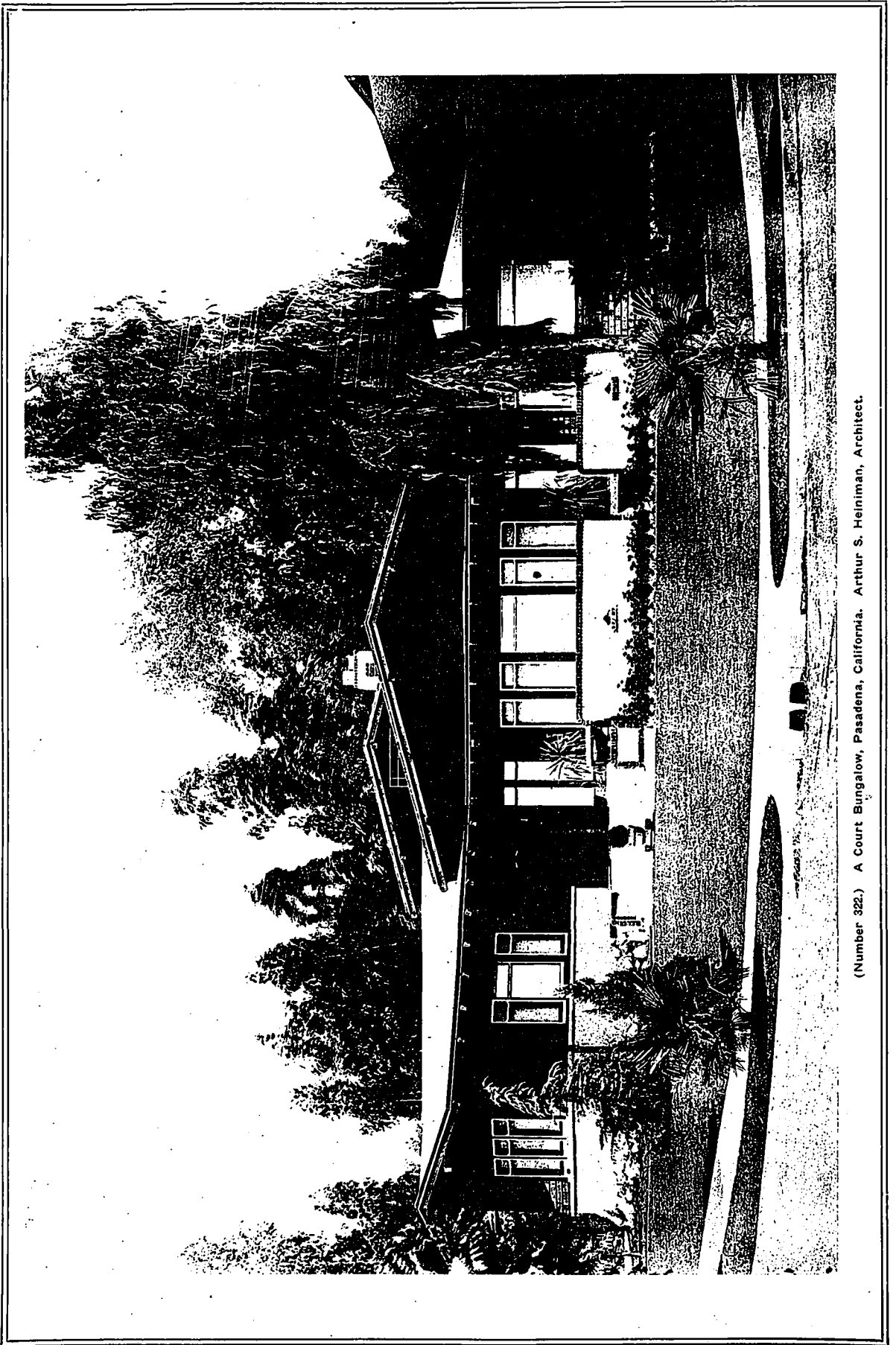
This is certainly an innovation and must prove a most attractive one wherever it is adopted. The ground area is laid out as a court or street, which opens from the highway through an attractive entrance way, and is broadly planned so that the street can be parked with grass and trees, and the sidewalk shaded from end to end.

The bungalows illustrated are designed by Arthur S. Heineman, architect, of Los Angeles, and most of them are court bungalows. One of these, designated as Number 381, was built for renting purposes. In this the living room contains a disappear-

ing bed, so that at night it can be used as a sleeping apartment. The floors are all of hardwood. Number 383 is another court bungalow, and Numbers 227 and 267 are two-family court bungalows. Number 322 is located at Oak Knoll, Pasadena. As indicated by the plan, the lot is peculiar in shape, coming to a point in front. All the main rooms are finished in Juana Costa, and the ceiling panels in the living room are covered with tapestry. The cost is about \$12,000.

One of the attractive features of the bungalow type of house is its adaptability to material. For summer use it can be constructed of wood, with such brick, stone or concrete adjuncts as may be chosen for veranda floors or posts, chimneys and other details, or it may be entirely constructed of these materials, and without detracting from the general picturesque effect in the design. In its evolution from the bungalow of India it has taken on a Japanese feeling that lends itself readily to low walls and broad roofs, and the verandas or pateos that are desired by those who enjoy living as much as possible in the open air.

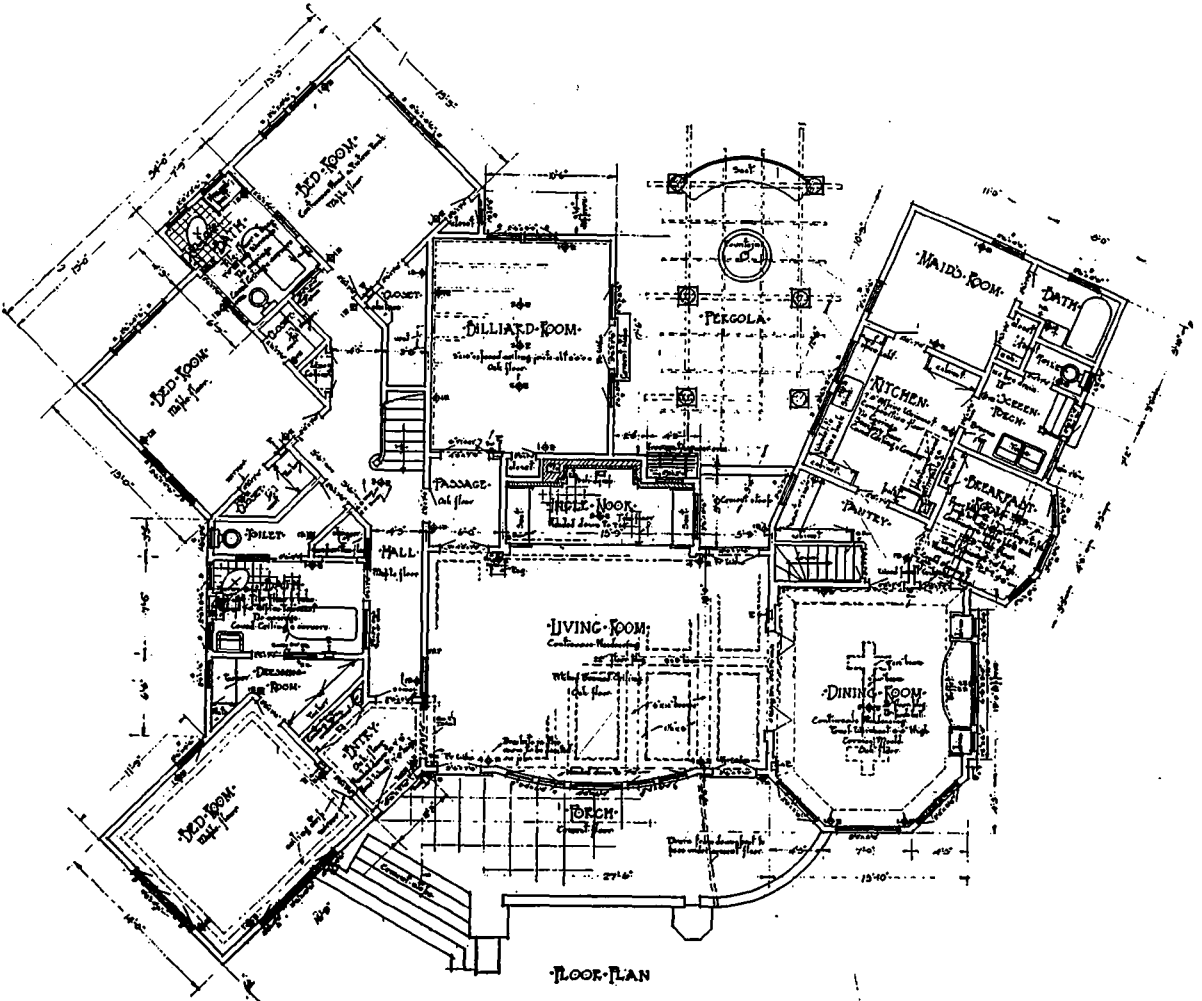
While the vegetation in California is so profuse that astonishing growths are obtained with little labor, there is no climate where hardy vines and climbing



(Number 322.) A Court Bungalow, Pasadena, California. Arthur S. Heiniman, Architect.

roses may not be grown if proper care is taken to protect them in winter. A climbing rose bush can be trellised on wire so that in the fall the entire bush and trellises may be detached from the porch, laid on the ground and covered with straw, and in the spring replaced, when, with appropriate trimming it will blossom with all the luxuriance of those in California. The Boston ivy will not stand severe frost, but there are varieties of Japanese ivy that it is very hard to frost kill. The growth of the court idea, if practised on a liberal plan as to lot widths, will not only compete suc-

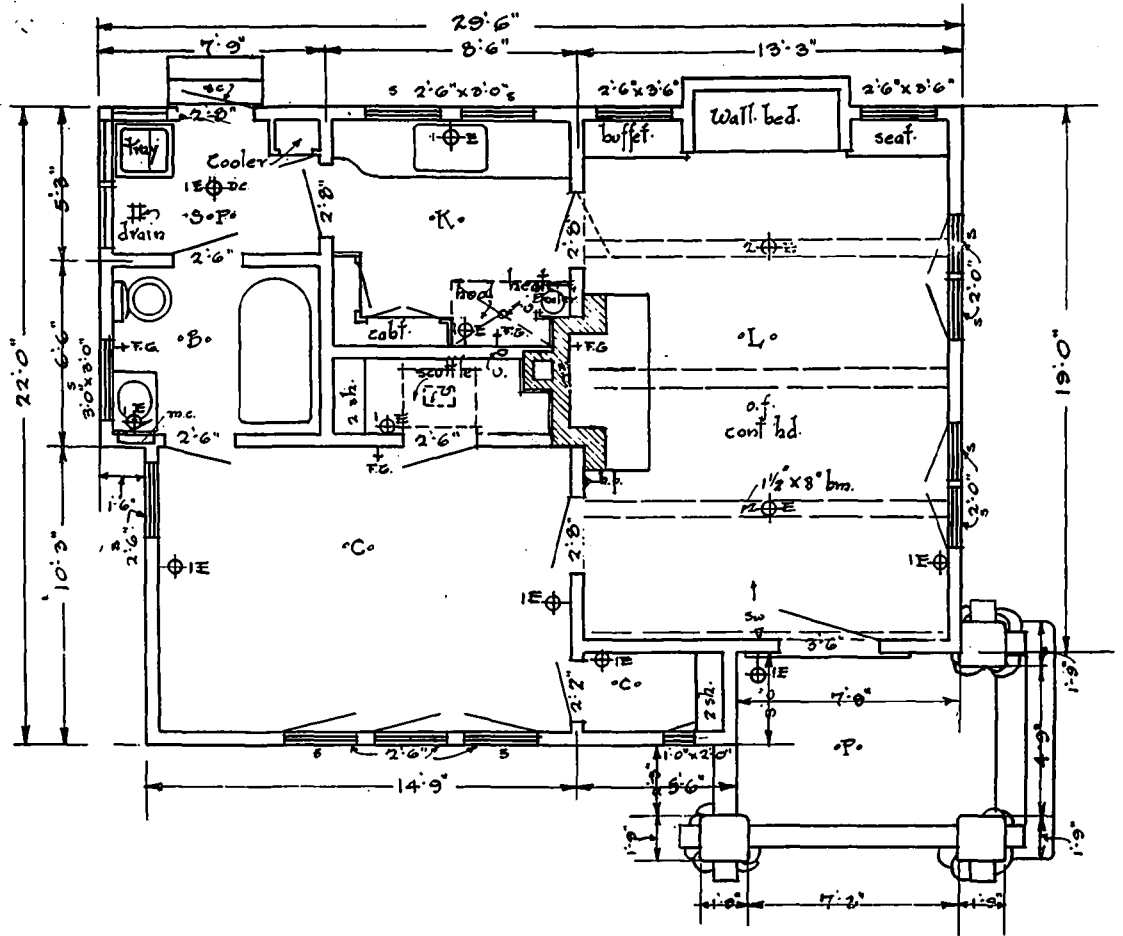
cessfully with apartment houses as a rent proposition, but give a picturesqueness to the suburbs of any city where the plan is adopted, especially if the bungalow type of house, with its large opportunity for variety in design is adopted. These California types are illustrated because the peculiar conditions of climate, topography, and habits of the people have called for a greater amount of study and brought forth to a greater degree the quality of architectural invention necessary than in any other locality. While the wood superstructure found there is as a rule too light for permanent residences in more northern latitudes, they are applic-



Plan of Court Bungalow. (Number 322.)

able to the demand for summer cottages and weekend residences. But there is no reason why stone or brick walls with stucco finish combination, hollow tile, or any of the substantial materials used in permanent residences, should not be applied in the construction of these picturesque and comfortable bungalows. Those here presented are the first that have been built by the investor for renting purposes to any extent, as far as CONSTRUCTION can learn, but the idea is attractive and should be remunerative, as such a habitation properly located could not possibly remain tenantless. It is probable that, taken as

apartments, the bungalow of four rooms with service adjuncts would not cost as much as that proportion in an apartment building, while the difference in the cost of ground occupied would be great enough to allow for the multiplied space occupied by each bungalow because of its suburban location. It is a problem it would be worth the while of any investor to work out in conjunction with a sympathetic architect, as aside from its commercial aspect it would be of inestimable benefit to the occupants that are thus given the surroundings of air and sunshine instead of the enervating and sunless lives of the ordinary flat dweller.

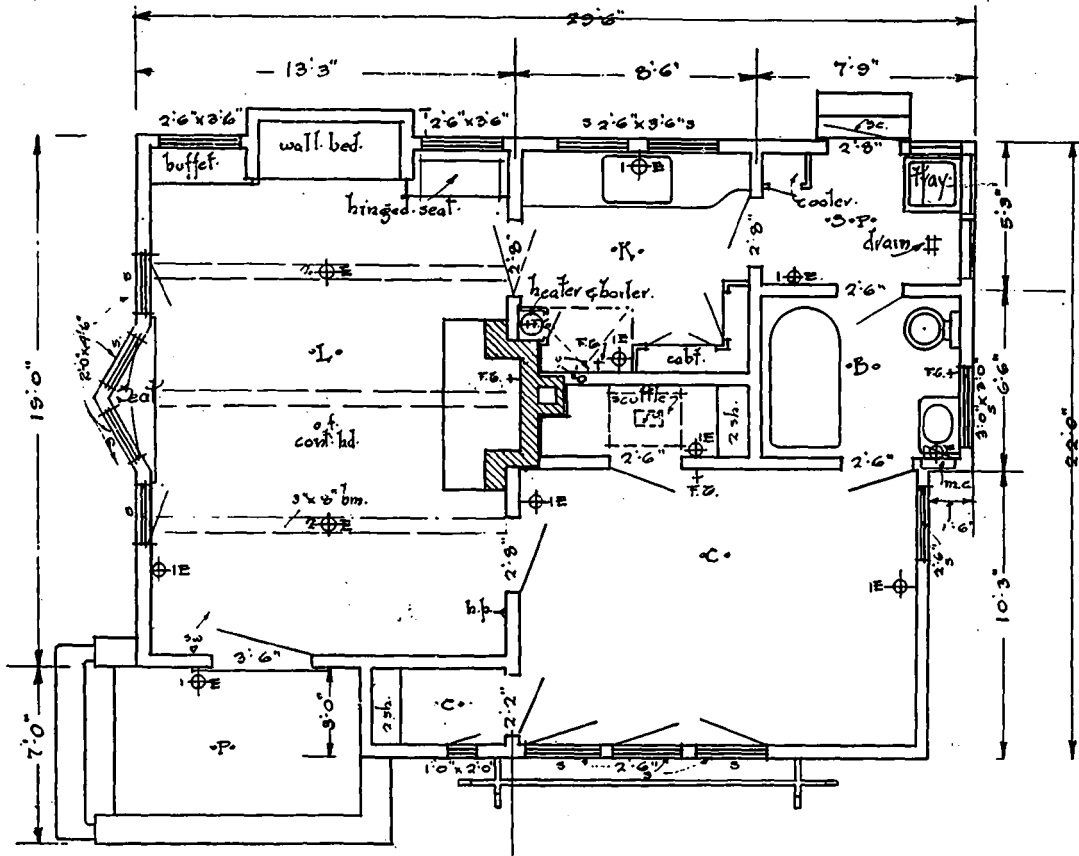


Plan of Court Bungalow. (Number 381.)



