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CONSTRUCTION

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



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**Makes Concrete Impervious to Water
Prevents Discoloration and Efflorescence**

It is a dry powder, to be thoroughly mixed with dry cement before sand and water are added, thus becoming an inseparable part of the concrete.

“MEDUSA” GIVES ABSOLUTELY PERMANENT RESULTS, WILL NOT AFFECT STRENGTH, SETTING OR COLOR OF PORTLAND CEMENT.

Medusa White Portland Cement

A true Portland, perfectly White in color—Stainless—Guaranteed to Pass Standard Specifications.

Equal or Superior to any other White Portland Cement known. For Exterior and Interior Work where any High-Grade Portland is required.

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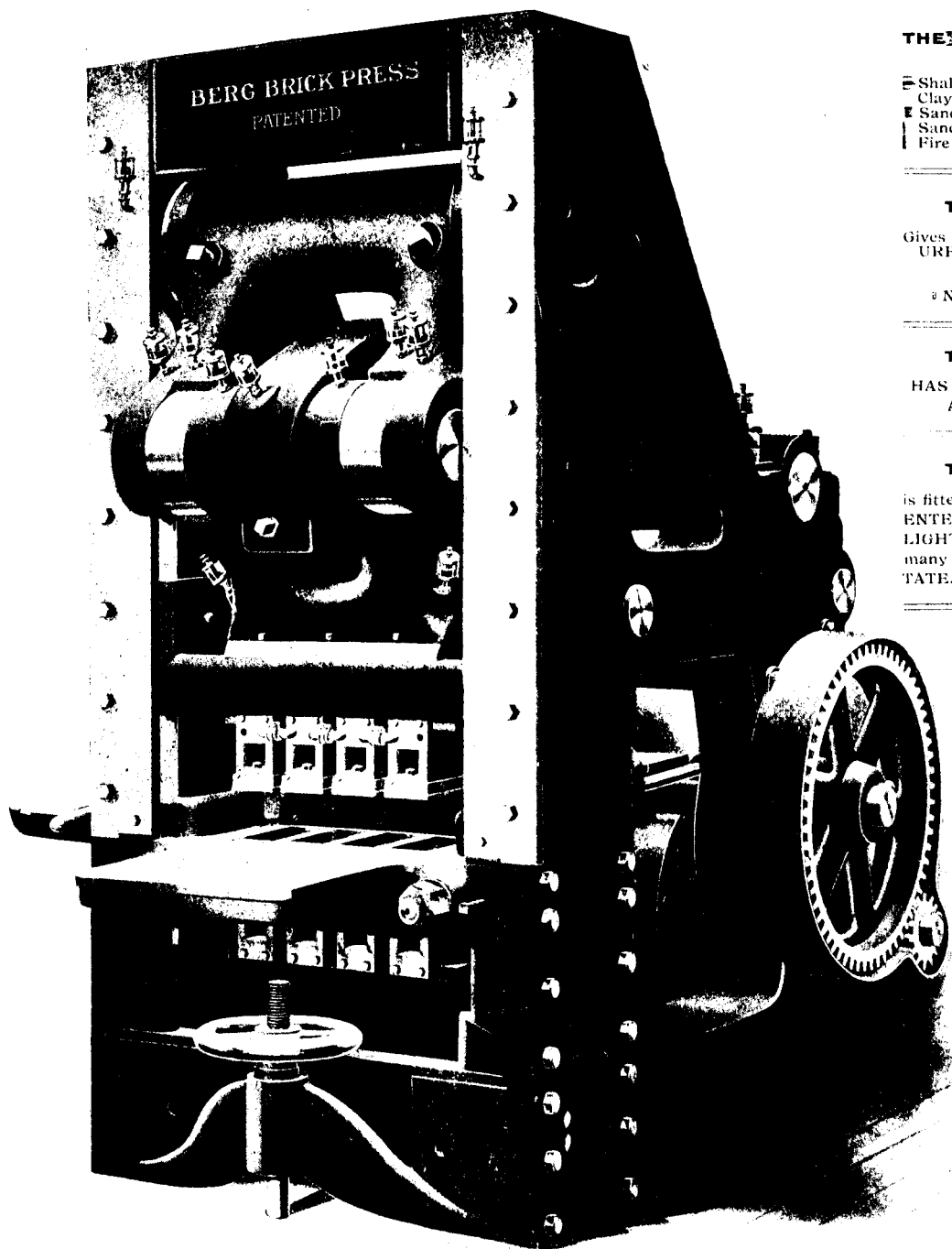
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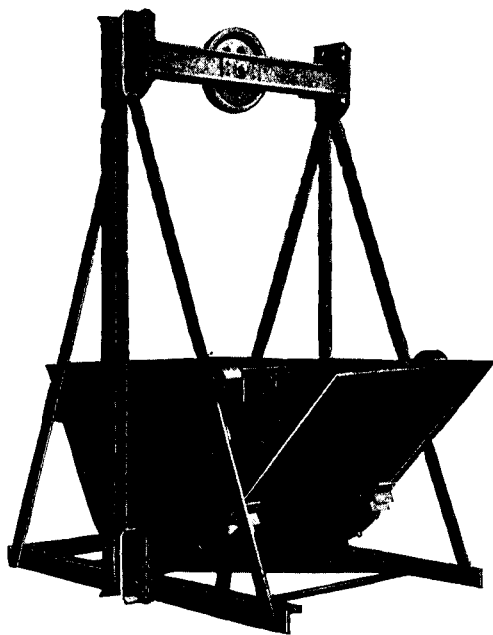
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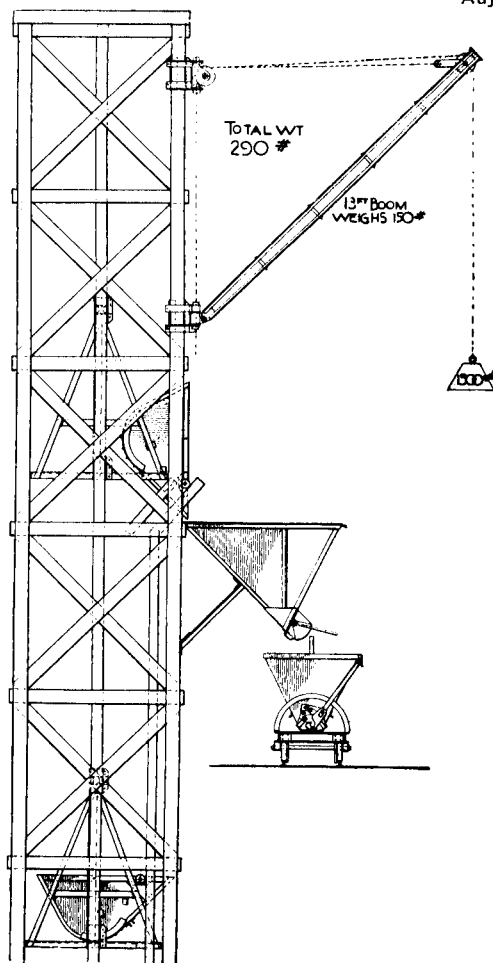


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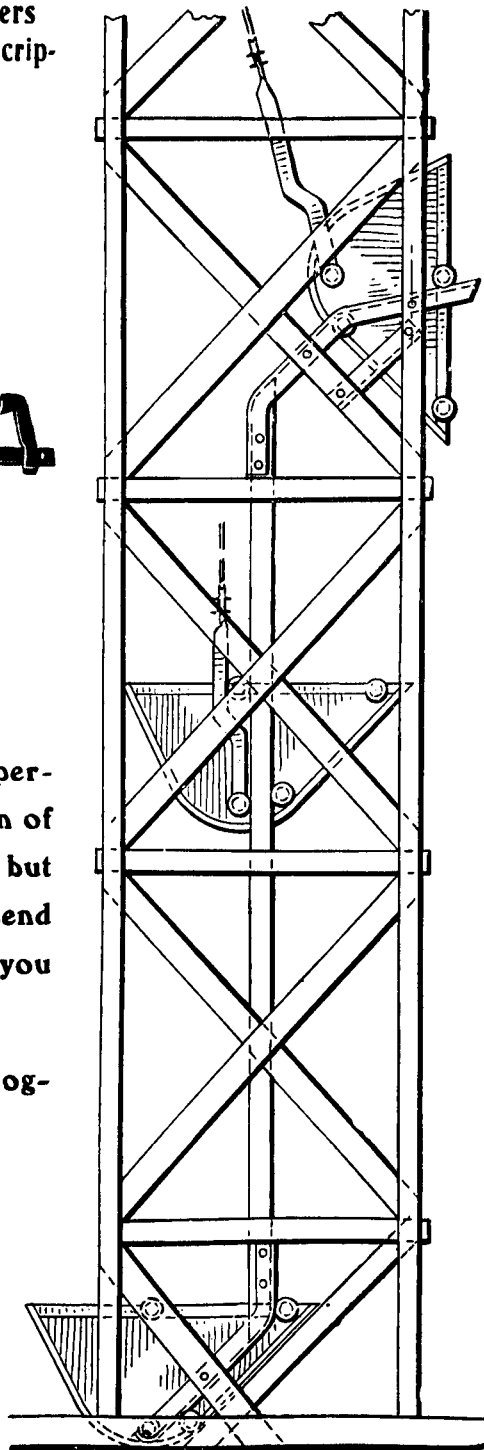


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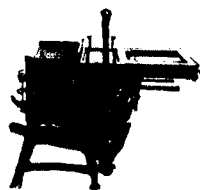
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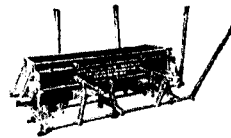
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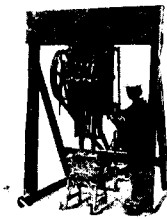
The Ideal line includes Block Machines, Automatic Power Tampers, Sill and Lintel Machines, Proportioning, Continuous and Batch Mixers, Brick Machines, Water Proofing and Colors, Metal Wall Plugs, Attachments for Chimneys, Water Tables, Course Blocks, Octagons, Circles, Face Designs of all kinds and Stucco Blocks, Special Molds for Columns, Bases, Capitals, Balustrades, Balls, Piers, Porch Columns, Vases, Steps, Sidewalk, Tile and Fence Posts.



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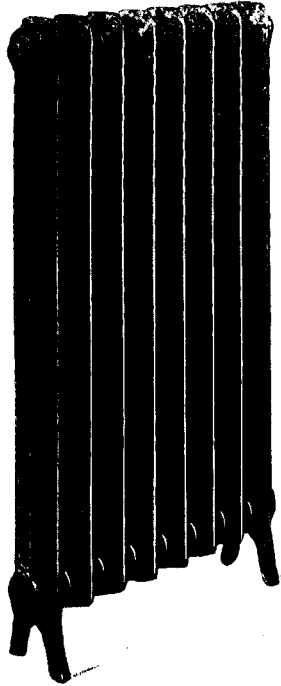
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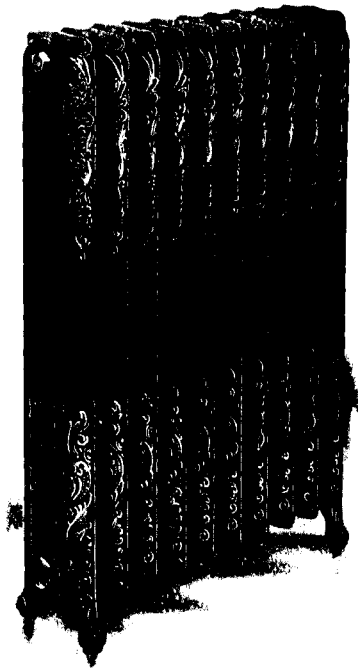
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SAFFORD RADIATORS



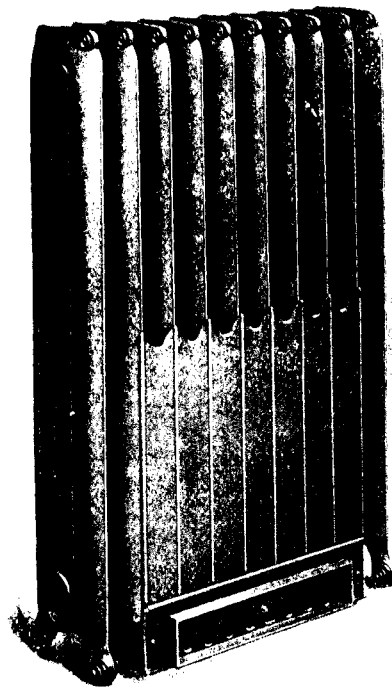
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The outstanding feature of the "Safford" line is the magnificent assortment of styles and patterns. There is no requirement in either heating or ventilating apparatus that cannot be fully satisfied by the installation of "Safford Radiators."



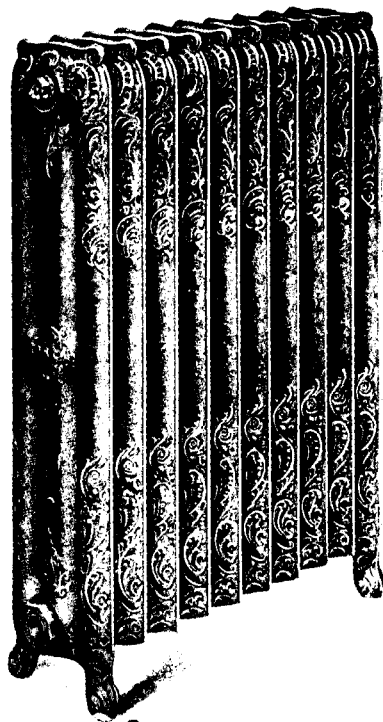
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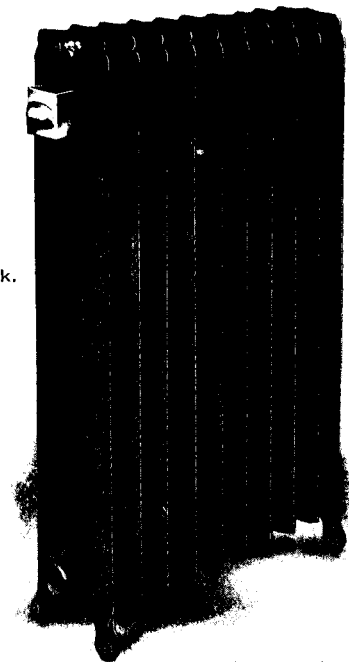


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Advance Announcement



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The Sherardizing process is the last word in metal protection. It is a process of galvanizing by which the zinc is forced *into* the steel as well as deposited upon it. Weight for weight, the tests show that the zinc thus used is fifteen times more efficient than when used in the hot process. Even disregarding the less amount of zinc used, the protection afforded by Sherardizing shows results two and one-half times better than by hot galvanizing.

The cost of Sherardizing will be very reasonable. We expect it to replace other types of galvanized lath and cut deeply into the field now occupied by the painted and japanned coatings.

