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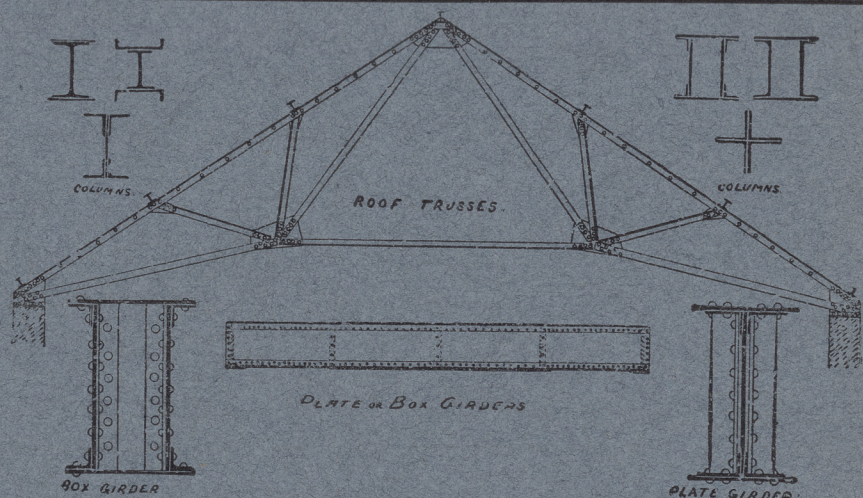
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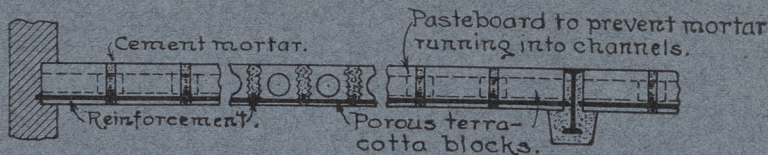
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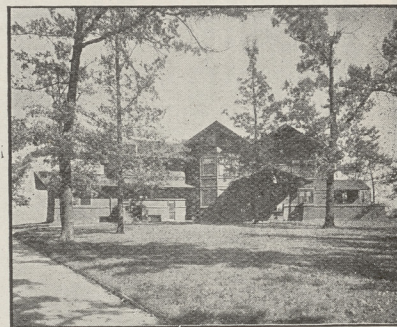
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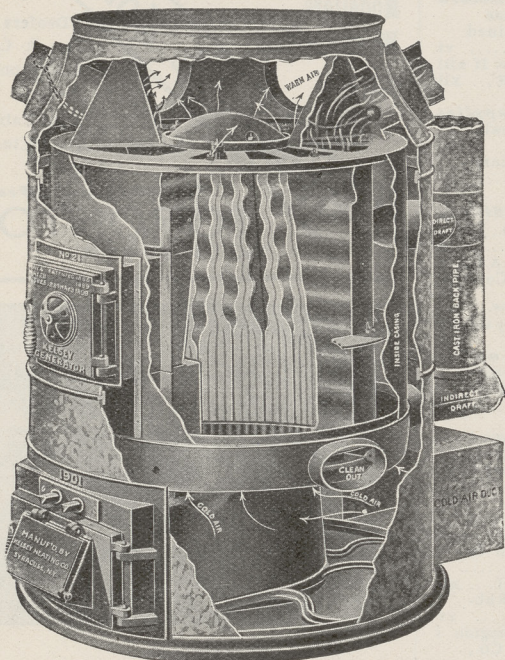
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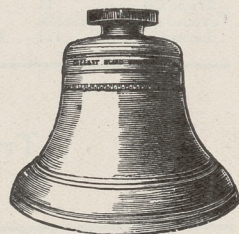
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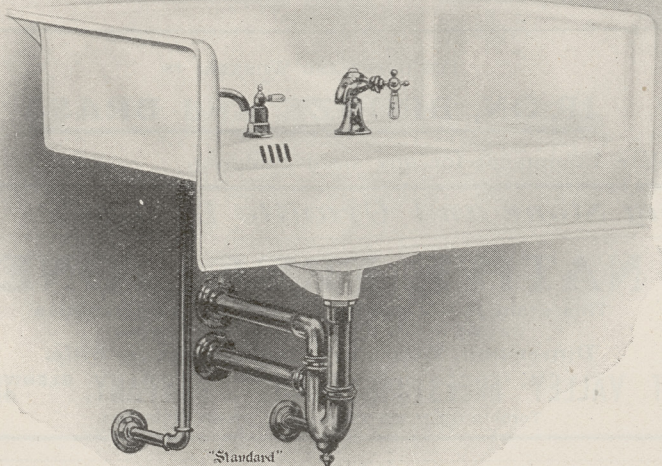
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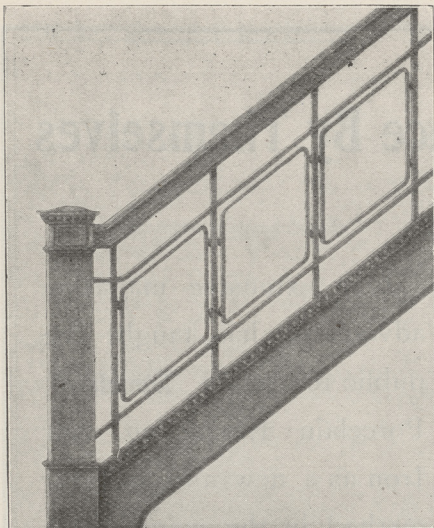
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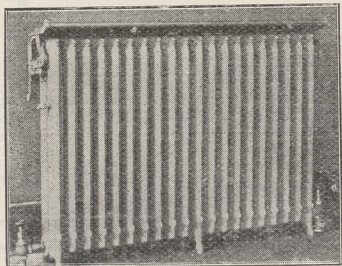
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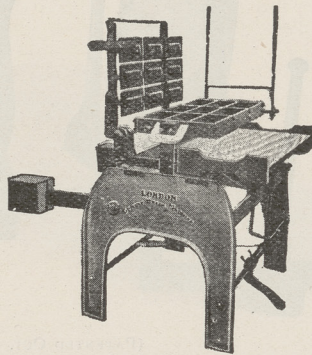
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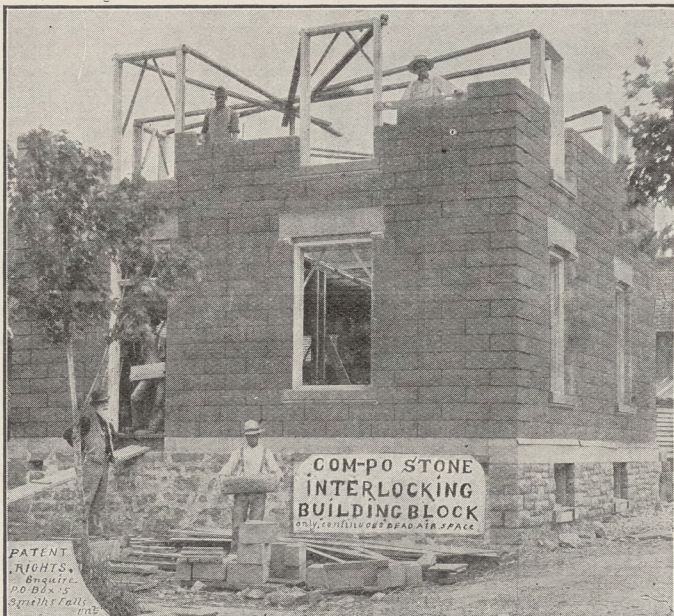
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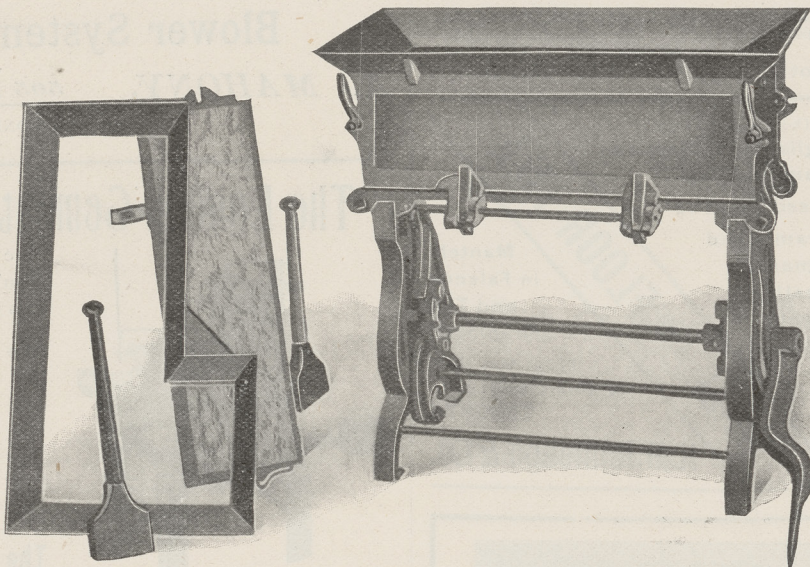
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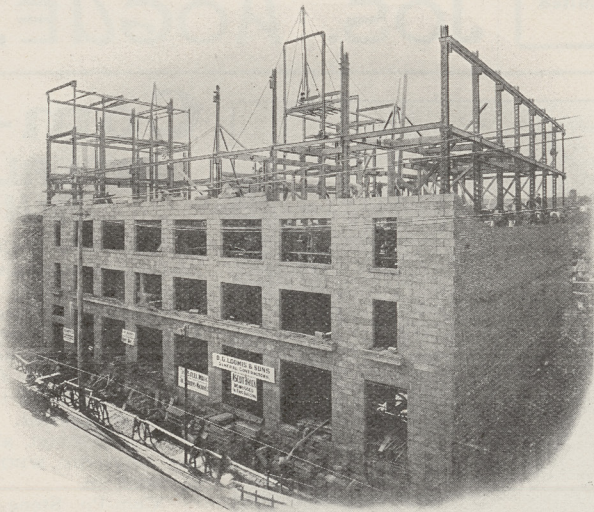
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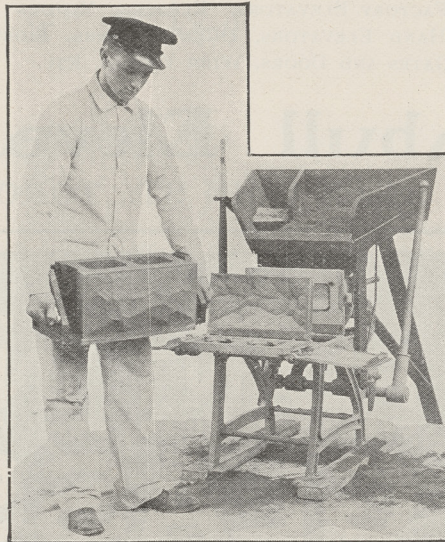
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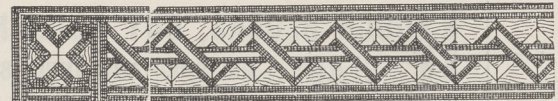
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VOL XX.—No. 233.

MAY, 1907.

ILLUSTRATIONS.

CANADIAN ARCHITECT AND BUILDER Competition for a Farm House.—Design by "Wood"

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Three Typical Canadian Carnegie Libraries, Ottawa, Lindsay and Paris, Ont.
The Old Church at Tlalpam, Mexico.

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Housing Canadian Workmen.

That there is congestion in the house market and particularly so in that class of houses suitable for workingmen, not only in Toronto, but in almost every progressive city and town in Canada, is a fact that cannot bear too frequent repetition. In the track of our phenomenal industrial development follows this difficulty of housing the artisan, a question which cannot go much longer without serious consideration. In Toronto and Hamilton the matter is receiving the attention it merits, and before the close of the present building season some definite steps will have been taken toward a solution of this very important problem. No half way measures can be considered, as now at the opening of the building season the danger of a house famine and consequent depression of trade must be encountered. With the great expansion in our export trade must be coupled the requirements for home consumption, owing to the increase of population, supplemented by the tide of immigration seeking to develop our vast Western territories. Obviously, a city is under a great disadvantage in its endeavor to secure new industries when it is unable to provide homes for its workmen. It is the city at large and the manufacturers particularly who will benefit by the proper housing of the artisan.

The question now arises as to who will best deal with this matter. The ordinary investor as yet fails to realize any prospect for safe returns in any extensive project of this nature, and, consequently, as in the case of the International Harvester Company at Hamilton, the manufacturer himself must turn in and build houses for his employes. His business and plant is continually increasing, and it would be at least an indirect benefit to himself to have dependable

workmen permanently and comfortably housed. The first requisite is to have the workman understand that no attempt is being made to compel him to shoulder a financial burden which will be oppressive for years, but that he is being placed in a position to purchase a home for himself, not on a charitable but on a legitimate financial basis.

That there is money in the project for the investor seems indisputable. An International Harvester Company's representative is credited with the statement that he would guarantee a return of 20 per cent. on an investment of \$200,000 in workingmen's houses in East Hamilton, and that 200 small residences could be sold within the next six months in that city.

It seems probable that Canadian efforts along this line will, for the present at least, be confined to the construction of small and comparatively cheap dwellings that will command a ready sale. Tenements have their advantages as well as disadvantages. In the first place, they must be built by moneyed investors, who expect to hold them for rental. Apartments in them cannot easily be sold. On the other hand, in congested city districts, where land is valuable and small families require only limited quarters, they may serve a useful purpose, and Toronto may yet have to face the tenement problem, which is not by any means new to the old world countries nor to the United States. In the latter country, a general alteration of the tenement house law is contemplated in a series of bills which have been lately introduced into the Assembly at Albany.

In England, instead of "Workingmen's Houses," "Dwellings for the Poor" is the usual phrase employed, and there it presents one of the most difficult problems of the day. The attempts of the London

County Council to provide dwellings for workmen upon a self-supporting basis have been a conspicuous failure. Their tenements are either let to a class of tenants superior to those for whom they were intended, or they are not let at all, and the financial return presents a delicate problem. This question has not been grappled with in England as it should have been, and when any alteration of the Building Acts is discussed the idea of making operations cheaper by scientific attention to details is usually overlooked, and the whole trend of proposed alterations is towards increase of cost. Architects realize that it is much more difficult to plan convenient dwellings, fitted with modern conveniences and sanitary arrangements upon a very small scale than upon one where the size of the rooms is not severely limited, but it is sometimes not recognized that these pinched plans, applied to large blocks of buildings, result in structures which have an excessively large factor of stability, an excessively large waste of space by reason of thick walls, and a consequent unnecessary costliness.

A singular universality attaches to the housing problem in the commercial and industrial centres of the older Provinces of Canada, a condition which can not be likened to anything at present existing in Britain or the United States. The fact of the matter is that Canadian workingmen cannot find decent houses either for rent or for sale at reasonable figures. Builders are doing little to remedy the trouble as yet, because no definite plan has been decided upon that seems to embody the necessary features of stability, utility and cheapness. A pleasing feature of the present condition is the manifest dislike of the Canadian artisan to be housed in tenements and apartment houses. He appears to appreciate too much the privacy and seclusion of a private home, a characteristic which should be given every legitimate encouragement.

Here, apparently, we have a problem where labor and capital may meet on common ground, and the outcome will be important.

Architects' Competitions.

At the present time there is much being written in American architectural journals anent the question of competitions, and opinions on the matter seems fairly equally divided. In every competition there can be but one man made happy, all the others being more or less convinced that injustice has been done them, and, so long as human nature remains imperfect, competitions, in whatever line they may be, can never bring unmixed joy to all competitors. It has been argued that select competition is but a trifle better than direct selection, and that limited local competition savors of trades unionism. This, it is said, ensures that mediocrity will be the order of the day, and that paid competition tends toward creating an aristocracy in the profession. This result scarcely follows. There are competitions and competitions.

The competition for designs for the proposed Departmental Buildings at Ottawa appears to be arousing unusual interest among Canadian architects. Plenty of opportunity has apparently been given prospective competitors to inform themselves thoroughly as to the proper interpretation to be put upon the conditions and also to make any suggestions which in their opinion would render the competition more popular. To give all competitors an equal chance the time limit

for offering designs has been extended to July 1st. The prizes offered are sufficiently large to induce the best architectural talent in Canada to compete, and an unusually creditable display of designs seems likely to ensure a difficult task for the judges in awarding their decision. It is announced that all the designs will, with the permission of the authors, be placed on public exhibition after the selection has been made.