A Court Bungalow, Pasadena, California. Arthur S. Meiniman, Architect. (Number 381.)

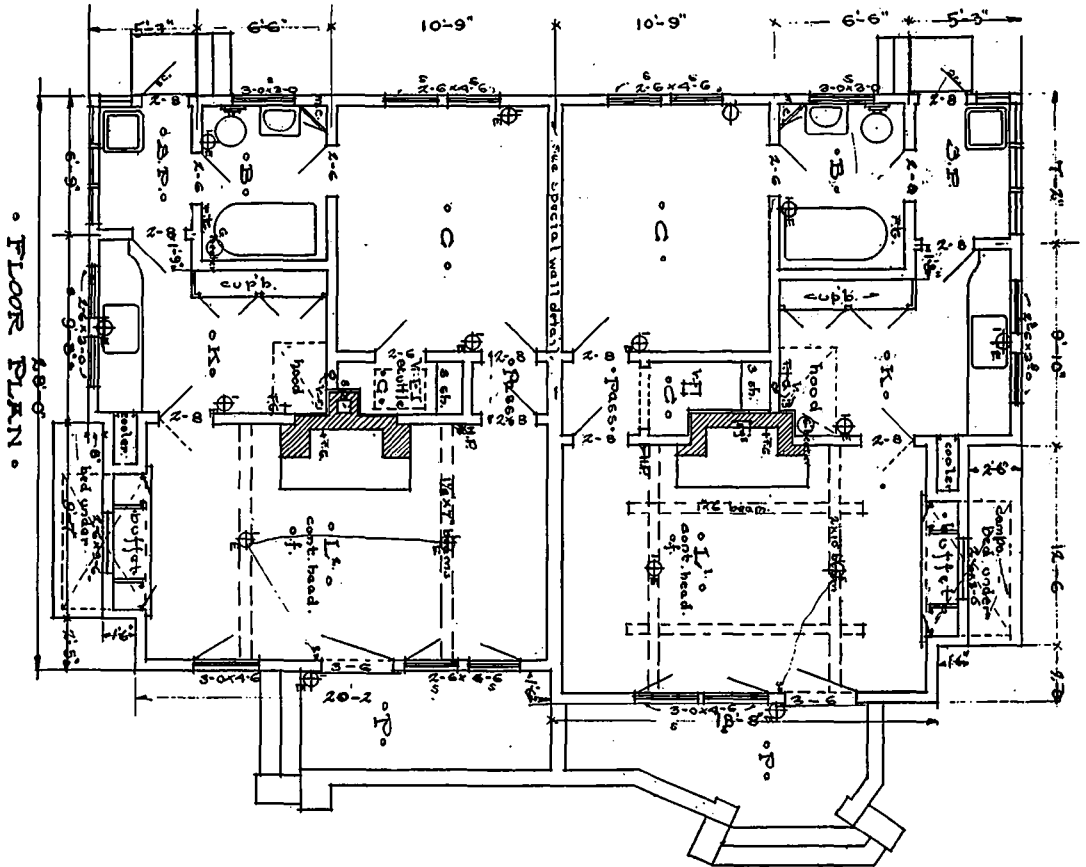




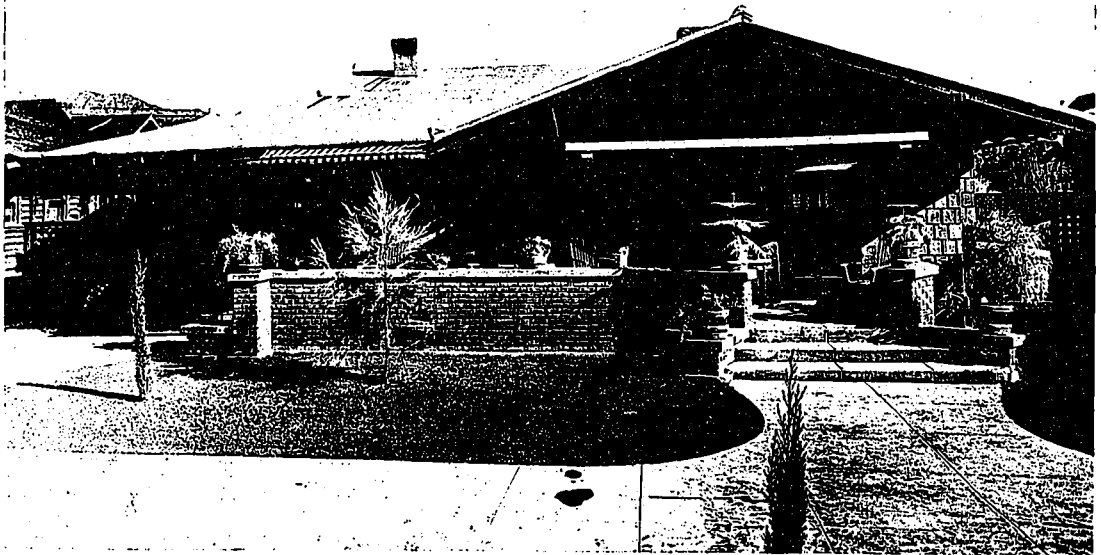
Plan of Court Bungalow. (Number 383.)



A Court Bungalow, Pasadena, California. Arthur S. Heiniman, Architect. (Number 383.)



Plan of Court Bungalow. (Number 267.)

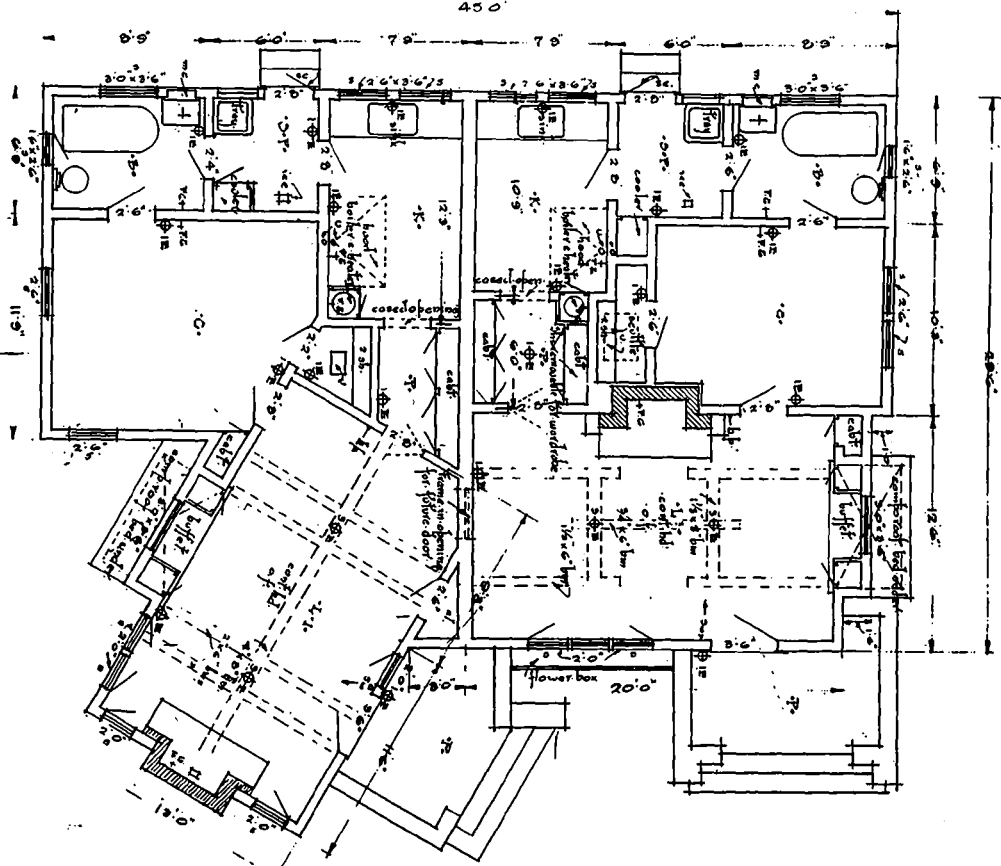


A Court Bungalow, Pasadena, California. Arthur S. Heiniman, Architect. (Number 267.)

450

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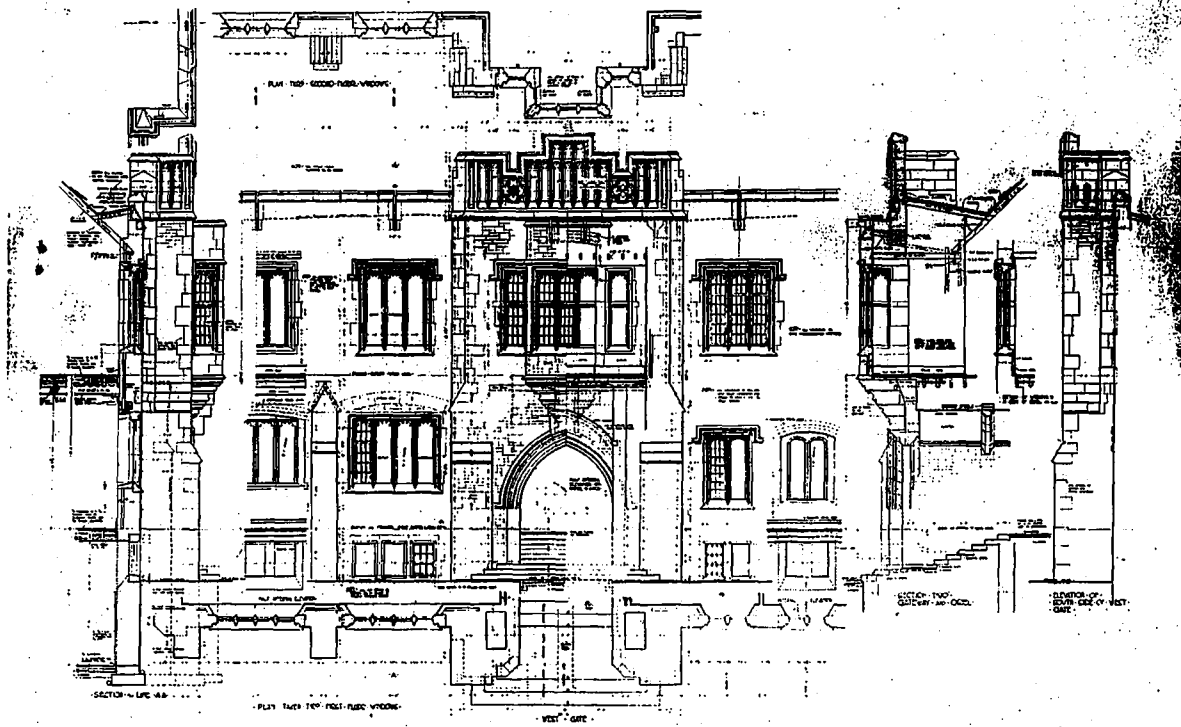
FLOOR PLAN



Plan of Court Bungalow. (Number 267.)



A Court Bungalow, Pasadena, California. Arthur S. Heinman, Architect. (Number 267.)



Hart House, University of Toronto, Toronto, Ontario. Sproatt & Rolph, Architects.



**AN IMPORTANT  
EXAMPLE IN  
MODERN GOTHIC**

The Club House designed by Sproatt & Rolph for the University of Toronto presents details in design interesting to architects and draughtsmen, and stone work that promises a distinctive advance in Canadian architecture.

**H**ART HOUSE, an important addition to the group of the University of Toronto buildings, is planned to accommodate all the athletic and social institutions of the University, including the Y.M.C.A. It is designed by Sproatt & Rolph, architects, of Toronto. The building will cover eighty thousand square feet of ground, and will be three stories above ground, with basement and sub-basement. As a study in modern Gothic it is probably the most interesting in detail of any design yet produced in Canada, and as such CONSTRUCTION has obtained the consent of the architects to photograph and reproduce a large number of the detail drawings of the exterior, as well as the plans, for the benefit not only of architects, but draftsmen, to whom these exceptional pictures will be most interesting.

The reproduction from the eighth scale sheets was most difficult, on account of the reduction necessary. No perspective has as yet been prepared, so that the interest lies in the details which form the different facades of the completed building.

The structure is designed in stone. Its frontage on the campus is three hundred and seventy-two feet, and the depth two hundred and twelve feet. The cost will be over one million dollars, ten per cent. of which is contributed by the provincial government, and the remainder by private donors.

CONSTRUCTION, JUNE, 1912.

The sub-basement will contain, beside the mechanical plant, a large and well equipped theatre with a seating capacity of eight hundred and thirty. The stage will be twenty-five by fifty-eight feet, with a proscenium opening thirty feet in width.

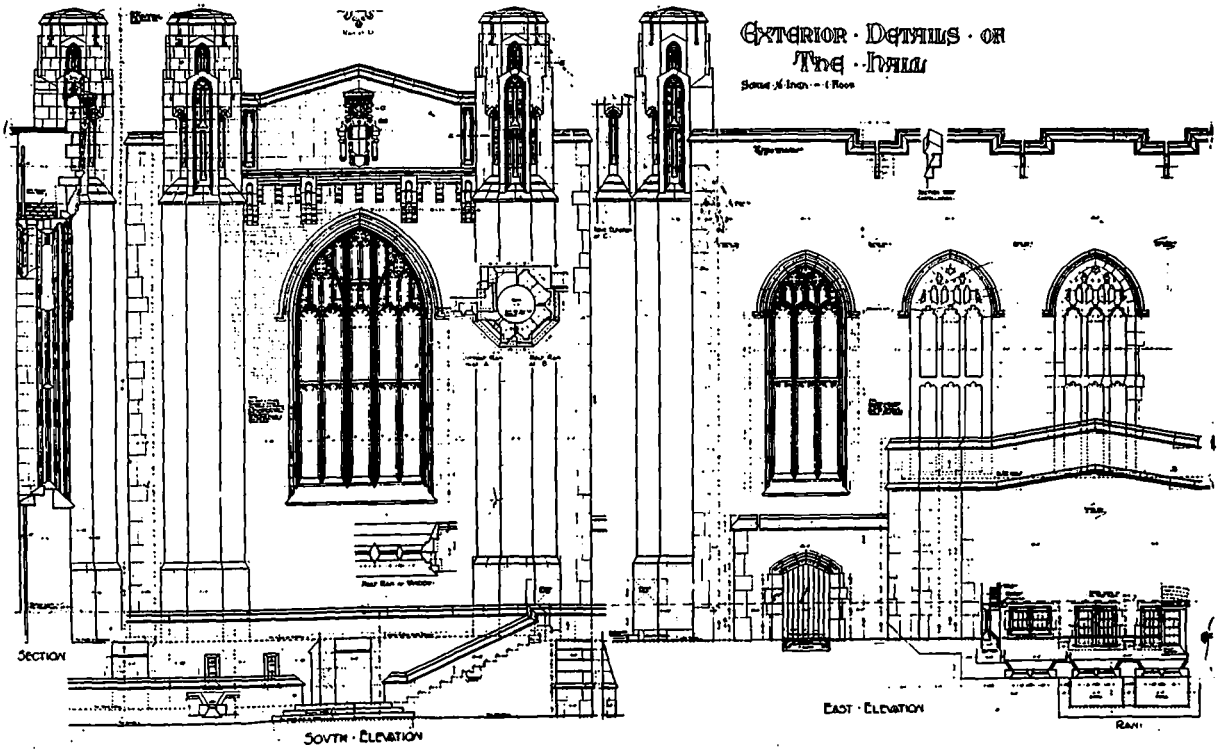
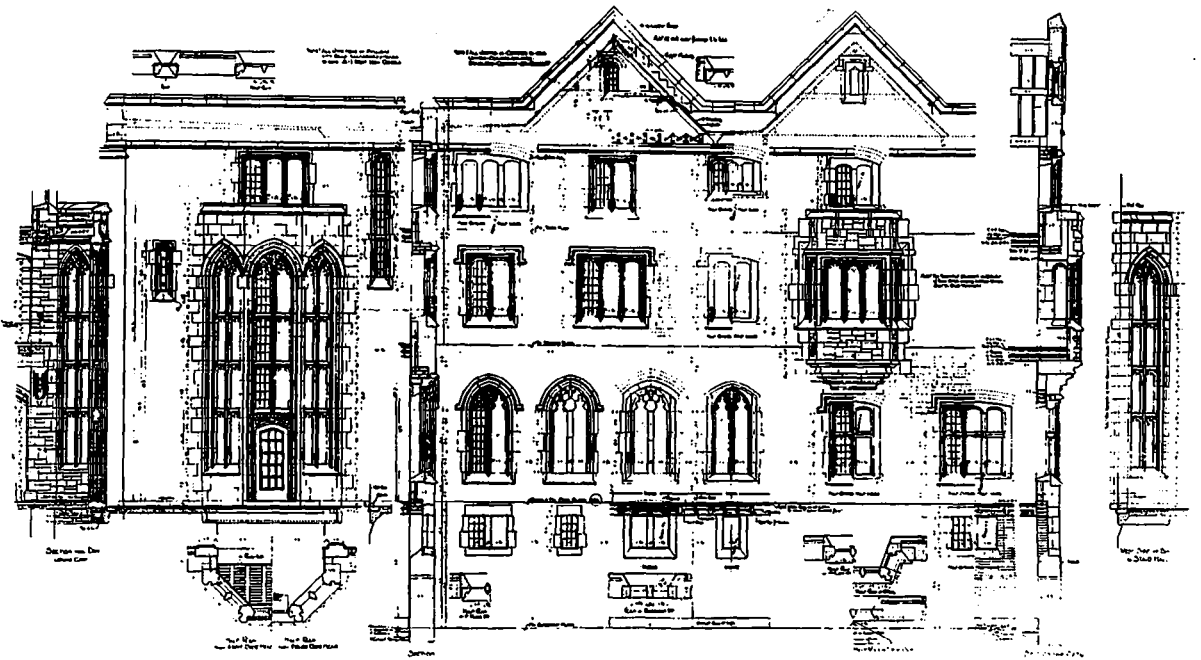
The basement will contain a billiard room twenty-four by one hundred and fifteen feet; chess and game room twenty-four by sixty feet; a large locker room with two thousand lockers and an additional locker space of nine hundred, making a total of two thousand nine hundred lockers; and a swimming pool thirty-four by seventy-five feet.