A catalogue is in preparation. In the meantime architects and others interested can obtain fuller information by addressing

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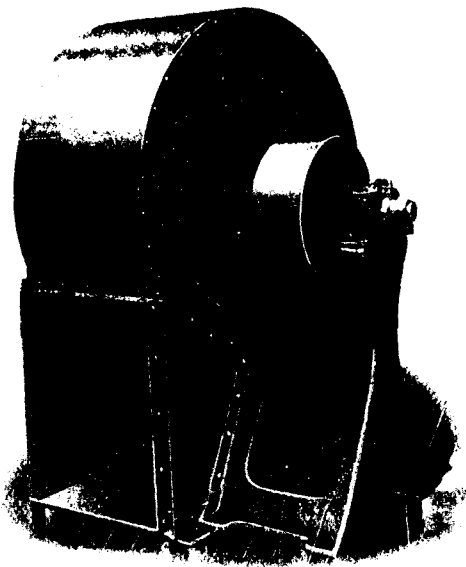
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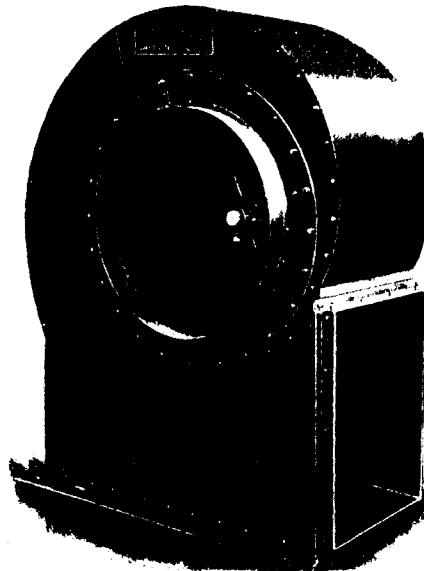
THE ÆOLOS FAN

(Pronounced E-O-LOS)

The
King
of
The
Winds



ÆOLOS FAN, pulley side, bottom discharge.



ÆOLOS FAN, inlet side, bottom discharge.

Canadian
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No. 122822

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"THE ÆOLOS FAN WHEEL represents the result of these tests."

The ÆOLOS FAN WHEEL differs from all others in design and construction; the blades are set at an angle peculiar to these fans only; they are so set that they take advantage of the natural flow of the air in its passage through the fan and simply assist it on its way. These blades are not curved or buckled in any way, but being perfectly straight and flat on their surface, offer the least possible resistance.

Some idea of the mammoth capacity of ÆOLOS FAN WHEELS may be gained from the fact that

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Heating and Ventilating Engineers and Manufacturers

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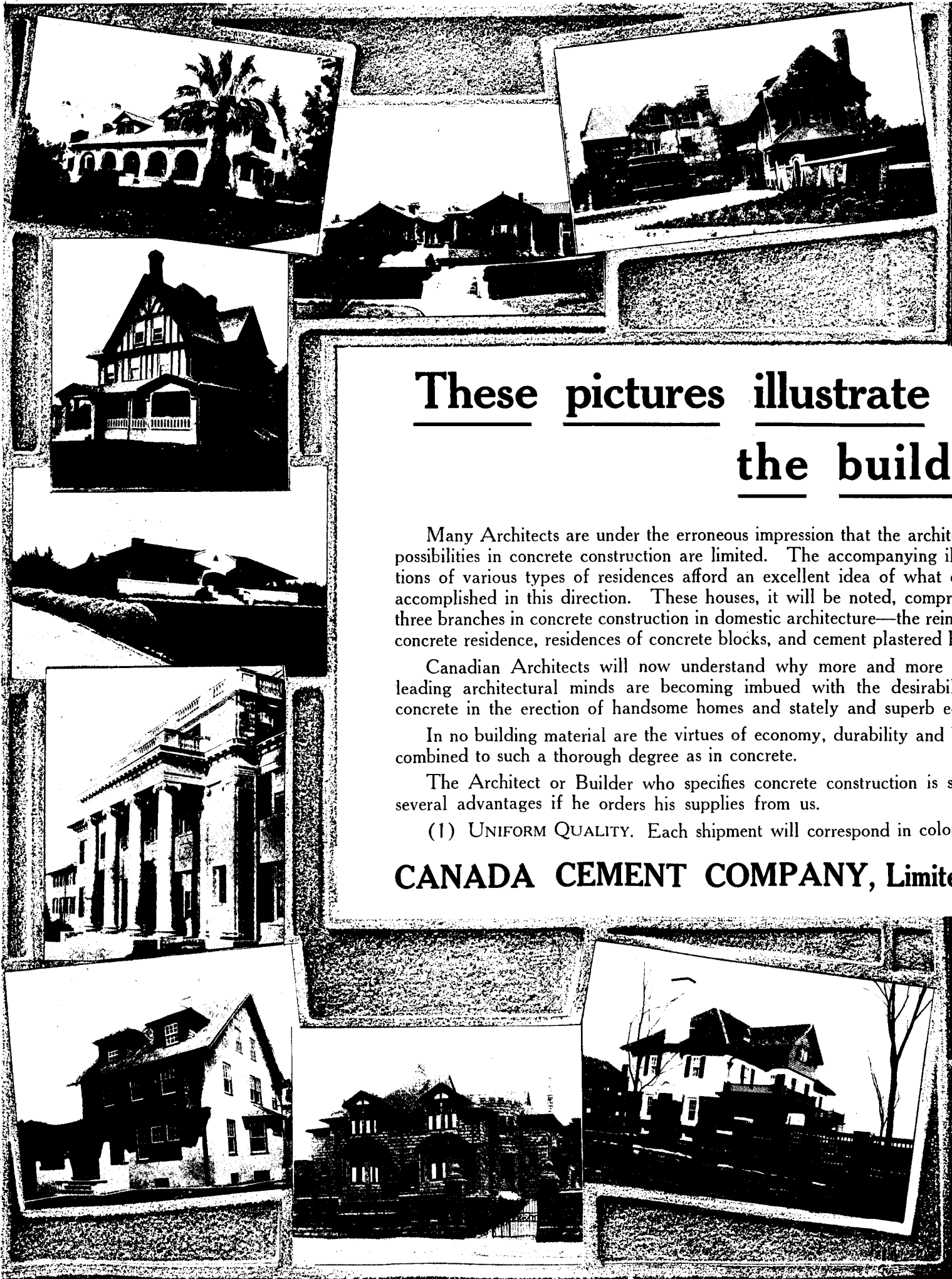
HEAD OFFICE AND WORKS:

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CANADA



These pictures illustrate the the building

Many Architects are under the erroneous impression that the architectural possibilities in concrete construction are limited. The accompanying illustrations of various types of residences afford an excellent idea of what can be accomplished in this direction. These houses, it will be noted, comprise the three branches in concrete construction in domestic architecture—the reinforced concrete residence, residences of concrete blocks, and cement plastered houses.

Canadian Architects will now understand why more and more of the leading architectural minds are becoming imbued with the desirability of concrete in the erection of handsome homes and stately and superb edifices.

In no building material are the virtues of economy, durability and beauty combined to such a thorough degree as in concrete.

The Architect or Builder who specifies concrete construction is sure of several advantages if he orders his supplies from us.

(1) UNIFORM QUALITY. Each shipment will correspond in color, fine-

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ness, strength and setting with that previously used. All our cement is manufactured under the supervision of an expert chemist, who requires every barrel passing through each of the ten mills to meet standard specifications.

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These services mean that Portland Cement construction may be undertaken with the understanding that fixed charges will be reduced to the lowest point, freight charges to the lowest point, and that no more will be paid than "the market."

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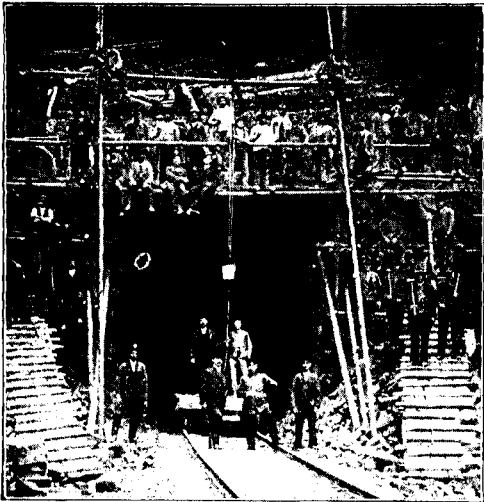
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No expert help required; no scientific and expensive mixing.

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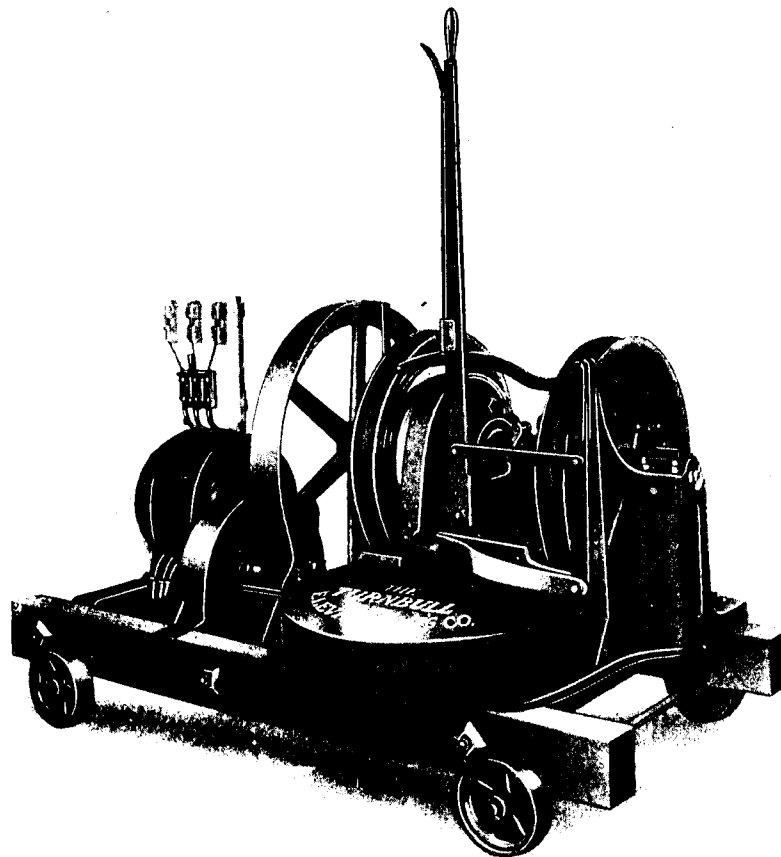
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CEMENT SHINGLES
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BUILDING LUMBER**

Mark an Epoch in the Building Industry as far as Fireproof Construction is Concerned

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ASBESTOS CEMENT SHINGLES are dense and elastic, made of hydraulic cement—reinforced in every direction with interlacing asbestos fibre—dampness (rain and snow), freezing and thawing—hasten the maturing of the cement and make the shingles tougher and harder.

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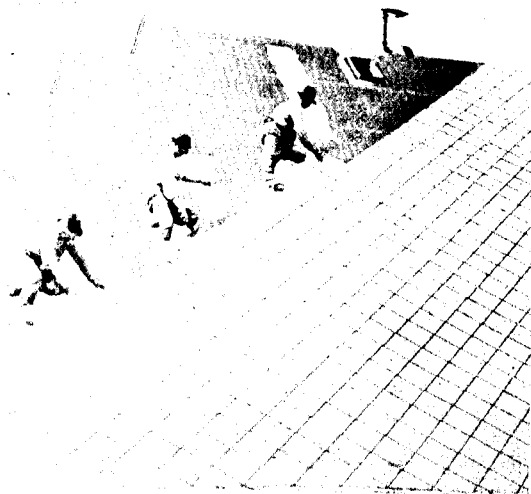
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705 EASTERN TOWNSHIPS BUILDING, MONTREAL, CANADA

Factory at Lachine, P.Q.

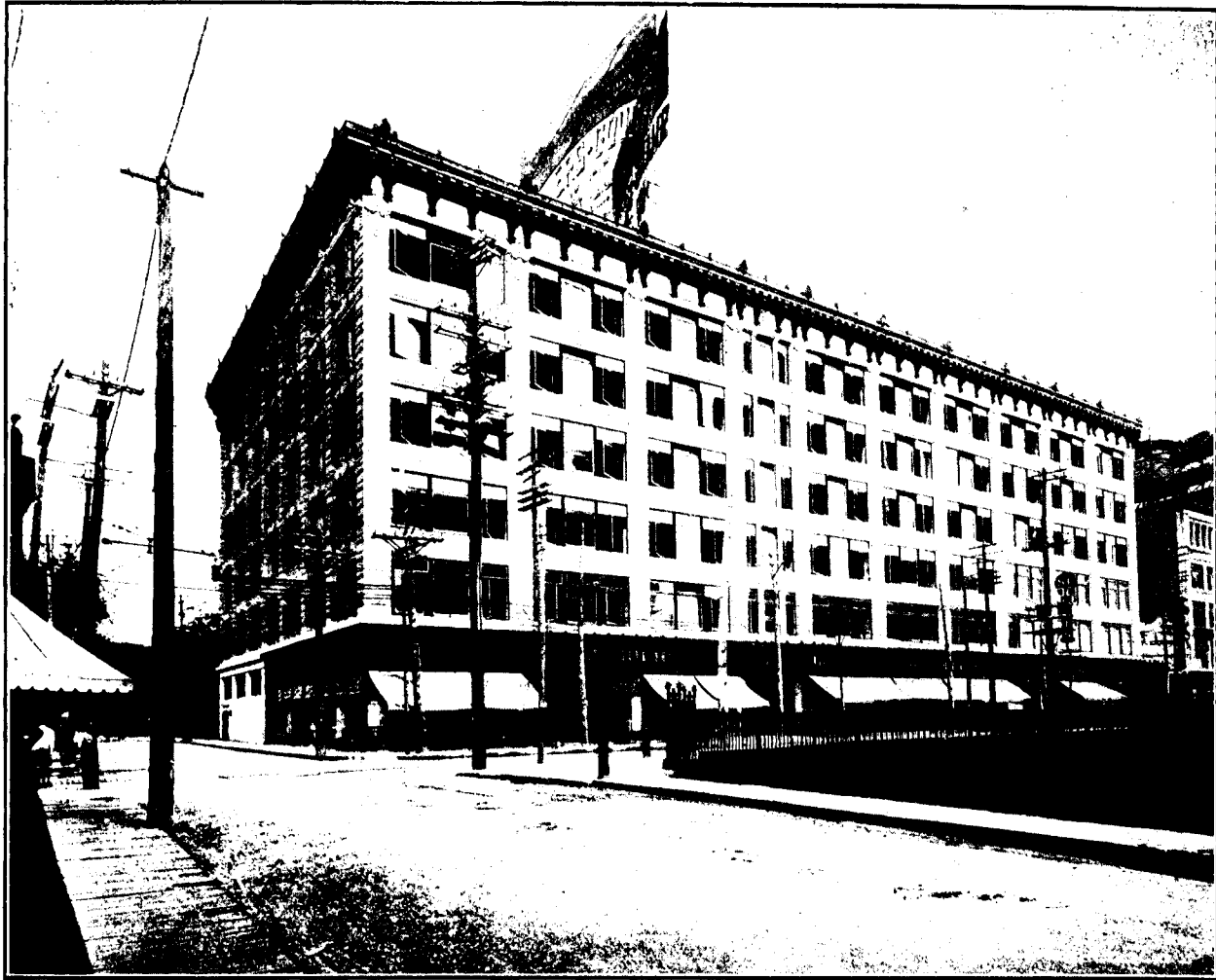
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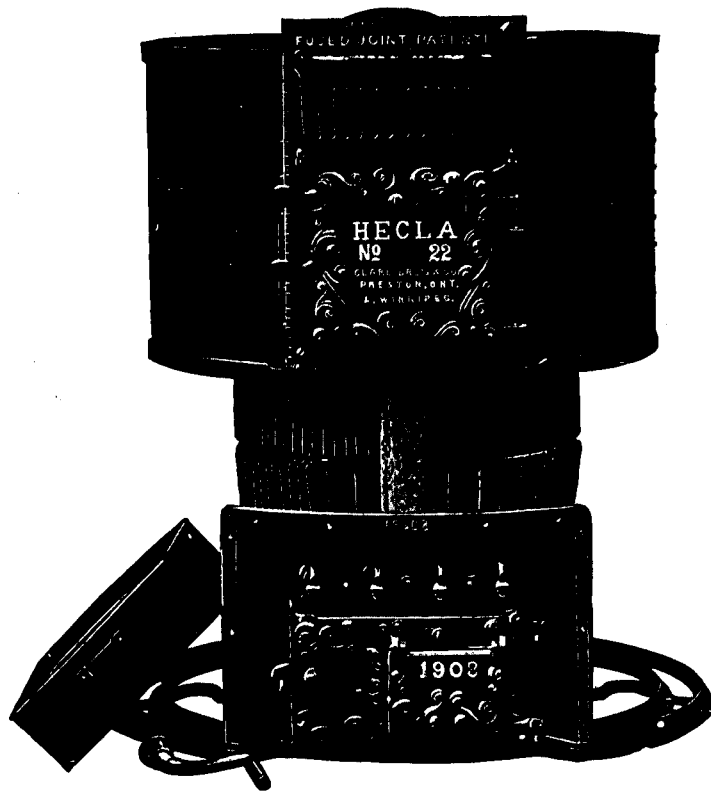
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“HECLA” FEATURES