The call for plans for the new building for the International Bureau of the American Republics is one which apparently is being conducted in all fairness. Ten architects of known repute are invited to submit plans and are guaranteed \$1,000 each for their trouble. A general invitation is then extended to all other architects, of whatever professional rank they may be, to submit plans, with equal chance of acceptance if their work possesses sufficient merit.

Surely such competitions as these, conducted under such conditions, are quite legitimate and, while giving the entire profession a chance to compete, take care that the best architectural talent will furnish a standard that must aid the judges in making their award.

Announcement has recently been made of another important competition which is being conducted along similar lines by the London County Council for the erection of a new city hall and offices on a site of about five and a half acres on the east bank of the Thames. The competition will be divided into two stages, the preliminary and the final. The preliminary competition will be open to architects of any nationality and not less than ten and not more than fifteen of the designs will be selected by the assessors. The final competition will be open to the authors of the designs selected by the assessors in the preliminary stage, and eight architects who have been specially invited by the Council. R. Norman Shaw, R.A., and W. E. Riley, F.R.I.B.A., the architect of the Council, will act as assessors in both stages, and the competitors in the final stage will vote for the third assessor. Each of the competitors in the final stage will be paid twenty pounds.

Point is given the contention of some opponents of architectural competitions that they tend toward creating an aristocracy in the profession because of the fact that the expense of getting out elaborate plans often prevents promising talent from competing, and leaves the field open to those who are able to carry a large force of assistants and hence can get out plans with comparative ease. This phase of the question is receiving some attention in Philadelphia, where the legal status of the "notice to architects" sent out by building committees, inviting the profession to enter drawings in competition, will shortly be established, in a degree at least, by the suit of Rankin, Kellogg and Crane. This firm was one of the competitors selected by the Board of Education of Philadelphia when it was decided to secure a design and plans for the new Manual Training and Commercial High School. The competition was held and the Board rejected all plans and returned them, subsequently appointing another architect. The complaining firm seek to recover the amount of fees that would have been accorded to the architect winning the competition, and also an equal sum which the firm estimates as the value of the opportunity to compete. In setting aside the competition it is claimed that the Board of Education violated the agreement that was supposed to have been made by the competition circular, announcing that the successful competitor's plans would be accepted.

Strict adherence to the announced conditions of a competition must always be adhered to, if it is to produce satisfactory results. On the whole, the principle of competitions seems particularly well suited to the architectural profession, provided that they can be conducted on conditions that will ensure equal opportunities of acceptance to all classes of architects, irrespective of professional standing or past achievements.

BUILDING CONSTRUCTION AS AFFECTING INSURANCE RATES.

A matter on which there should, theoretically, be no diversity of opinion between the Canadian Fire Underwriters' Association and Canadian architects is that of fireproof building construction. That such is scarcely the case at the present time must be admitted. However, in view of the marvellous strides that are continually being made in building construction, unanimity of opinion can scarcely be possible. The fire underwriter, oblivious to architectural beauty and intent on absolute conformity to a stern code of rules which time has established as being absolutely necessary in protecting a city from fire, finds it impossible to see eye to eye with the cultured architect, whose aesthetic sense often blinds him to the need of adhering as closely as he might to established principles for guarding the public safety.

In Canada the underwriters have found it impossible as yet to lay down an absolute standard of regulations for fireproof building construction, and, in consequence, every building is rated by comparison with others which more or less nearly approach it in design. However, there is a standard of requirements published for mercantile risks. According to this standard, buildings may be of three classes: Factories of ordinary construction, factories of slow burning or mill construction, and fireproof buildings. What these terms imply is pretty generally understood by architects and contractors generally. What requirements must be observed to enable a building to be rated in either of the two latter classes is likewise a matter of common knowledge. More and more, builders of expensive structures are paying attention to the opinions of the fire underwriter, and are asking their architect to prepare his plans in such a way as will entitle them to the most favorable rate possible. Instances are not rare in Toronto where annually thousands of dollars are being spent needlessly in fire insurance premiums, because of slight and oftentimes unnecessary departures from the code of the underwriters, a little attention to which would have resulted in better buildings and greatly increased revenues.

That the time is at hand when the underwriter and architect will no longer have the old grounds for dispute seems probable, in view of the fact that methods of fireproofing buildings have at last advanced beyond the primitive stage of semi-opaque windows and iron shutters. For the heretofore sole remaining vulnerable parts of a building, such as door and window openings, wire glass and metal sash are now provided, the former as transparent and as neat in appearance as the costliest plate. In this connection, the recent tests of Professor Woolson, the fireproof expert of Columbia University, have established beyond doubt the practical value of wire glass as an absolutely fireproof material. Professor Woolson has kept samples of this material heated up to 1,700 degrees Fahrenheit for half an hour at a time. At the first rush of heat the glass crackles, but the netting holds it together and flame cannot pass through. It will hold flame up to the melting point, which is different in various kinds of glass, some melting at 1,000 degrees and others standing 2,000 successfully. When a stream of water is turned on wire glass that has melted almost to the running point, it immediately solidifies, so that it is a material well suited for elevator shafts, where a sudden rush of flame would crack ordinary glass and admit fire to all floors.

The continually growing favor with which reinforced concrete is being regarded by architects for fireproof building construction makes it necessary that some common understanding should at once be reached with the underwriters regarding it, whereby builders of such structures might be reasonably certain of securing the best passing rates. The question is frequently being asked how it is that reinforced concrete should not have any specified advantages in the matter of insurance rates, such structures when properly built with suitable concrete aggregates, and

with the metal properly protected, being obviously safer insurance risks than any other class of building. The answer to this question lies in the fact that the mere provision of a reinforced concrete structure does not affect the insurance question solely, but that in many other points, thickness of walls and floors, position and construction of stairways and elevators, windows, lighting, heating, etc., the requirements of the fire underwriters must be observed.

It seems, of course, most regrettable, from the building owner's point of view, that, having erected what he considers a building worthy of the best possible insurance rates, he should find himself compelled to pay the same as his neighbor, who has buildings with unprotected steel joists, or, as it is generally called, old-fashioned "fireproof" construction. The fact of the matter is the insurance companies prefer unprotected steel joists, because they know exactly where they are from the fire insurance point of view, a knowledge which they cannot have in the case of reinforced concrete, concerning the exact composition of which they are uncertain.

As a matter of fact, insurance companies encourage good reinforced concrete construction, and they were among the first to recognize its advantages if properly installed, from a fire-resisting point of view. At the same time nothing can be more dangerous in a great conflagration than such a structure, in which the necessary precautions have not been observed. Of "poor" reinforced concrete the best that can be said to its advantage is that the material used is incombustible, but incombustible material is not synonymous with fire-resisting construction. In fact certain incombustible materials are a distinct source of danger as, for instance, the steel bar and steel joist, if not properly applied.

At New York recently, Mr. Edward T. Cairns, chairman of the Committee on Fireproofing and Insurance of the National Association of Cement Users, said in his annual report:—

"In the hollow block line there have been no actual fires of importance in buildings of this construction, so far as your committee have learned, but several tests have been conducted by various parties, all of which tend to confirm the views expressed in last year's report to the effect that concrete, properly made and applied, is an excellent fire-resisting material for certain uses, but has limitations which preclude its being properly classed as absolutely 'fireproof.' Tests such as have recently been reported in the press by Mr. Somerville, of the Washington Building Department, and others, demonstrate beyond doubt that hollow block will surely break apart from unequal expansion of the different sides if subjected to a very serious fire, and therefore such blocks are not suitable for 'fire walls' or for any part of a building which, by reason of its size or contents, may develop a fire of high temperature, or, particularly, of long duration.

"Other experiments, involving fire of shorter periods or lower temperature, have developed this weakness, and indicate that under conditions of comparatively mild exposure, hollow blocks may be reasonably safe. Just how much fire they will stand in point of temperature and time is yet to be determined, and, we anticipate, will be ascertained in the tests now in progress by the Government Laboratory, under Mr. Humphrey, and the Underwriters' Laboratory at Chicago. We shall be disappointed if considerable of this data is not produced during the current year."

It must therefore be impressed upon Canadian architects, entrusted with the designing of factories and warehouse buildings, that they bear in mind the safeguards necessary for reinforced concrete construction, which, if carefully considered before the work is started, will mean not only a substantial economy to the building owner in insurance rates, but also ensure him a more desirable class of tenants and increased revenues.

Modern Steel Buildings*

BY MR. JOHN M. EWEN, M. AM. SOC. C.E.

(Continued from April number).

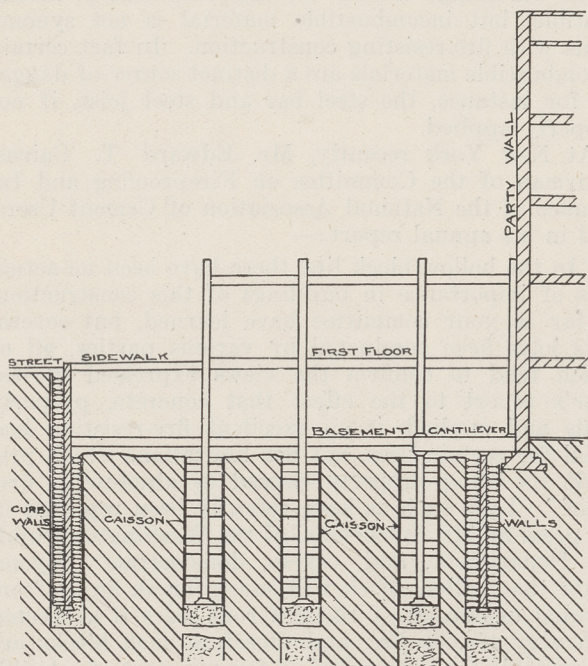
Let us now go back to our own building. The wrecking contractor has removed the old building. The foundation contractor has dug the caisson wells and has filled them with concrete. We now have our concrete columns on which to rest our steel columns, and we are ready to go ahead with the erection of the building.

Meanwhile the core of earth, where the basements will be, is still in place. We have saved a good deal of time by letting it stay there and by getting the caisson wells dug and filled first. If we had spent our time excavating we should not be able to begin on the steel work till late in the season and then the cold weather would come on and the men would be subjected to hardships and the work would be delayed. Now, however, we shall be able to get all the outside work done during good weather, and by the time winter comes we shall have the shell of the building completed and we shall be able to turn some steam on

and merchandise and mail and express matter, and anything else that can be transported in a bore of this diameter. To a considerable extent it is intended to relieve the congestion of teams on the streets above.

In order to get down to the tunnel a building must have at least a third basement. Then it can receive its coal and get rid of its ashes and do a lot of other work without cluttering up its sidewalks or its back doors.

Altogether aside, however, from the advantages con-



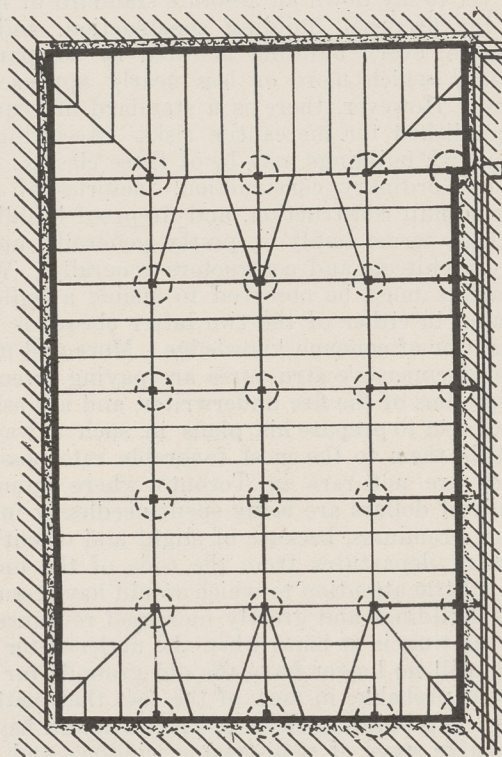
FIRST FLOOR AND BASEMENT FLOOR BEAMS IN; EXCAVATION IN PROGRESS; SUPERSTRUCTURE GOING UP.

while the plasterers and decorators are finishing the interior

Meanwhile we can do our excavating at our leisure and we can go as far down as we please and put in as many basements as we desire.

It is coming to be customary to go forty feet downward in Chicago and to have three or four basements.

Deep basements have become very desirable in Chicago ever since the freight tunnel was built. This tunnel is forty feet below the street level. It is about seven feet in diameter and fifty miles long. It runs underneath practically all the streets of the downtown districts and it extends south to about Archer avenue, west to about Halsted street and north to about Chicago avenue. It is designed to carry coal



PLAN OF FLOOR BEAMS AS USED IN BASEMENTS.

nected with a freight tunnel, it seems likely that the buildings of the future will have a great many basements. Land is so valuable in the heart of a great city that as we have been forced to go upward instead of spreading out, so we shall also be forced to go downward.

Using the methods we have already described, it would be perfectly feasible to construct a building with eight of its stories underground. Such a building could be lighted by means of an interior court, extending all the way from the top of the building to the bottom of the lowest underground story, if desired. From the engineering standpoint, there is practically no limit to the height or depth of a building. That is, of course, within reason. When you have caisson foundations, resting on bed rock, you have a basis on which you can construct twenty, thirty, fifty or sixty stories without danger. The real limit is the financial willingness of the owner to pay for the expense of carrying on building operations at so great height, and the personal willingness of the tenant to put in his time traveling from the fiftieth story of one building to the fiftieth story of another. The speed of the elevator service here becomes an important consideration. Such matters,

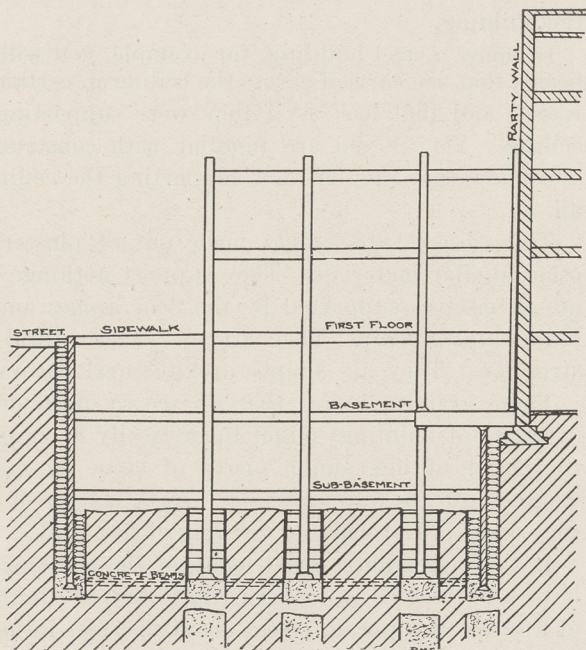
* Paper read before the Engineering Society of the School of Practical Science, Toronto, and reprinted from the Transactions by permission.

however, are not directly connected with the actual feasibility of erecting high structures. Such structures can be built. And they can also be extended as far downward into the earth as is financially desirable.

Already there have been successful experiments in this direction. The Criterion Theatre in London is an underground theatre. The floor of the Criterion Restaurant forms its ceiling. The theatre is entirely underneath the restaurant, and the restaurant is at the street level. This is an extreme case. But it might frequently be desirable to build a theatre with its first balcony at the street level. One advantage of this plan would be that in case of fire the people in the second balcony would have a better chance to get out. They would be one story nearer the ground.

Let us now return once more to our new building. While the basements are being excavated, the steel contractor is getting his columns erected and is starting the building on its upward course.