The first floor will contain the main gymnasium, fifty by one hundred feet; a large dining hall thirty-eight by one hundred and fifteen feet, seating comfortably two hundred and eighty persons at dinner; boxing, fencing and wrestling rooms, each thirty-two by fifty feet; a reading room twenty-four by sixty-eight feet; a Y.M.C.A. lounge twenty-four by forty-five feet, and a students' lounge twenty-four by sixty feet.

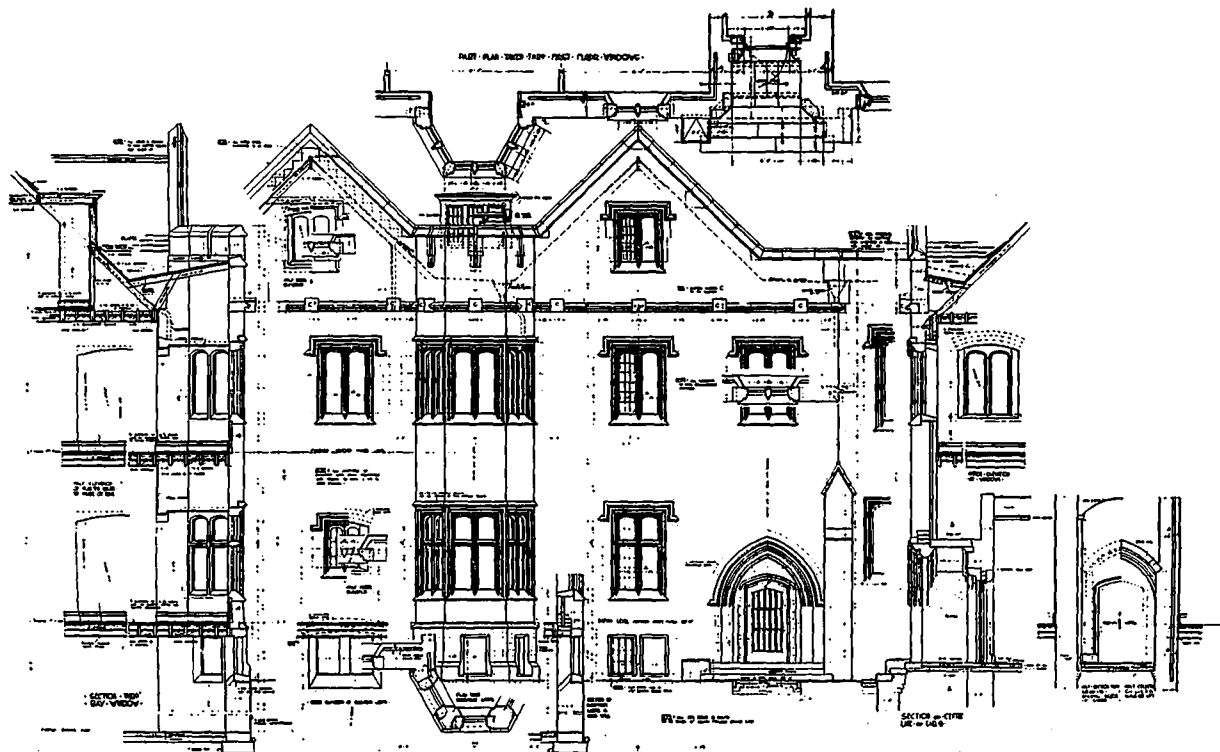
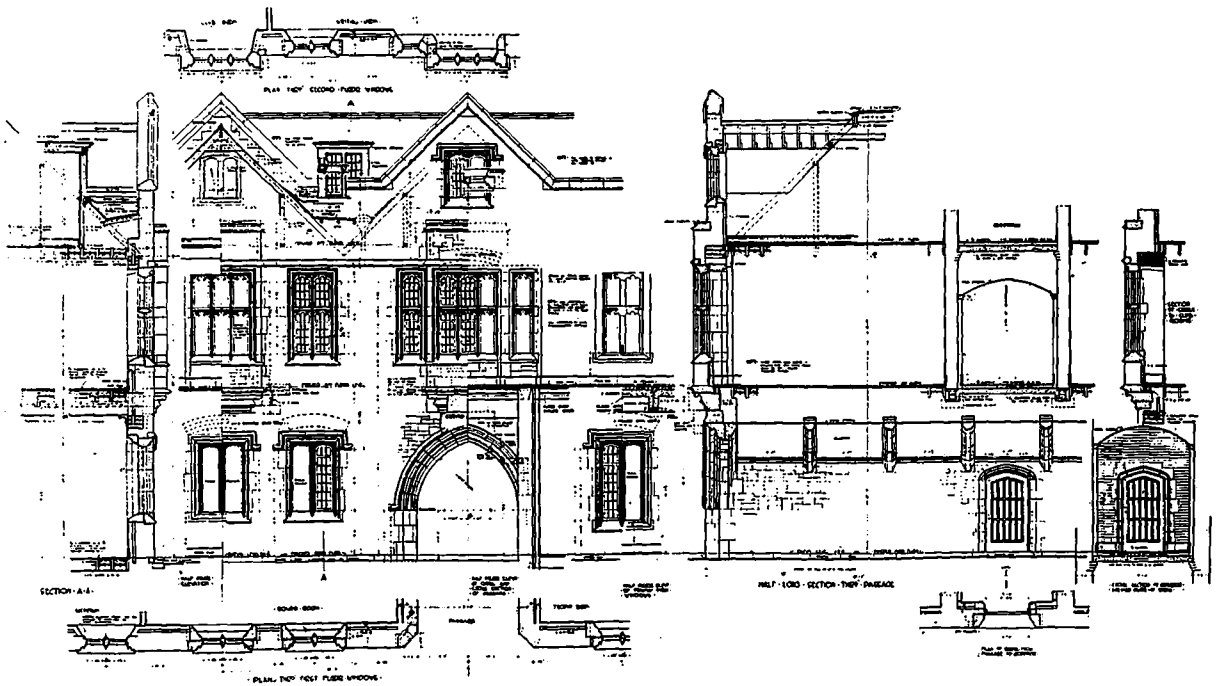
The second floor will be a running track, one hundred and forty-six and two-thirds yards long, or twelve laps to the mile; a gymnasium thirty-eight by ninety feet; a hall twenty-four by ninety feet; library, twenty-four by sixty feet, and a music room twenty-one by seventy-five feet. A gallery will overlook the hall.

The third floor will contain the secretaries' living-rooms, guest rooms, and servants' quarters.

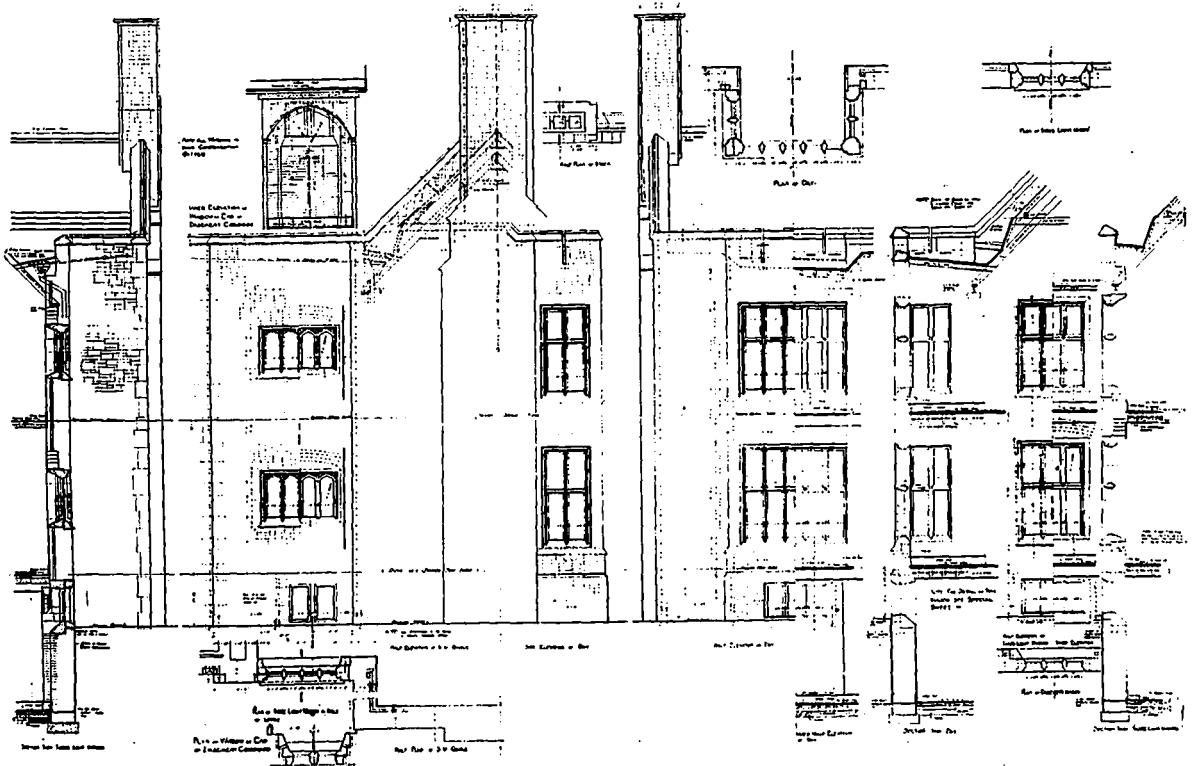
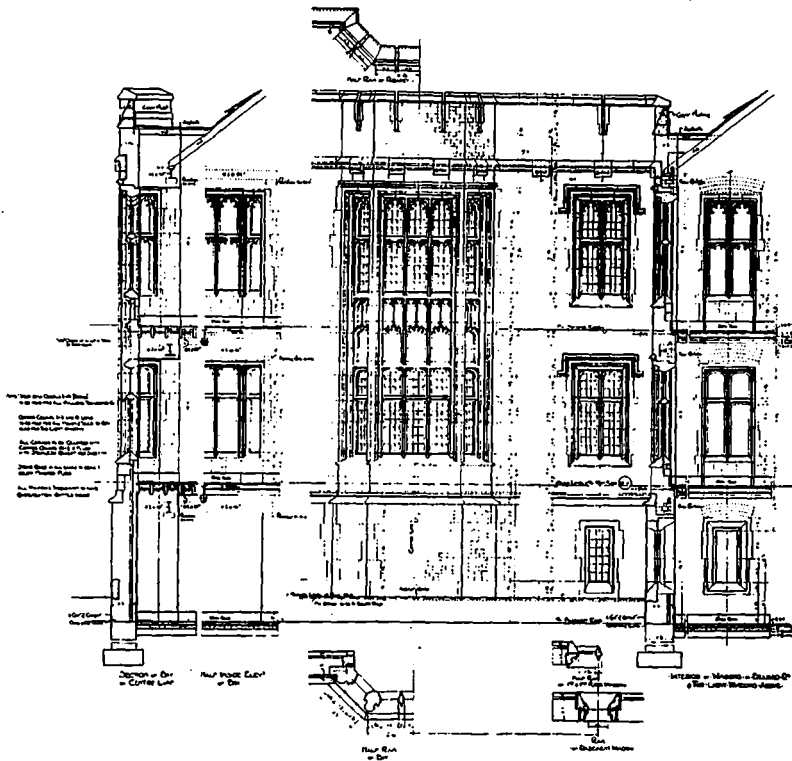
In thus projecting a University club house on this immense scale, athletics, which has become an important feature of the University, will be made a permanent and recognized adjunct to this Provincial institution, and give it pronounced leadership in the field as well as in the study.



Hart House, University of Toronto, Toronto, Ontario. Sproatt & Rolph, Architects.

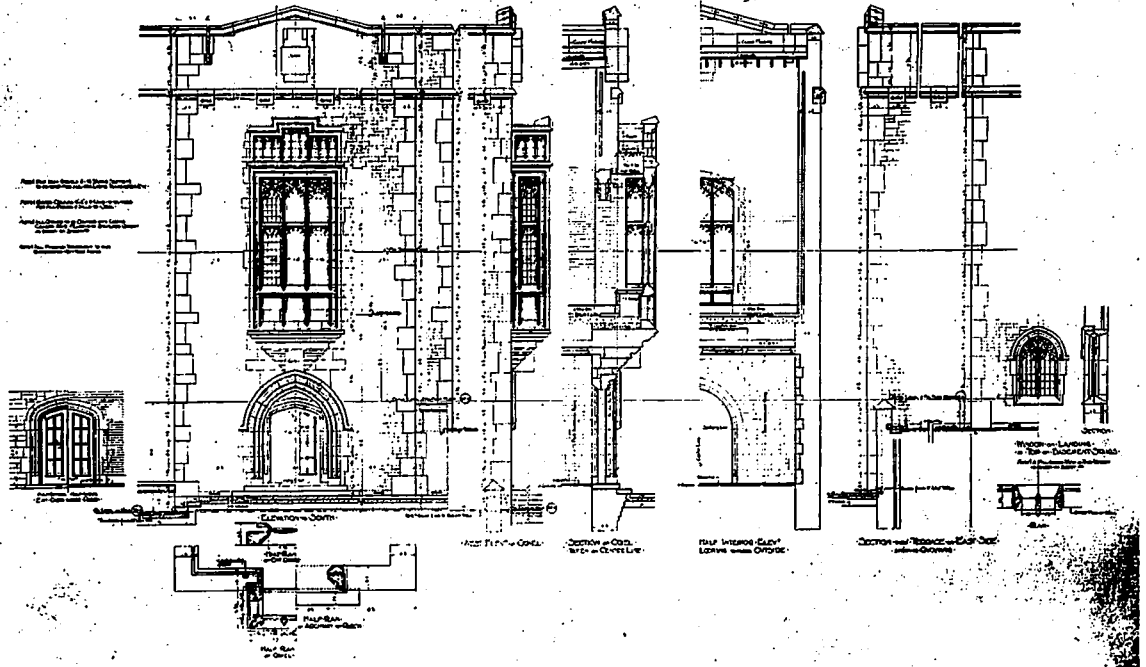


Hart House, University of Toronto, Toronto, Ontario. Sproatt & Rolph, Architects.



Hart House, University of Toronto, Toronto, Ontario. Sproatt & Rolph, Architects.