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INDIVIDUAL GRATE BARS

PATENT FUSED JOINTS
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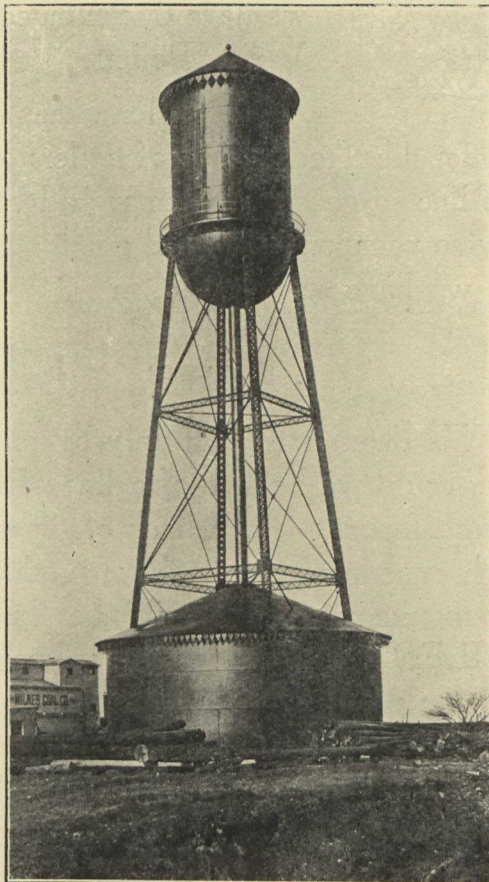


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THE preventive is BITUNAMEL. No corrosion on iron or steel surfaces where this coating is used. BITUNAMEL will prevent corrosion, whether above or below ground, and as a waterproof for foundations of buildings it has no equal. BITUNAMEL should be used everywhere that you wish to prevent rust or corrosion. It

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AND TOWER
EAST TORONTO
CITY WATER WORKS