Meanwhile the other contracts have most of them been awarded. The brick, the granite, the terra cotta, the ornamental iron, the elevators, the boilers, the electric wiring, the rubber mats, everything goes under contract. In quarries and in foundries and in factories the materials that are to go into our buildings are being dug and shaped and burned and moulded and rolled and pressed and stamped and tested and prepared for shipment. In addition to the engineering plans, we now have shop plans, which go to the places where the materials are being made ready. Each piece of steel or iron or granite or terra cotta arrives clearly marked or numbered, so that the workmen will know just where to put it. These workmen are

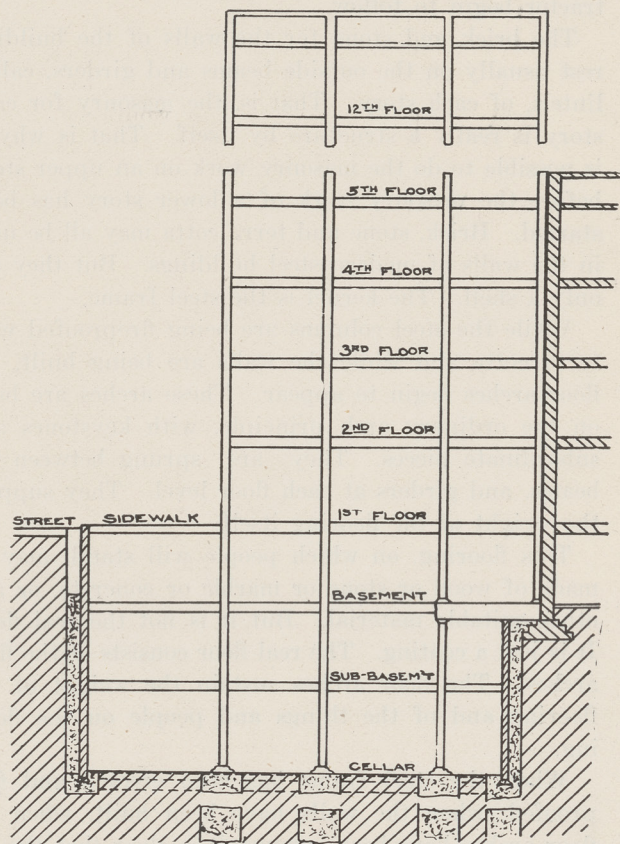


SUB-BASEMENT BEAMS ALL IN; STEEL OR CONCRETE BEAMS BETWEEN SIDE WALL IN CELLAR.

employed by the contractors. The contractors have foremen who are in direct charge of the work. It is the business of the engineer constructor to watch the contractors and their foremen and their workmen and to see that they work harmoniously and that they finish their part of the job on schedule time. The engineer constructor tells them on what day they are each of them to begin and on what day they are each

of them to finish. He provides them with a schedule, showing at just what stage of progress they ought to arrive on certain successive days. The engineer constructor, therefore, has his representatives on the site of the building every day. He is responsible to the owner for the accomplishment of the work, and the owner deals with the contractors through him.

In speaking of the engineer constructor in this way we are assuming that both the architect of the building and the consulting engineer are in the same business organization, or that they work together as a unit. If, however, the consulting engineer and the architect come from separate offices, then both of them keep representatives on the job, and frequently visit it in person. Whether they are personally associated



STEEL FRAME COMPLETED.

in the same firm or not, they, after all, represent the same idea. That is, they furnish the technical skill and knowledge through which the owner works in paying his money to the contractors. The contractors do the work of erection and are paid fixed sums for their labor and material. The engineer constructor is usually paid a certain percentage on the total cost of the work. There are other financial methods under which buildings are constructed, but this is a quite usual one.

As the steel columns are going up it should be noticed that each one of them consists of a large number of different pieces of steel, all soundly riveted together.

Piece by piece, then, the columns rise toward the required height of the building. As they go up, the contractor erects steel girders between them at the floor levels and then erects steel beams between the girders. The floors, therefore, will be supported by the beams and girders; the beams and girders will be supported by the steel columns; the steel columns will be supported by the concrete caisson columns; and

the concrete caisson columns will be supported by bed-rock. A building of this kind, carefully erected, is about the safest kind of building ever devised.

Right next to the steel comes the terra cotta or concrete fireproofing. Each column in a fireproof steel building is encased in terra cotta from top to bottom. This is called fireproofing the steel. Terra cotta is a clay product that has been burned with exceptional thoroughness. It has come to have a large place in building operations. And it is used not only to encase the steel frame of the building, but also to form the arches of the floors and in a more refined state to cover and ornament the street elevations of the building. As the terra cotta, piece by piece, begins to creep over the steel, the brick contractor and the stone contractor begin to follow.

The brick and stone for the walls of the building rest usually on the outside beams and girders, called lintels, of each story. That is, the masonry for each story is really a structure by itself. That is why it is possible to do the masonry work on an upper story before the masonry work of a lower story has been started. Brick, stone and terra cotta may all be used in the walls of modern steel buildings. But they are only a shell. The kernel is the steel frame.

While the steel columns are being fireproofed with terra cotta and while the walls are being built, the floor arches begin to appear. These arches are built on the ordinary arch principle, with keystones and subordinate pieces. They are sprung between the beams, and girders at each floor level. They support the weight of the flooring itself.

This flooring, on which people will stand, may be made of wood or stone or marble or concrete, or any other suitable material. But it is not the real floor. It is just a coating. The real floor consists of the floor arches. The floor arches sustain the weight of the flooring and of the things and people on the flooring.

When the steel frame has been erected and fireproofed, when the walls have been built, when the floor arches have been sprung, it is clear that the big outlines of the building have been completed. But meanwhile everything else has begun. The staircases are going in. The elevators are being installed. The boilers are being moved into the basement. The woodwork of the doors and windows is being erected. Glass is being moved into place. All these things keep happening at the same time, and unless they are managed harmoniously the building will be delayed.

When the last tap of work has been done, and when the building is ready to be handed over to the owner for occupancy, we can stand off and take a look at it. Six months, or twelve months, or eighteen months, depending upon the size of the building, have passed since the wreckers were let loose on the old structure. Since that time the engineer in charge may have spent five million dollars on behalf of the owner. Of such a sum about \$600,000 may have been spent on steel and about half a million each on brick and stone. In the new County Building, Chicago, there are 35,000 different pieces of steel, besides 500,000 rivets. The steel pieces in that building, set end to end, would reach 250 miles. If the same weight which exists in steel pieces were put into an iron bar a quarter of an inch in diameter it would reach all the way around the

world, with a thousand miles to spare. The granite in the County Building weighed more than 11,000 tons. Five hundred cars were needed to haul it from the quarries. The scope of such a structure, and its wealth of detail, are overpowering.

But let us take a look at its strictly architectural features.

Most modern steel buildings are erected for purely commercial purposes. The owner has land of a certain value. He puts up a building of a certain value. And he naturally wants to get the largest possible return on his investment. The architectural features of the building are therefore the features in which he economizes, except in so far as the public comes to demand a handsome building for business purposes. In some cases a big firm will erect a handsome building simply as an advertisement. In such cases the architect is freer to devote himself to the development of a beautiful structure. But the usual rule is that the building is strictly commercial, and that the owner is satisfied with such architectural beauty as will be sufficient to attract tenants. And perhaps it is more fortunate in some respects for the architect when the owner looks at the proposition in that way. For when the architect is given a free hand his troubles begin.

The modern steel building is more difficult to harmonize with the traditional rules of architecture than any other kind of building that was ever invented.

One of these traditional rules is, for instance, that the building shall look to be what it really is, that it shall not be a sham, that it shall be sincere. Now a modern steel building has a steel frame. Yet, on the outside, it looks as if it were made of stone and brick and terra cotta. This is clearly inconsistent. And it is an inconsistency that runs all the way through the building.

In many a steel building, for example, you will find beams that are carried across the ceiling in certain big rooms, and that look as if they were supporting the ceiling. Yet, if you are familiar with construction, you know that they are not supporting the ceiling at all.

These beams are simply made out of plaster and other similar materials. They support nothing. They are themselves supported by the floor arches and the beams and girders. They are not architectural construction. They are simply architectural decoration.

These grand columns that we see so often on the exteriors of buildings might theoretically be supposed to consist of big, single pieces of stone or marble, worked into the proper shape. As a matter of fact, they are in all probability nothing of the kind.

If they resemble a great many of the columns that have been erected in modern times they are built out of a series of separate pieces about five feet in height, these pieces being placed one on top of the other. It frequently happens that the eye is even more grossly deceived. Each piece of the column (technically called a drum), may consist of several smaller pieces tied together with pieces of metal called dowels. The column may be hollow in such cases, or may have concrete work and masonry inside it. It may also be anchored by other pieces of metal to a steel column. The architectural column, then, consists of metal, of concrete, of masonry, of hollow spaces, and of pieces of stone joined together to form drums which then,

arranged in a vertical series, produce a column-like effect. Such a column is extremely painful to some people. But this is merely incidental. The fundamental difficulty is to make a steel building look sincere, that is, to make it look like a steel building.

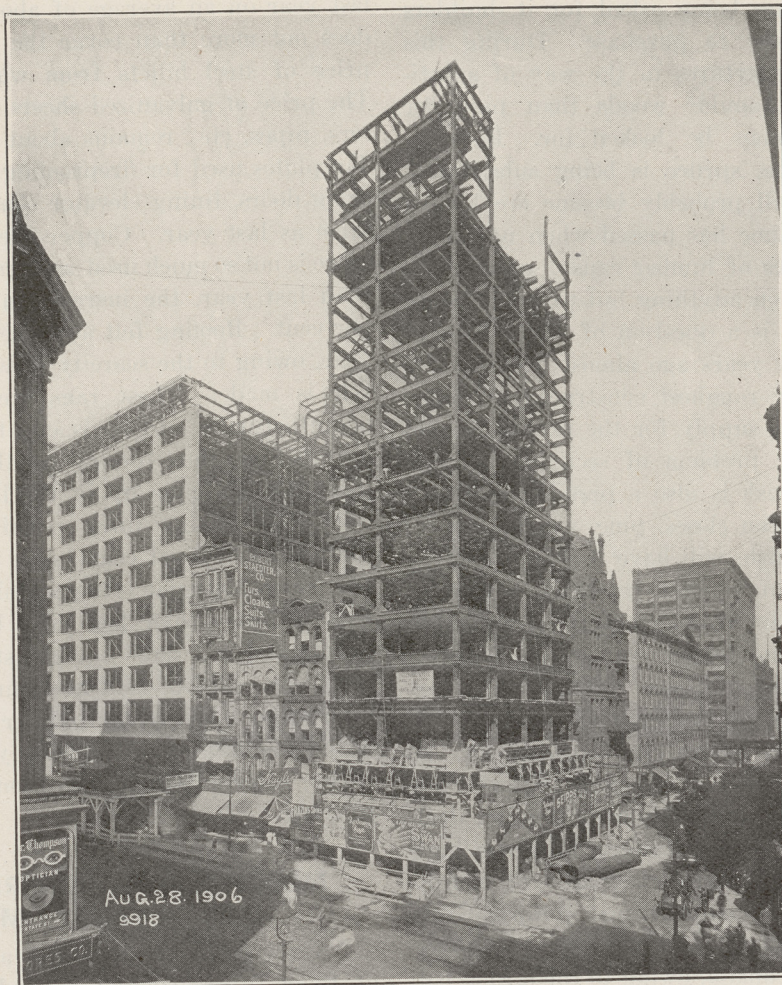
Now the central fact in a steel building is the steel column. Yet how can the fact of the existence of steel columns be even indicated to the occupant of the building? In the first place, it has to be concealed with terra cotta in order to render it fireproof. In the second place, it has to be still further concealed in order to make it attractive to the average eye. The steel column, by itself, is a comparatively narrow and

HOW TO MAKE PUTTY.

Pure putty is usually made in what is known as a "chaser," of whiting and linseed oil. The proportions are about eighty-five pounds of whiting and fifteen pounds of raw linseed oil. Bolted American Paris white is commonly used in this country for the purpose, though I suppose you would probably use an imported whiting. Of course these proportions are only tentative and must be varied according to the consistency of the mass produced.

For quick drying putty boiled linseed oil is used instead of raw, and about ten per cent. of dry white lead is added to the whiting.

This is the old recipe for pure putty. At the present time, however, very little commercial putty is



CHICAGO SKY SCRAPER, SHOWING STEEL ERECTED AWAY IN ADVANCE OF MASONRY.

superlatively angular and ugly thing. People demand that it be padded out and made to look symmetrical before it is allowed to appear in the walls of the finished rooms. If the steel column were exhibited to the tenant in its original shape it would look sincere, but its sincerity, like that of many human beings, would not bring it many friends.

The difficulty we have with the column is the difficulty that exists for the whole building. The frame of the building must be of steel. Yet it is very puzzling to discover any way of finishing the rest of the building with any reference to that fact. As things stand to-day, the modern office building continues to look as if it depended on masonry, while in reality it depends on metal.

Australian Yate is believed to be the strongest of all known woods. Its average tensile strength is 2,400 lbs. to the square inch, equalling that of cast iron. The tree grows to a maximum height of 100 feet and sometimes has a diameter of $2\frac{1}{2}$ or even 3 feet.

made according to this formula, large proportions of crude cotton seed oil (known in trade as "putty oil") being substituted for some of the linseed oil and bailed linseed oil being used instead of raw to counteract the slow drying qualities of the cotton seed oil. Instead of fine Paris white common whiting with varying proportions of fine marble dust is used. It is claimed that cotton seed oil, which never becomes so rock-like as linseed oil in whiting, is preferable on many occasions to the latter.—Exchange.

JOINTLESS FLOORS.

The use of jointless flooring, made from pulverized wood fibre and other materials, and laid in a plastic condition on a cement foundation, was begun in Germany about ten years ago. This flooring has proved so successful that several mills manufacturing the same product were started and are now running prosperously. The problem has been to make a continuous flooring which will fit closely at its junctions with the upright walls, and be not only fireproof but impervious to liquids, dust and vermin of all kinds.

BUILDING MATERIALS FOR 1907.

At the opening of the building season for 1907 several problems of more than passing significance have to be faced. The season is already late, and building operations are in many districts almost a month behind. In the cities this backward state of affairs is not so pronounced, although even in Toronto building construction is not what it would have been had more favorable weather prevailed. However, this is by no means a serious matter. The scarcity of material, particularly of lumber, presents a difficulty whose ultimate effect on the building industry for 1907 is problematical. Pine is scarcer than ever before in the building industry of Canada, and, at the prices which are being asked for it, builders are not in any anxiety to purchase. During this season several new departures in the way of substituting hitherto less popular woods than pine for structural purposes may be looked for. For the coarser grades of pine, spruce is being substituted, and for flooring it will probably become ere long a popular wood. The time has passed when unlimited quantities of all classes of lumber caused contractors to look with disfavor on anything but pine for house construction. Now it is a question of what is available. Hemlock, a few years ago almost despised for anything but the very roughest construction, is now at a premium, and the supply for the present season is very limited. The problem of securing suitable material for inside finish is also a pressing one, and before the present season closes, pine, which hitherto has been the staple finish, will have been replaced by cheaper substitutes, in smaller dwelling houses at least. Lath and shingles are in much the same condition. Pine lath is no longer in great demand; spruce is rapidly taking its place. The shingle market at the present moment presents an aspect which is more than puzzling. There are practically no shingles in Ontario lumber yards, and inquiries for them are coming in constantly from the smaller dealers to the city yards. The Western railroads have been merely dribbling shingles eastward for months past, and, as Ontario manufactures comparatively few shingles and no considerable quantity can be expected from Eastern Canada, owing to the strong call for the New Brunswick shingle from the Eastern States, the situation appears serious indeed. At the present moment there are orders with British Columbia dealers for 1,200 cars of shingles, and an average of only three cars a day is being shipped. Substitutes may, of course, be obtained. There is slate, much more expensive, to be sure, and various kinds of metallic roofing, but these have not yet come into general popularity.

The stringency in the lumber market will inevitably turn men's attention to other materials which may advantageously be substituted for lumber. Among the first of these, of course, is concrete. The price of Portland cement, which advanced about 50 cents a barrel last summer, has, up to the present, remained stationary, but prices throughout the country vary, and in some instances the advance over last year is 50 per cent. This is due to the tremendous demand. To meet it new mills are being set up, and a number of established concerns are doubling and trebling their capacity.

With the increased use of cement must also be considered the growing demand for crushed stone. In Toronto alone the consumption of crushed stone for 1905 was 68,000 tons, and, for 1906, 103,000 tons. It is expected that this year 130,000 tons will be a conservative estimate of the consumption. Last year the price was \$1.20 per ton, and this year \$1.25.

The use of galvanized iron is increasing enormously each year, Canada's consumption for last year being 12 1-2 per cent. over that of 1905. The value of Canada's importations is at least a million and a quarter dollars at point of shipment, which would be equal to more than a million and a half delivered in Canada. The price of iron has advanced during the last year on an average of about 10 per cent., which does not more than cover the actual advance in the price of steel billets from which sheets are rolled. The price of galvanized sheets used for cornices, gutters, pipes, etc., remains about the same as last year. Tin plates used for fireproofing purposes, such as covering doors, lining elevator shafts, etc., are about the same as last year. Copper sheets, of which material there is not so much used as formerly, are much higher than last year, the increase in price being about 50 per cent. Roofing felt advanced 12 1-2 per cent. this year, owing to the scarcity of wool rags, out of which felt is made. These rags are now being used for manufacturing of tweeds, etc., to a greater extent than ever before, thus forcing up the price. Dry felt at the mills has gone up in the last year about 25 per cent., but roofing pitch remains about the same. Slate is about 5 per cent. lower than last year. Asbestos, which has come into general use since the Chicago fire, is lower than last year by about 5 per cent. Paints and oils show a slight stiffening in price over last year. White lead and turpentine are the most interesting items to the painter just at present. The latter has been steadily rising year by year, and substitute after substitute has been put forth only to be rejected.