DETAILS OF PORCH - 3 - ORIGINAL  
SOUTH FRONT - NEAREST THE EAST

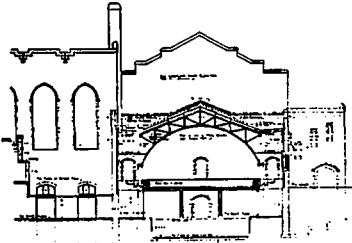


HART HOUSE : UNIVERSITY OF TORONTO

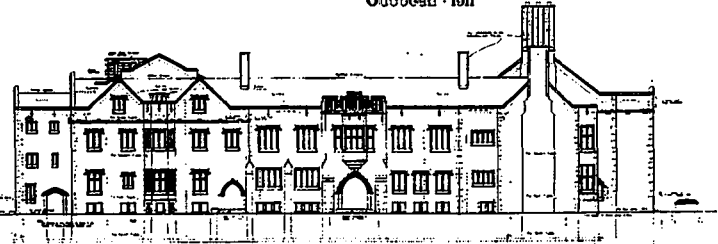
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Section - 3 - Floor - East

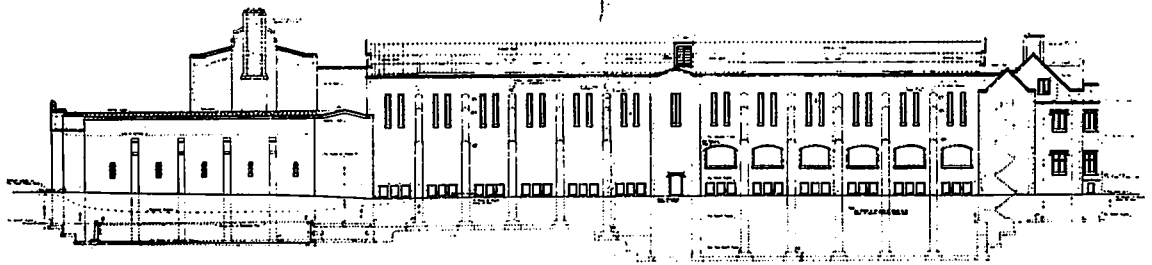
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Section - 6 - 6



Section - 5 - 5



Section - 4 - 4



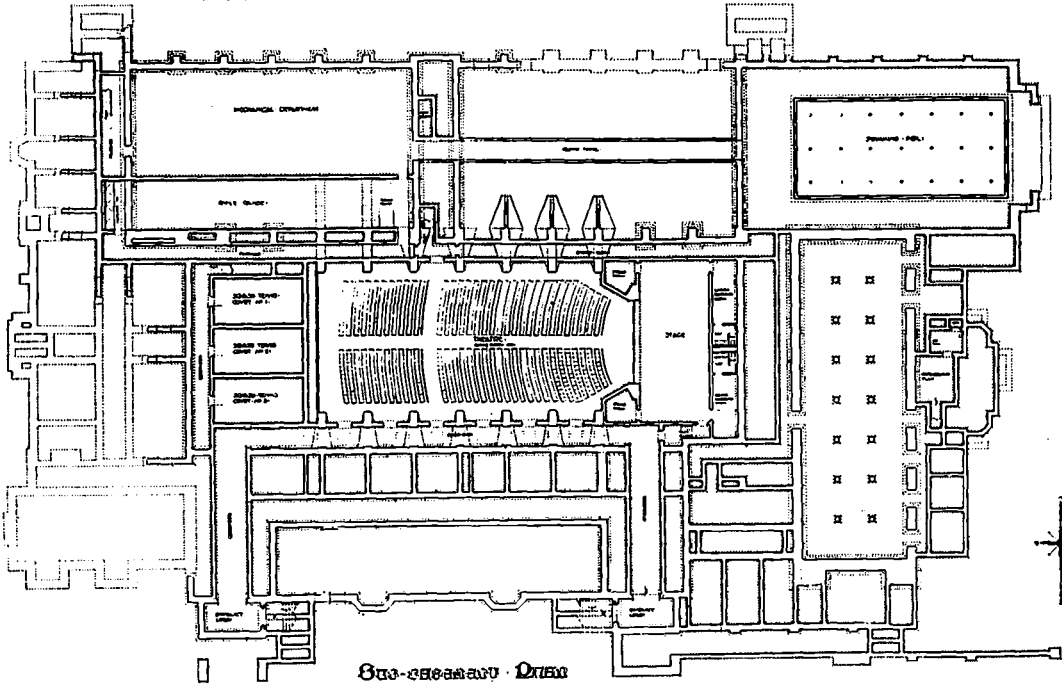
**HALE HOUSE : UNIVERSITY OF TORONTO**

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Скала: 1/8" = 1'-0"

October 1911

Sheet No. 1:



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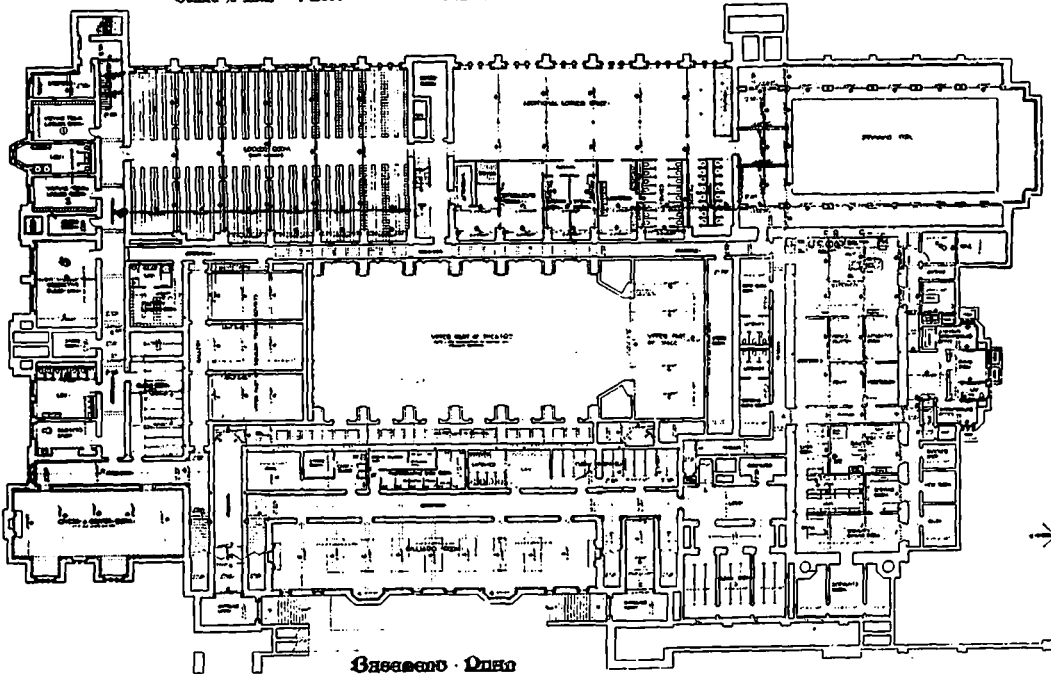
**HALE HOUSE : UNIVERSITY OF TORONTO**

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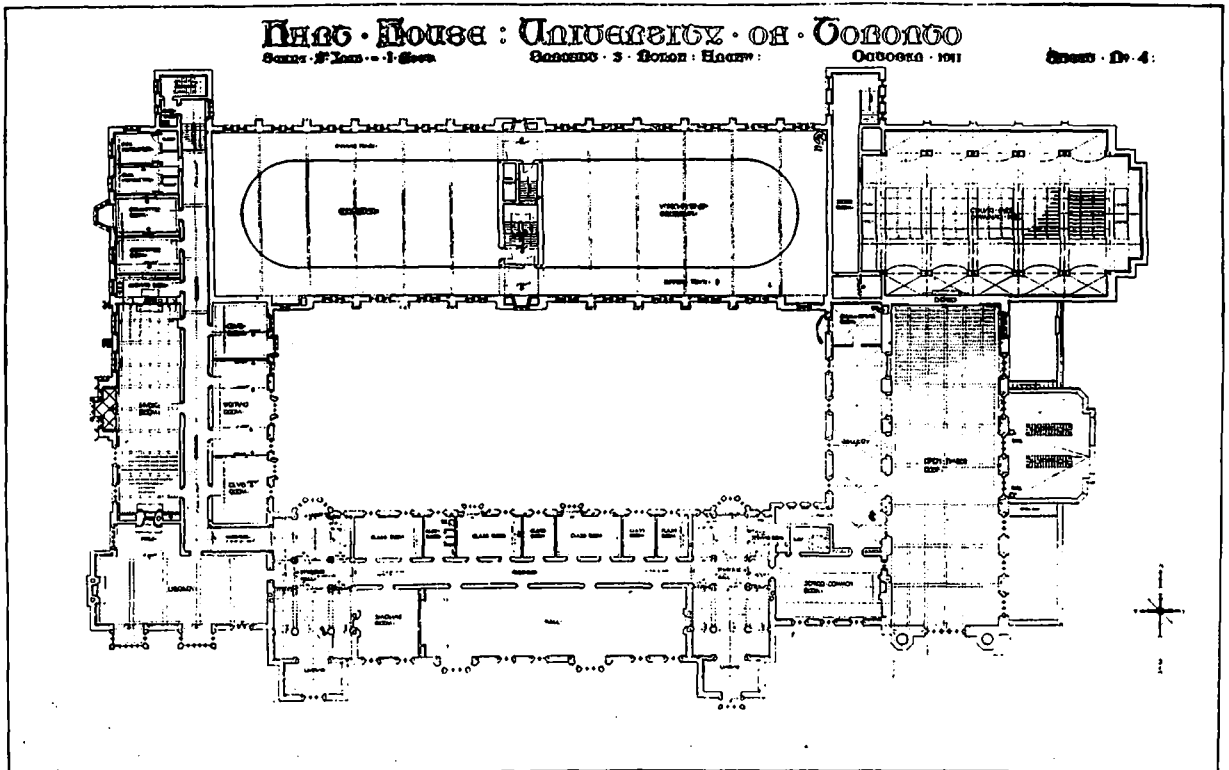
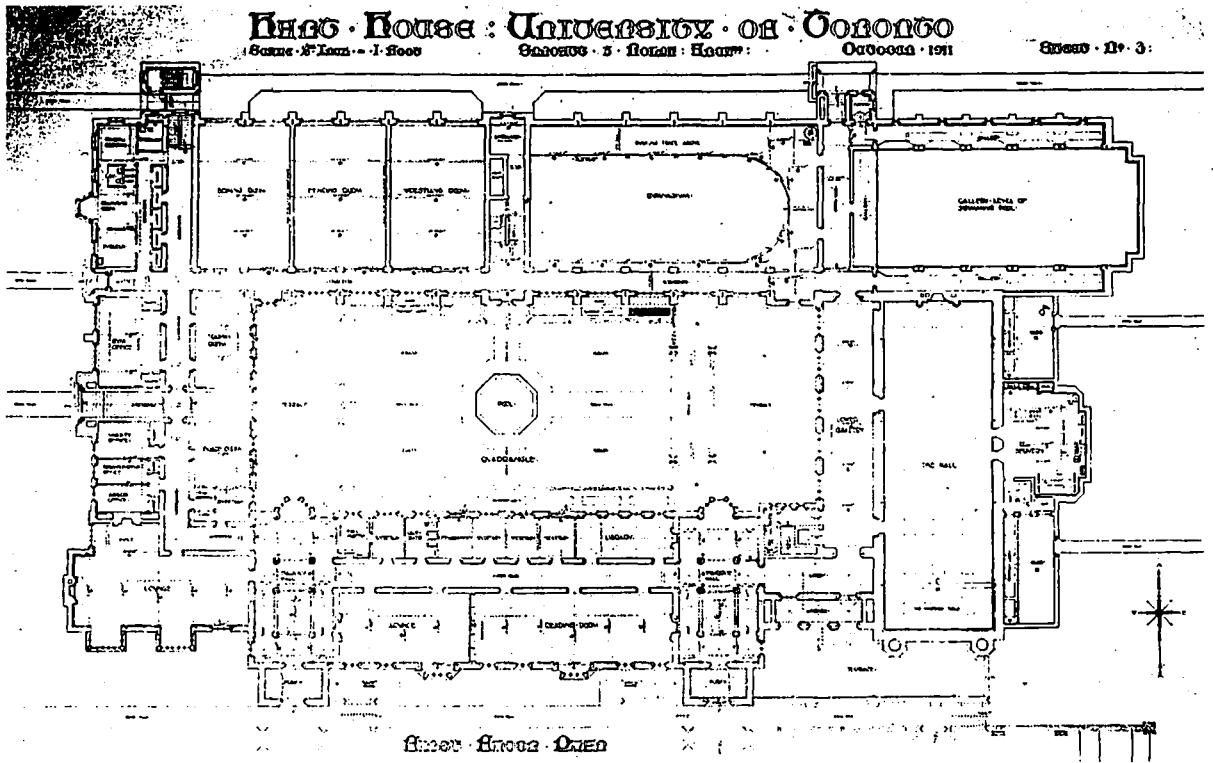
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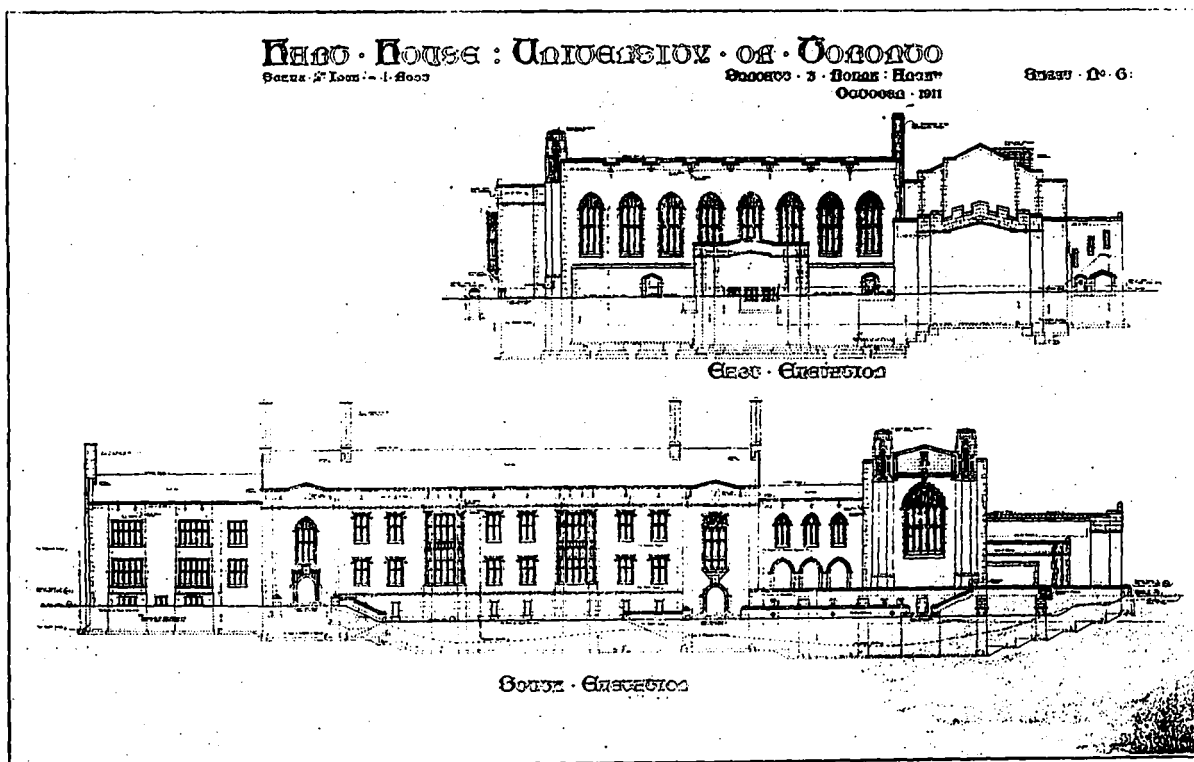
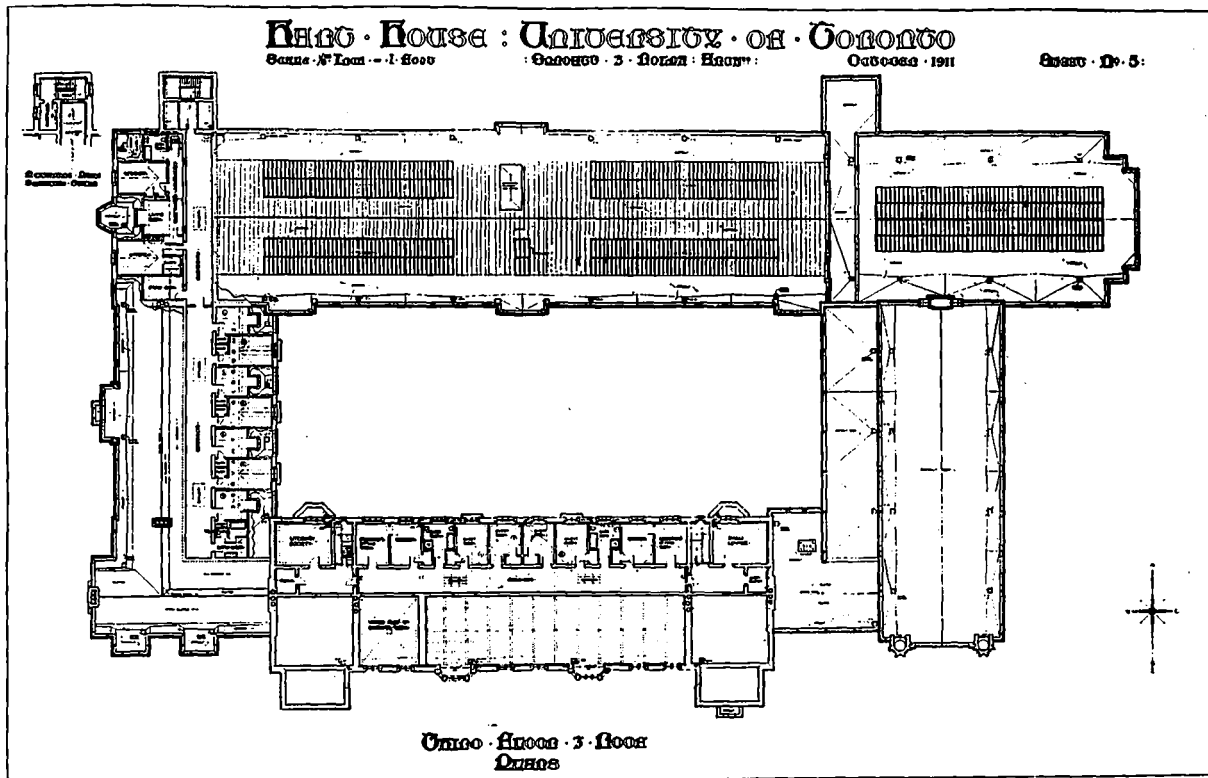
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Hart House, University of Toronto, Toronto, Ontario. Sproatt & Rolph, Architects.