COATED WITH
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THE ANTI-CORROSIVE
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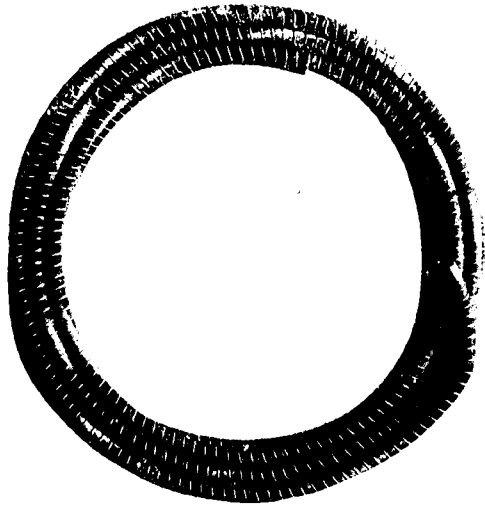
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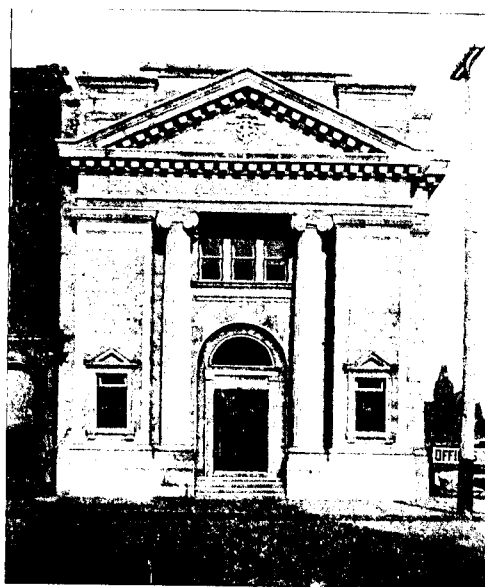
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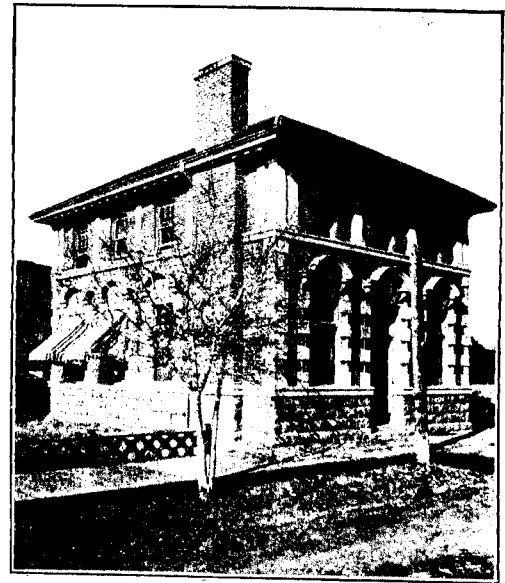
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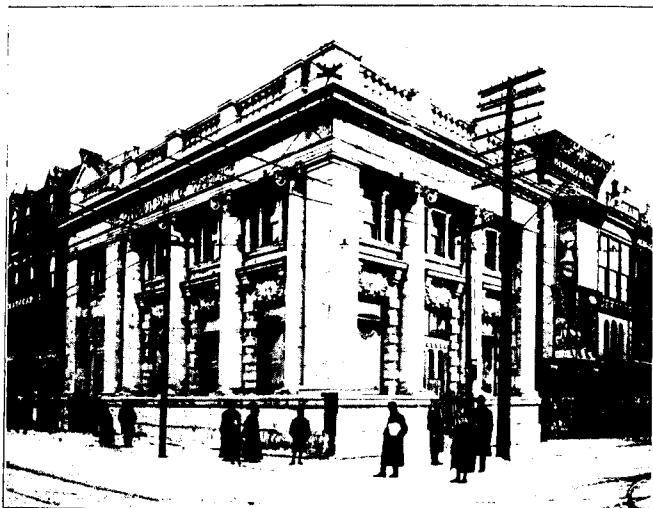
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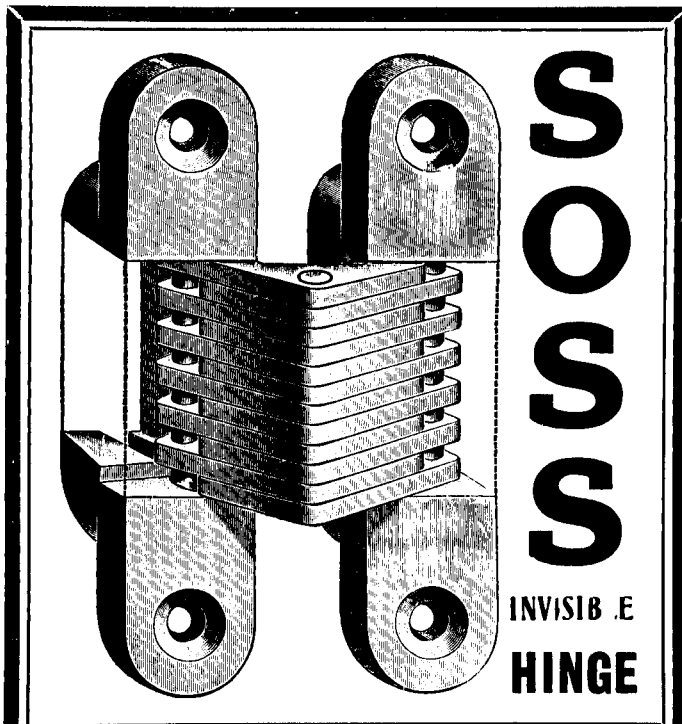
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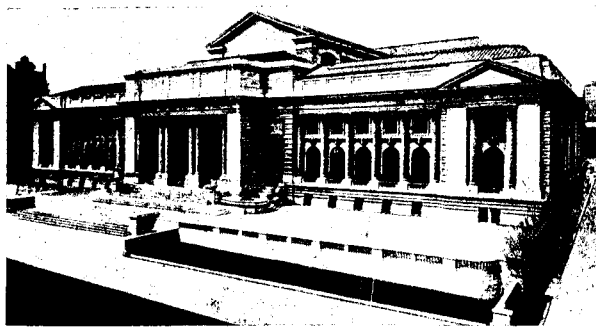
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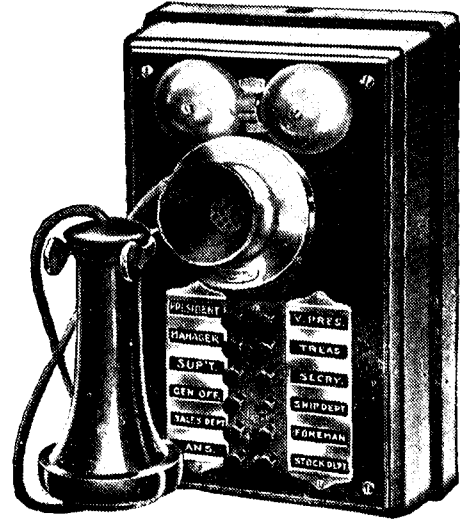
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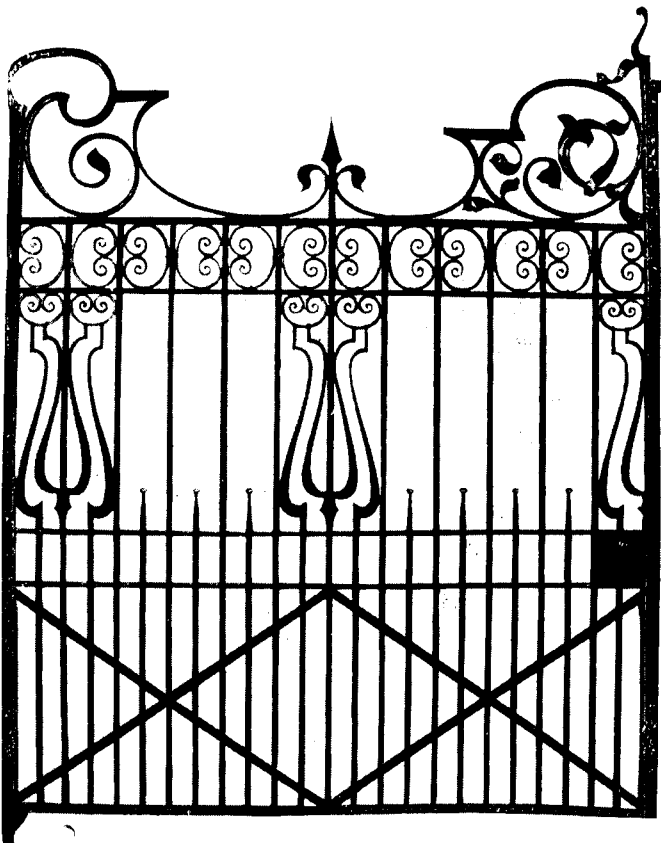
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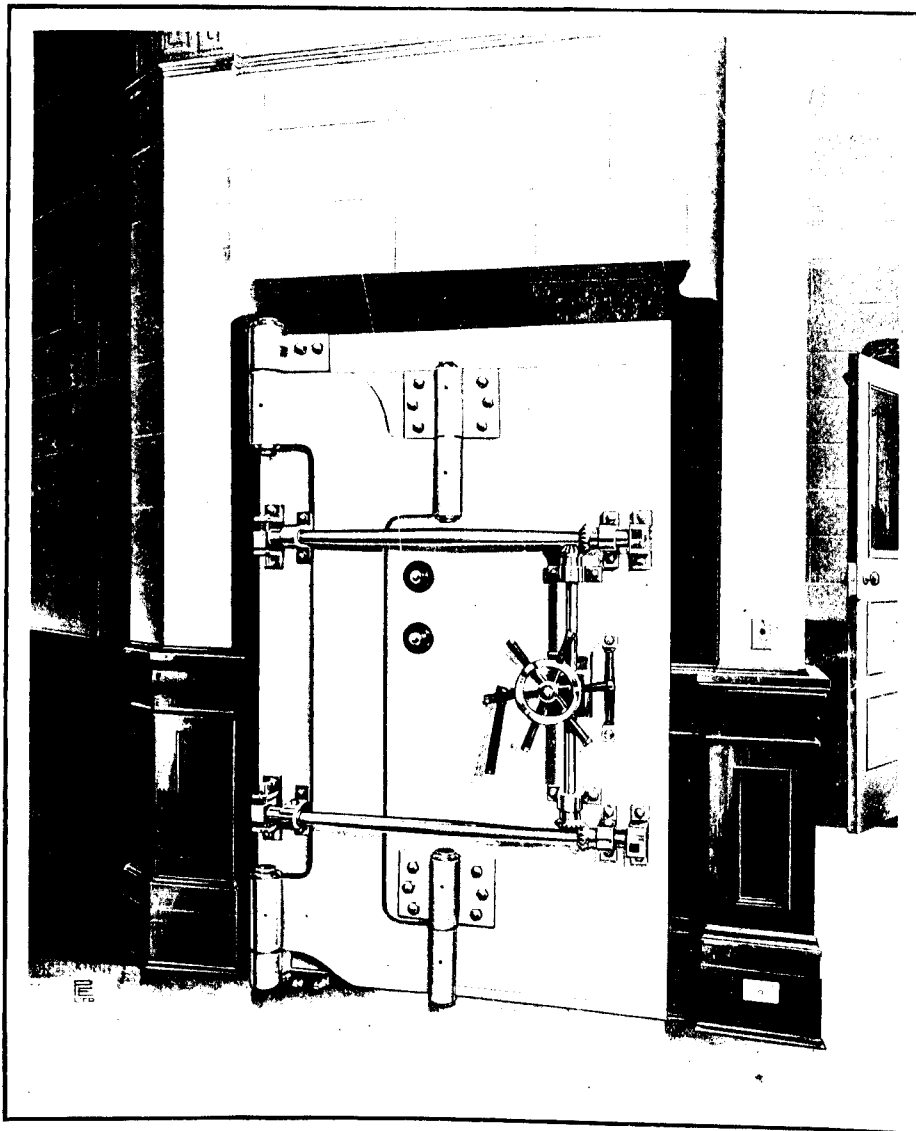
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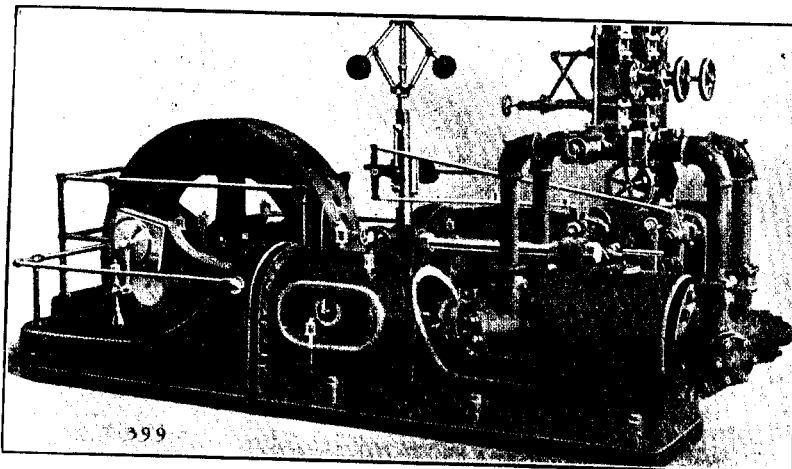
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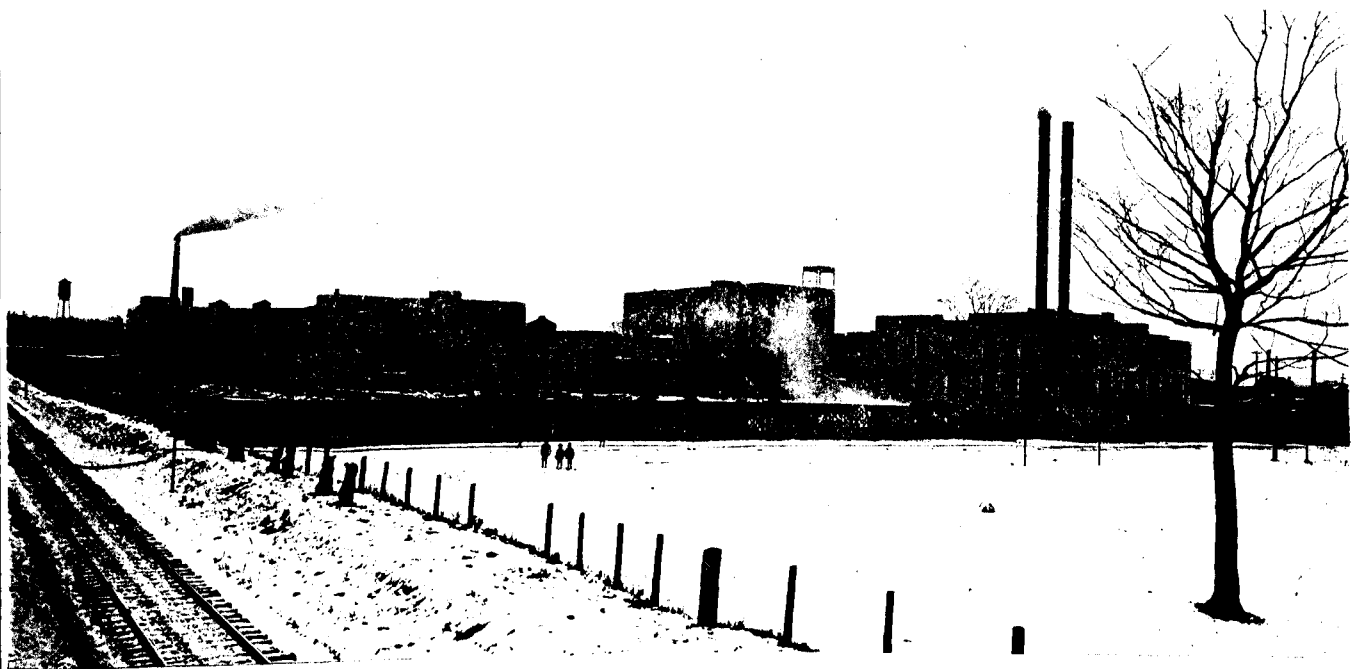
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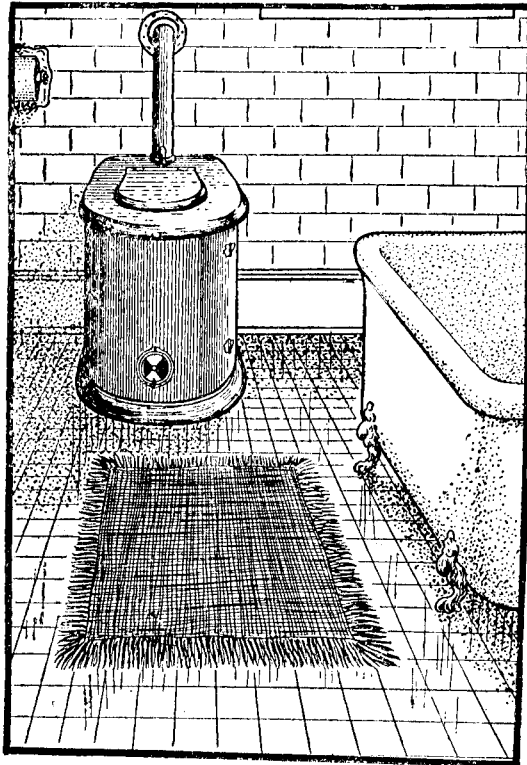
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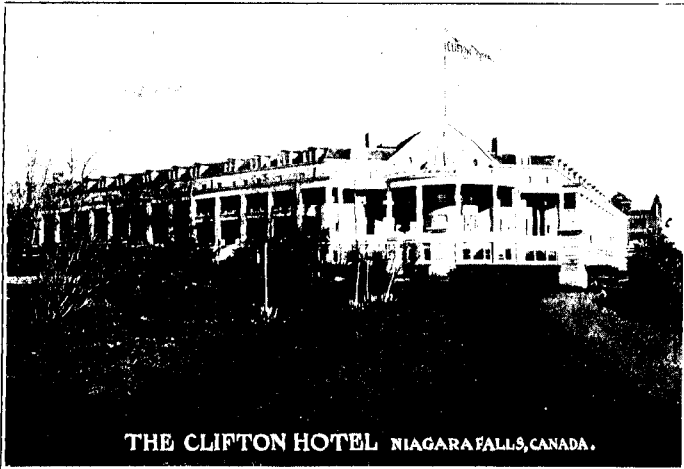
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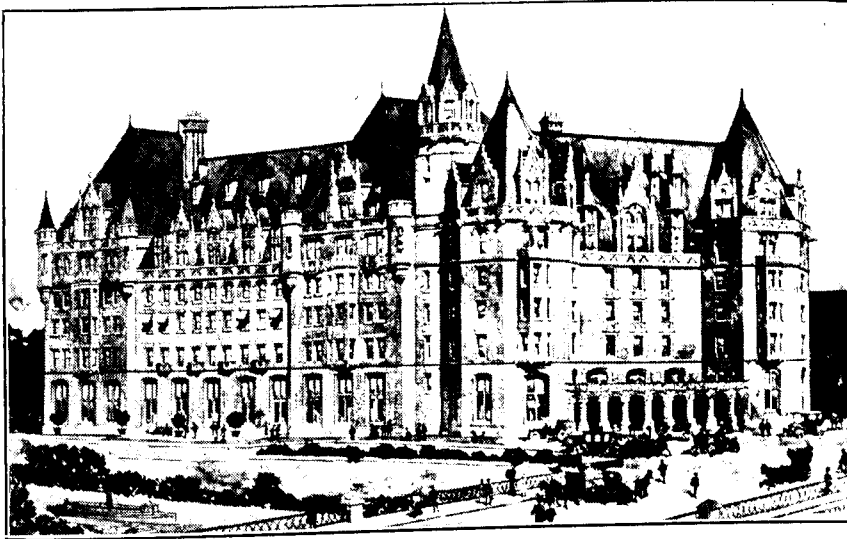
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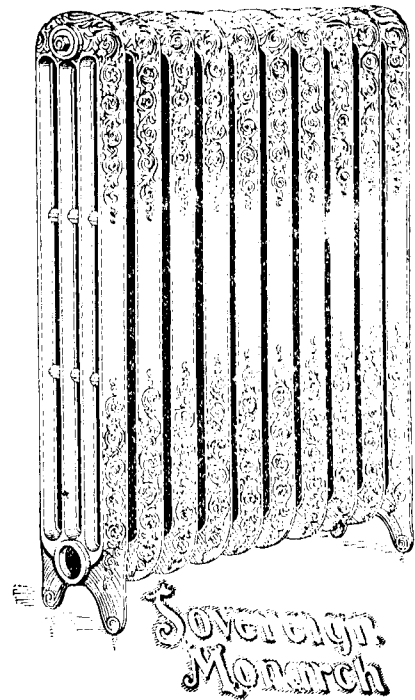
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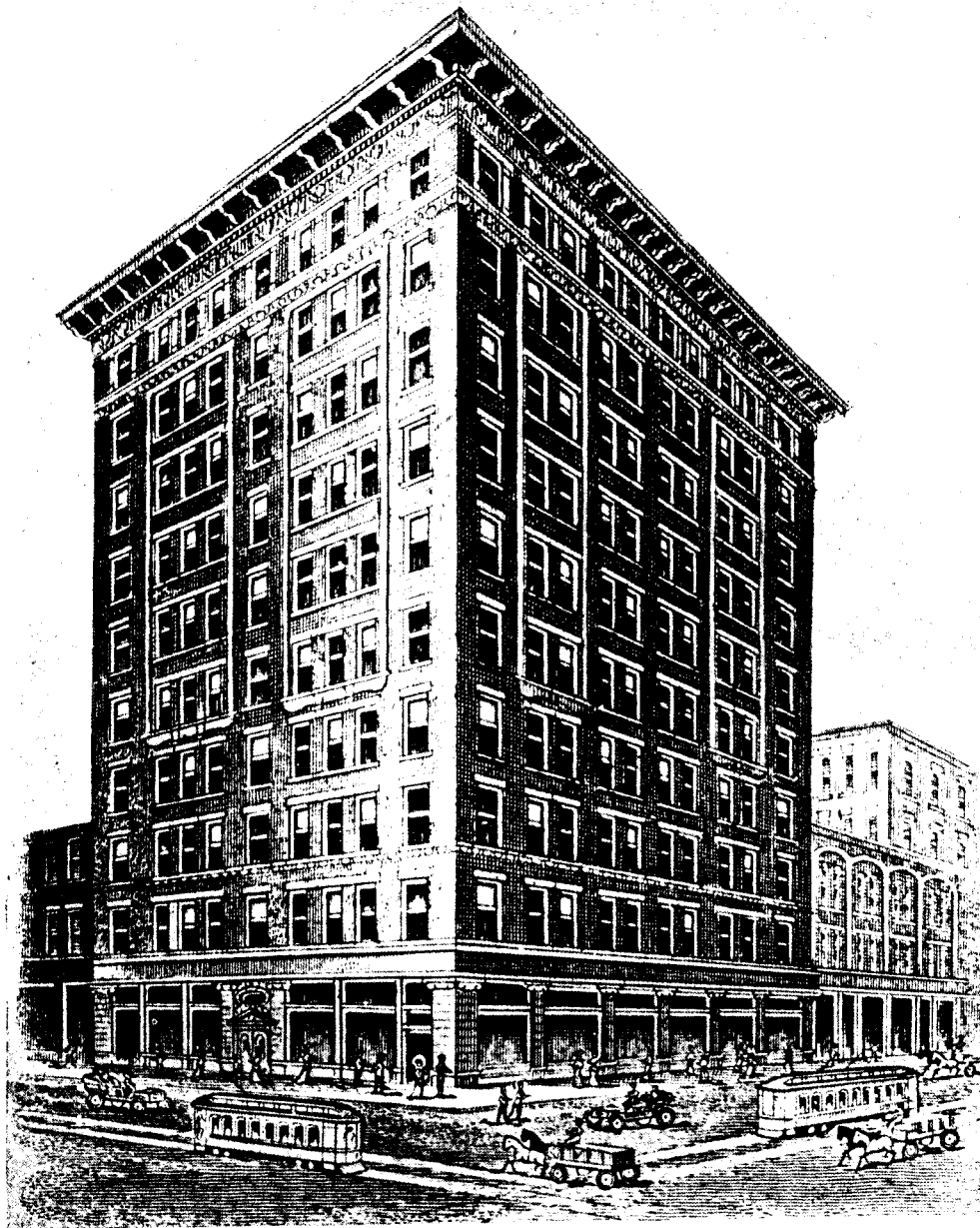
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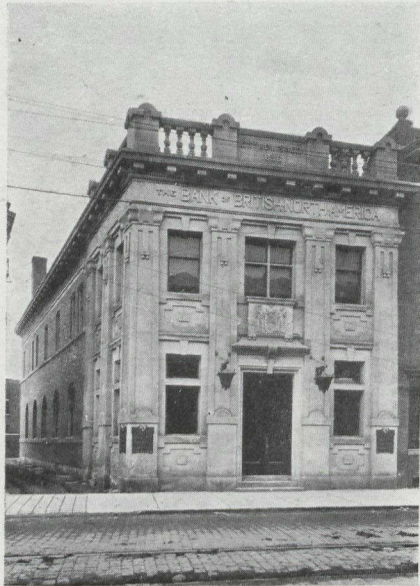
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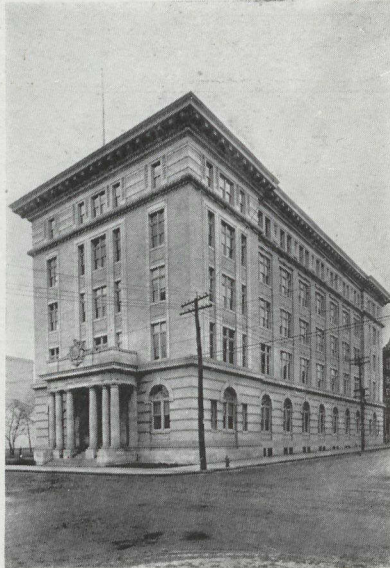


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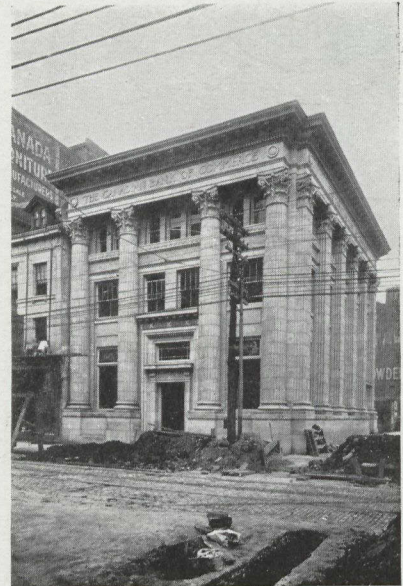
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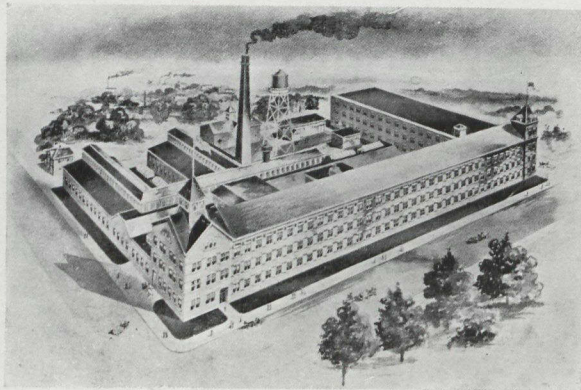
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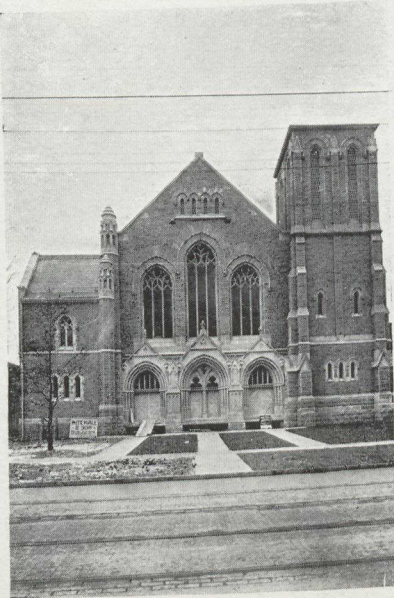


La Patrie Building, St. Catherine Street, East, Montreal. — Penault, Architect. D. Ouimet, Plumber.