MONTREAL BUILDERS' EXCHANGE
QUARTERLY MEETING.

"Are contractors, realizing as a whole how much of their future success depends on their attracting and retaining the better class of capable mechanics in this city?" was the pertinent question put by the secretary, Mr. J. H. Lauer, at the second quarterly general meeting of the Montreal Builders' Exchange, held recently. There was a good representative gathering of contractors in the various building lines, and the questions of current wages and a sufficient supply of labor for the needs of a brisk building season were discussed at length. Mr. Lauer, in his opening remarks, stated that the arrangement reached last year with the Bricklayers' Union No. 1, Quebec (the only incorporated union in this city), which had worked on the whole satisfactorily to both employers and employees, had been renewed for the coming season, the wages to be 50 cents per hour from May 1, no recognition of sympathetic strikes with other trades to be allowed, and any disputes to be referred to joint arbitration board. In all other trades the principle of the "open shop" prevailed, a principle endorsed by this Exchange because founded upon reason and justice; the worker should be paid according to merit

and ability, and not according to an artificial uniform scale which destroyed all personal ambition and only benefited the incapable workman.

In spite of much misrepresentation and many hard knocks aimed at it by representatives of organized labor, the Builder's Exchange was not the enemy of the best principles of unionism; it had combatted in the past, and would endeavor to oppose in the future, only those despotic tendencies of present-day unionism which aimed at a monopoly of the labor market and denied the right to earn a living to any but its own members; here was a "combination in restraint of trade" with a vengeance.

It was for this reason that the Exchange had made a protest recently to the City Council on the subject of the award by the Road Committee of the season's contract for curbstones to the highest tenderer, who pledged himself to exclusive union labor, instead of to the lowest, who ran an open shop without discrimination against any class of worker. Such an award was neither in the interests of justice nor of rate-payers.

In comparing the rates of wages paid here and in other cities, the secretary pointed out that while conditions had improved with the Master Plasterers and Carpenters, there were other trades, notably those of plumbing, painting and electrical mechanics, where the wages were altogether too cheap as compared with any city of similar size. We were losing our best mechanics for two main reasons: the restrictions placed upon apprentices by the unions, and the attraction of higher wages elsewhere. He felt convinced that if, year by year, as cost of living increased, the employers would meet their employees in friendly conference, and, where the trade warranted it, would voluntarily increase the scale of wages in proportion without waiting to have every concession wrung from them by union pressure, they would both gain the good-will and confidence of their workmen and destroy the tyrannical side of unionism by rendering it unnecessary.

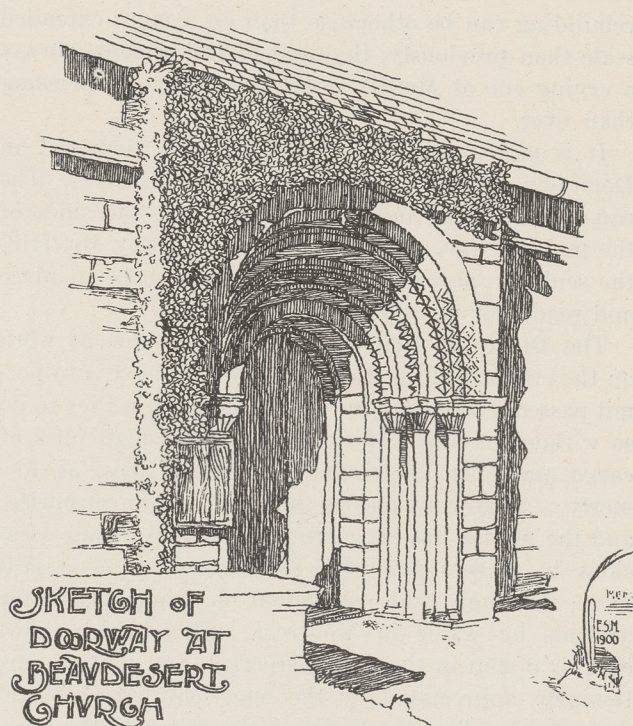
Mr. W. E. Ramsay, of the Pedlar Roofing Company, spoke earnestly in favor of the old indenture system, by which lads should be bound by their parents for four to six years at a graded scale of wages, to be really taught a trade by actual personal interest taken in them by the employer, and not left as at present to pick up any scraps of knowledge they may chance to run across. He was opposed to all artificial interference with apprentices by unions, as the country was starving for capable mechanics. After some remarks agreeing in the main with the foregoing statements by Messrs. Pause, Fernald, Watson, Walsh and Thibeault, the following resolution, drafted by the secretary, was proposed by Mr. Ramsay, seconded by Mr. Arcand and carried unanimously:—

"That this special general meeting of the Builder's Exchange of Montreal desires to convey to the Hon. Rodolphe Lemieux its congratulations on behalf of the successful intervention made by the Department of Labor in arresting the recent incipient strike in connection with the iron and steel industry in Nova Scotia, and on its prospective settlement of industrial trouble in the coal mines in Fernie, B.C., and the West; which prompt action of his Department assures a reasonable hope that violent dissensions between

labor and capital in large public utilities will in future be greatly mitigated, if not entirely obviated, through the adoption by Parliament of the special legislation introduced during the present session by the Hon. the Minister of Labor for compulsory enquiry into all labor disputes concerning such public utilities."

TIN CLAD FIRE PROOF DOORS.

The new departure has been taken by a number of prominent architects in Toronto and Montreal of placing the fireproof tin clad doors in the sheet metal workers' specification. Heretofore these invariably appeared in the carpenter's specification. The carpenter built the doors himself, and, not being in touch or familiar with the requirements of the fire underwriters, it frequently happened that he had friction with these gentlemen, as the cores were not built strictly to their requirements. Then he had to have a tinsmith cover them, being obliged, of course, to



SKETCH BY E. STANLEY MITTON.

buy the hardware from some hardware firm, so that even if he did make his cores right his two subcontractors were liable to fall short. The result was worry, inconvenience and delay to both architect and client, and, while the architect could tell his carpenter what a nuisance he was, the carpenter would find excuses, perhaps rightly, too, by putting the blame on the second and third party in the contract.

All this confusion is obviated by transferring these doors to the sheet metal worker's specifications. He is wholly responsible for the building of the doors, the covering, the hardware and the hanging. Any first-class sheet metal worker, who makes fireproof windows, doors and skylights, makes these doors from start to finish, is thoroughly familiar with what the underwriters demand and the probability of any short-coming in the work is very small. If any trouble should, however, arise, there is only one man to blame, and it is to him and to him alone that the architects, owner and fire underwriters look to have the doors made right.

MONTREAL NOTES.

The extraordinary circumstance of two of the most extensive and valuable of the McGill University buildings being destroyed by fire within one fortnight led to a special investigation of the cause in the case of the Medical Building. The inquiry, however, seems to have resulted in no confirmation of theories of incendiarism, and both fires can be ascribed only to accident. Professor Nobbs is in charge of the reconstruction of the Macdonald Engineering Building, which is to be rebuilt with a view to accommodating the Civil Engineering and the Architectural Department, and it is hoped that an entirely new building may be erected before long to house separately the Electrical Engineers, who have hitherto been accommodated in the same building with the Civil Engineers. For the rebuilding of the Medical department four firms of architects have been asked to submit competitive designs. It is believed that private munificence will come forward to pay for these new constructions, but, as it is not to be thought that the rebuilding can be otherwise than on a more extended scale than previously, the need of endowment, always a crying one at McGill, is likely to be more pressing than ever.

It is announced that the Strathcona Memorial in Dominion Square is shortly to be completed. The equestrian statue and the bas-reliefs on the sides of the pedestal have been prepared in Paris by Mr. Hill, the sculptor, and it is hoped that all will be in place and ready for unveiling on Victoria Day.

The Dominion Bridge Company are now at work on the erection of an overhead bridge, which is to permit passengers going to or from the Victoria Pier to do so without having to pick their way through piles of cargo and over labyrinths of railway lines, as formerly. This convenience has long been promised, and the matter has been referred to on previous occasions in these notes with the suggestion of a still more thorough and convenient accommodation for arrivals by water in Montreal. This bridge, however, is a step in the right direction, and will be particularly appreciated by the many-childrended Canadiennes who dare the perils of the water in the summer time.

A proposal which has been broached before is again on the tapis, viz., that of providing a car line on to the mountain to make it more accessible to the poorer people. The suggestion is to connect the Guy street line with the Park Avenue line in the neighborhood of Mount Royal avenue. The new service would thus run across the back of the mountain, presumably between the summit and Mount Royal cemetery. Of course such a proceeding would materially de-ruralize and take away much of the beauty of that part of the hill, but it must be conceded that the most accessible part of the Mount Royal Park, that which is known as Fletcher's Field, is pretty fully taken advantage of by poor families, who gather there in thousands on Sundays throughout the summer, a practice which must be exceedingly beneficial to the children and ought by all means to be encouraged even at the risk of losing a little of the scenery.

The Temple Building at present bears a placard announcing that "this building is to be entirely demolished in thirty days; watch it." The boarding

erected in front of this building has been a cause of some difference of opinion among civic officials, the building inspector maintaining that such an obstruction is not permissible according to the city by-laws. We hope the city inspector is right and that he will carry his point. There is no doubt that much inconvenience to the public may be saved by insistence on keeping good footway for the foot passengers. Some little provision for overhead scaffolding is necessary, but the public deserve some such consideration. For some time now the public right of way along the south side of Craig street has been practically barred by the operations at the MacIntyre Building, and anyone trying to make his way past was forced to cross at one of its foulest points one of the filthiest streets that ever disgraced a city.

In the beginning of May there was an increase asked and given in the minimum wage of several trades. The only strike was that of the granite cutters, who asked \$3 for an eight-hour day, instead of \$2.50 for a nine-hour day. Those granite workers who were engaged on building work, however, were already receiving the higher rate, so that building is not affected.

The Engineers' Club has now moved into its new premises in Beaver Hall Square. The fine house, formerly part of the Dow estate, has been altered to suit the purposes of the club by Messrs. Lake & Archibald.

Work has now begun on the new Arena which is to take the place of the old Chrystal Rink on Dorchester street. The St. Lawrence Hall, the historic hotel of Montreal, is now no more. Its premises are now occupied by the Dominion Express Company, the property having been purchased by the Canadian Pacific Railway for \$550,000. The upper portion of the building will be used as a hotel for one year.

A suggestion has been made that Mr. Carnegie should be again approached with regard to a public library for Montreal. On a former occasion Mr. Carnegie offered one hundred and fifty thousand dollars on condition that the city should spend fifteen thousand annually on a public library. At that time our corporation, in its inscrutable wisdom, considered that the city could not afford so much money for such a purpose.

The following items relating to Montreal formed part of the supplementary estimates laid before the Federal Parliament on April 20:—\$3,000 for fittings in the Amherst street postal station; the enlargement of the head postoffice, St. James street, \$300,000; eastern postoffices, \$25,000; St. Henri postoffice, \$1,200. The office of the Gazette newspaper, situated in the rear of the General Postoffice and separated from it by Fortification Lane, has been purchased as a site for the extension of the postoffice.

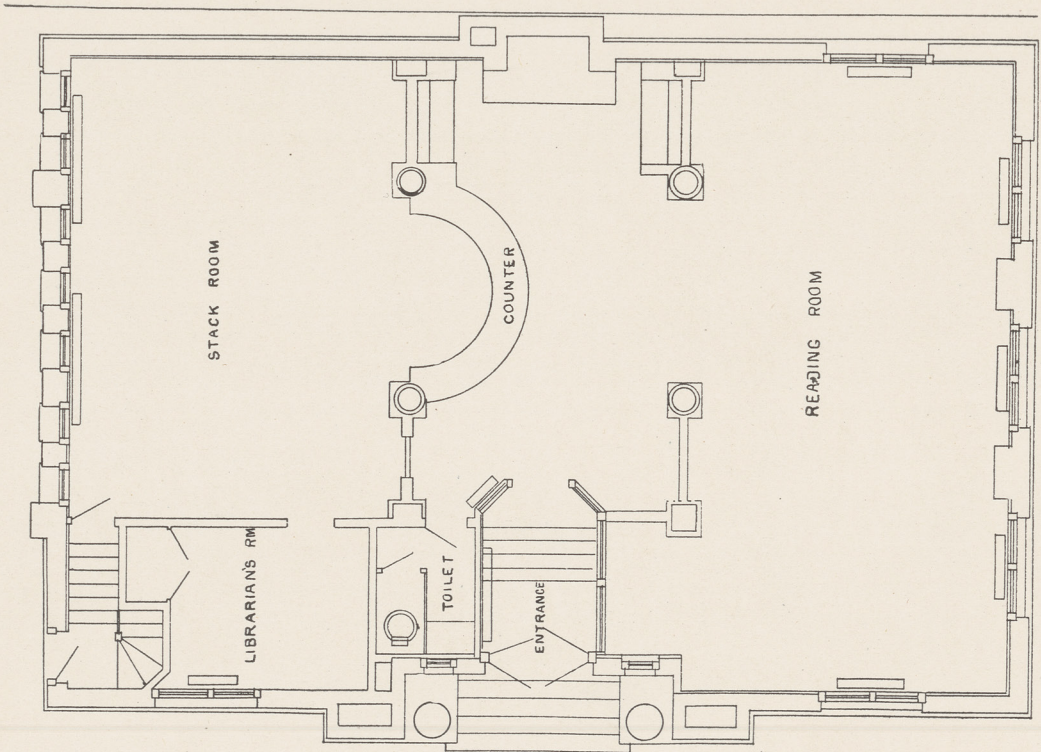
The committee which is to advise the Government as to the purchase of works of art consists of Sir George Drummond, the Hon. Arthur Boyer, of Montreal, and Mr. Byron E. Walker, of Toronto.

BOND & SMITH CHANGE OFFICES.

Messrs. Bond & Smith, architects, Toronto, with Mr. A. H. Cassels as associate, have moved into the Union Bank Chambers.