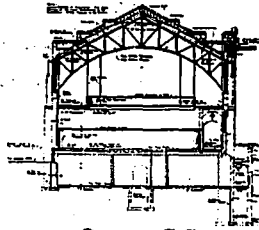
Hart House, University of Toronto, Toronto, Ontario. Sproatt & Rolph, Architects.

HALL HOUSE : UNIVERSITY OF TORONTO

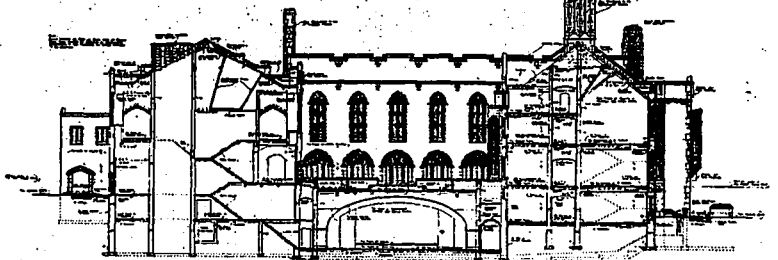
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SECTION - 3 - SOUTH - HALF  
OCTOBER - 1911

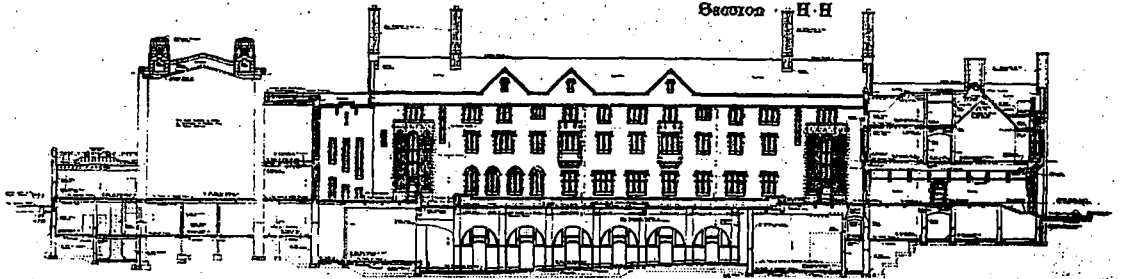
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SECTION - H-H



EAST ELEVATION - IN - QUO.  
SECTION - H-H



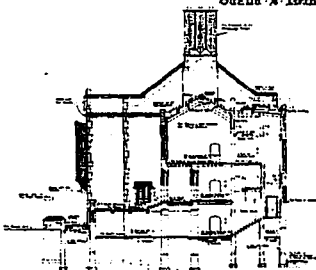
SOUTH ELEVATION - IN - QUO.  
SECTION - G-G

HALL HOUSE : UNIVERSITY OF TORONTO

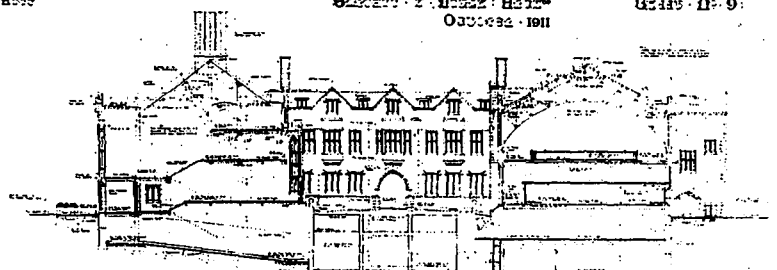
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SECTION - 2 - NORTH - HALF  
OCTOBER - 1911

Sheet No. 9



SECTION - C-C



WEST ELEVATION - IN - QUO.  
SECTION - D-D



NORTH ELEVATION - IN - QUO.  
SECTION - E-E

# CONSTRUCTION

A JOURNAL FOR THE ARCHITECTURAL  
ENGINEERING AND CONTRACTING  
INTERESTS OF CANADA



ROBERT CRAIK McLEAN, Editor.

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

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Vol. 5 Toronto, June, 1912 No. 8

## CURRENT TOPICS

AS CONSTRUCTION has urged in no uncertain terms the necessity for governmental regulation of the suburbs of cities, the proclamation on May 4 establishing such control under the City and Suburbs Plans Act, is most gratifying. The act causes all plans for proposed suburbs within five miles of cities having a population of fifty thousand, or over, shall be first submitted to the Ontario Railway and Municipal Board. This board is given authority to have all changes made, including the number and width of roads and streets, their direction, and, what is most important, the size and form of lots, according to its discretion, before the plot receives its approval. It is hoped that the established distance between any two houses will not be less than twenty feet, or that no lot of less than fifty feet frontage will be allowed to contain a residence. Such a rule would not be necessary were these plots laid out for investment rather than speculation, as the rule of permanent and increased value in residence suburbs has been found in the advanced cities in the United States to lie not only in the location,

but in the separation of the houses in a residence suburb.

\* \* \*

AT EDMONTON the question of the right of a city to set a minimum as well as a maximum height to building has arisen. The right to a maximum height is not denied, but the by-law that prohibits anything less than two stories is contested. It is probable good law that a city can regulate the construction of buildings in the city, and have different rules to apply to different sections, as circumstances may warrant, and that these rules apply to height, as well as to construction or location on the lot in its relation to the street, or its distance from other buildings. The regulation of buildings by a municipality is in the interest of public health and the preservation of values of adjacent property, or the property in a city as a whole, and no private interest can supersede that of the public.

\* \* \*

CALGARY starts right in laying the foundation of her university of the future by planning the plot in advance. The work is in the hands of Dunnington, Grubb and Manson, landscape architects, of Toronto, and the buildings will be located as they are needed and the grounds laid out for future improvement according to this plan, and the conglomeration of design and location, which is the rule rather than the exception with most groups of buildings, will be avoided. It is so logical that a plan should precede all work of grouping buildings and laying out driveways that it is hard to understand why it only recently became adopted and deemed a work of exceptional intelligence on the part of the projectors.

\* \* \*

THAT a majority of the council of the city of Toronto is in favor of decent conditions and desirous of doing its part toward bringing the city up to the standard of those building on modern lines is indicated by its recent action in regard to the apartment house law. One alderman, probably at the instigation of real estate speculators, sought to have one of its vital provisions, that requiring 500 feet yard space per tenement, cut down to 350 feet. After such amenities as the mover of the amendment being accused of lack of business ability and accusing his opponent of being proprietor of a picture show, its denial and labeling as "an absolute falsehood," and the acceptance of the statement, the motion to amend was properly "snowed under" by a vote of the council.

\* \* \*

MR. LEONARD STOKES, president of the Royal Institute of British Architects, has recently been in Winnipeg, where he judged the sixty-six designs submitted in the Manitoba Parliament Buildings competition. According to the terms of the competition five designs were selected and their authors will submit other designs to be judged later by Mr. Stokes, the sets to be sent to him in England for that purpose. Mr. Stokes reports that the designs sub-

mitted in the competition were excellent, which is rather by luck than good management, as the failure to mention in advance the name of the adjudicating expert in the programme was a deterrent factor which might have resulted disastrously to the success of the competition. As CONSTRUCTION suggested at the time, the confidence of the architects in the probity of the commission was rewarded by the engagement of a high architectural authority for the work of judging the drawings, and Manitoba and the Dominion will be benefited by thus securing designs of high architectural merit for these public buildings. The five architectural firms that were selected from among the sixty-six competitors are.—Edward and W. S. Maxwell, Montreal; Sharp and Brown, Toronto; Brown and Wallace, Montreal; F. C. Clemesha and F. H. Portnall, Regina; and F. W. Simon of Liverpool, England.

\* \* \*

*THE CITY* and Suburbs Plan Act, which came into force in Ontario on May 4, is designed to put an end to the haphazard laying out of suburbs, without regard to the relation they will, in the course of time, bear to the rest of the city of which they will form a part. It provides that any person desirous of laying out into building lots any tract of land lying within or within five miles of a city, having a population of not less than 50,000, shall submit a plan of the proposed survey and subdivision to the Ontario Railway and Municipal Board for approval. The board is given power to require changes as to the number and width of the streets, the location and the direction in which roads and streets are to run, and the size and form of the lots. The board in this respect is to be guided by any general city plan adopted by the council, and where the land lies outside the city limits the board is to be guided by the proximity of the land to the city, the probability of the city limits being extended so as to include it, the securing of driveways and thoroughfares connecting the city and outside thoroughfares, and the making of the roads, streets, etc., to conform with the plan adopted by the city. The Act provides that notice of the filing of any plan must be given to the corporation of the municipality, accompanied by a copy of the plan, and if no objections are made within 21 days the applicant is entitled to have the plan certified as approved unless the board of its own motion has directed changes.

\* \* \*

*SIGNIFICANT* of the way in which property values have been boosted around Toronto, and through this, with the aid of a thoroughly inadequate car service, establishing congested, if not veritable, slum conditions in the city, is the recent attempt of the Canadian Northern Railway to buy a site for railway yards. A citizen three years ago bought a farm of 200 acres for \$125 an acre. The railroad was recently asked to pay \$3,500 per acre for this property. That it purchased elsewhere for a less sum does not change the fact that this owner has placed a largely fictitious value upon farm land

located where it can never be expected to earn the interest his price calls for. The holding of property at exorbitant prices would ultimately bring its own punishment, but the necessities of the city are such that it cannot wait for this financial nemesis to overtake this too common class of land speculators. It must not only control prices of land surrounding the city, but prohibit an equal evil, that of cutting it into lots less than fifty feet frontage. No house should be built within twenty-five feet of another, especially in the suburbs, where combustible materials are used, though the unsanitary conditions that result through crowding houses together are a greater menace to the health and growth of the people than the direct loss of the property by fire. If Toronto and other cities in Canada would attack this exploitation of the physical and moral future of the people and make it as earnest a cause as the attempt to eradicate the drink evil, they would be working along lines that come nearer practical success in bettering the lives of their citizens.

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*A LOCAL* Builders' Exchange was formed at Moose Jaw on April 9th with a membership of about twenty-five. The constitution of the Regina Exchange was adopted as that of the new organization. The officers elected are:—President, H. Navin; Vice-President, J. Blix; Treasurer, J. Fidler; Board of Directors, T. Potts, C. Forbes, A. Frost, T. Grayson and G. Marlatt. As the organization of the builders of a city is the first step toward stability in the contracting business, the city of Moose Jaw will be benefited by its existence, and this affiliation of the men on whom the future upbuilding of the city depends will make for better methods and safer construction.

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*THE ELECTION* in Seattle of a mayor who is an engineer by profession will undoubtedly work to the advantage of that city, when its present problems are largely in the line of reconstruction in the department of public works. Chicago at a critical stage in its history elected De Witt C. Cregier, a noted civil engineer, who served as mayor to the lasting benefit of the city. But even there much that he attempted was abandoned when a change of mayors took place. But cities do not need the talent of the professional men at the head of its affairs as badly as it does a capable-business man such as those selected to head large corporations. Men of this type are executive and select the trained specialists who are placed at the head of departments and carry out their work with an ambition to succeed that is not nullified by interference and tacit opposition from the contracting head of the corporation.

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*HAMILTON* has taken up the question of insufficient housing accommodation along the lines adopted recently at Toronto, under a corporated "co-partnership garden suburb," in which a tract of land is to be secured by the city, and each man requiring a house becomes a member of the company in charge

of a co-operative plan of building. An investigation of the housing conditions showed near-slum conditions 2,200 people living in 1,094 rooms, many families living in one and two rooms. As in Toronto, this condition has grown upon the city suddenly, and the city authorities are taking energetic measures to meet the condition.

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**THE BY-LAW** adopted by the City Council of Toronto to govern the future erection of apartment houses is as follows:—"Every dwelling house or other erection to be occupied as a dwelling house shall be so located and erected on the respective premises as to provide for and preserve a yard area of not less than 500 square feet for each and every suite of apartments or dwellings situated on any floor of the building containing the greatest number of suites or dwellings, and said yard area to be free from all construction from ground to sky, and be situated so that each and every suite of apartments or dwellings shall be adjacent to the said yard area, which is to be exclusive of any space proposed to be used as a side entrance or any portion of the lot or premises between the extreme front of such erection and the street line, but in no event shall said yard area be less than ten per cent. of the area of the said lot. Dwellings and apartments having frontages on two streets may be excluded from the above restrictions. Buildings on business streets may cover the entire area of a lot for such of the stories, beginning with the lower, as are used for business purposes only."

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**SCULPTURE** seems to have received a new impetus through a recent exhibition of the work of Prince Paul Troubetsky. Report says that the spirit of that which was Greece pervaded some of his work; "optical delusions" were produced by a delicacy of line, a shade of expression, and what we call "character" was the distinguishing quality. If here is found one who can carve into stone that illusory something that all art possesses, yet is so seldom brought out, especially in statuary, then there is hope that this, the greatest of the arts, may some day be represented by those works that we have to refer to as Grecian, as they have been practically lost since the days of Phidias.

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**TOO MUCH** attention is usually given to the objections of property owners to the proposed widening or extension of streets. Their opposition in the first place is from ignorance of the direct benefit that will in general accrue to their property. They have never seen cities with wide streets and open spaces, and do not know the sanitary advantages, or care, for that matter. They only fear an additional taxation. It is time that such protests should be ignored by civic authorities, and the rank and file of property owners taught that they owe something to the public. That a deed of property does not entitle them to stand in the light of a public benefit, and that the public good comes first in everything that relates to the use or surroundings of their holdings. It was

with great difficulty that a law was passed which gave cities the right to control the location of apartment houses. It isn't so long in this country since building regulations were deemed an interference with personal property rights. It is hoped that not only will cities see the equity in directing the improvement of civic physical conditions without regard for individual protest, but that designs will be likewise passed upon so that the city street may be attractive in the contour of its buildings, as well as their appropriate setting.

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**PRESERVATION** of Australian forests is urged because of the fast disappearance of the tallest trees in the world. No provision is being made for replanting these trees, and the lumbermen fell those already growing before they reach half the normal height. Even one moderately tall tree, the 150-foot red cedar, is nearly extinct. Such trees frequently yielded 30,000 superficial feet of timber per tree. The timber trees of New Zealand are still numerous, but the best are being picked out. The *Eucalyptus calyx*, popularly known as the Cumberland blue gum or Clarence flooded gum, is one of the most useful trees in this State. It rarely attains a greater height than 80 feet, with a diameter of 7 feet, but it frequently yields 6,000 to 7,000 feet of timber. It is used for all kinds of building purposes, as well as for coach building. The next best tree for building purposes is the stringybark (*Eucalyptus capitellata*), which sometimes attains a height of 400 feet, and thus stands out as the tallest tree in the world. The tallest American redwood recorded was 340 feet.