Eveleigh Trunk Factory, J. Eveleigh & Co., Owners, Montreal, Que. Messrs. McVicar & Herlot, Architects. A. T. State, Plumber.

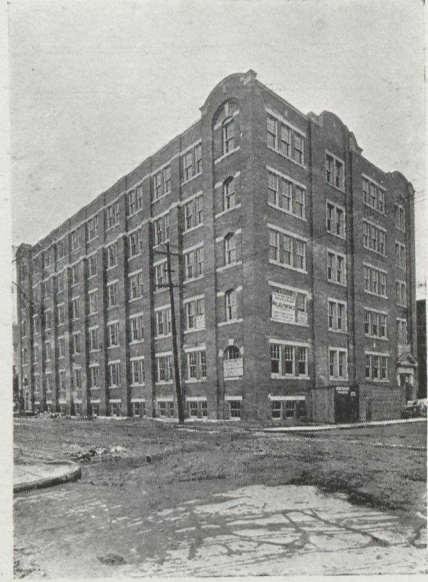
The Standard Ideal Company Ltd.



Knox Church, Spadina Avenue, Toronto. Mr. Wilson J. Gray, Architect. John Ritchie Plumbing Co., Plumbers.



Verhoeven Building, Carry Street, Winnipeg. John Woodman, Architect. J. L. Wells, Plumber.



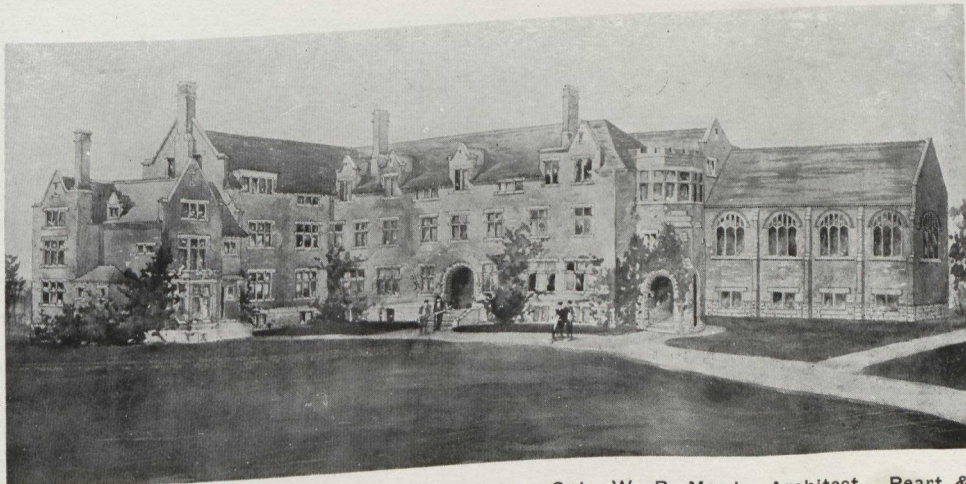
Southam Press Building, Adelaide and Duncan Streets, Toronto. Messrs. Sproat & Rolph, Architects. W. J. McGuire, Limited, Plumbers.



Sunbeam Incandescent Lamp Co.'s Building, Dufferin Street, Toronto. F. Herbert, Architect. W. J. McGuire, Limited, Plumbers.



Smart Bag Company, Logan Avenue, Toronto. J. C. Havill, Architect. W. J. McGuire, Limited, Plumbers.

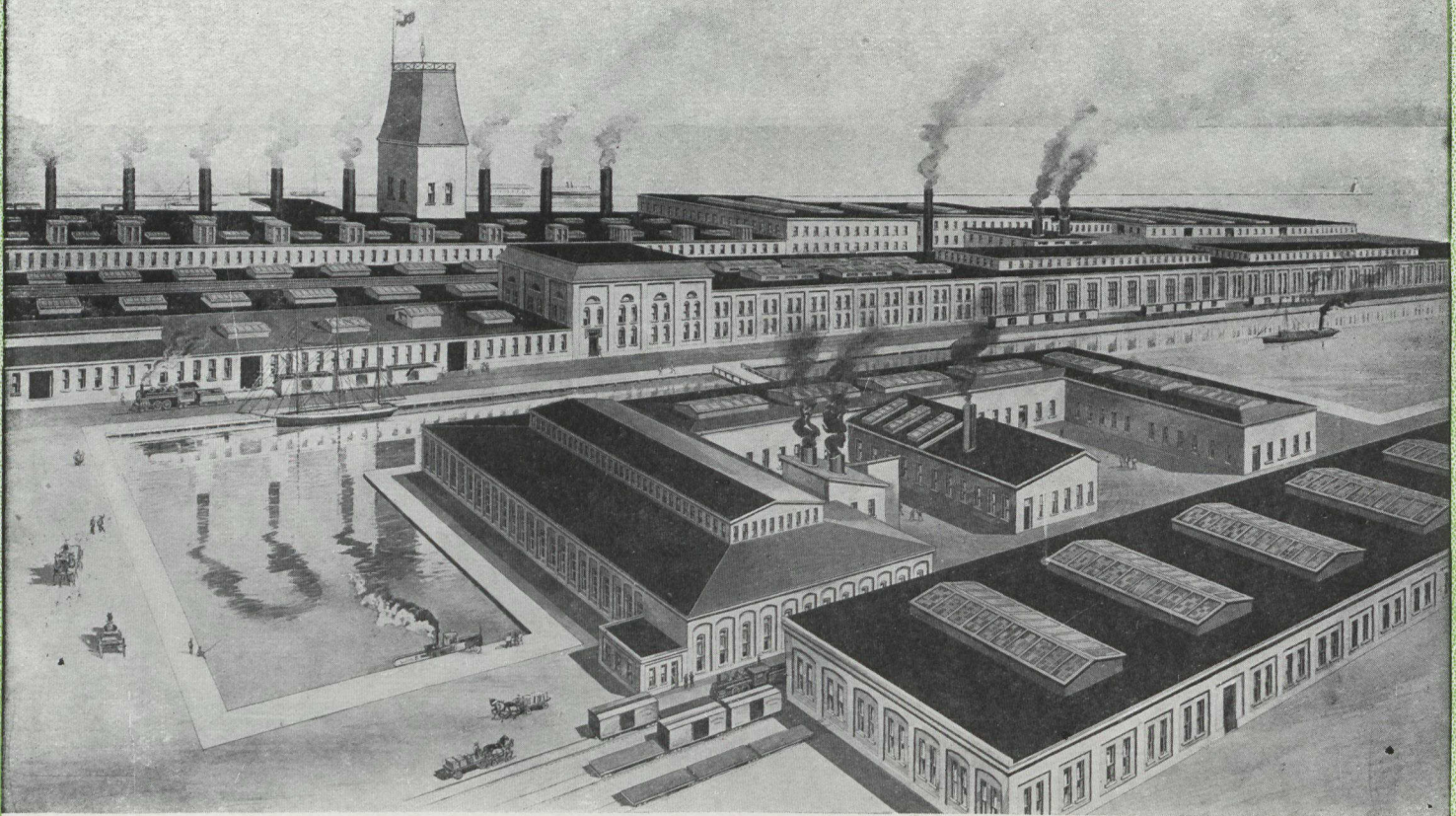


Upper School Building, Ridley College, St. Catharines, Ont. W. R. Meade, Architect. Peart & Co., Plumbers.



Continental Life Building, Bay Street, Toronto. Mr. Tellier, Architect. Purdy-Mansell, Plumbers.

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CONSTRUCTION

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



Vol. 4

TORONTO, JANUARY, 1911.

No. 2

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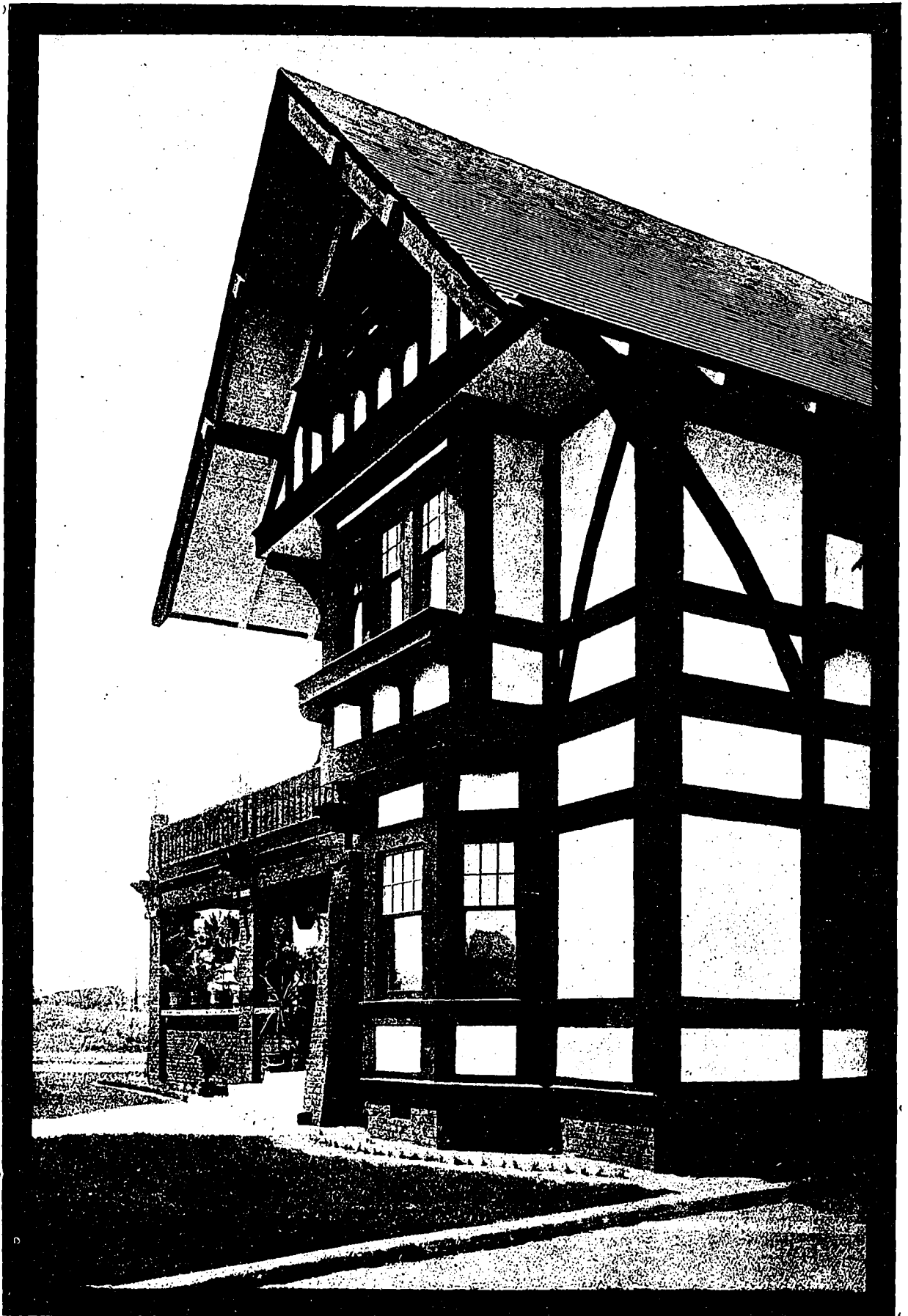
Saturday Night Building

TORONTO

CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building. LONDON, ENG.—Byron House, 85 Fleet St. E.C.



Detail of Half-Timber Work, Residence of Dr. W. T. McArthur, Los Angeles, California. R. Mackay Fripp, Architect. (See page 50.)



Building Statistics for November—Returns from twenty-four important centres show average increase of 64 per cent. over same month of last year.

THE WINTER SEASON LET UP in building operations held in anticipation by the more pessimistic, has as yet failed to put in its appearance. Judging from the present state of activities, the Canadian builder no longer cares the snap of his finger for the frost, the snow, or the sweep of the wind. Experience has taught him to meet weather conditions as they come, and his work is no longer confined to specific seasons, but one that keeps him busy from one end of the year to the other. Nothing more clearly demonstrates this than the comparative figures for the month of November, submitted to CONSTRUCTION from 24 important centres throughout the Dominion. These figures show a most gratifying state of progress on practically all sides, with individual gains in some cases such as has never before been attained in the history of the community they represent.

An average gain of 64 per cent., representing an investment of \$8,051,419, as against \$4,719,564 in the corresponding year of 1909, tells them the story of the month's progress in brief, and while the amount noted is slightly less than that recorded in October, it nevertheless indicates a growth that is well in keeping with the remarkable development that has characterized the season throughout.

Possibly the most pronounced feature of the month was not so much the universal activity that obtained in general, as it was the heavy proportionate gains made in all parts. Toronto, as is its usual wont, stands well at the head of the list with an amount of \$2,040,030, a splendid total to top off the heavy successive gains already to her credit; while Vancouver registers an amount for permits issued of \$1,897,895, which is a most remarkable showing in view of this city's past performance. These totals are the largest reported for the month, and the gains are 5 per cent. and 211 per cent. in order named.

Although three more losses are noted than in the previous month, it must be remembered that the number of cities reporting is again one-third as great. Apart from Halifax's loss of 76 per cent. and the decrease in Lethbridge of 27 per cent., the falling off, collectively, but little affects the exceedingly active conditions which otherwise prevailed. The highest increase for the month goes to Port Arthur, whose mighty development is reflected in a gain of 1,263 per cent., representing an investment of \$182,016 as compared with \$13,350 in the months of November, 1909. Ontario, in fact, turned itself to good account in practically every direction. Berlin recorded an increase of 365 per cent., Hamilton a gain of 44 per cent., and Brantford is ahead by 162 per cent. A big advance is also noted in the case of Fort William, which registered 198 per cent., and this is equally true of St. Thomas,

which annexed a gain of 432 per cent. Fort William's total amounts to \$411,480, which is \$273,515 in excess of her previous corresponding figures. Again, Ottawa, which witnessed operations to the extent of \$230,100, has an increase of 12 per cent.; Windsor records a gain of 27 per cent.; and Kingston, which does not submit comparative figures, reports operations to the extent of \$23,965. The only two reversals noted in this province occur in the case of London and Peterboro, but considering the investment in either cases these declines are of very small proportions.