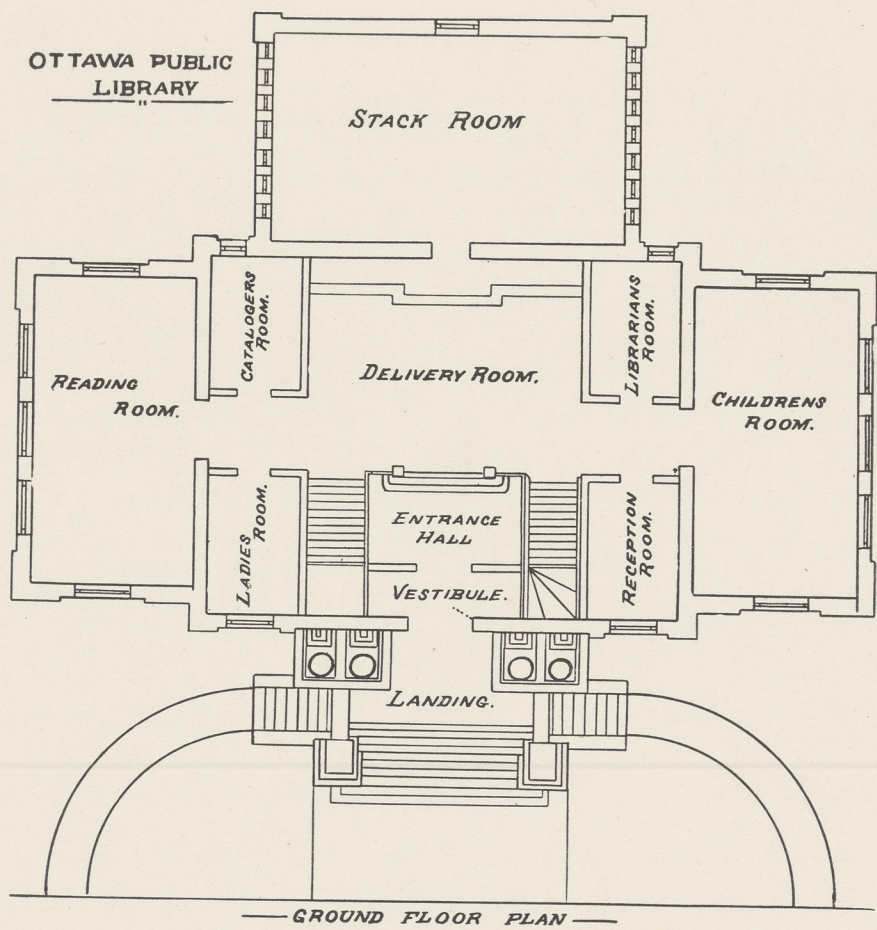
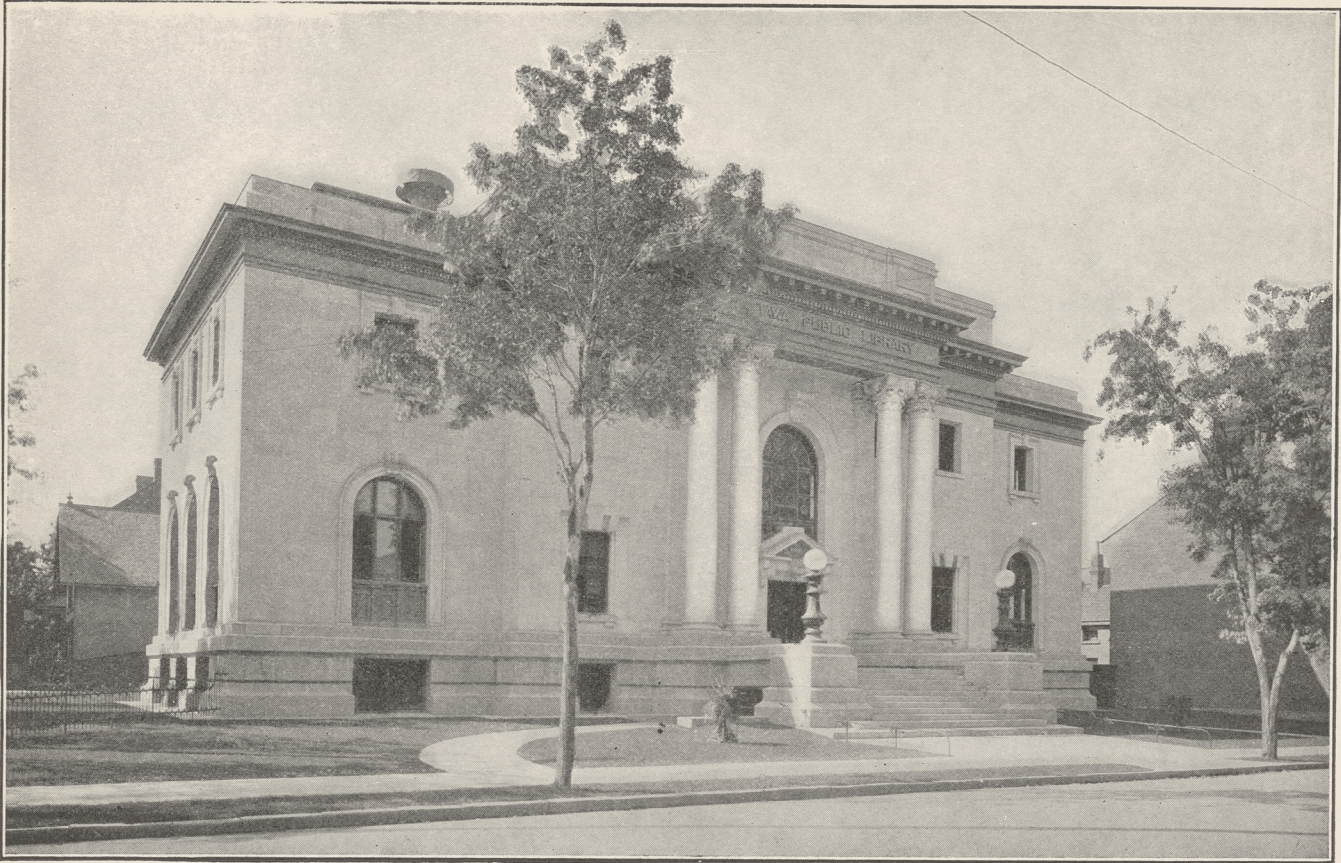
PARIS PUBLIC LIBRARY



FLOOR PLAN

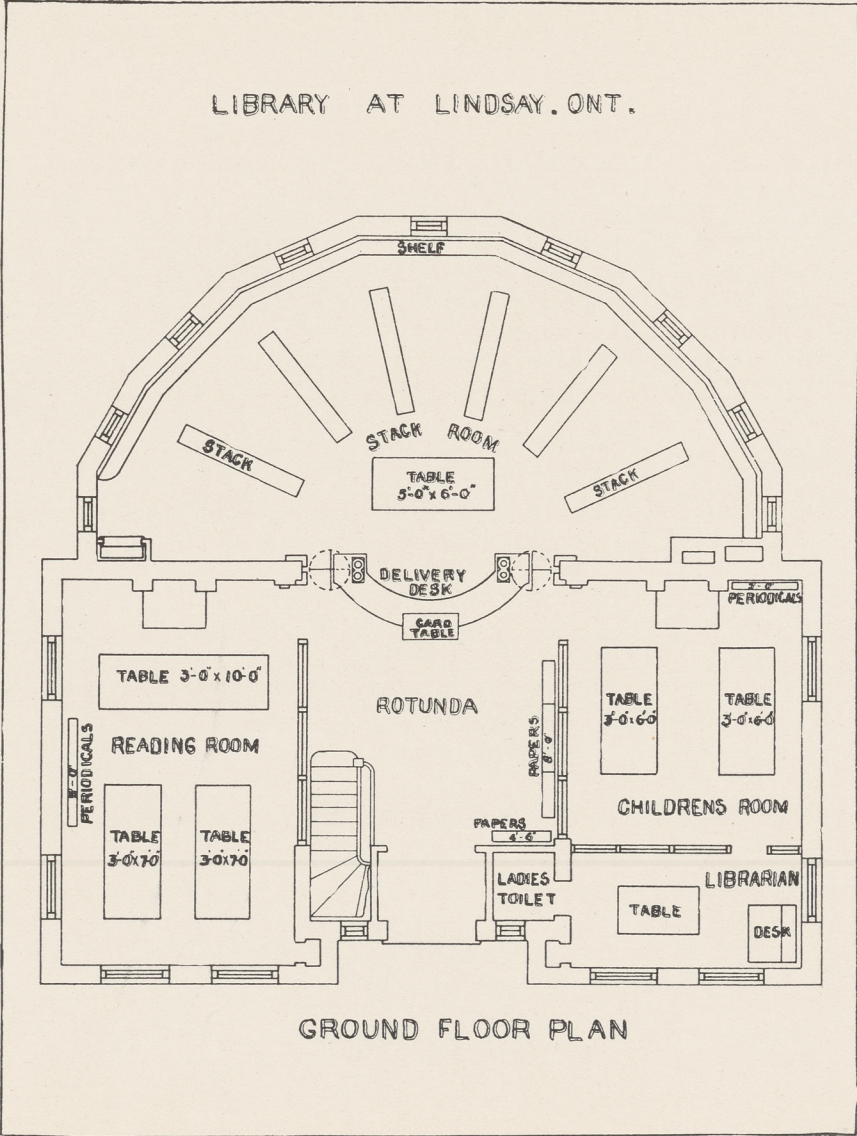
GROUND FLOOR PLAN.

PARIS PUBLIC LIBRARY.



THE OTTAWA PUBLIC LIBRARY.

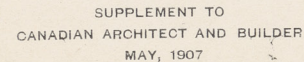
AND BUILDER.

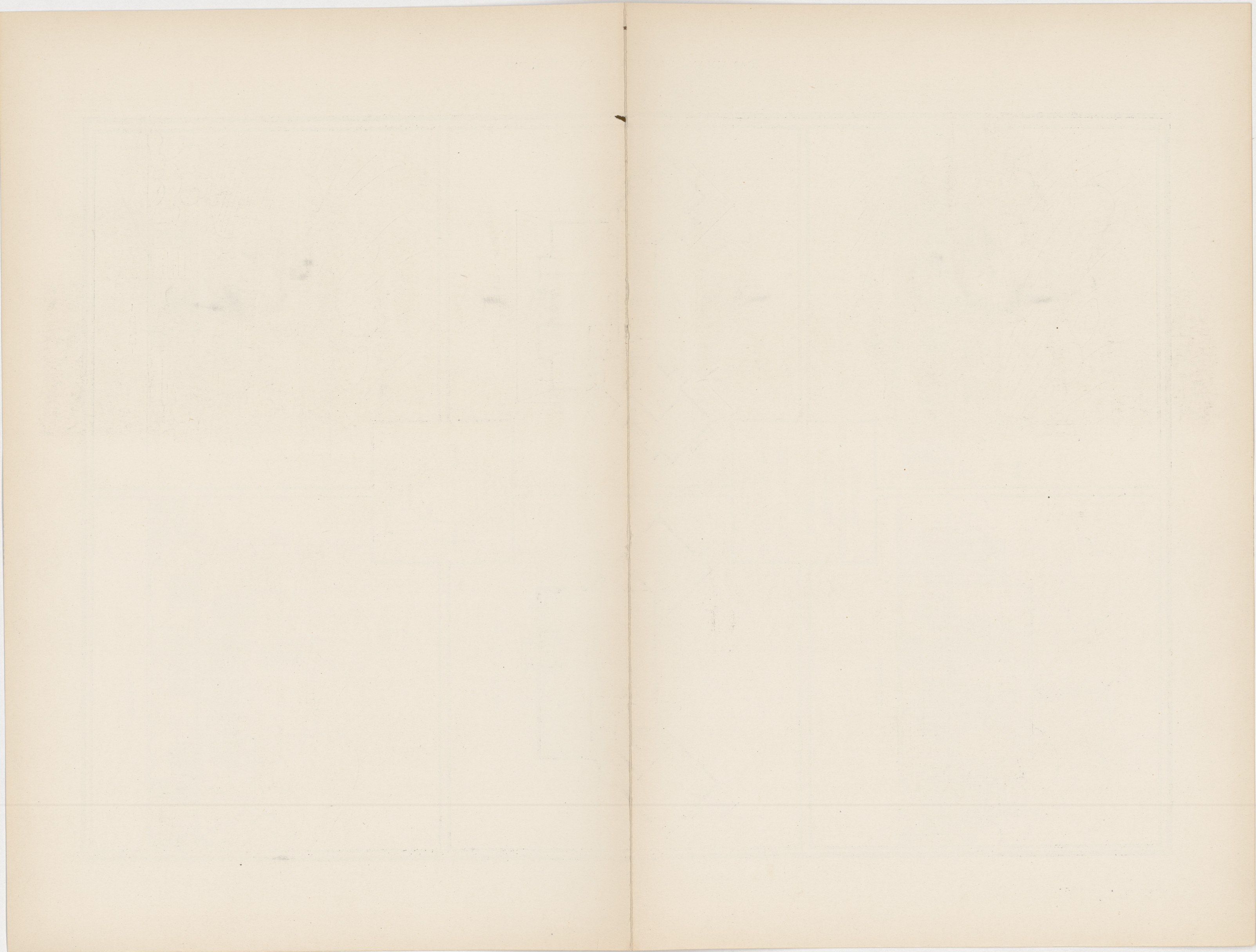


THE LINDSAY PUBLIC LIBRARY.



THE OLD CHURCH AT TLALPAM, MEXICO.





TECHNICAL EDUCATION IN MONTREAL.

On April 25 a meeting was held in the Commercial and Technical High School, Sherbrooke street, which ought to have important results in regard to technical education in Canada. Mr. Alex. McFee, president of the Montreal Technical Institute, occupied the chair. This Institute has for some years endeavored to attract interest in and support for its educational schemes. Dr. Shaw, on behalf of the Protestant School Commissioners, read the formal offer of the use of their new and splendidly equipped school, in which the meeting was held. The following were the terms of the offer:—

“In harmony with the recent negotiations, I have much pleasure in placing at your disposal for evening classes, by way of experiment for one session, the premises of the Commercial and Technical High School on Sherbrooke street west, in this city, on the conditions:—

“That you appoint and pay the staff of teachers for such evening classes, including a qualified superintendent, who will be responsible for the proper condition and discipline of the school.

“That you recoup the board for the cost of heating and lighting for such classes, and pay the janitor such gratuity as may be just for his additional work.

“That you provide such additional equipment as you may think necessary for the purposes in view.

“We have now equipment and provision for sloyd or woodwork, typewriting, drawing, cooking and sewing. We propose to provide for chemistry and millinery.

“We have no equipment for electrical work nor work in metals, though for the latter we have a suitable room now vacant.”

Mr. Charles Stevens, speaking for the Mechanics' Institute, announced that that body had voted five hundred dollars to assist in establishing the proposed evening classes.

Several persons attending the meeting were called on to discuss the scheme, among others who spoke being Hon. W. A. Weir, Hon. J. D. Rolland, Mr. S. H. Ewing, Mr. Jas. Kinghorn, Col. Gardner and Mr. W. E. Doran. Mr. Robert Munro, when called upon for the financial statement, explained that there were no finances, but outlined the proposals on foot as follows. In addition to the work for which the Protestant Commissioners' School was already equipped, it was proposed to add an electrical laboratory, to extend the capacity of the physics department, to fit out the metal workshop, and to provide for special branches in chemistry. It was approximately estimated that the cost of this equipment, including running expenses, materials and superintendence for one year, would amount to \$10,700. It was hoped that even at the start they would obtain two hundred pupils, and that the fees might be reckoned at about \$2,400. An equal amount might be raised by asking employers, whose assistants attended the classes, to contribute a sum equal to their assistants' class fees.

Mr. Munro then moved a resolution to the effect that the munificent offer of the use of the Protestant School Commissioners' school should be accepted, that a guarantee fund of \$10,000 should be called for from manufacturers in the city and that classes be

opened in September. After further discussion the motion was carried.

Mr. G. W. Stephens, chairman of the Harbor Commissioners, suggested that twenty of the leading manufacturers of the city should be induced to subscribe five hundred dollars each to establish such a fund as was required. If the nineteen others could be secured his own firm would be glad to take its share. He thought the scheme was one that should be carried out on a large scale. Mr. Doran had suggested that the Mechanics' Institute, which was interesting itself in this matter, might be willing to realize \$125,000 on their property in St. James' street and devote the money to this scheme. If they were to do that and get subscriptions to make up \$200,000, Mr. Stephens would himself subscribe five thousand dollars. He thought Montreal manufacturers showed a disgraceful lack of public spirit in not turning out in greater numbers to discuss this question.

Mr. C. C. Ballantyne said he believed manufacturers had only to be appealed to in a business manner and they would be glad to support what was in their own best interests. On the part of his company he would gladly subscribe five hundred dollars.

The fine school, which was designed by Mr. A. F. Dunlop, R.C.A., architect, was open to inspection during the evening; the scholars and teachers of the day school were in attendance and gave an exhibition of teaching methods.

EFFORTS TO PRESERVE ST. PAUL'S CATHEDRAL.

Considerable adverse comment has been called forth recently in London by the recommendation of Mr. Lethaby, the well-known authority on Gothic architecture, that Westminster Abbey should be gradually coated with yellow-tinged whitewash, by which method he hopes to preserve the fast crumbling of the stonework, occasioned by the deleterious fumes of the atmosphere. In defence of his suggestion, Mr. Lethaby stated that in the middle ages whitewash was frequently applied to stonework as a preservative, with excellent effect. Accordingly, experiments have been recently made with the wash in some of the passages leading out of the Dean's yard, with satisfactory results.

It has been estimated that the amount of sulphuric acid poured out into the air of London amounts to between 500,000 and 1,000,000 tons annually. When coal is burned most of the sulphur contained in it escapes in the form of sulphuric and sulphurous acids. Illuminating gas is also a source of sulphur supply, as is paraffin oil. The chemical effect of sulphuric acid in the atmosphere is that the carbonate of lime of the stone is converted into sulphate, the carbonic acid escaping. This action has for so long been destroying the stone walls of old St. Paul's that the mediaeval expedient of applying whitewash has at last been resorted to. A treatment that is recommended by some experts as being more satisfactory than the whitewash is to employ repeated coats of a three per cent. solution of baryta, applied as a fine spray, in cases where the surface of the stone is very tender, and where the stone is firmer with a rose syringe or brush.