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**CONVINCED** that Canadian problems in architecture can be dealt with exclusively by Canadian architects, as they alone are familiar with the national and local requirements, having their country's interest at heart, and are imbued with their country's spirit, the sixth Exhibition of Architecture held at Toronto will present Canadian work exclusively. Not only will the exhibition present the work of the present in drawing and photography, but much of the good work of the past will be presented in photographs, so that the advance in design and the changes of method may be studied. It is hoped by this exhibition of purely Canadian work to prove that Canadian architectural problems are to a fair degree being intelligently studied and worthily solved.

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**AN OBITUARY** notice recording the death of Mr. Chillion Jones recently printed in the daily press stated that he "planned the House of Commons at Ottawa." Mr. Fuller was the architect of the Dominion Parliament Buildings, and the drawings with which he won the competition are in the National Gallery at Ottawa. Mr. Jones was associated with Mr. Fuller for business purposes in connection with the start of the construction and had nothing to do with the plans.



North Elevation.

South Elevation.

Residence of W. H. Baker, Parkwood Avenue, Toronto, Ontario. Chadwick & Beckett, Architects.

# R OUGH STONE AND STUCCO ON BRICK

*A combination type of design and construction that has many attractive qualities and where isolated and contrasted with trees or hillside is attractive, and in construction is permanent, needing little repair.*

**T**HE PROBLEM with the prospective residence builder, after weeks have been spent over tentative plans, and finally the architect is retained, is, "what material shall be used?" It is a serious question because it is many sided. It takes in with most people that of cost, and this is governed to some extent by the locality through the accessibility of materials and labor. But aside from this there is the question of appearance and of stability. Any one of three or four materials in general use will answer equally well, if properly designed and constructed.

CONSTRUCTION recently presented a typical construction in hollow tile where all the requirements of cost, appearance, stability and permanence were met through an intelligent use of the common hollow tile used for fireproofing. In the accompanying illustrations a combination of several materials is found to work harmoniously as to design, and stability as to construction.

CONSTRUCTION, JUNE, 1912.

The residence of W. H. Baker, Toronto (Chadwick & Beckett, architects), which is selected for illustrating what can be done in combining stone, brick and shingles, is, roughly, sixty-three by thirty feet on the ground, and two stories beside cellar and attic in height.

The walls of the first story are rough stone with the appearance of having been quarried near the site of the building. The chimneys are also built of the same material. The second story walls are of brick, covered with stucco finish, which find a firm foundation on the stone and carry up the walls to the cornice. The gables and roof are shingled.

The plan is attractive in that it is simple and gives plenty of veranda space, as well as sunlight to the interior. On the ground floor a spacious veranda, at one end of which is a glass enclosed sun room which opens through glass doors into the living room. The main entrance, which is in the center of the front facade, gives entrance to a vestibule and hall. On one side of the hall is the living room, with

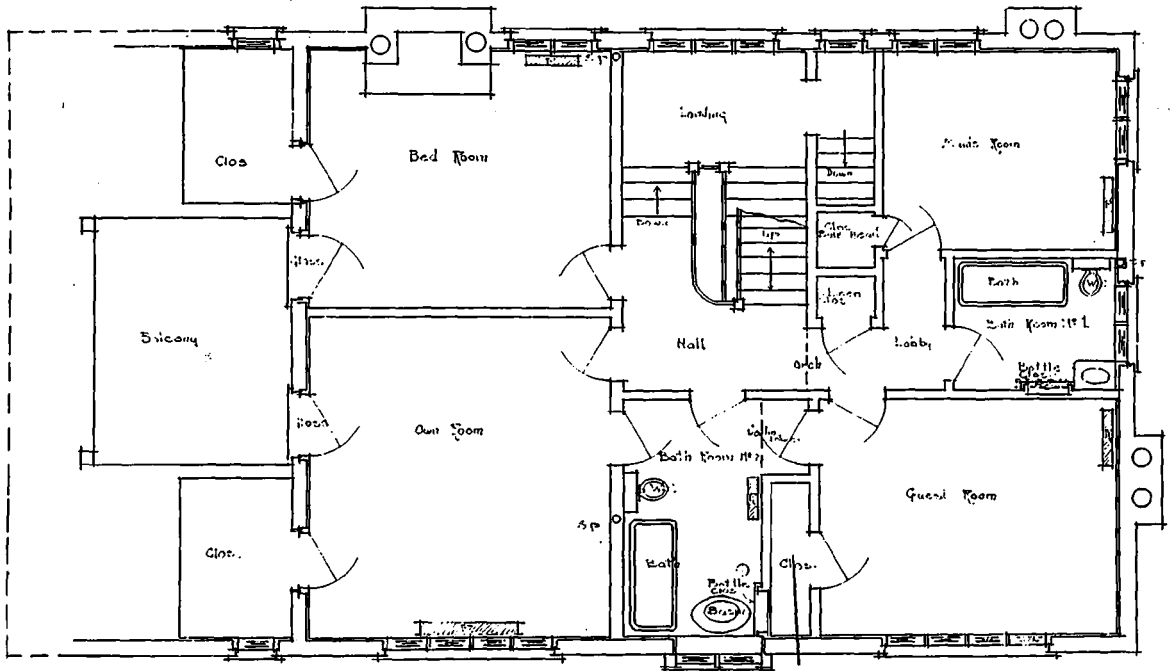


the dining room opposite, with kitchen and service beyond the dining room.

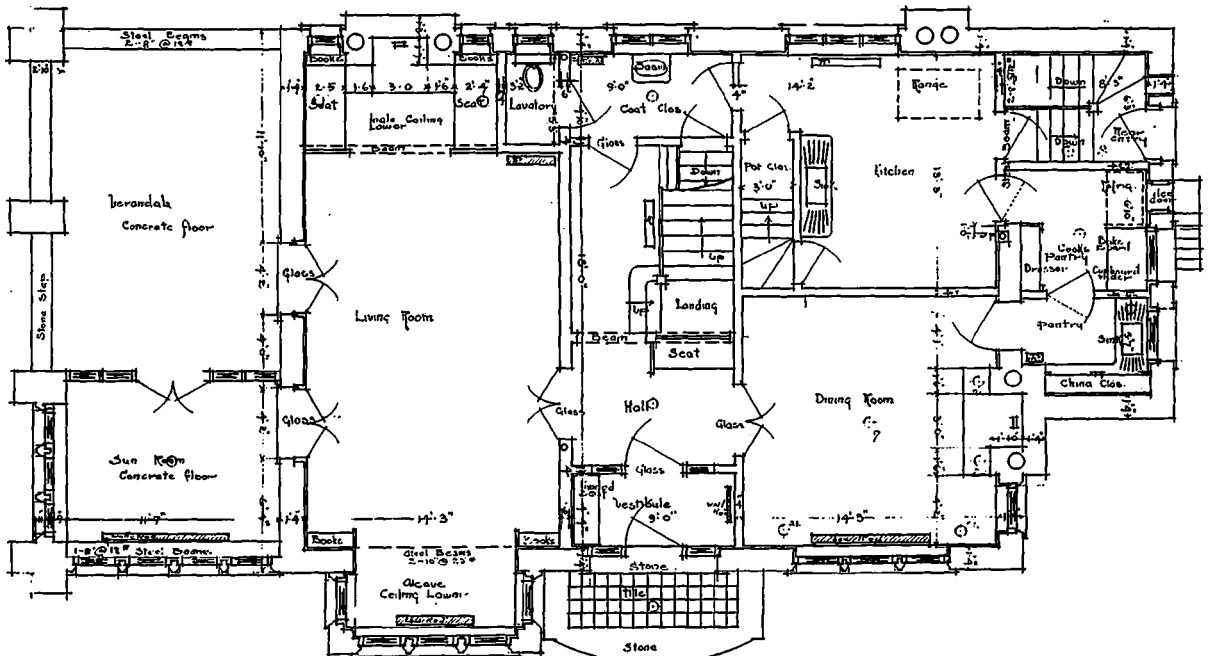
On the first floor the hall, stairway, bathroom and closets occupy the center. In front are two bedrooms, over the living room, opening out onto a balcony. At the opposite side are the guests' and maids' bedrooms. The attic is divided into bed-

rooms, bathroom, large storage room, stairway, etc. In the interior construction steel beams are used wherever long spaces without support is necessary.

This exterior combination of stonework with stucco finish above is especially attractive when wide gables and broad roofs are necessary to the plan, and the entire appearance is one of stability and comfort.



First Floor Plan.



Ground Floor Plan.



West Elevation.



East Elevation.

Residence of W. H. Baker, Parkwood Avenue, Toronto, Ontario. Chadwick & Beckett, Architects.

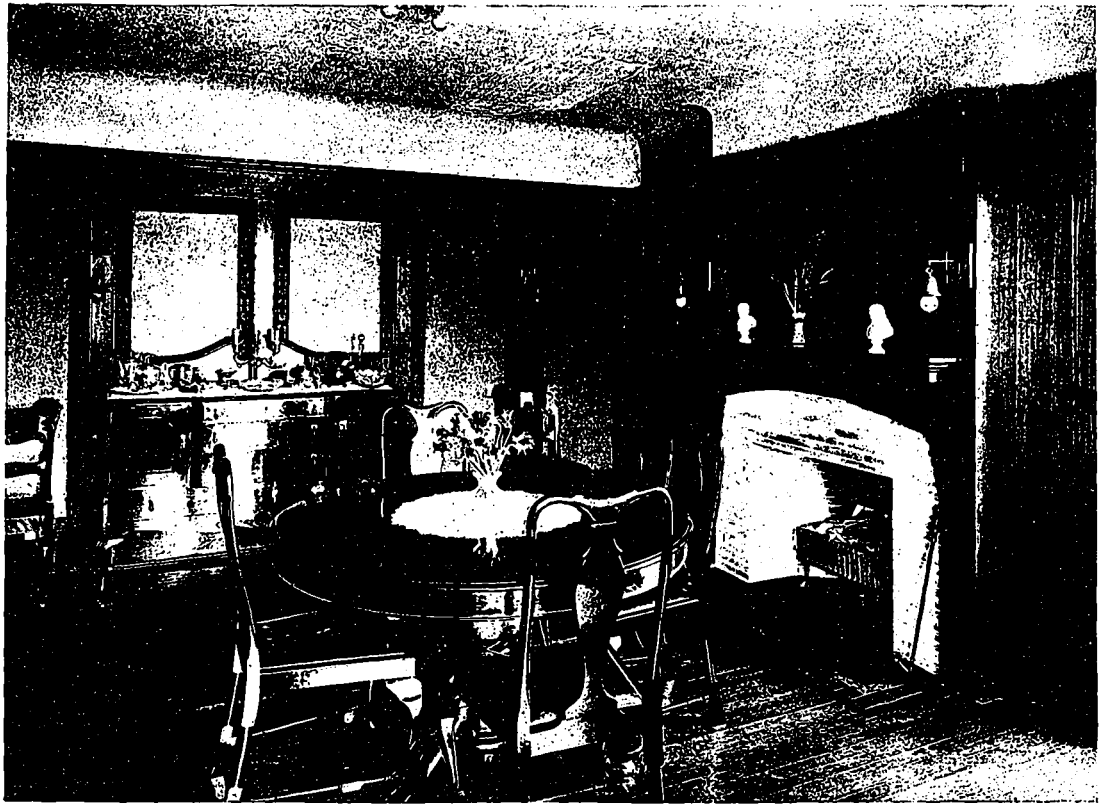


Southeast View.



East Front.

Residence of W. H. Baker, Parkwood Avenue, Toronto, Ontario. Chadwick & Beckett, Architects.



Dining Room.



Living Room.

Residence of W. H. Baker, Parkwood Avenue, Toronto, Ontario. Chadwick & Beckett, Architects.



RUSSIAN

WOMEN

ARCHITECTS

A development in the line of architectural talent among women a feature of the progress Russia is making toward a higher civilization.

RUSSIA, with her restrictive laws that pass the comprehension of more independent nations, is certainly advancing beyond them in some details, if the report in regard to women architects is true.

Press reports state that Russia has just turned out nine certificated women architects, and that they are the first in Europe. All have finished courses of study of architecture, engineering and practical building; and all except one are already sufficiently provided with work to insure their success.

The women architectural courses from which these nine graduated were started four years ago at the expense of Mme. Molas, and of Mme. Bagayeff. The instructors are professors, who at present have forty odd pupils. Although all these fully fledged architects are under 25 years old, some of them already have achievements to their credit.

Mme. Triassoff is said to have had such success with her designing work that she has been invited to go to Germany, an honor that has been accorded to no Russian male architect. Mme. Triassoff specializes in the building of school premises. She has put up several elementary schools in villages which experts pronounce the best ever built in Russia, and at the lowest cost.

These women architects, who are not at all "new women," but young and attractive girls, have undergone the same practical tests as are applied in the case of male students. They were set to work gratis on different undertakings.

Two received practical training under the St. Petersburg Street Car Commission; another pair worked on the new Neva bridge at Ohta; others helped the construction of a six-story steel house in the Koniushennaya street, which is to be used for a co-operative department store. The remainder supervised house building under the direction of private architects of reputation.

The enemies of feminism prophesied that the women architects would break down when faced with these rough tests, but the prophecy proved wrong.

For several weeks Mlle. Kasperoff was in charge of the house breaking operations connected with a steel building, and had then under her two score of the roughest workmen in Russia. The Russian house breaker's man is always illiterate, intemperate and foul mouthed. Nevertheless, Mlle. Kasperoff reports that the two-score men behaved splendidly, and that they got through a quarter more work than is usual when a man is in charge.

Even on Mondays, when according to immemorial precedent, all Russian workmen are drunk, Mlle. Kasperoff had trouble only once. A workman attacked her with a shovel. The other workmen came

to her assistance and nearly beat the offender to death. "The moral effect of a woman in charge of men," says Mlle. Kasperoff, "is usually tremendous."

St. Petersburg professional circles are waiting to see how the fair architects will get on when they begin to work independently. The innovation is not opposed by male architects, as it is an article of faith among Russia's liberal professional classes that feminism is justified.

Trouble, however, is probable from the official side. It is expected that the Government will stretch the present vague law in a sense unfavorable to the women, as it did two years ago against the first female lawyer.

The present law does not give women architects any definite rights; but it does not deny them rights. They will probably not be allowed to participate in competitions for public building designs, but there is nothing to prevent them practicing as private architects, and building houses for themselves or for others.



CIRCULAR

CONCRETE

RESERVOIRS

A paper on circular reinforced reservoirs read before the New England Waterworks Association by Alexander Potter, Consulting Engineer.

THE ECONOMY in constructing water works service reservoirs, circular in shape, is not appreciated as fully as it should be. The circular shape for small reservoirs is not only the safest type of construction from a structural standpoint, but permits also a more economical use of the structural materials. Among the many, and unfortunately only too frequent, failures in reinforced concrete construction, it is rare to note failures of circular reinforced concrete tanks, other than those of badly leaking tanks, due either to poor workmanship, poor design, or both.

One of the greatest advantages possessed by the circular section and not possessed by any other, is the ability to increase economically the great importance in the design of water works improvements. It enables the designer to keep down the first cost of construction by building a reservoir of a size sufficient for the immediate needs. As the water consumption increases, it is possible to increase economically the capacity, and at the same time raise the water level to counteract the increasing frictional losses in the distribution system.

The design of a circular reinforced concrete reservoir appears to be so very simple that the inexperienced designer is apt to create a structure of larger diameter than the application of the simple formula of tank design would seem to warrant. To him there appears to be no ostensible reason why a structure twice the size of one already built should not offer every evidence of strength and stability if designed in accordance with the formula for ring tension—a very mis-

leading deduction. The secondary stresses, which in small structures are insignificant and consequently deemed of too little importance to have attention called to them, increase rapidly with the size of the structure, and only too often limit the size to which any particular type of construction can be adopted. In a circular reinforced concrete tank, the writer has in mind the varying tension from point to point in the steel reinforcement, due to the difficulty of obtaining a true circle in the field. In a small tank this is not so serious, as its effect upon the resultant stresses in the steel reinforcement is slight. To make this point clear, some computations have been made by the writer based on the assumption that in the construction of this type, even with the best of care taken in the field, a variation of a half inch in the middle ordinate of a 10-foot chord is likely to occur.

Radius of Tank.	Variation in Radius of Curvature due to a variation of $\frac{1}{2}$ in. in middle ordinate of a 10-ft. chord.	Range of Tension in Steel Reinforcement.	
		Average Unit Tension, 14,000 lbs. per sq. in.	Lbs.
25 ft.	23.0—27.2	12,850—16,200	
100 ft.	74.9—150.5	5,910—21,100	
200 ft.	120.2—632.0	5,820—44,500	

This table is not made to show accurately the variation in the tensile stresses of the steel reinforcement for the various diameters given. It does, however, give a fair idea of what may be expected in the variation of the ring tension in a circular structure. It points out the danger resulting from carelessness in constructing a circular reservoir more than 100 feet in diameter. For reservoirs of large diameter, however, the economy resulting from the use of a circular section does not obtain to the same extent, and consequently recourse to this type is not so frequent.