In the western section of the Dominion the headway made was equally pronounced. Aside from Vancouver's phenomenal upturn previously mentioned, many of the cities reporting forged ahead in a most substantial manner. Especially can this be said in the case of Calgary, which undertook new work amounting to \$590,604, equal to a gain of 179 per cent. This total, which is slightly in excess of that noted in the previous month, speaks volumes for the wonderful development which this city is experiencing. Edmonton, where a falling off of 16 per cent. is noted, was, however, less fortunate; as was also the city of Lethbridge, whose decrease has been previously stated. In Saskatchewan, both Regina and Moose Jaw slightly topped their figures for the same period of 1909, the investment in each case being approximately \$50,000. Prince Albert sends in a stated amount of \$240,000, without corresponding figures for the previous year; while Saskatoon, which issues permits aggregating \$184,210, shows a gain of 647 per cent. Substantial strides were also made in Winnipeg and Victoria, which have to their credit gains of 27 and 94 per cent. in the order named. Brandon, however, is in the arrear to the ex-

| | Permits for November, 1910. | Permits for November, 1909. | Increase, Per cent. | Decrease, Per cent. |
|---------------------------|-----------------------------------|-----------------------------------|------------------------|------------------------|
| Berlin, Ont. | \$27,950 | \$6,000 | 365.83 | ..... |
| Brandon, Man. | 4,400 | 6,430 | ..... | 31.57 |
| Brantford, Ont. | 98,400 | 37,550 | 162.05 | ..... |
| Calgary, Alta. | 590,604 | 211,550 | 179.17 | ..... |
| Edmonton, Alta. | 52,606 | 63,365 | ..... | 16.98 |
| Fort William, Ont. | 411,480 | 137,965 | 198.25 | ..... |
| Halifax, N.S. | 24,350 | 104,675 | ..... | 76.72 |
| Hamilton, Ont. | 239,225 | 165,850 | 44.24 | ..... |
| Kingston, Ont. | 23,965 | ..... | ..... | ..... |
| Lethbridge, Alta. | 69,755 | 96,755 | ..... | 27.91 |
| London, Ont. | 31,074 | 37,475 | ..... | 15.48 |
| Montreal, Que. | 905,427 | 479,540 | 88.81 | ..... |
| Moose Jaw, Sask. | 52,000 | 51,350 | 1.26 | ..... |
| Ottawa, Ont. | 230,100 | 205,100 | 12.19 | ..... |
| Peterborough, Ont. | 8,570 | 15,075 | ..... | 43.16 |
| Port Arthur, Ont. | 182,016 | 13,350 | 1263.41 | ..... |
| Prince Albert, Sask. | 240,500 | ..... | ..... | ..... |
| Regina, Sask. | 50,240 | 49,205 | 2.10 | ..... |
| Saskatoon, Sask. | 184,210 | 24,635 | 647.76 | ..... |
| St. John, N.B. | 66,900 | 33,900 | 97.34 | ..... |
| St. Thomas, Ont. | 44,300 | 7,600 | 482.89 | ..... |
| Sydney, N.S. | 15,737 | 10,070 | 56.27 | ..... |
| Toronto, Ont. | 2,040,030 | 1,940,650 | 5.12 | ..... |
| Vancouver, B.C. | 1,897,895 | 610,189 | 211.03 | ..... |
| Victoria, B.C. | 104,295 | 53,585 | 94.63 | ..... |
| Windsor, Ont. | 84,200 | 66,000 | 27.57 | ..... |
| Winnipeg, Man. | 371,200 | 291,800 | 27.21 | ..... |
| | \$8,051,419 | \$4,719,564 | 64.99 | ..... |

tent of 31 per cent, although the amounts recorded for both this year and last indicate nothing other than a possible state of a seasonable activity.

In the more eastern section, Montréal comes strongly to the front, with a gain of 88 per cent. Permits were issued for new buildings aggregating in value \$905,427, as against \$479,540 in the previous year. Montreal has enjoyed a great expansion, and at no time during the year has a decrease been experienced. St. John also shows an advance by a gain of 90 per cent., as does also Sydney, where the total for the month is 56 per cent. in excess of the previous corresponding month.

Altogether, the year has been a most remarkable one in many respects. Toronto's total for the year is over \$20,000,000; Montreal, \$15,000,000; Winnipeg, \$14,000,000; and Vancouver, \$12,000,000. A large number of other cities also have amounts that are well up in the seven figures. As regards the immediate outlook, prospects were never brighter, and in practically every section and corner in the Dominion architects and builders are at present making preparations for a large volume of work to be carried out in the early months of 1911.

Q The Future of the Roof—French Designer predicts that aerial navigation will bring about both its architectural and constructive transformation.

IN CONSIDERING the growing appreciation now manifest as regards the aesthetic in building design, there is just an element of speculation as to what will be the ultimate architectural status of the roof. Outside of the residential districts, it is a much unaesthetic, sadly-neglected and disfiguring feature of the average building. Possibly not so to the pedestrian on the street, for whom its ungainly appearance is hidden by cornice and parapet walls, but to the man "higher up"—a term which fits in well in this connection—its shortcomings are conspicuously evident.

As it applies to our commercial and industrial buildings, with a few possible exceptions, architecture to be seen at its best must be viewed from the bottom up and from the top down. From the upper windows of the modern office building, or the tower of the public edifice, the sight which greets the eye is anything but an inspiring one. Instead of any semblance of order, one is confronted with a chaotic riot of hideous disorder, which in many phases is so naked and black and repelling in its ugliness, as to strike one with amazement at the Jekl and Hyde duplicity which architecture from this viewpoint reveals. For apart from its purpose as a covering, the roof has but little in its make up to commend it. In its present considered state, it adds nothing to the prestige or rarer qualities of the "Mother" of all arts, but rather makes her appear at times as a beautifully dressed and girdled matron, who bears the odium of having a tow-selled and unkempt head.

Not that architecture has always appeared in this unfavorable light, for in Egypt, Jerusalem, and countries of the Levant, there are many examples of buildings, both old and new, where the roof is as interestingly considered from an aesthetic point as any other part of the building. A brief sojourn in almost any art shop or a glance through a representative collection gallery of architectural photographs, fully bears out the correctness of this statement. Even at the present day in certain parts of Europe, there is at least a pretence at harmony in outline, but on this Continent the roof of the average commercial and industrial building has attained no status other than that which is purely utilitarian and unadorned. As charity covers a multitude of sin, and an overcoat a multitude of rags, so the cornice and parapet conceal the ugliness of the roof from the street below.

However, with the increasing popularity of aviation,

there is a possibility that the roof will some day come into its own. At least this is prophesied by Mr. M. E. Henard, Architect of the City of Paris, who, in a paper on the "Cities of the Future," read before the recent Town Planning Conference, stated that "with the resources afforded by the use of armored cement it is easy to cover buildings with platforms upon which small flower beds and verdant shrubberies could be laid out. The most important result is that these terraces at an early date would be used for landing stages for aeroplanes, and when this has been accomplished, the physiognomy of the town will be changed. All the terraces will become landing stages for flying automobiles. Aviators will be able to fly from one terrace to another, starting and landing as they please." The natural consequence of this new state of things, to quote Mr. Henard further, "will be that each building will have to be furnished with big elevators, capable of raising the machines ready to start and to take them to their garage on their return. Lifts of this description would also be used to house motor cars. The elevation of the courtyard which would result from the raising of the road would permit of all necessary garages being located underground.

"The profound revolution which aviation is producing in the public mind is so great, and opens up such wide vistas, that we may indulge in the belief that all this will be realized. The conquest of the air will bring with it peace and wealth. The cities of the future, more easily than the cities of the past, will be capable of transformation and embellishment. In them will be erected magnificent towers to call the flying giants from all points of the horizon, and perhaps ere long the great capitals will erect higher and higher their lofty beacons to attack the stormy clouds themselves."

It is quite evident from this, that when the architects take to flying, and whisk their way to and from their offices in a Wright biplane or Bleriot, a much needed improvement as regards the roof will be brought about. In the meantime we must be content to view its ugliness through opaque glasses, and to encourage for the sake of a consummate architecture, the exhilarating and exciting pastime of aerial navigation.

Q Architects or Brokers?—The question of professional integrity as regards the authorship of buildings.—Interesting letter of anonymous writer on the subject.

FROM TIME TO TIME one hears much concerning the authorship of buildings that leave a grave doubt in the mind as to where the credit really belongs. This, as a rule, is brought about by a statement which charges one architect with appropriating under his own name, work that was in reality designed by another. It seems that there are certain instances where the identity of the rightful designer has been completely submerged, owing to the fact that circumstances had placed him in an advisory or subordinate capacity at the time the plan was executed, but yet it hardly follows that the reputation and professional integrity of the majority of architects can be justly assailed on these grounds. Touching upon a controversy regarding the disputed authorship of the old New York City Hall, "Vindex," in a letter published a short time ago in the *Architectural Record*, deals interestingly with this important subject. "Doubtless," says the writer, "the great majority of architects do the work they pretend to do. Still, it were desirable that there should not be five per cent. or one per cent. of basis for censure. A distinguished American architect, lately deceased, concerning whose own authorship of the work that went out with his office-stamp upon it there never was any question, was hugely disgusted whenever it appeared that there was such a question about the work that bore the office-stamp of any

one of his contemporaries and competitors. 'Yes,' he remarked of a rather exceptionally good piece of work emanating from an office in which good work was not the rule, 'that is weak, but not infamous. It does not show the same nasty mind as the bulk of his work. He had a better draughtsman that year than usual.' But when it seemed to be demonstrated that some architect confined his attention to getting the jobs and handed them over to some underling to do, he exclaimed in disgust: 'Are we architects or are we brokers?'

"This architect used to say that the only way of finding out whether an architect did his own work or had it done was to watch it from year to year, and note the difference. But, we know that even this test is not final, that a work may go one for a decade, even for a generation, under one man's name, which is really done by another whose name is not known out of the office in which he works, or out of some strictly limited social and artistic circle. In England it is held to be 'bad form' for an employed draughtsman to claim his own work, even among his own acquaintances. The theory, promulgated by employing architects, is that not only the work of the employed, but the reputation of it, is an asset of the office and not of the employed individual. So Charles Reade, when once reproached by an 'anonymuncule' or a 'pseudonymuncule,' for stealing a Frenchman's brains, vehemently retorted that he did not steal them, but honestly paid for them and had bought permission to use a plot, scene, or incident, or whatever it may have been. Where-to, Anthony Trollope retorted, with justice, that Charles had missed the point, that the gravamen of the charge 'was not that of taking another man's property, but of passing off as his own creation that which he did not himself create.' That is precisely the point. The memory of McComb would not be vindicated if he had produced, as possibly he might have produced, a quit-claim receipt from Mangin, covering all Mangin's right, title and interest to the plans for the City Hall.

"As to Charles Reade, he might have said of himself, as Johnson said of Dryden, that 'his known wealth was so great that he might borrow without impeaching his credit.' And that is, unfortunately or fortunately, the case with a considerable proportion of the architects who put their names to work that they did not do. They could have done it better, or at least as well. But they were engrossed by another job. Or they were hunting another job. 'Peradventure they were on a journey.' Europe becomes very attractive when the job is secured. The loss, in these cases, is ours:

"Ah, but the artist that was gone."

"How desirable, if possible, some regulation whereby an architect should be prevented from taking more work than he can personally attend to and really do.

"It is 'commercialism' evidently enough, that is at the bottom of the defection of this kind of architect from his appointed mission of design, the desire to have more to do than he can do himself. Every architect who is an artist knows when he is yielding to this temptation, knows when he is taking more work than he can do, knows that he ought to be ashamed of himself. But also, of course, there is always the hustler, the 'architect,' the proprietor of an officeful of draughtsmen whose work he can neither do nor really judge, and who aspires to the status of an artist because he needs that reputation in his business as a hustler, who has facilities for getting jobs, but no faculty for doing them. Morally he is perhaps above the perverted artist, knowing no better. Artistically he is above nobody, being an aesthical 'chump.' Still he is exasperating. To have him affix his office imprint on work of which he does not know whether it is good or bad, is bad enough. But to have him look you in the face and tell you that he personally did a thing which you know him to have been personally incapable of doing, when the thing has turned out to be a success, and when you may know the thing to have been done by

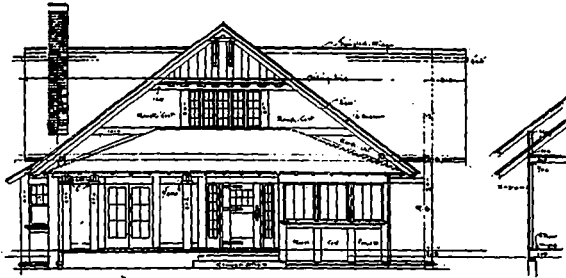
one of his draughtsmen, or by his artistic partner—that is not only irritating but infuriating. When he goes these lengths, he sinks, even morally, below the perverted artist who might have done the thing in question, only he didn't. Then it is that one yearns to 'do the brass-plate act,' that one longs for some exposure of the 'chump' who is not commercialized only because he was born exclusively commercial. But it cannot be expected that the artist shall often secure such a posthumous revenge upon the chump as it appears Mangin has secured upon McComb."

IN CONNECTION WITH the article on the New York Cement Show, appearing elsewhere in this issue, it should be kept in mind that the Canadian Cement and Concrete Association will hold a similar exhibition in the St. Lawrence Arena, Toronto, from March 6 to 11, 1911. Judging from the arrangements being made at the present time, this year's event promises to be a most representative and successful affair in every way. Not only will there be a most complete array of cement products and concrete machinery and appliances, displayed by the foremost manufacturers in Canada, but some of the most interesting exhibits of the New York Show will also be seen at the same time. Mr. William Snaith, 57 Adelaide street east, Toronto, the writer of the article in question, is both secretary of the Association and manager of the coming Cement Show, and his visit to New York has suggested a number of original and noteworthy ideas that will make this year's exhibition at Toronto a big attraction both to the allied interests it represents and the lay public as well.

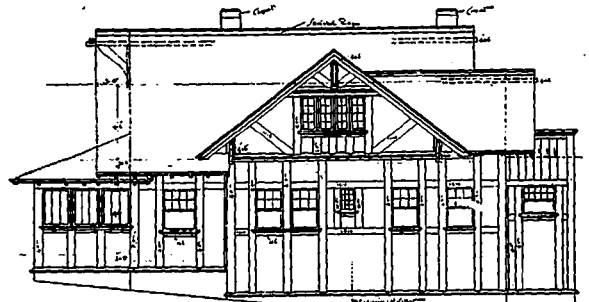
THE CO-OPERATIVE POLICY adopted by the municipal government of Bockenheim, a suburb of Frankfurt, Germany, to assist local capitalists in providing low-priced sanitary dwellings for the working class, is something that can well commend itself to other communities having similar problems to solve. The latest step taken in this direction consists of a block, incorporating five groups of four buildings each, erected by a local stock company known as the Mieheim-Aktiengesellschaft. The houses occupy a site of sixty acres (7,176 sq. yds.), and are built around a court. In each house are eight dwellings, composed of two rooms with a kitchen and appurtenances, in addition to cellar and ground space placed at the disposal of each respective tenant. The city's part in the scheme consisted of the providing of the site which was ceded with the stipulation that the concession would expire in 1980, when the ground would revert to the municipality. According to a contract made with the city the average rental of these dwellings is to be 30 marks (\$7.14 per month). The total costs of constructing the block of houses, 160 dwellings in all, was approximately 730,000 marks (\$173,740). The granting of the land for similar purposes, by many cities and towns on this continent would prove to be a highly advantageous undertaking; as it would not only work out an economic betterment of benefit to a community in general, but in the accumulation of the yearly taxes would pay the municipality a substantial interest on land to which it would have a permanent claim.

CORRECTION

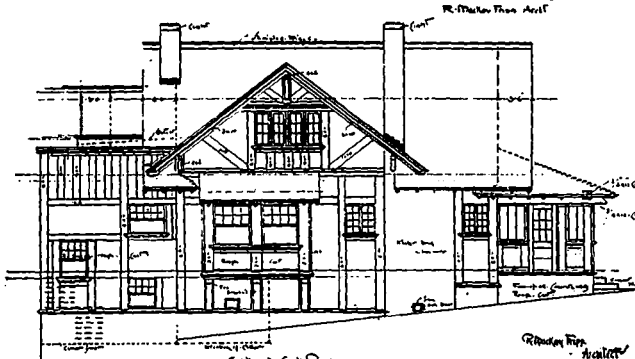
ON PAGE 40 of the December issue of *CONSTRUCTION*, in connection with the advertisement of the Standard Ideal Company, Messrs. E. & W. S. Maxwell are credited with being the architects for the Bank of Toronto's St. Catherine street branch in Montreal. In this we were unfortunately in error, as this important structure was designed by and erected under the supervision of Messrs. Ross & McFarlane, Montreal. *CONSTRUCTION* regrets the occurrence of this mistake.