In the interim report of the committee appointed

to inquire into the stability of St. Paul's Cathedral, the statement is made that the construction of the proposed sewer would be a probable source of danger to the building. This opinion is, however, not held by many who have made a study of the subject. As designed, this sewer will be entirely in the London clay, 60 feet deeper than and some distance horizontally from the foundations of the cathedral. It will have a cast iron lining built up in segments as fast as the work of tunnelling is executed, and the very small clearance between the exterior of the lining and the cylindrical hole in the clay will be filled with cement grout injected under pressure.

RIGHTS OF CANADIAN ARCHITECTS.

Apropos of the objection taken by a number of Toronto architects to the action of the Manufacturer's Life Association in entrusting to a Detroit architect the construction of their new building, to be erected at the corner of Bay and Melinda streets, Mr. F. S. Baker writes *THE ARCHITECT AND BUILDER* as follows:—

Toronto, May 6th, 1907.

My Dear Sirs,—I have read the article in your April number referring to "Recent Amendments to the Toronto Building By-law," and I am of the opinion that all of the proposed amendments make for the safety of the public, which, in the absence of the necessary amendment to the Ontario Architects' Bill, is the most important consideration.

I have already read your article entitled "Rights of Canadian Architects." In a recent issue of the *Daily Star* there appeared an article, quoting a letter written by the Ontario Association of Architects to the owners of a proposed large building to be erected in Toronto, and also an interview with a member of the Association. This I, for my part, thought very undignified and calculated to increase the tendency of capitalists to seek professional advice abroad, as it might indicate a condition which could not exist in the mind of a man competent to successfully conduct the erection of a large building. Neither is it reasonable, as at the present time I know a Toronto architect who is erecting a \$400,000 building in the State of New York, without any inconvenience, or interference. I also know that one of the largest commercial buildings in New York City was erected by a firm of London architects, who were well received by the New Yorkers.

At the present time there is being erected in Yonge street a steel frame, the weight of which indicates to me a ten or twelve storey building, and I have not heard the name of any outside architect or engineer mentioned in connection with it.

When I introduced a New York firm, at the head of the profession, to the directors of the Traders Bank, I felt that I would be upheld by every architect in Toronto, owing to the high standing of Messrs. Carrere & Hastings, and to the certainty that, having them with me on the work, the building would be a success architecturally. Consequently the arrangement was made whereby we were jointly to design and erect the building, and the building begun in September, 1905 is now an accomplished fact and speaks for itself. It began to produce revenue on the first of October, 1906.

I have ever been taught that it is futile to try to make water run up hill, and in the same way no locality could so organize its various departments that everything should be done by the inhabitants of the locality. If such a condition were ever brought about the result obviously would be sterile, and I think the occasional introduction of clever men from other localities, in any profession or business, makes for improved conditions wherever it occurs. For my part, I welcome United States architects to Toronto, just as I welcome the scores of young English architects who are arriving here every month, and I am of the opinion that my business and the general business of the country will be improved owing to their coming here rather than interfered with. A man cannot be in two places at once.

Apologizing for the amount of space which I have taken up in complying with your request, I am,

Yours very truly,

F. S. BAKER.

THE MODERN HALL.

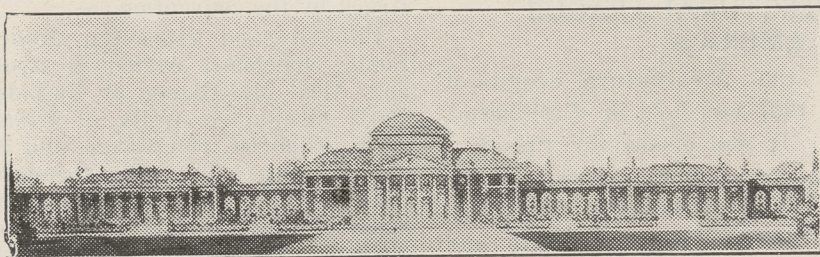
An important feature of the modern hall is that it should be well heated. The tendency of the construction is to allow a free and unobstructed ventilation of all parts of the house by means of the lower and upper hallways, and, by heating the hall thoroughly in the winter time, the other rooms are also warmed appreciably, with a saving in the amount of coal used in the furnace. The defect of the hall as a living room is that it is not always possible to light it thoroughly from the windows of the stairway landing, and the light must necessarily come from the doorway, or arrive, at second hand, from the adjoining room windows. The majority of these new halls make the most of such light as there is by having the portion of the wall above the wainscoting done in plaster, which is left in its natural color. The hallway is finding increased usefulness in the newest types of house as a halfway and informal apartment where all members of the family may receive visitors, whether of a mere social call or for the transaction of business. Its popularity is justified.

THE JAMESTOWN EXPOSITION.

On the three hundredth anniversary of the landing of the first English colonists in Virginia, President Roosevelt, on April 26, opened the Jamestown Tercentennial Exposition at Norfolk. The President in his address welcomed the representatives of foreign Governments present, laying particular stress on the close relationship between American people and their English ancestors who settled at Jamestown three centuries ago, and this, he said, should be a tie between the two nations now as it was in colonial days.

At the touch of a gold button the Exposition was opened by the President and the machinery set in motion. The scene was a remarkable one, combining the splendid features of previous Expositions with the added magnificence of the great naval display and the other beauties of one of the finest waterfronts in the world.

The longest cement bridge in the world is that at Playa Del Rey, near Los Angeles, which measures 205 feet 8 inches. Its span is 146 feet. The width is 19 feet, the spring 18 feet, and the height above water 20 feet.



THE AUDITORIUM.



PURE FOODS BUILDING.



MANUFACTURES AND LIBERAL ARTS BUILDING.

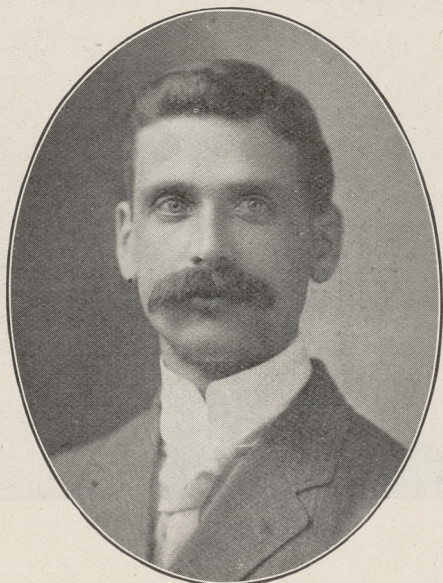
BUILDINGS AT THE JAMESTOWN EXPOSITION.

PROCEEDINGS OF 1907 CONVENTION OF THE ARCHITECTURAL LEAGUE OF AMERICA.

The convention of the Architectural League of America for the year 1907 was held in Washington, April 22, 23 and 24. It was opened by President Russell, of St. Louis, in the convention parlors of the New Willard Hotel, addresses of welcome being given by President Windrim of the Washington Club, and Mr. McFarlane, chairman of the Washington Commission, who welcomed the delegates on behalf of the city.

Among the more important things dealt with by the convention were the scholarships which have been granted to its members by Harvard University, George Washington University of St. Louis, and the League's own scholarship, the first winner of which is now in Europe.

The question of raising the standard of entrance



J. P. HYNES,
President Architectural League of America, 1907-08.

into the club was dealt with at length and several resolutions embodying recommendations to the clubs of the League were passed in this line in conjunction with the Educational Committee's report, which proved to be the centre of interest of the convention. It was also determined to continue issuing the Architectural Annual, and to retain the services of a permanent secretary and to establish permanent headquarters for the League, which, it has already been practically determined, shall be located in Washington.

The Washington Club was very lavish with its entertainment. A visit to Mount Vernon and several automobile rides through the city were particularly enjoyable. The delegates also had the privilege of being presented to President Roosevelt, who welcomed them with a few very encouraging remarks on civic government.

The convention terminated with a banquet in the New Willard Hotel, presided over by Mr. Waddie Wood, of Washington, and addressed by Mr. J. P. Hynes, of Toronto, the new president of the League; Mr. E. J. Russell, of St. Louis, the retiring president, and Mr. N. Max Dunning, of Chicago, the president of two years ago; also by Congressman Batholdi, chairman of House and Grounds Committee of Congress; Mr. Cas Gilbert, of New York; Mr. Thos. Nelson Page, and Mr. J. Knox Taylor, Supervising Architect of the United States Treasury.

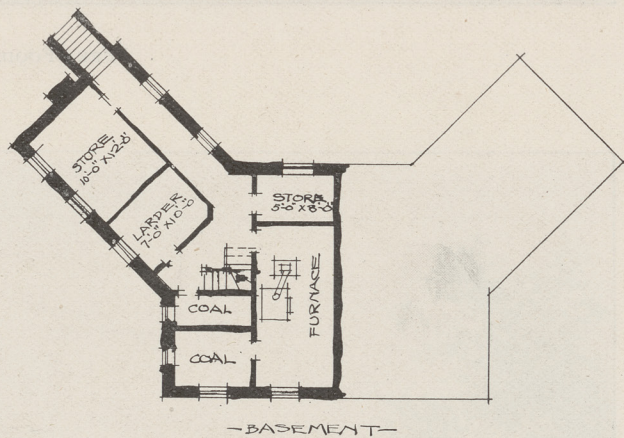
The following standing and special committees were struck by the convention:—

Publicity and Promotion, Jesse N. Watson, of St. Louis, chairman; Alfred S. Alschuler, of Chicago, and Alex. M. Adams, of Philadelphia. Education, Prof. Newton A. Wells, of Urbana, Ill., chairman; H. V. Vonholst, of Chicago, and Frederick M. Mann, of St. Louis. Traveling Scholarships, Prof. Percy Ash, of G. W. U., Washington, chairman; Albert G. Skeel, of Cleveland, and S. C. Gladwin, of Cleveland. Architectural Annual, Edmund H. Poggi, of Philadelphia, chairman; Chas. Mason Remey, of Washington, and N. Max Dunning, of Chicago. University Fellowships, Prof. Emil Lorch, of the University of Michigan, chairman; August G. Headman, of San Francisco, and Charles T. Ingham, of Pittsburg. Special Committee on Individual Membership, E. Helfensteller, Jr., of St. Louis, chairman; Wm. B. Ittner, of St. Louis, and John C. Stephens, of St. Louis. Special Committee on European Tour, Prof. N. A. Wells, of Urbana, Ill., chairman.

Mr. J. P. Hynes, of the Toronto Architectural Eighteen Club, who was elected president of the League by the convention at Washington, entertained his club to luncheon in Toronto on May 9, when the following Executive Board was selected:—President, Mr. J. P. Hynes; vice-president, Mr. J. M. Lyle; corresponding secretary, Mr. A. H. Chapman; recording secretary, Mr. H. Eden Smith; treasurer, Mr. C. D. Lennox; advisory, Messrs. Eden Smith and J. C. B. Horwood.

OUR ILLUSTRATIONS.

Three typical Canadian Carnegie libraries, Ottawa, Lindsay and Paris, Ont. The Ottawa building was designed by Mr. E. L. Horwood, of that city, and constructed of Indiana limestone and local freestone. The interior and fittings are of golden oak. The Lindsay Library is of modern Greek architecture.



PLAN BY "WOOD" IN C. A. & B. COMPETITION FOR FARMHOUSE.

Red stack brick was used, laid with American bond in brown mortar. Clear pine lumber alone was used in the construction. Mr. A. T. Wickson, of Wickson & Gregg, Toronto, designed the Paris building, which is of brick with stone trimmings. The interior is finished in southern pine, while the fittings are of golden oak.

The Old Church at Tlalpam, Mexico.

CANADIAN ARCHITECT AND BUILDER students' competition for a farm house. Design by "Wood" (Mr. Chas. Dolphin, 73 Park avenue, St. Henri, Montreal). House to be balloon frame, shingled outside. Heated by furnace and supplied with hot water from kitchen range. Chimneys and fireplace to be of rough stone. House and barns to be connected by covered passageway. Living room, maple floor, pine finish, stained brown. Dining room, same material stained white. Kitchen and office, pine floor, pine finish. Bedrooms and bathroom, pine floors.

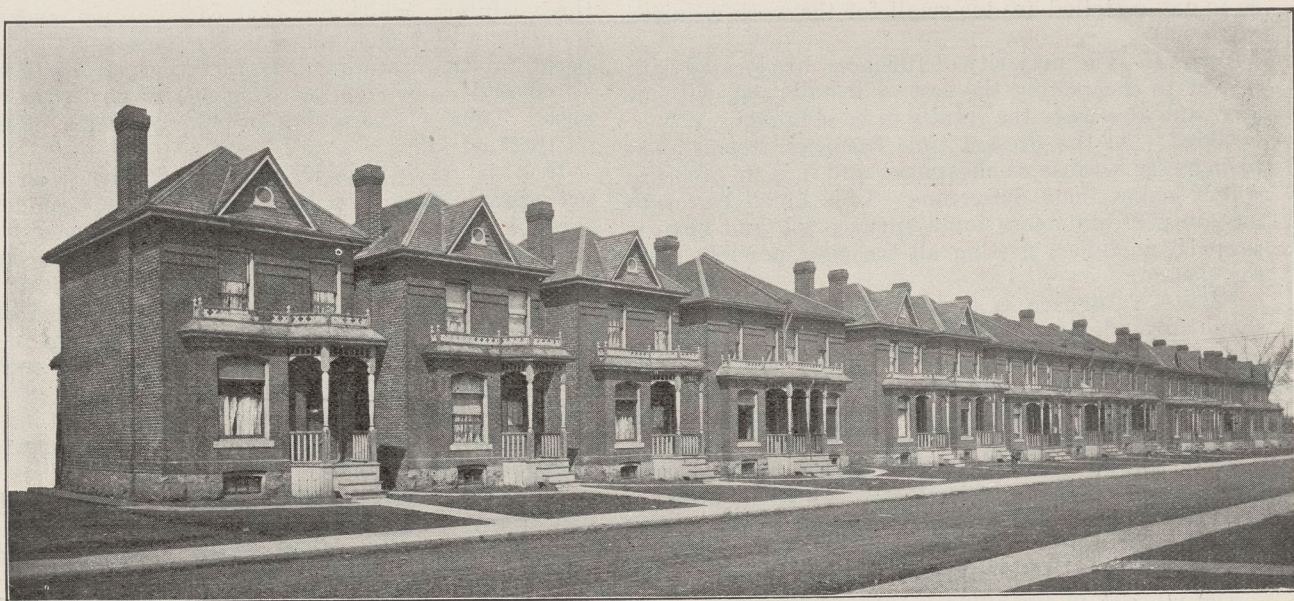
HOMES FOR WORKMEN.

The efforts being made in Toronto by the local branch of the Canadian Manufacturers' Association to father a scheme for the building of workingmen's houses seem to have at last assumed definite shape, and soon some tangible results will be in evidence. A stock company, capitalized at \$1,000,000 is being organized, and it is thought that little difficulty will be experienced in raising the necessary capital. As yet no definite plan has been decided upon for the proposed houses, which are to be semi-detached, of brick veneer with concrete cellar, and have six rooms each, the cost being about \$1,800. The idea is to

in Hamilton four years ago. This company's charter gave them the right to manufacture farm machinery only, so, when the problem of finding homes for their employes had to be met, the promoters formed the Eastern Building Company, Limited, for the purpose of putting up the necessary houses, and one hundred and fifty were erected with the expectation of renting them to the workmen. However, so many of these objected to paying the rental, amounting to about five per cent. on the investment, and preferred to buy a home of their own, that the company determined to give them that chance. Accordingly, a basis of sale was arranged, 10 per cent. down and



REPRESENTATIVE WORKINGMEN'S HOUSES, EAST FULLERTON AVENUE, HAMILTON, CONSTRUCTED BY THE EASTERN BUILDING SOCIETY (INTERNATIONAL HARVESTER COMPANY.)



REPRESENTATIVE WORKINGMEN'S HOUSES, WEST FULLERTON AVENUE, HAMILTON, FOR SALE AT \$16 A MONTH, CONSTRUCTED BY THE EASTERN BUILDING SOCIETY, (INTERNATIONAL HARVESTER COMPANY.)

encourage workingmen to undertake to buy these houses, by an initial cash payment of \$100 and subsequent installments of \$16 a month for twelve years. The monthly payment includes taxes, etc., and will leave the purchaser in much the same position as an ordinary renting tenant until his house is his own. It is intended to build at once from 50 to 75 of these houses in various localities.