The writer's experience would tend to limit the working tension in the steel reinforcement to 14,000 lbs. per sq. in. in a small tank, and to 12,000 lbs. per sq. in. for comparatively large tanks. A reduction in the allowable steel tension for large tanks is recommended, because of the greater range in the ring tension present in the larger structure. It may even be advisable to reduce the allowable unit stresses below 12,000 lbs. per sq. in. to keep within safe limits the excessive local stresses which cannot be avoided.

The variation in the tension of the steel reinforcement from point to point, due to the varying curvature of the shell, makes the use of a reinforcing bar with mechanical bond advisable. The reinforcing bars, for this reason, should also be of as small a size as it is possible to handle economically in the field.

A high carbon steel, with an elastic limit of 50,000 lbs. per sq. in., can be used to great advantage. Another difficulty to be considered in the design of a circular reservoir is the tendency to rupture along the line between the inside wall of the reservoir and the base, due to the expansion of the walls by internal water pressure and the consequent drawing away, as it were, from the base of the tank.

A good example of increasing the capacity of a

circular reservoir is the enlargement of the distribution reservoir for the village of Suffern, N.Y. This village takes its water supply from Anthrim Lake, formed by impounding a branch of the Ramapo River. The water is pumped from the lake to a distribution reservoir located on the side of a mountain to the north of the village, about 180 feet above the average datum of the village. This distribution reservoir, built a number of years ago, is a circular tank, 70 feet in diameter and 10 feet 6 inches deep, sunk entirely into the ground. The walls forming the sides of the tank are two feet thick, and both bottom and sides are constructed of plain concrete. This reservoir has a storage capacity of 266,000 gallons, and cost approximately \$4,000.

The recent growth of the village has made it advisable to double the capacity of this distribution reservoir. The old structure, although massive, nevertheless leaked to a considerable extent, especially in the bottom. It was, therefore, decided to line the bottom of the tank at the same time that the sides were being raised. The reservoir as remodeled has an inside diameter of 69 feet and holds approximately 20 feet of water, giving a storage of 659,000 gallons. The side walls of the old tank are lined on the inside with 6 inches of reinforced concrete. Above the old work the width of the new work is 12 inches, tapering to 8 inches at the top.

The circumferential reinforcement consists of  $\frac{5}{8}$ -in. square corrugated bars, possessing an elastic limit of 50,000 lbs. per sq. in. These bars are so spaced that the average unit tensile stress in them does not exceed 14,000 lbs. per sq. in.

In designing the lining for the old reservoir, it was assumed that the reinforcement would only have to take care of the increased tension due to the additional depth of 10 feet 6 inches. This is a constant quantity with a full reservoir, consequently the spacing and size of the steel in the lining of the old reservoir are uniform. The existing wall is relied upon to resist the hydrostatic pressure that it formerly did. It is not very likely, because of the great daily fluctuation in the water level in this reservoir, that ice pressure will develop to such an extent as to overstress seriously the reinforced concrete shell, and consequently no provision has been made for such pressures.

The bottom lining is reinforced with  $\frac{3}{8}$ -in. square corrugated bars, which have their ends hooked over the lowest reinforcing rings. Vertical  $\frac{5}{8}$ -in. square bars, spaced 3-ft. centers, were used as vertical distributors. Each reinforcing ring is made up of six sections lapped 30 inches and wired. The rings were also wired to the vertical reinforcement at every intersection.

The forms consisted on the inside of vertical sheathing extending the full height of the reservoir, and of horizontal sheathing on the outside.

The thickness of the bottom lining varies from 3 inches to 6 inches, so arranged as to offer better drainage than was obtained in the old tank.

The reservoir was completed October 12, 1911, and filled for the first time to its full depth on

November 11, 1911. No leaks whatever have thus far appeared. The only precaution to render the reservoir watertight, other than that of using a fairly wet concrete, which was mixed in the proportion of one part of cement to two parts of sand and four parts of  $\frac{3}{4}$ -in. broken trap rock, was to wash the inside of the tank with a semi-liquid cement.

The writer wishes to call attention to the comparatively low cost of this work. An increase in the storage capacity of 294,000 gallons was obtained at a cost of \$2,500, the contract price for this work. The location of the reservoir on a steep mountain slope, about 180 feet above the street level, added considerable to the cost of hauling the structural material to the site, and consequently, to the contract price.



COLORED

GLASS

WINDOWS

A layman's pertinent remarks regarding church windows strikes the fundamental art principle in colored glass design.

**T**HE VENERABLE W. Foxley Norris, Archdeacon of Halifax, in a charge to the clergy recently, expressed what every lover of architecture must admit to be very sound views on the insertion of modern stained-glass windows. There appears to be, on the part of very good churchmen who desire to become donors, a very imperfect appreciation of what stained glass is or should be. They do not realize that the making of a good stained-glass window is one of the most difficult achievements that an artist can attempt, that the artist who would succeed must be a perfect master of his craft, a highly technical craft involving the maximum of study and experience before its mastery can be obtained. It is an easy thing to make a pretty water-color sketch of a design for a stained-glass window. It is another thing altogether to translate the sketch into stained glass. The general treatment of the leading is but the first of the problems that the artist has to tackle; he has to deal with translucent color, which is quite a different thing from opaque color he must know the difference in effect of transparent and translucent color, above all he must be perfectly acquainted with the relative mordant action of translucent colors, and of transparent colors. Then he has to exercise infinite patience and perseverance to find the right kind, in texture and tint, of the glass he requires for every particle of the mosaic or jig-saw puzzle of the design he would fain accomplish.

In regard to this Archdeacon Norris says: "I have no hesitation in prophesying that strenuous and probably ineffectual efforts will be made in the next generation to get rid of much of the glass that is being so lavishly and thoughtlessly put in at the present time. It seems to be entirely forgotten that working in stained glass is an art which can only be

attempted without disaster by trained artists and is necessarily very costly. There are very few artists in stained glass and they well know the limitations and the exceeding difficulty of their art. But the demand is general. A supply—of a sort—has arisen to meet it and now cheap, poor stuff is turned out at so much a square foot by dealers in all sorts of ecclesiastical commodities, who find that it is necessary to add a stained-glass department to the rest of their stores, and I do not blame them. The designs sent in are so deplorably bad in drawing and in general conception, that criticism is difficult. There is really no regard whatever paid to the architecture of the church or to the conditions of the atmosphere. There are certain stock windows that can be supplied at listed prices. It does not matter whether it is for a church on an open moor, or in a sunless, smoke-laden slum, whether the church is thirteenth century or fifteenth or early nineteenth—whether there is already too much light or too little. Some kind friend wants to give a window; does not want to spend more than seventy pounds, and sample photographs of seventy pound windows are sent down and selected, and the seventy pounds is worse than wasted. A man of taste, or someone with some little knowledge of the fitness of things comes and looks and says. 'What in the world are the authorities thinking of? Is there no check to these things?' But what check can there be? In the first place, *de gustibus non est disputandum*, and, in the second place, before the design reaches the Archdeacon or the Bishop, the order has been given, and the trade firm which has secured it cannot with impunity be told that they are not equipped for artistic work. It comes very near to libel. I have no panacea to offer, but I do entreat those in authority in the parishes first, to pause and consider; secondly, if they must give way to the colored window demand, to consult their own good taste and judgment, and to give the work to a recognized artist; and thirdly, to remember that it is the most costly kind of work, and they ought not to think of it unless they have plenty of money to deal with. Sometimes this happens: People go to a front rank artist in stained glass and say, 'We want the east window put in and we have got one hundred and fifty pounds.' He answers, 'It cannot be done under twice that sum, I cannot undertake it under four hundred pounds.' Nothing daunted, and meaning to spend their money and no more, they go from one to another until at last the window is put in by some firm which caters for all ecclesiastical furnishings, and in a few weeks there is erected that which will strain the temper and interfere with the devotion of every man of taste who enters that church perhaps for a hundred years."

The Dominion Government has decided to call for competitive designs for the new departmental buildings soon to be built in Ottawa. Details have not yet been arranged, but the competition, if the programme is properly arranged, should be interesting. The cost will approximate six million dollars.

## TRADE NOTES

*BUILDING* statistics for the first four months of the year in four Western cities indicate that there is no cessation in volume of building in British Columbia and Alberta even upon the phenomenal advance of last year. Vancouver reports 1,141 permits, aggregating \$4,958,212, as against 873 permits aggregating \$5,793,650 for the first four months of 1911. North Vancouver reports an almost double increase, the amount for the past four months being \$234,784, against \$173,985 for the same period in 1911. The city of Westminster, B.C., organized its building department in February, 1911, and reported total for the months of 1911 of \$1,124,587. The past four months aggregate \$518,448. Edmonton and Strathcona total a building aggregate for the first four months of 1912 of \$3,384,732, as against \$2,102,770 for the same period last year. Saskatoon is also increasing rapidly, the permits for April alone amounting to \$1,431,600, and the buildings under way include nine business blocks of eight stories or under, five churches, two factories, three apartment blocks, two hospitals, three department stores, one hotel, three schools, and approximately a thousand residences.

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*FORT WILLIAM* development is increasing rapidly, the total building permits for the past four months aggregating \$1,227,775, as compared with \$413,310 for the same period last year. The general growth is indicated by the changes that are being made in the original plans for the development of the Kaministiquia River by the Dominion Government. The harbor engineer states that dredging will now be made on the bank opposite the Canada Iron Corporation Works, and thirty-five acres will also be taken of the Grand Trunk Pacific property at the turning basin. The former plans allowed for the river to be slightly straightened, and the work thus changed lays out a great deal more work than had been originally intended. This will be only the beginning of greater development on the upper portion of the river. The Kaministiquia River can easily be made navigable for about two miles above the point mentioned. It will only be a matter of time before further work will be necessary to suit the industrial development. Already dredging operations have begun on the McKellar River, which will be dredged to a width of 400 feet, and a depth of 30 feet.

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*DURING* the past month one of the Enamel Concrete Company's machines has been installed and is being operated successfully by the Canadian Enamel Concrete Brick and Tile Company of Winnipeg. Mr. D. C. Cameron, Lieutenant-Governor, is the president and large stockholder of the company, and the other officers and directors are prominent Winnipeg people; and the company has a capital stock of \$250,000. Mr. Stehm, the inventor of the machine, is now in Winnipeg and negotiations are under way for the establishing of another plant at Vancouver. The Enamel concrete machines are

being used at Salt Lake City in a twenty story bank and office building of which the exterior walls are up now to the twelfth story, and are also to be used in a very large school building there.

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*IN ORDER* to give better attention and meet the demands of their largely growing trade in the West, the Pease Foundry Co., Limited, of Toronto, have recently formed a subsidiary company in Vancouver under the title of the Pease Pacific Foundry, Ltd., with head offices at 324 Drake street, Vancouver, where a large stock will be kept, so that prompt deliveries can be made. The officers of the company are: President, D. J. MacKinnon (also president of the Pease Foundry Co., Toronto, and of the Pease-Waldon Co., Winnipeg); vice-president, Jas. Gill; secretary-treasurer, T. B. Medforth (formerly chief accountant, Pease Foundry Co., Toronto); sales manager, Wm. Crane (formerly superintendent, Pease Foundry Co., Ltd.). All British Columbia business will be transacted by the Vancouver company.

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*THE EXECUTIVE* offices and New York show rooms of the H. W. Johns-Manville Co., manufacturers of asbestos, magnesia and electrical supplies, were moved on April 20th to the new twelve-story "H. W. Johns-Manville Building," Madison avenue and Forty-first street, New York city, from their old quarters at 100 William street, where they have been located for the past fifteen years.

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*INSTALLATION* of one of the complete brick-yards in Western Canada is being accomplished at Portage la Prairie with P. Whimster president and manager, and Roy Marlatt, of Vancouver, secretary-treasurer. The machinery was made by the Raymond Manufacturing Company at Dayton, Ohio. A dryer, worked by steam, will take the place of the ordinary racks and will have a daily capacity of fifty thousand bricks.

## ARCHITECTURAL FIRMS

*ARCHITECT* J. A. Harvey, Toronto, has removed his offices from the Manning Chambers to 164 Bay street.

*ARCHITECT* E. R. Conlan, of Toronto, has removed from 155 Queen street west to 802 Lumsden building.

*GLADMAN & GLADMAN* is the name of a new Toronto firm which has opened an office for architectural practice at 2 Toronto street. The members are C. R. A. Gladman and V. L. Gladman, both former residents of Lindsay, Ontario. The former is a graduate of the School of Architecture of Harvard University, and has recently been identified with Frank Eaton Newman, one of the rising practitioners of the younger generation of New York architects; while Mr. V. L. Gladman is a graduate of the School of Architecture and Engineering, McGill University, Montreal, and until recently was with Carrere & Hastings of New York.



# Barrett Specification Roofs

## On the "Concrete City"

**I**N the illustration below the Turner Construction Company, of New York has brought together in a scale drawing an accurate representation of most of the important modern concrete buildings which they have erected during the past nine years, at an approximate cost of \$12,000,000.

It is an imposing display of best types of modern construction—"a concrete city" indeed—scientifically designed for maximum service at minimum cost and minimum maintenance.

It is significant that 95 per cent. of the entire roof area is covered with this type of roofing. The figures are as follows:

Barrett Specification type of Roofs	1,490,523 sq. ft.
Plastic Roofings	14,714 sq. ft.
Slate Roofings	21,640 sq. ft.
Tile Roofings	5,619 sq. ft.
Ready Roofings	38,381 sq. ft.
Copper Roofings	6,355 sq. ft.
All other kinds	7,448 sq. ft.

It is important to remember that while all these buildings were constructed by the Turner Construction Company, the specifications were drawn by a large number of architects and engineers.

Barrett Specification Roofs were almost unanimously selected for one reason only, namely, that they would give **better** service at **lower** cost, than any other roof covering.

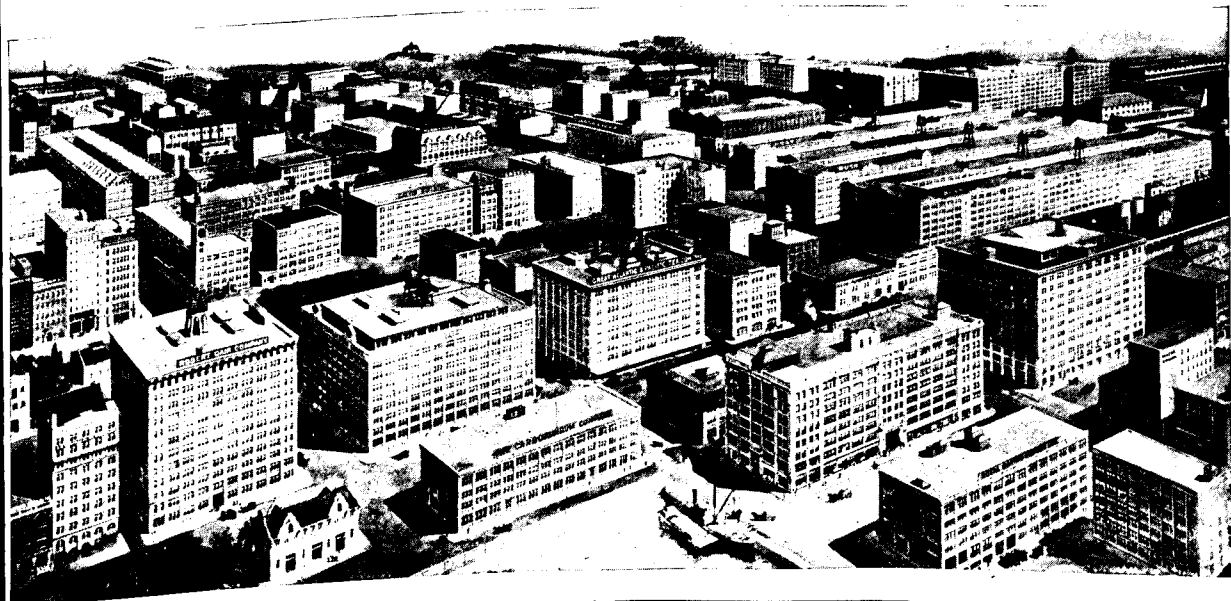
Barrett Specification Roofs require no painting or similar attention—in other words, there are no maintenance costs. They will last upwards of 20 years without any care.