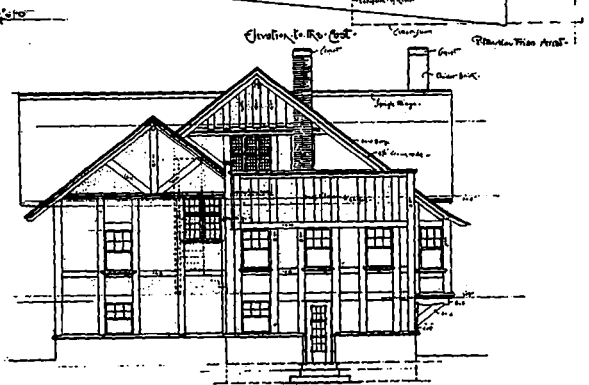
Elevation to East Ave.



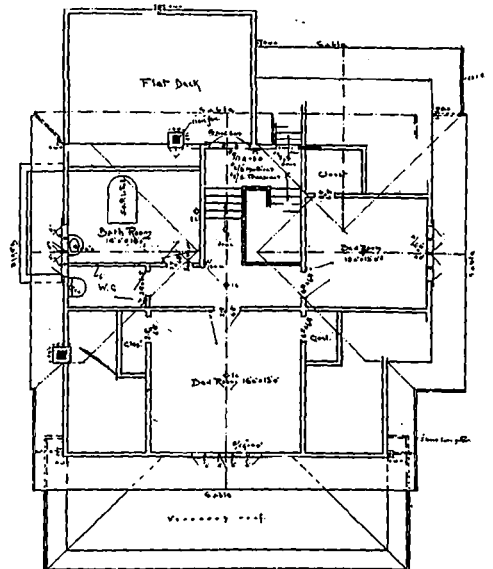
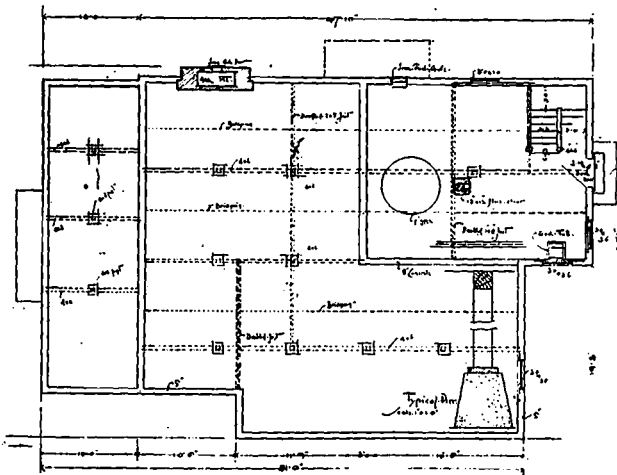
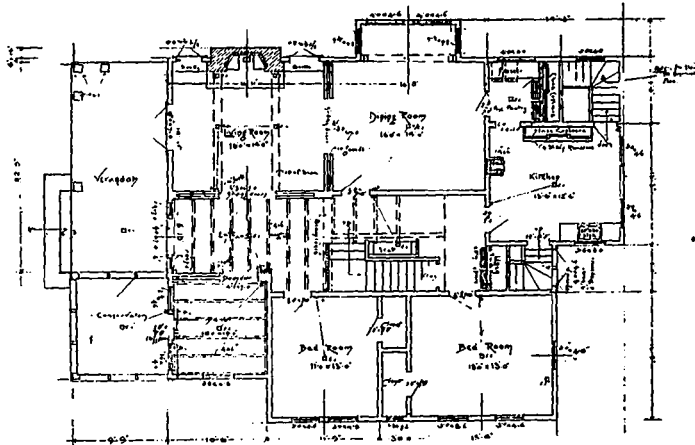
Elevation to West Ave.



Elevation to East Road



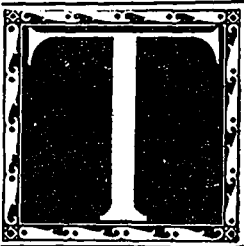
Elevation to West Ave.



Elevation and Floor Plans, Bungalow of B. S. Walker, Earl Road (West Collingwood), Vancouver, B.C. R. Mackay Fripp, Architect.



Home of Mrs. A. F. Lathrop. A Shingle-Clad California Cottage Which is Typically Bungalow in Design. R. Mackay Fripp, Architect.



YPES OF PACIFIC COAST HOUSES

The bungalow and its influence on domestic work. Examples of British Columbia and Southern California Homes that are noteworthy both in architectural lines and composition.

IT IS IMPOSSIBLE to study the buildings of the Pacific Coast district either in Canada or the United States without becoming impressed with the broad influence which the bungalow is exerting on domestic work. Few houses there are, erected within recent years, but what exhibit to a greater or less degree essential traits of this particular style. This does not, of course, necessarily imply that the vast majority of the Pacific Coast dwellings are specifically of the bungalow type as perhaps no section offers a greater diversity of styles in the character of its homes; but it holds, nevertheless, that certain characteristic features which have developed with the bungalow are being extensively adopted and used with no little success in practically all classes of residential buildings.

While this influence is strikingly evident in the low straight lines, overhanging eaves and inclosed porch of the average exterior, it is perhaps even more conspicuously displayed in the interior where built-in devices make for compactness of plan and structural utility dictates to a large extent the architectural character of the rooms. In many cases panelling of native woods enter extensively into the wall scheme and the ceiling beams are, as often as not, made to serve a real structural purpose. These woods, as a rule, are richly grained and stained in soft harmonizing tones that produce a most satisfying and restful effect. Where plaster is principally used, the mill work is of the simplest character and generally follows the straight lines of the mission furniture. Frequently where a house is other than of frame construction, the brick work or building tile is left exposed on the interior

and the lower portion of the wall is finished with a strapped dado inset with plaster panels.

Of course this refers particularly to the better and more thoroughly considered homes, as in many of the cheaper houses, especially the smaller Californian structures that are typically bungalow in design, the interior finish simply consists of sheathing which is less expensive, and which often gives better results than if other materials were employed. With the latter character of dwellings, mild climate conditions have made possible a very light form of construction, and the availability and cheapness of good lumber gives the average man little excuse for not possessing a home of his own. There are many instances in California where these houses are little better than mere shells, and owing to the extreme dryness of the climate have no foundation other than sills placed directly on the ground; although in the more northerly situated district of British Columbia, even the cheapest character of dwellings are built along more substantial and enduring lines. As a rule, these bungalows are either covered with shingles, or with wide spaced clap-boarding. Sometimes the shingles are of a larger size than those adopted in the East, and are often left unstained, the native wood in many cases producing a warm and pleasant effect.

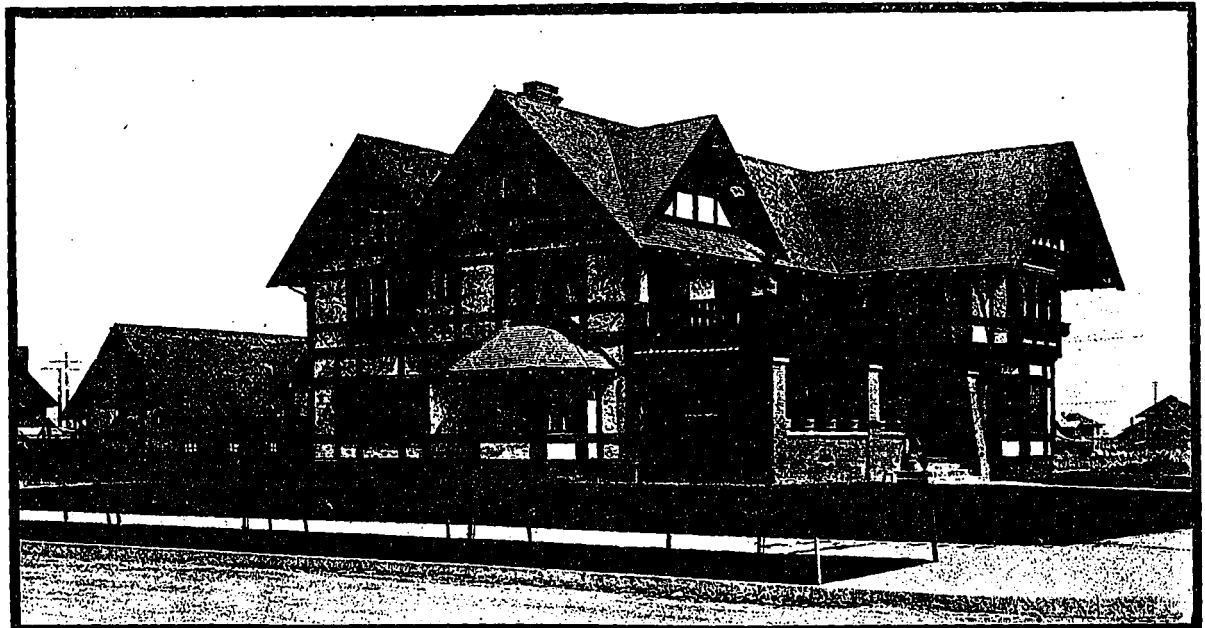
However, it is not so much the ~~low cost bungalow~~, engaging as it is, with which one is most forcibly impressed, but rather certain characteristics which have been evolved through its development, and which have enabled architects to incorporate in their work common features which bring their residential buildings into closer relations with each other. For, in this connection, one must not



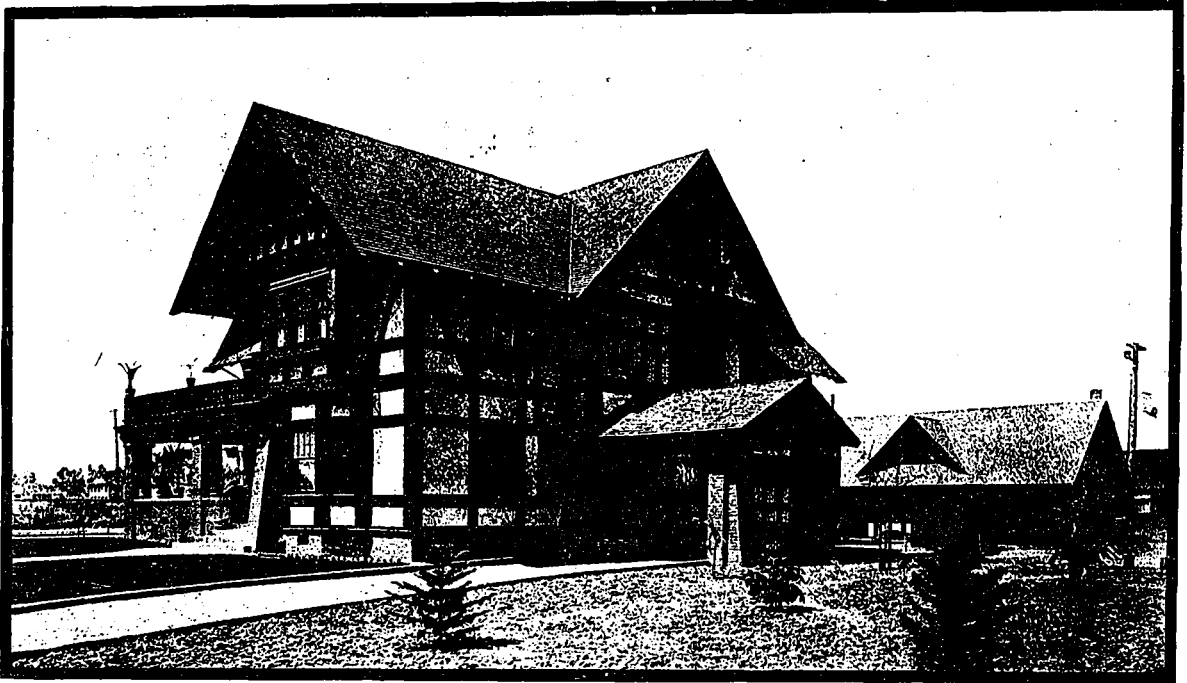
Studio, Home of Mrs. Lathrop, Showing a Decidedly Simple Scheme made Attractive by Ceiling Beams, a Brick Fireplace and High Placed End Windows. R. Mackay Fripp, Architect.

lose sight of the fact that while small frame buildings are in the preponderance, many of the bungalows of the Pacific Coast district are of brick, hollow tile, or concrete construction, and this also holds true in the case of the half timber houses and other types of larger residential

buildings which occur throughout that section with considerable frequency. All houses, whether large or small, however, have something of the bungalow in common, and it is by adopting and perpetuating the good traditions which have come with this style that designers are suc-



Residence of Dr. W. T. McArthur, Los Angeles—An Attractive Southern California Home in Half-Timber Design. R. Mackay Fripp, Architect.



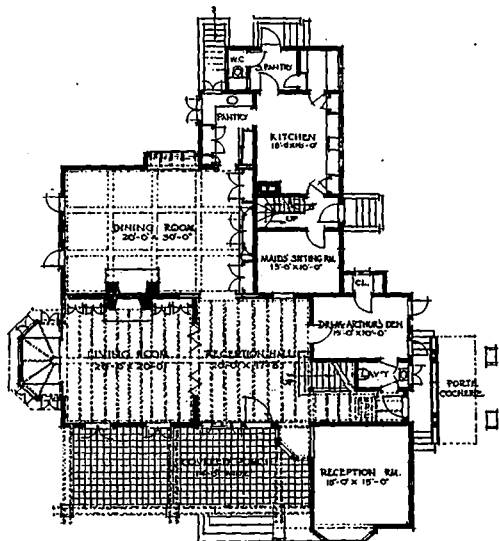
Residence of Dr. W. T. McArthur, Los Angeles—Showing the Carriage Approach and Porte Cochere. The Wall Construction is of Frame with Cement Plaster on Metal Lath, a Type of Construction not Uncommon in Many Parts of California. R. Mackay Fripp, Architect.



Living Room, Residence of Dr. W. T. McArthur, Looking Towards the Reception Hall. The Woodwork is Scraped Quarter White Oak, Stained and Waxed. Note the Unusually Long Vista from One Interior to the Other. R. Mackay Fripp, Architect.

ceiling in creating a residential architecture which, if not original, is nevertheless distinctive and noteworthy in its general composition.

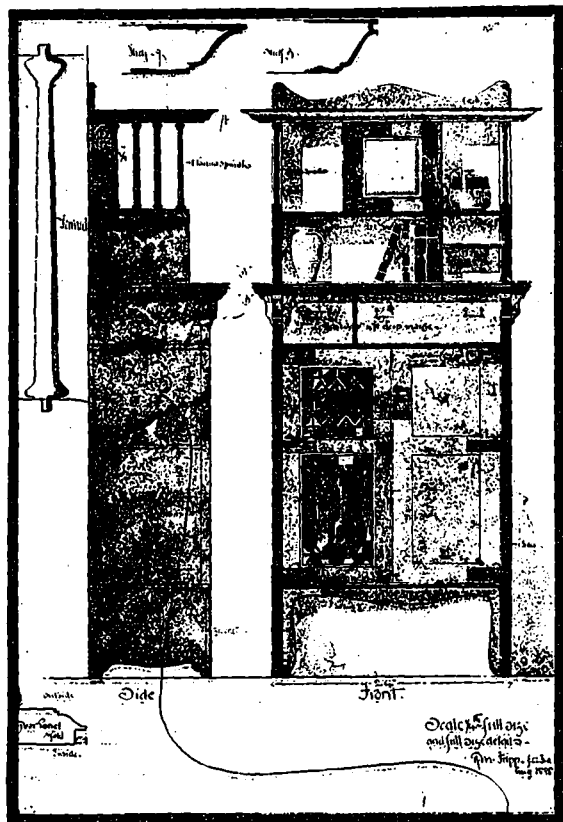
Many of the earlier Pacific Coast structures, of course, display the perverted architectural tendency which prevailed at the time they were built, but these only serve to



Ground Floor Plan, Residence of W. T. McArthur. R. Mackay Fripp, Architect.

accentuate the admirable progress which is being made at the present time, and to more fully indicate how seriously the extreme westerner is beginning to consider the architectural character and construction of his home.