Toronto will have one or two useful examples to study in her attempts to house the workingman. The city of Hamilton is tackling the problem in much the same way as is being contemplated in Toronto, but appears to have been forestalled in the movement by the International Harvester Company, which located

the balance at the rate of \$16 a month. According to the company's statement, seventy-five houses have thus been sold to employes, none of whom were earning less than \$2.50 per day, care being taken to see that the purchasers were industrious and economical. This discrimination was made in order to prevent houses getting into the possession of men who might later prove undesirable employes.

The houses put on the market by the Eastern Building Company are erected in the vicinity of thirty large factories and industrial concerns, all of which are constantly expanding and may therefore be expected to supply a demand for housing accommodation for many years to come.



[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.]

HOT AIR FURNACES.

By A. G. KING.

(In Architects' and Builders' Magazine.)

The original type of hot air furnace was nothing more than a large stove enclosed in a brick chamber, taking its air supply from the cellar or basement room in which it was placed. Much has been said and written against hot air furnaces. For instance, it is said that they heat only certain portions of a building, and that you cannot force the heat toward the windward side of the building; also that the fresh air supply is brought in contact with the red hot iron and devitalized, thereby destroying all its health-giving properties.

There is no doubt but that there are many residences and other buildings which, from their conditions of exposure, can never be successfully warmed with a furnace. On the other hand, it is equally true that there are thousands of residences and buildings which may be heated by a furnace in a satisfactory manner.

There is a feature of furnace heating we wish to make particularly plain to all our readers, both architects and builders, and that is, it is the furnace man and not the furnace who must be charged with many of the faults so common in a hot air heating apparatus.

First.—Let us say that 90 per cent. of all furnaces as to-day installed are too small for the work required of them.

Second.—The majority of furnaces are located with a view to cheapening the cost of installation, without any sane idea as to the results to be obtained.

Third.—At the present time furnaces are installed principally because of cheapness, and it is this feature which makes them dangerous. It is much better to pay 50 per cent. more for a furnace job and have it properly installed, getting all the good possible from the system.

Where a furnace is to be installed, the architect should provide a smoke flue well towards the exposed end of the building, that is, the end of the building most affected by the wintry winds. The writer has noticed rows of houses, hundreds of them, built for renting or speculative purposes, where the flue to be used for the furnace was located at the centre of the parlor or front room, no matter what the location of the room was as regards exposure or the points of the compass. Plainly then, this portion of the work is largely the fault of the architect.

The blunder of installing a furnace too small to do the work properly may be chargeable not only to the furnace man, but to the manufacturer as well. After a comparison of the catalogues of a number of prominent manufacturers in this line, we have selected the following as a fair representation of the ratings of their goods:—

Size.	Diameter of grate.	Capacity.
A	18 inches	15,000 cubic feet of space.
B	20 "	20,000 "
C	22 "	30,000 "
D	24 "	48,000 "
E	26 "	70,000 "

"The above is for winter temperature and for a single room. Where the space is divided into several rooms, deduct about one-third from capacity given."

Notwithstanding that the above is taken from the

catalogue of a manufacturer of a high grade cast iron furnace, we believe that the ratings as given should be reduced one-third for the best results. A bit of personal testimony will illustrate this and prove interesting to our readers.

For a term of years the writer lived in a medium sized city residence, one of a pair built on the "twin" order. Before renting and while examining the property we saw that the furnace was entirely inadequate to properly heat the rooms. The owner of the property agreed to install a new furnace and sent his furnace man to me with instructions to "fix it up" to my satisfaction. There was a trifle more than 9,000 cubic feet of space to be heated.

The furnace man looked the property over, made several memoranda in his notebook, and, as he was about to leave, remarked that he would have the new furnace in the next day. When I insisted on knowing the size, he referred to a catalogue and indicated a furnace with a net rating of 15,000 cubic feet. I told him without hesitation that I desired the next larger size. He was disposed to argue the question, but finally agreed to put in the larger one, or a furnace rated to heat 20,000 cubic feet of space.

Now as to results. My neighbors in similar sized houses, but with small furnaces, burned an average of eight, eight and a half and nine tons of coal the next three winters, while my coal consumption averaged four, four and one-half and five tons for the same period, notwithstanding the fact that no ashes were sifted and no particular attention given to the furnace. Thus was a saving of \$30.00 yearly effected on the fuel bill.

It seems quite probable that the furnace man does not always take into consideration the heat losses through windows, walls and doors, which may more than equal the amount of heat necessary to warm the cubic feet of air in the building. We look at one square foot of glass (window), twenty square feet of outside or exposed wall, and two hundred feet of air space, as being about equal, when figuring cooling surfaces or heat losses, and estimate the size of furnace accordingly. It is only by an intelligent inspection of the building to be heated that the proper size of furnace may be selected.

Another matter to which we wish to call the attention of our readers is the method of taking air to the furnace. The furnace should sit over a carefully built pit of brick laid in cement, and the fresh air should be brought to this pit through a tile conduit with carefully cemented joints. It is a lamentable fact that in many localities more than 75 per cent. of the furnaces are installed without the provision of a pit and an air supply from outside the building. As usually installed, they have an open fretwork base and take air direct from the basement—air frequently contaminated by poisonous gases and the odor of decaying vegetables.

A point in furnace construction which may be readily followed up by both architect and builder is the method of taking the heated air from the furnace. The top casing of the furnace is what might be designated as the hot air reservoir, and from this the various hot air ducts are taken. In all furnaces there is a certain amount of flue surface leading to this top casing. It is a common practice among some contractors installing furnaces to take more air from

the furnace, that is to say, from the area of the hot air ducts, than is represented by the hot air flues within the furnace, notwithstanding that the combined area of the hot air ducts should never equal more than 60 per cent. of the area of the hot air flues in the furnace. This latter practice reserves a certain percentage of hot air in the top casing of the furnace. It is a point which the majority of furnace men overlook or of which they are densely ignorant. When this percentage of heated air is retained in the furnace, the fresh air supply may be increased and a greater velocity of the heated air obtained in the ducts, with the result that it is possible to heat rooms at a considerable distance from the furnace, which otherwise it would be impossible to keep warm.

CESSPOOLS AND THEIR CONSTRUCTION.

The use of cesspools should cease when the country place becomes the town and the houses are built within 100 feet of each other.

When the locality has reached this position a sewerage system should be installed, not only for convenience but for the health of everybody concerned. No greater risk can be taken with regard to one's health than the placing of the cesspool in the wrong location, and if a cistern or well furnishes the water supply, so much more is the risk increased.

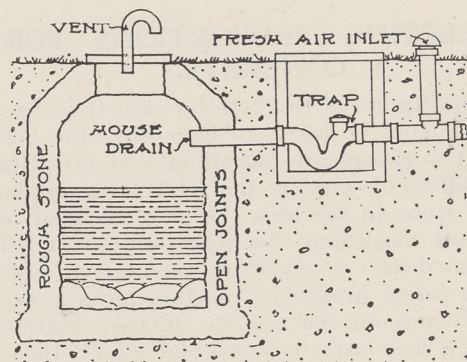
Where there is not a regular sewerage system, the cesspool, of course, must be used, as there is no other known low cost method of sewerage disposal. If a well furnishes the water supply, the cesspool should be located at a lower grade than the well, and there should be at least 75 feet distance between them. But however the water supply may be secured, the cesspool should always be located at the lowest possible grade of the property convenient to the house, and kept as near the surface as possible.

Our illustration, type "A," shows the leeching cesspool, so-called because of its being built of dry stone or brick, without cement jointings. By omitting the cement and placing the stone or brick dry, face to face, sufficient space is given between each stone or brick to allow for the leeching of the liquids and the retaining of solid matter inside the cesspool.

The leeching cesspool should never be used unless it is to be located where the soil is of a sandy nature, because if the seams, which are intended to carry off

No. 1) and have a pipe overflow (type "B" shows this arrangement) which connects with a leeching cesspool marked No. 2. The leeching cesspool under this arrangement receives practically only the liquids and the sediment or solid matter is retained in the first or solid masonry cesspool. The piping from one cesspool to the other should be of cast iron pipe and the house drain be trapped before entering the first cesspool. This house drain should also be provided at the second or leeching cesspool, as indicated.

The inside of the first cesspool should be lined with

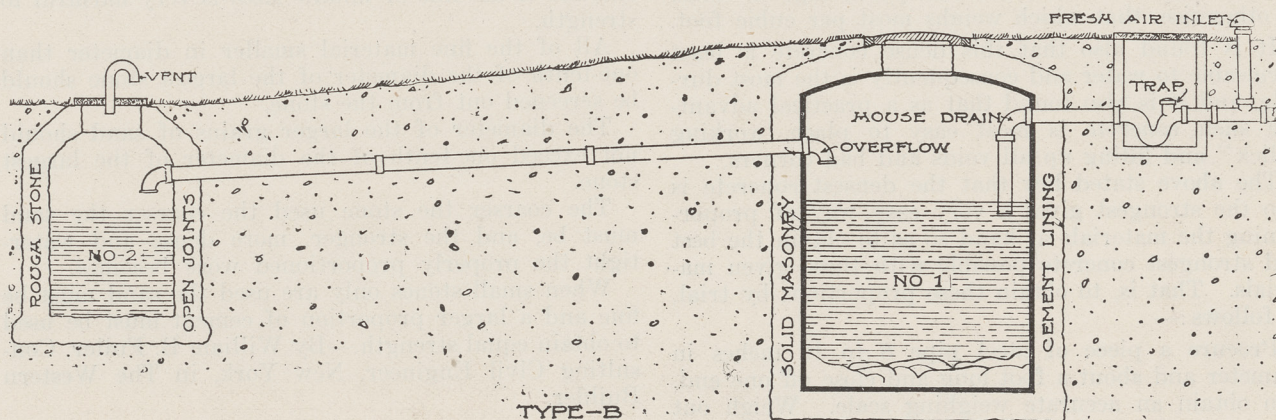


TYPE-A

cement at least an inch and a half in thickness, and an air-tight cap or cover be placed at its dome at the grade level. This also holds good for the cover of the leeching cesspool.

The size of the cesspool, of course, will vary according to the number of fixtures it will have to take care of, but the tight cesspool for the use of the usual number of fixtures in the ordinary house (several sinks, a set of wash trays, wash basin, bathtub and several toilets) should not be less than 70 inches in diameter and 100 inches in depth. This is the inside measurement. The leeching cesspool should be about one-half the size of the tight cesspool, and the nearer the surface the leeching cesspool is kept the better chance it will have to do its complete duty.

The nature of sandy soil makes it a natural filtering medium. Proper filtration depends upon certain bacteria, which cannot exist without air, and in the lighter soil, such as sand, they exist in great numbers, consequently the nearer the surface the leeching



TYPE-B

the liquids, should become filled from the exterior and solid matter should fill the joints from the interior, it will be seen that in a very short while the leeching cesspool will be anything but effective. Another argument against the use of the leeching cesspool is that in the passing of the liquids through the crevices and into the ground, more or less solid matter is also carried off, and when this occurs the real purpose of the cesspool (it really being a filterer) is partially or wholly destroyed.

The most effective manner of arranging the drainage is to have two cesspools; the first one, which receives the entire contents of the house drain, should be built of solid masonry (in our drawing marked

cesspool is located the better the opportunity for the natural filtration of the liquids.—Shoppell's.

TECHNICAL EDUCATION FOR HALIFAX.

The City Council of Halifax has agreed to donate a free site to the Government for the Technical Education College Building. The Technical Education Bill has passed the House of Assembly, and is now before the Legislative Council. A clause will be added in the Council, incorporating in the bill the fact that Halifax shall give a free site. With that amendment it will come back to the House of Assembly for concurrence.

CEMENT AND CONCRETE

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers]

SELECTING PROPORTIONS FOR CONCRETE.

The growing use of concrete for structures in which great care must be taken to have only the best material and workmanship, has stimulated investigations into the effect of varying the relative proportions of sand and stone in the mix, the proportion of cement to the total remaining the same, and the result has demonstrated very conclusively that the proper grading and relative proportion of the ingredients has a great influence on the quality of the concrete produced. To demonstrate this great effect, the writer at one time made up a set of beams 6 inches square and 6 feet long, varying these relations very widely from almost all stone to almost all sand, and broke the beams after thirty days with the following results:—

Proportions.	Modulus of Rupture. Lbs. sq. in.
1 : 2 : 6	319
1 : 3 : 5	285
1 : 4 : 4	209
1 : 5 : 3	151
1 : 6 : 2	102
1 : 8 : 0	41

By inspecting the above table it is seen that although the amount of cement in each of the above beams was the same (namely, 1-9 of the total material, some of the beams were over 700 per cent. stronger than others.

In investigating this subject over a term of years, it has been found that there is one combination of any given sand and stone which with a given percentage of cement makes the strongest concrete, that is, the concrete which contains the least percentage of voids, or otherwise, that which weighs most per cubic foot.

It is found also that this dense concrete is least permeable to water and consequently is the most durable, and it is also found that as a practical advantage such concrete is most easy to place, working "slick" and filling up all voids and bad corners.

The above stated law that the densest concrete is also the strongest gives a very easy way of proportioning the materials at hand so as to obtain the best and strongest concrete possible with these given materials. That is, to obtain these proportions by trial, as follows:—

Procure a piece of steel pipe 8 to 12 inches in diameter and about a foot long and close off one end, also obtain an accurate weighing scale. Weigh out any proportions selected at random, of cement, sand and stone, and of such quantity as will fill the pipe about three-quarters full, and mix thoroughly water on an impervious platform, such as a sheet of iron; then, standing the pipe on end, put all the concrete in the pipe, tamping it thoroughly, and when all is in, measure and record the depth of the concrete in the pipe. Now throw this concrete away, clean the pipe and tools and make up another batch with the total weight of cement, sand and stone the same as before, but with the proportions of the sand to the stone slightly different. Mix and place as before and measure and record the depth in the pipe, and if the depth in the pipe is less and the concrete still looks nice and works well, this is a better mixture than the

first. Continue trying in this way until the proportion has been found which will give the least depth in the pipe. This simply shows that the same amount of material is being compacted into a smaller space and that consequently the concrete is more dense. Of course, exactly similar materials must be used as are used on the work, and after having in this way decided on the proportions to be used on the work it is desirable to make such trials several times while the work is in progress, to be sure there is no great change in materials, or, if there is any change, to determine the corresponding change in the proportions.

The above described method of obtaining proportions does not take very much time, is not difficult, and a little trouble taken in this way will often be productive of very important results over the guess method of deciding proportions so universally prevalent. I have repeatedly known concrete to be increased in strength fully 100 per cent. by simply changing the proportions of sand to stone as indicated by the above method and not changing the amount of cement used in the least.

A person interested in this method of proportioning will find on trial that other sands and stones available in the vicinity will give other depths in the pipe, and it is probable that by looking around and obtaining the best available materials the strength of the concrete obtainable will be very materially increased.

As a guide to obtaining the best concrete, the proportion of cement remaining the same, the following are the results of extensive tests:—

The stone should all be of one size or should be evenly graded from fine to coarse, as an excessive amount of the fine or middle sizes is very harmful to strength.

All of the fine material smaller in diameter than one-tenth of the diameter of the largest stone should be screened out from the stone.

The diameter of the larger grains of sand should not exceed one-tenth of the diameter of the largest stone.

The coarser the stone used the coarser the sand must be, and the stronger, more dense and water-tight the properly proportioned work becomes.

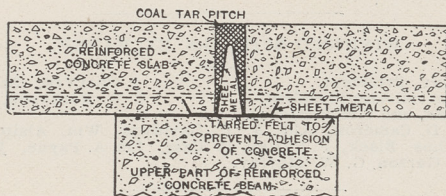
When small stones only are used the sand must be fine and a larger proportion of cement must be used to obtain equal strength.—By William B. Fuller, Consulting Civil Engineer, New York, in *The Western Builder*.

EXPANSION JOINT IN CONCRETE ROOFING.

In an article on the construction of walls and roofs for a building in a recent issue of "System," O. M. Becker, industrial engineer, and William J. Lees, construction engineer, of the International Harvester Company, made some interesting observations on the use of concrete in factory roof construction. Recognizing that the qualities desirable in a roof are strength combined with lightness, resistance to heat conductivity, fire and acid resistance and weather tightness, they hold that except possibly for the last named quality these desirable qualities are all to be

found in a monolithic concrete construction to a greater extent than in any other one material. By a roof of this description they mean, of course, one that is laid in place by putting the mixture of cement, sand and broken stone, when freshly made, into forms and allowing it to harden or set in a more or less homogeneous mass. As exponents of the concrete roof they add further that such a roof does not condense moisture on the under surface so much as other materials, with the exception of wood. The objection that is sometimes made to concrete roofs, however, that they are not impermeable to water, can, they claim, be overcome by mixing a good cement waterproofing compound with the top dressing of the concrete, providing also that the roof is designed to permit of expansion and contraction without causing cracks.