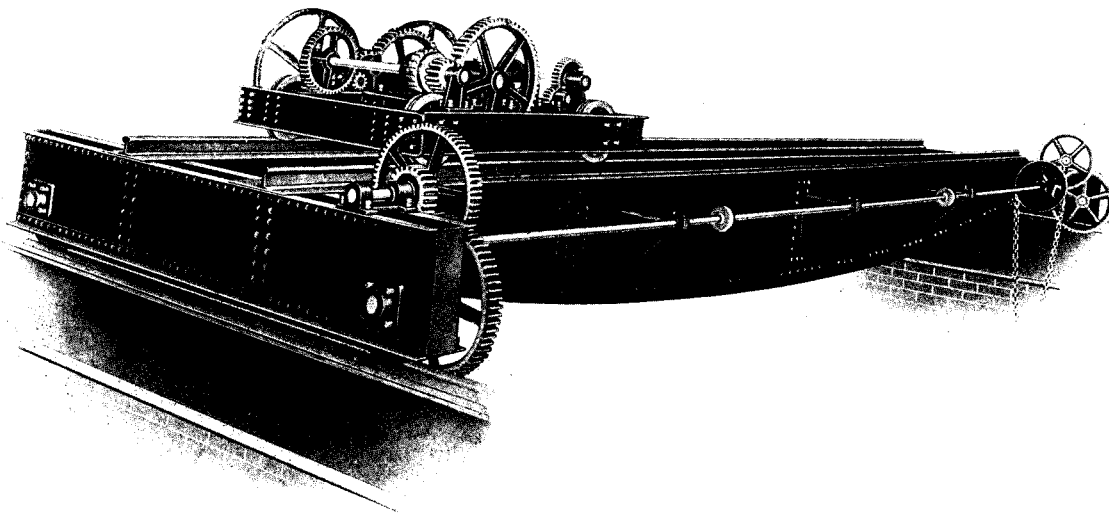
The superior economy of Barrett Specification Roofs justifies their adoption not only on big first-class concrete buildings, but on every flat roofed building from a tenement to a skyscraper—from a small mill to a modern manufacturing plant costing millions—but be sure it's a real Barrett Specification Roof—and the only way to be sure is to incorporate The Barrett Specification in full in your plans.

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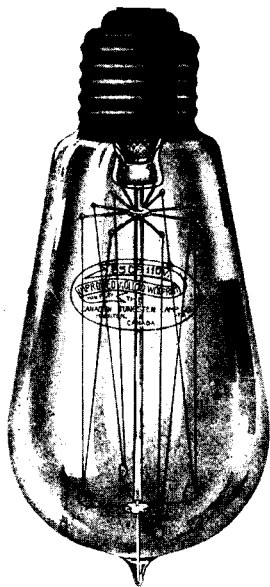
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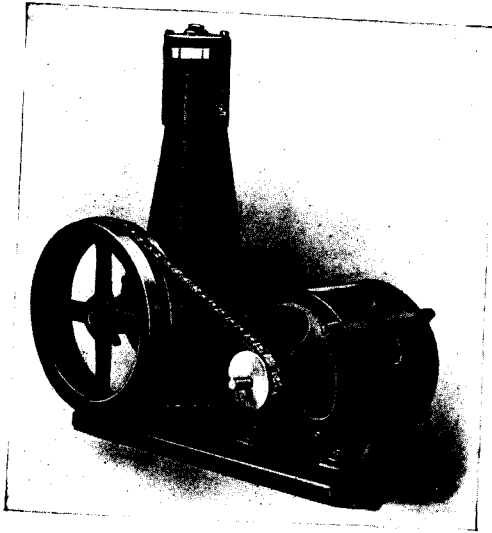
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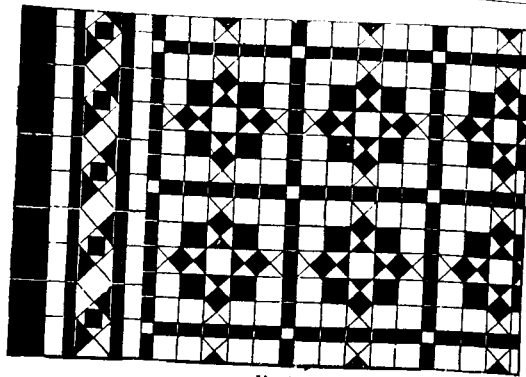
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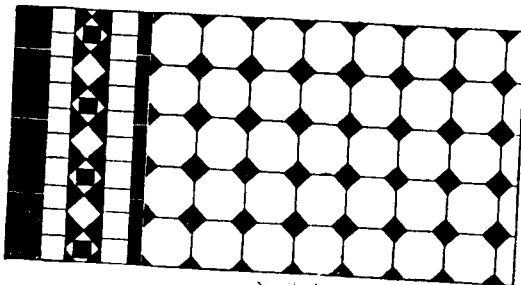
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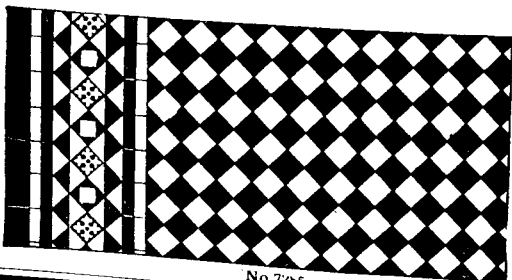
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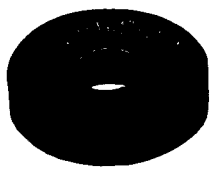
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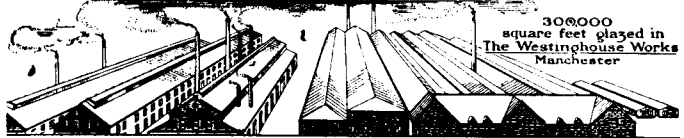
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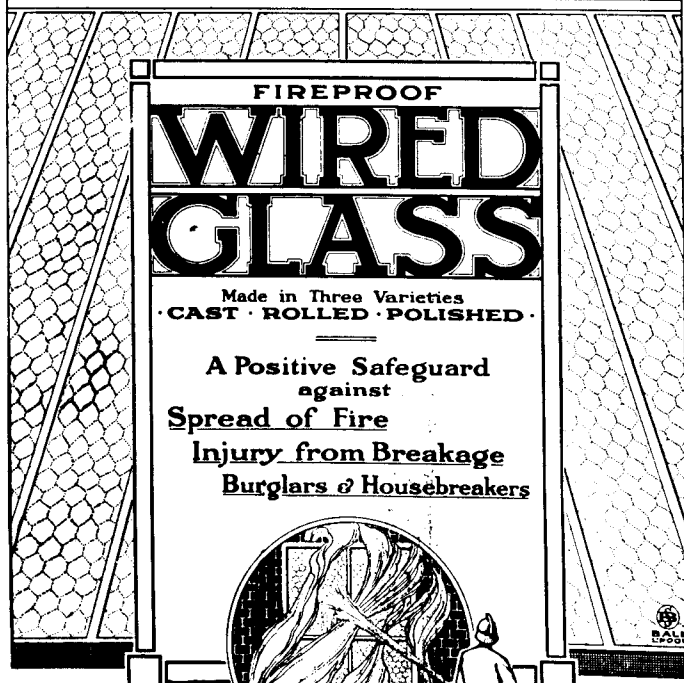
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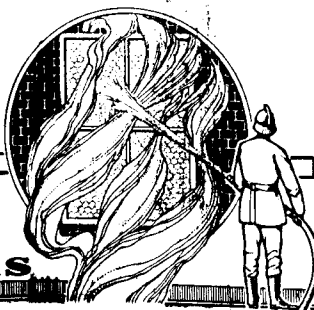
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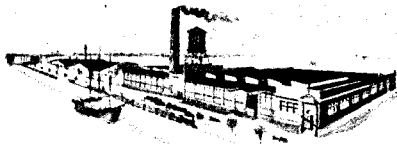
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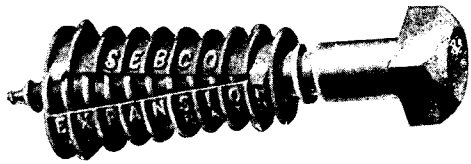
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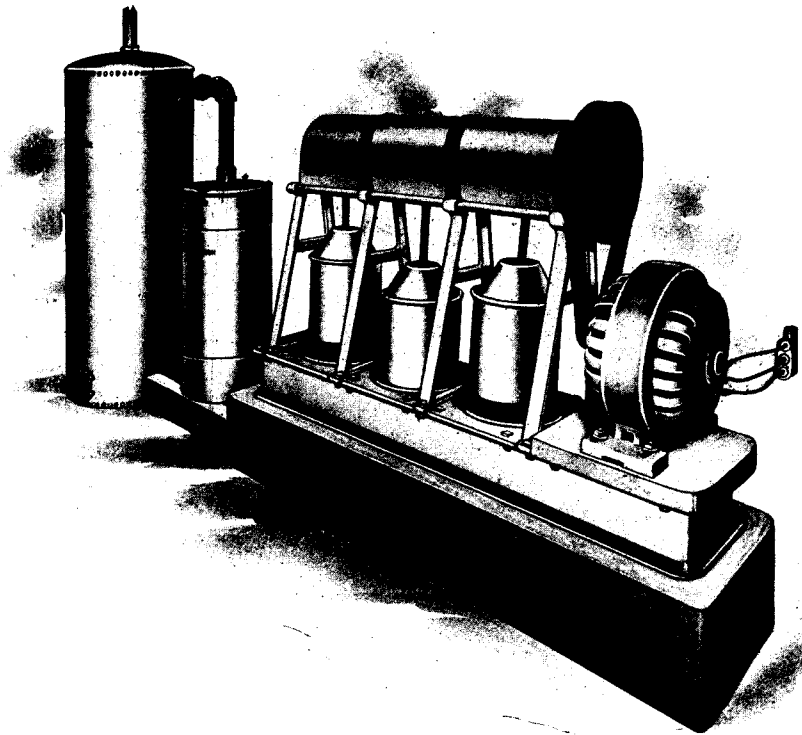
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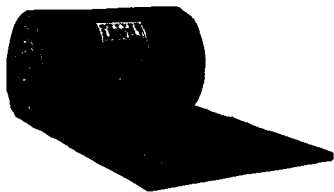
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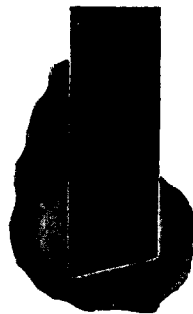
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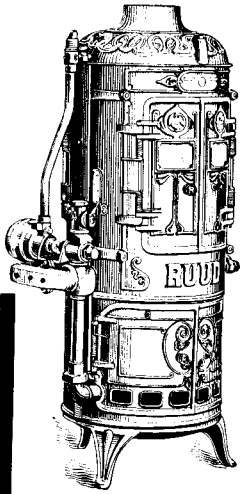
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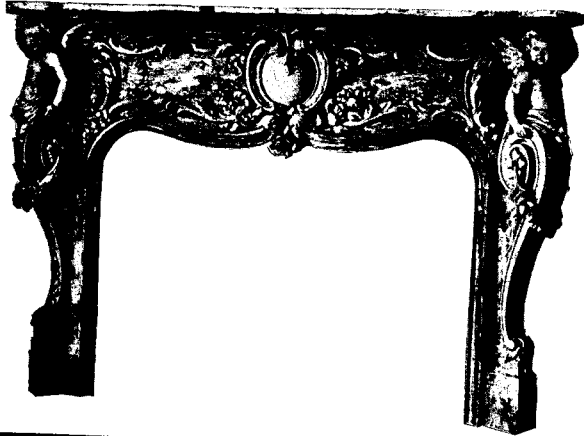
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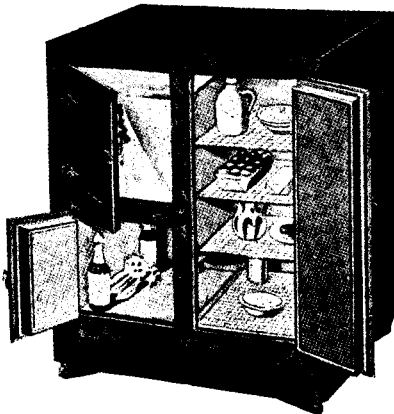
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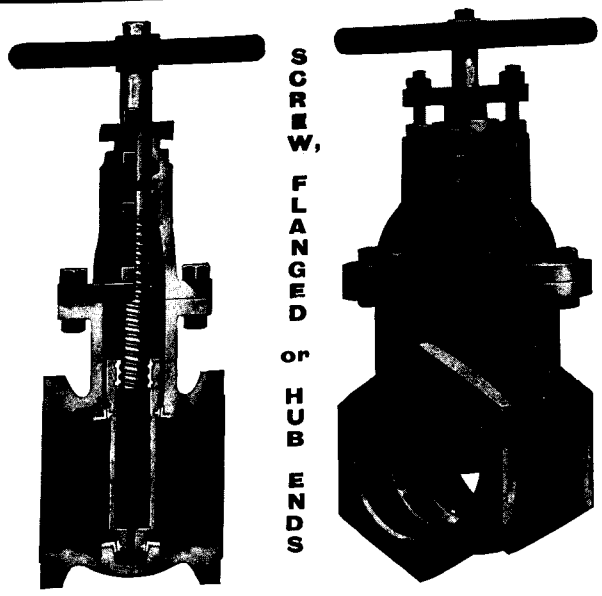
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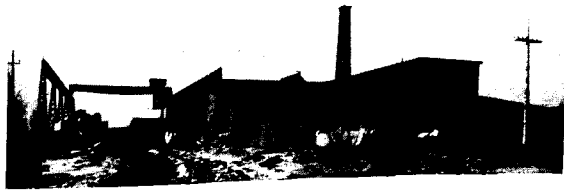
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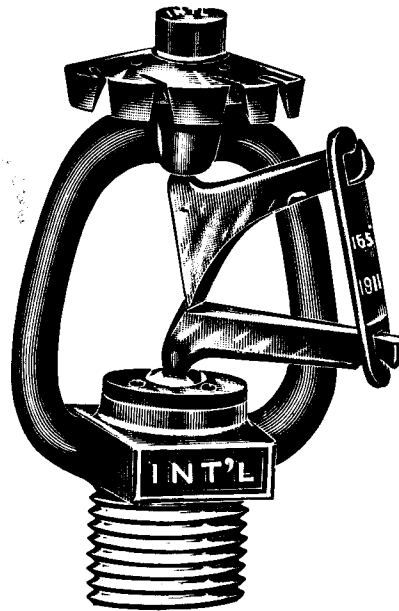
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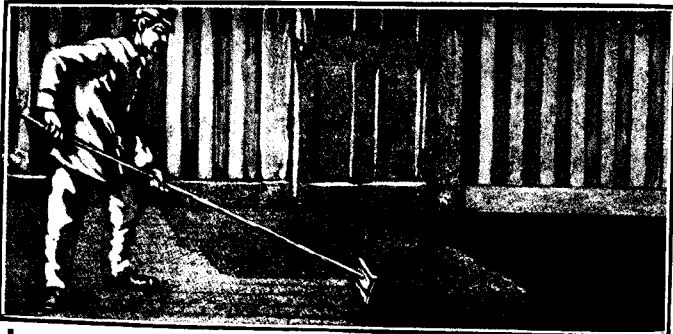
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- Tile (Floor and Wall). Carter & Co., Ltd. Waite-Fullerton Co., Ltd. E. F. Dartnell. Smith Marble & Construction Co. Asphalt & Supply Co.
- Vacuum Heating Systems. C. A. Dunham Co.
- Varnishes. Ault & Wiborg Co. Berry Bros., Ltd. Brandram & Henderson. International Varnish Co. Metal Shingle & Siding Co.
- Vaults and Vault Doors, Fireproof and Bankers. Goldie & McCulloch Co., Ltd. J. & J. Taylor.
- Valves. C. A. Dunham Co. Steel & Radiation, Ltd. James Robertson Co. Kerr Engine Co. Taylor-Forbes Co. Canadian Fairbanks Co., Ltd.
- Ventilators. Sheldons, Limited Metal Shingle & Siding Co.
- Wall Finishes. E. F. Dartnell. Berry Bros. International Varnish Co. Brandram & Henderson.
- Wall Hangers. Taylor-Forbes Co.
- Waterproofing. E. F. Dartnell. Ideal Concrete Machinery Co. Mussels, Ltd. Ault & Wiborg Co. Bird, F. W. & Son, Hamilton. Eadie-Douglas, Limited. Stinson-Reeb Builders' Supply Co. R. I. W. Damp Resisting Paint Co. Glidden Varnish Co. Johns-Manville Co., H. W.
- Waterworks Supplies. James Robertson Co., Ltd. Kerr Engine Co. Mussels, Ltd. Standard Ideal Co., Limited Phillip Carey Co.
- Wheelbarrows. Mussels, Ltd.
- White Lead, Putty and Oils. International Varnish Co. Brandram & Henderson. Glidden Varnish Co.
- Window Guards. Dennis Wire & Iron Co., Ltd. Steel & Radiation, Ltd. B. Greening Wire Co. Limited
- Wire Rope and Fittings. B. Greening Wire Co. Limited Mussels, Ltd. Otis-Fensom Elevator Co

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