A type of expansion joint to allow for expansion changes is shown in the accompanying sketch. This shows that the space between the abutting ends of the concrete slabs contains a fold of sheet metal imbedded at each end into the concrete, but allowing for flexibility without giving a direct opening of any kind through the roof at the joint. A filling of coal tar pitch is employed to fill the joint flush with the roof surface, it being a flexible material, which is also counted to resist the leakage of water. It will be noted that the concrete beam on which the slabs rest was especially covered with tarred felt to prevent



EXPANSION JOINT.

adhesion of the concrete slab itself, so that the slabs can have the freedom of lateral movement to accommodate such changes as take place with changes in temperature.

CONCRETE RAILWAY TIES.

Concrete plays an important part in a new invention in railroad ties on which Harry J. Corell, of Mt. Jewett, Pa., has secured patents. Concrete blocks connected by forged steel bars and securely bolted to the rails, make up the principal feature of the ties. It is said that with these ties there can never be a case of spreading rails, so common with wooden ties. The invention may solve the problem which has been confronting railroad companies for years with regard to the securing of wooden ties, owing to the great scarcity of suitable oak and other tie timber. It is said that the new tie is practically no more expensive than wood and will last for a lifetime. For street car tracks in cities, these would be desirable, it is said,

because when they are once in place, the pavement would never have to be torn up to replace them. Each sleeper is approximately thirty inches long, twelve wide and twelve thick, and if necessary to guard against possible fracture, could be reinforced with metal rods laid in the blocks. Another feature, which is said to appeal to railroad contractors, is the fact that these ties can be made at any point along the line of road where little concrete block work could be set up.

METAL SHINGLE AND SIDING COMPANY HONORS PRESIDENT.

On the occasion of the opening of the handsome new offices of the Metal Shingle & Siding Company at Preston recently, the office and travelling staffs presented their president and general manager, Mr. C. Dolph, with a fine quartered oak office table. About two years ago the plant of the company was completely destroyed by fire. New buildings have since been erected, finished inside and out with metal. Much of the success of the company since its inception has been due to the business ability and tireless energy of Mr. Dolph.

ARCHITECTS DISSOLVE PARTNERSHIP.

Messrs. Curry, Sproatt & Rolph, the well-known Toronto firm of architects, are dissolving partnership, Mr. Curry retiring. The other gentlemen will continue in business under the old trade name of Sproatt & Rolph.

NEW ARCHITECTURAL FIRM FOR BRANDON.

Messrs. Hogle & Davis, architects, of Montreal, and Mr. David Marshall, associated with the above firm, have opened offices in Brandon, Man., where they will carry on business. Mr. Marshall being resident architect in charge. The new firm are in charge of the new Merchants' Bank Buildings at Brandon and at Arcola, Sask., and are also about to start extensive alterations on the Merchants' Bank Building at Carberry, Man.

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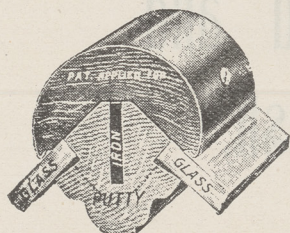
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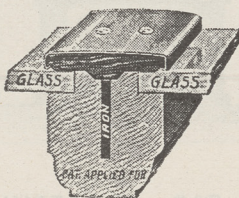
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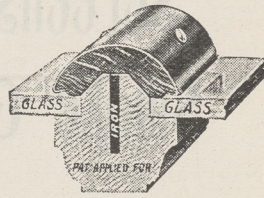
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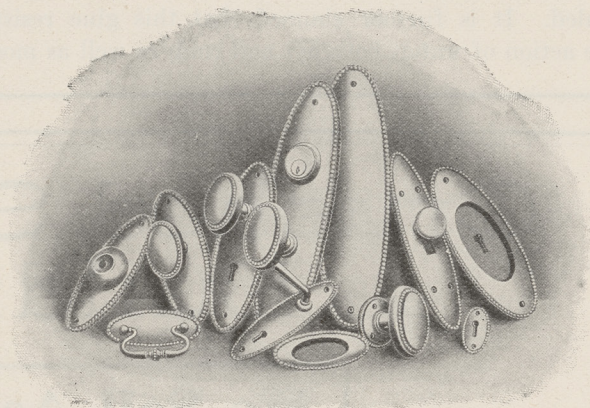
Some remarkable underpinning is being done below the foundations of the retro-choir and lady chapel of Winchester Cathedral in England. A gradual settlement of this portion of the structure has been taking place for four centuries, and of late the results have become serious. Cracks have appeared in the masonry, walls have moved from the perpendicular, and two bad cracks have occurred in the roof. The trouble is due to inadequate foundations and insufficient buttressing. The footings rest on a grillage of beach timbers packed with chalk and flint, which is carried by a thin sheet of soft marl only 10 feet below the surface. Below it is a bed of soft peat and gravel 6 feet thick, which rests on good, hard gravel. The peat is full of water and its presence is the probable explanation of the original failure to carry the footings to the hard gravel. Under the direction of Mr. T. G. Jackson, the underpinning is being done in small sections. A hole is sunk close to the wall down through the peat and then a heading is driven under the old footing and the old timbers are removed. The lower part of the pit is sunk by a diver, as the water is too deep for ordinary methods of working, and it would be dangerous as well as very costly to pump the water out. When the hard gravel bed is reached, the diver covers it with concrete delivered to him in bags, which he slits open. After a few feet of concrete have been placed in this way, grout is forced into it through pipes. The concrete is carried up in this manner to such a height that masons can complete the underpinning with brickwork.

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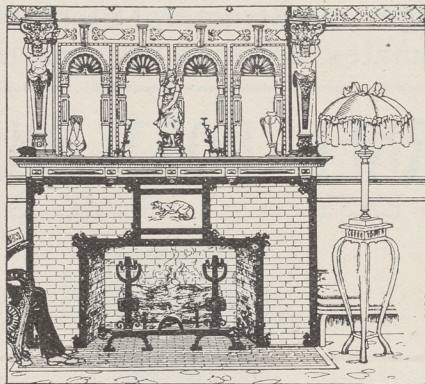
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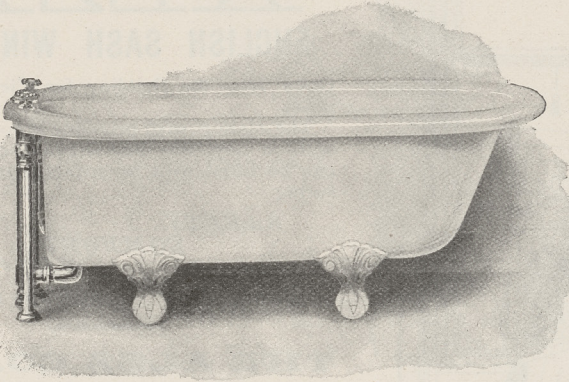
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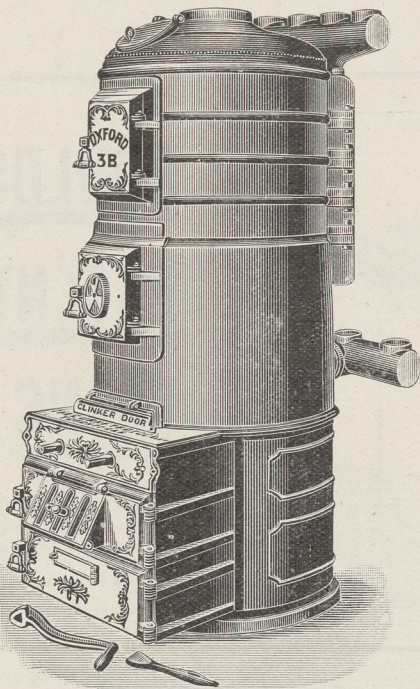
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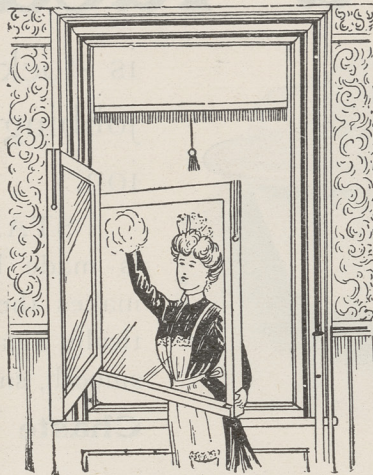
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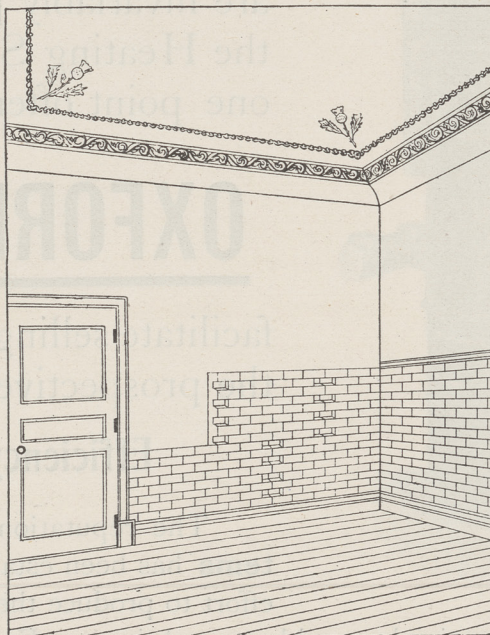
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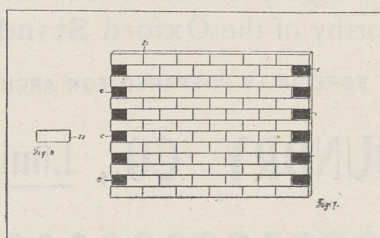
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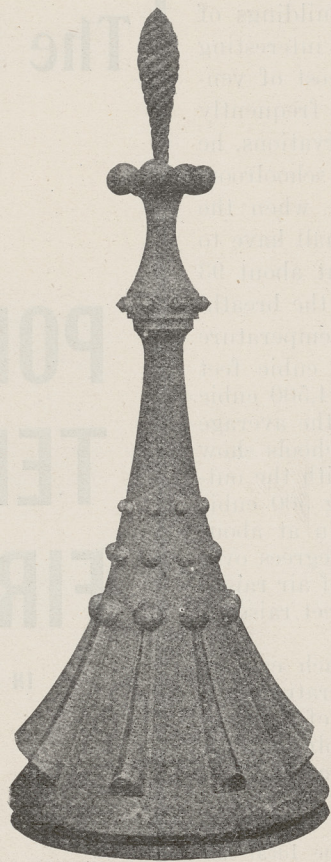
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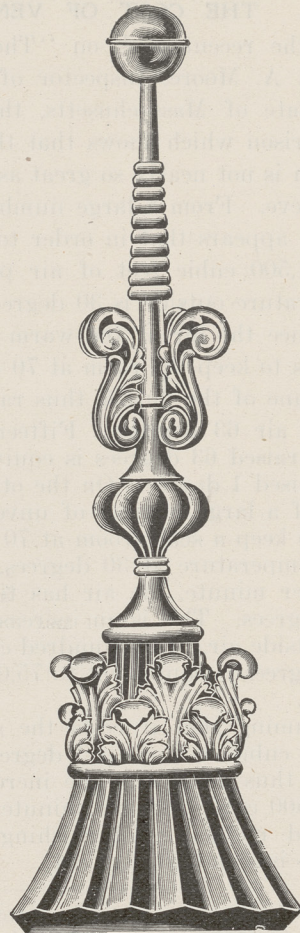
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THE COST OF VENTILATION.

In the recent book on "The School House," by Joseph A. Moore, Inspector of Public Buildings of the State of Massachusetts, there is an interesting comparison which shows that the actual cost of ventilation is not nearly so great as one is led frequently to believe. From a large number of observations, he says it appears that in order to supply a schoolroom with 1,500 cubic feet of air per minute when the temperature outside is 30 degree F., we shall have to introduce the air at the warm air inlet at about 93 degrees to keep the room at 70 degrees at the breathing plane of the pupils, thus raising the temperature of the air 63 degrees. Fifteen hundred cubic feet of air raised 63 degrees is equivalent to 94,500 cubic feet raised 1 degree. On the other hand, the average tests of a large number of unventilated schools show that to keep a schoolroom at 70 degrees with the outside temperature at 30 degrees, supplying 500 cubic feet per minute, the air has to be sent in at about 180 degrees. This is an increase of 150 degrees over the outside air. Five hundred cubic feet of air raised 150 degrees is equivalent to 75,000 cubic feet raised 1 degree.

Assuming that it costs the same in each case to raise a cubic foot of air 1 degree in temperature, Mr. Moore thus holds that the increased cost of furnishing 1,500 cubic feet per minute in a schoolroom over the old method of furnishing 500 cubic feet per minute is about 26 per cent.

A very attractive catalogue, gotten out by the Ideal Machinery Company, of London, Ont., has just come off the press and presents in a tasty manner much useful information regarding their cement brick and block machines. There are also several pages devoted to data regarding the mixing, curing and coloring of concrete. A number of cuts of cement block dwelling houses and other buildings add much to the attractiveness of the booklet.

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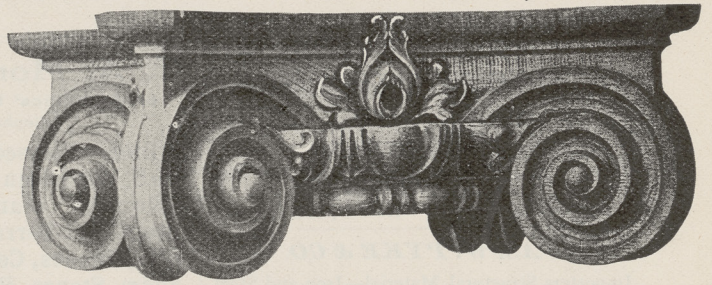
NOTES.

A St. Paul architect has won a case in court to recover his fees for making and furnishing plans, the jury deciding a question specifically put to them that the architect did not agree to cut his fee. The decision is a welcome one in more ways than one. There seems to be a somewhat general impression that it is perfectly proper for a possible builder to go shopping around for plans, and to secure sketches on the same terms that samples of dress goods are secured from departmental stores. The architect's work is not appreciated by the general public and it seems to be taken as a matter of course that if the proposed building is not erected, there is little obligation to the architect. A few more wholesome court decisions, as a means of enforcing the fact that the architect's work should be paid for, whether the client builds or not, would be quite educational as well as very satisfactory.

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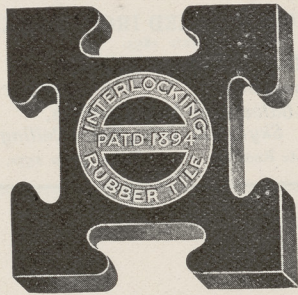
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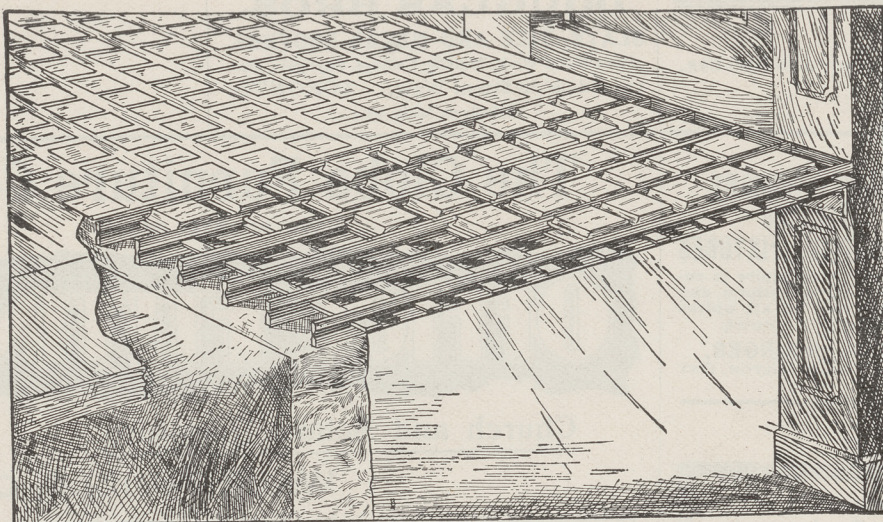
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