With a large number of the more recent structures, many interesting effects are worked out in other native materials beside wood. This is to be noted, for instance, in terrace walls and outside chimney pieces built of water-washed stone taken from neighboring creeks. In many



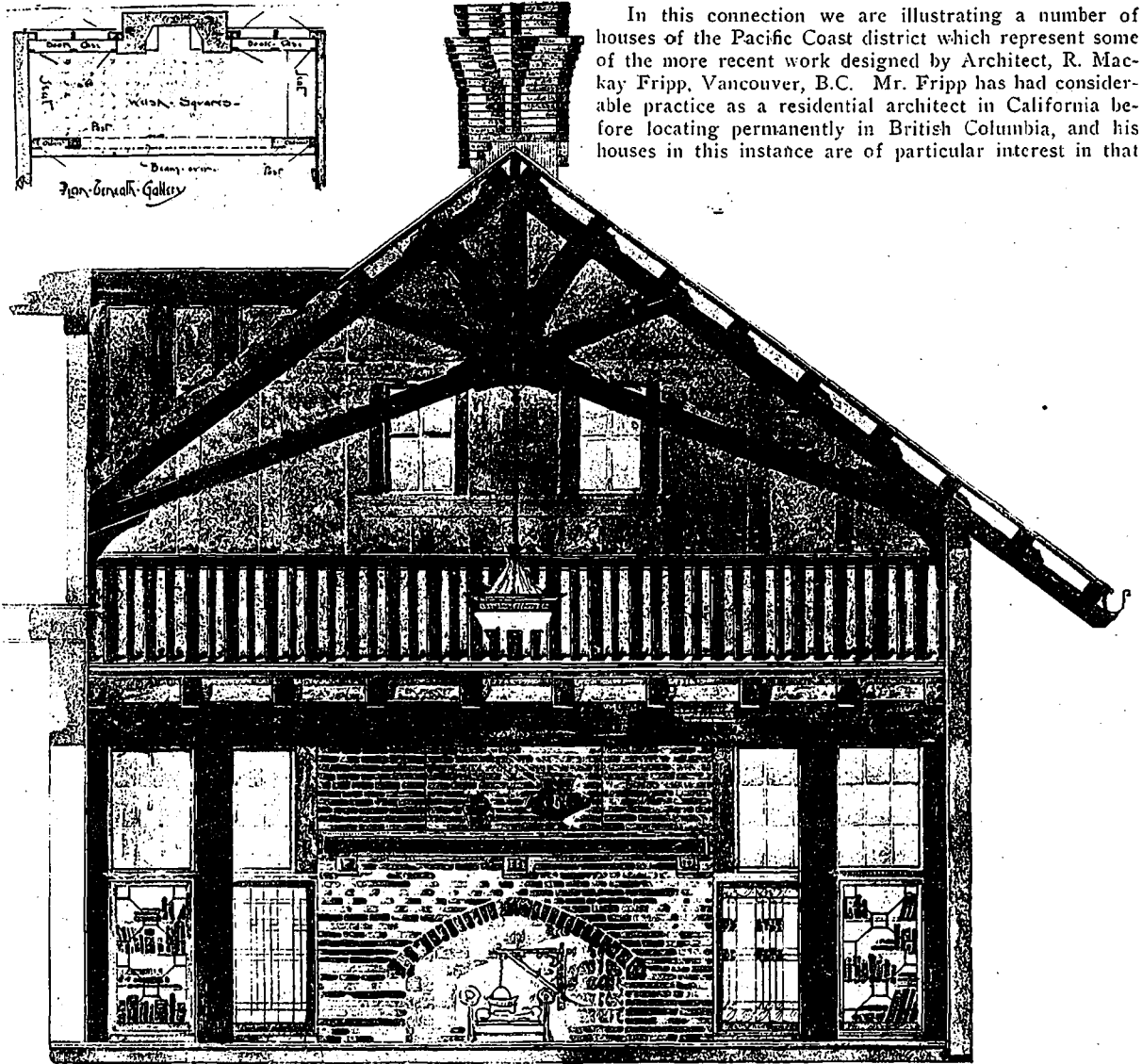
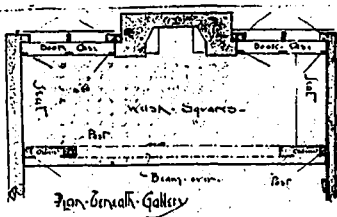
Design for a Domestic Cabinet. R. Mackay Fripp, Architect.

cases the effect produced is delightfully rugged and picturesque, and where shingles or siding is employed, it adds a feeling of permanence and stability to the appearance of the building. Stone of this character is also used to some



Sketch Elevation of Studio Erected for Mrs. Cole. R. Mackay Fripp, Architect.

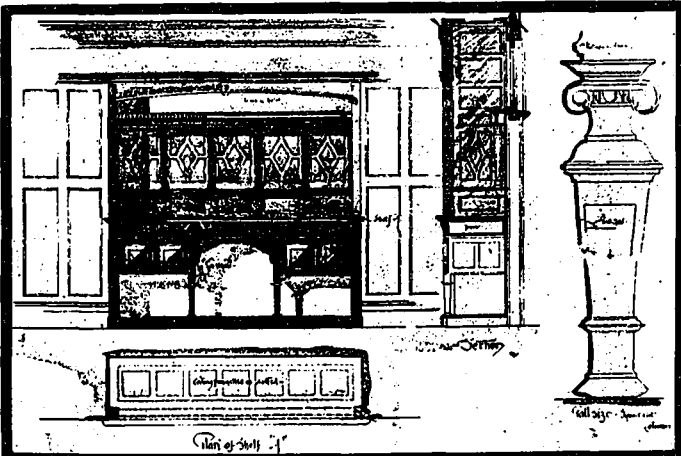
In this connection we are illustrating a number of houses of the Pacific Coast district which represent some of the more recent work designed by Architect, R. Mackay Fripp, Vancouver, B.C. Mr. Fripp has had considerable practice as a residential architect in California before locating permanently in British Columbia, and his houses in this instance are of particular interest in that



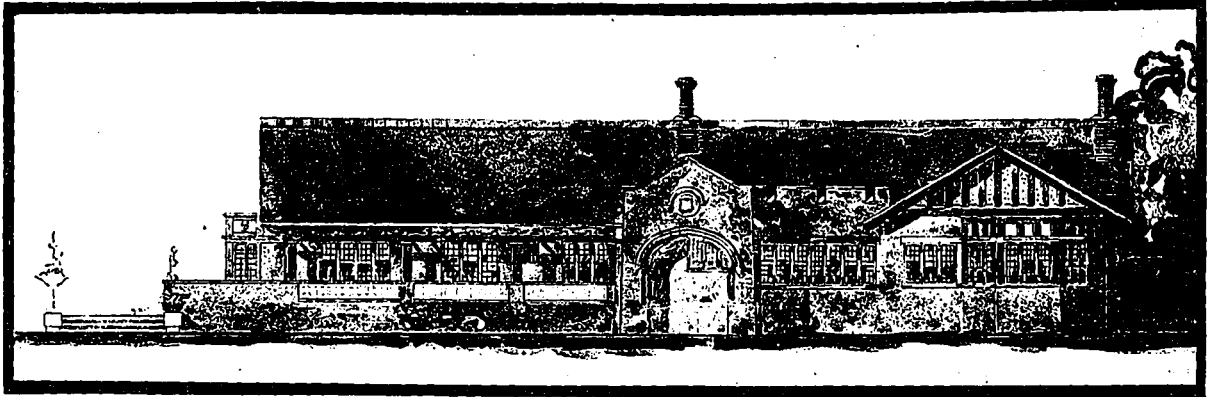
Sectional Elevation of Mrs. Cole's Studio, Showing Gallery and Fireplace. R. Mackay Fripp, Architect.

extent in the construction of fireplaces, which invariably form an important feature of the interior scheme, although generally brick or tile is adopted for this purpose, many of the brick fireplaces in particular being decidedly unique and effective in their design and treatment.

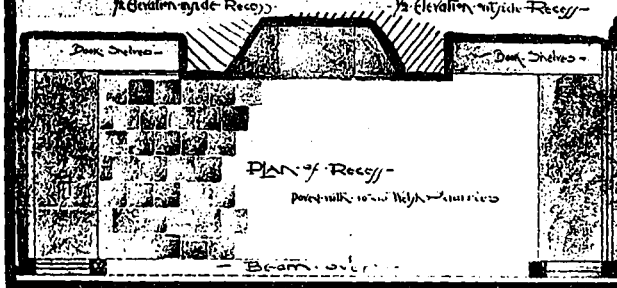
they are quite typical of the better considered class of residences that are being built in the extreme western section of both Canada and the United States. In the order in which these illustrations are arranged, the Californian homes are placed first as it is admittedly in that section where the modern bungalow is most generally in vogue, and where it has unquestionably experienced its most pronounced developments. The cottage of Mrs. Lathrop, which is the first illustration shown, is especially typical of this style, and is one of the inexpensive character of small homes which are found in great numbers in California. There is absolutely nothing insincere or affected about this little shingle clad structure. It expresses itself openly and frankly and its lines and distributions of its windows are more commendable in every way than those of its neighbor seen in the same view. The interior view of this home shows the owner's studio, which is principally executed in plaster and inexpensively finished. It will be noted that the mill work is of the simplest character and that the homelike feeling of the scheme is produced mainly by the beamed ceiling and small high-placed windows on either side of the fireplace.



Detail for Walnut Side-Board. Designed by R. Mackay Fripp, Architect.



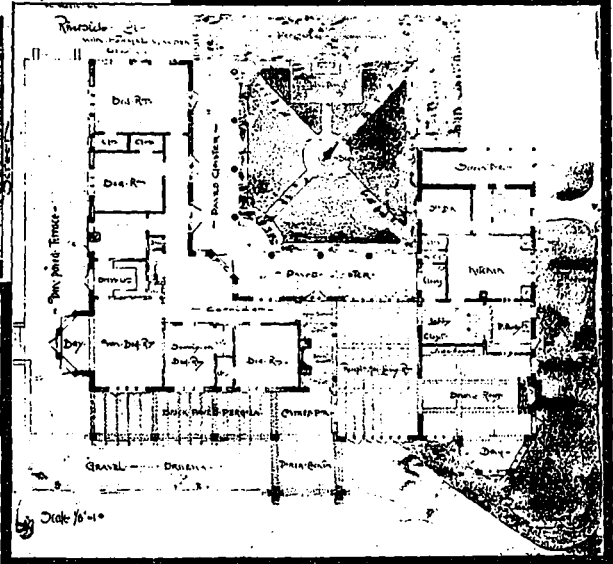
Front Elevation for a One-Story Concrete and Hollow Tile Residence, Riverdale, California. R. Mackay Fripp, Architect.



Recessed Stone Fireplace (Above House), with Oak Seats, Book Cases and Screens.

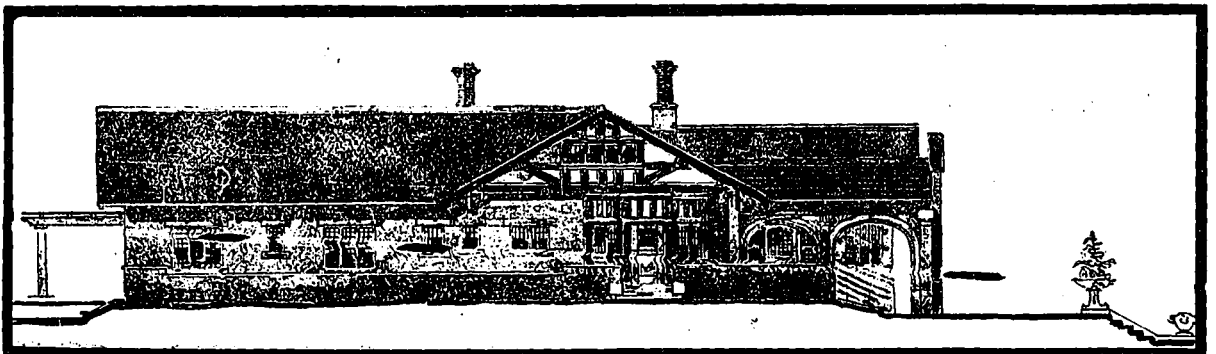
cuted principally in Norman squares joined by wide leads. On the interior the walls are finished with high wainscoting of slash grained Douglas fir stained in willow green. The open timber roof and gallery, together with the fireplace of the main room, are shown in an accompanying sectional elevation.

Although in many interiors the effects worked out are mere pretensions as far as structural character is concerned, yet a large number of owners are recog-



Ground Plan, Showing Scheme of Rooms and Formal Garden.

The two-story bungalow of Mrs. Coles, which is designed as an art studio, differs somewhat in its composition, in that the exterior is finished in clap-boards with cemented plastered gables, while heavy timber work is introduced in the columns and beam supporting the balcony above the bay window and entrance. This assists in giving the entrance an inset and private effect. A pleasing feature is the door with its wide strapped hinges, and also worthy of note are the windows which are exe-



Terrace Front of Above House, Showing Approach to Sunken Garden. R. Mackay Fripp, Architect.



Garden Front, Residence of Mrs. H. B. Kling. Another Interesting Californian Home in Half Timber Design. R. Mackay Fripp, Architect.

tile construction, the materials of the exterior walls are also made to serve as a part of the interior scheme. This is to be seen in the several views showing the floor plan and sectional elevations of an addition made to a house at Santa Monica. Here the building tile above the moulding is left exposed and in this manner forms an effective frieze above the strapped dado with inset panels below.

Two Southern Californian dwellings of much larger dimensions are the residence of Dr. W. T. MacArthur, Los Angeles, and the home of Mrs. H. B. Kling, both of which are in half-timber design. In the former house all the rooms on the main floor open off the reception hall, and unusually long vistas from one interior to the other have been obtained without in any way sacrificing the compactness of the plan. The exterior walls are of frame construction plastered with rough-cast cement on metal lath, an interesting feature being the covered porch which is paved and fourteen feet in width. Scraped white oak is used on the interior throughout, and the living room, hall and dining room are finished and panelled

nizing the advantages of economic stability and are adopting heavy timber work as an integral part of their buildings. Again brick, hollow-tile and concrete is being extensively employed in some of the more expensive and important structures. An example of the more substantial type of house is shown in the sketch for a one-story concrete hollow-tile residence built at Riverdale, California. The ground scheme and general plan of this house is worked out on elaborate lines with all rooms grouped about an open court having a pergola on its exposed sides. A wide terrace encloses the house on two sides, while the dining room and service department overlook a sunken garden. A feature in connection with the court is the paved cloister onto which all rooms open by French doors. The main porch is covered, and is approached either along a wide brick paved pergola or through the porch cochere. The interior scheme is suggested in the accompanying illustration showing the recessed fireplace off the living room, this interior being carried out in native woods with a heavy beamed ceiling.

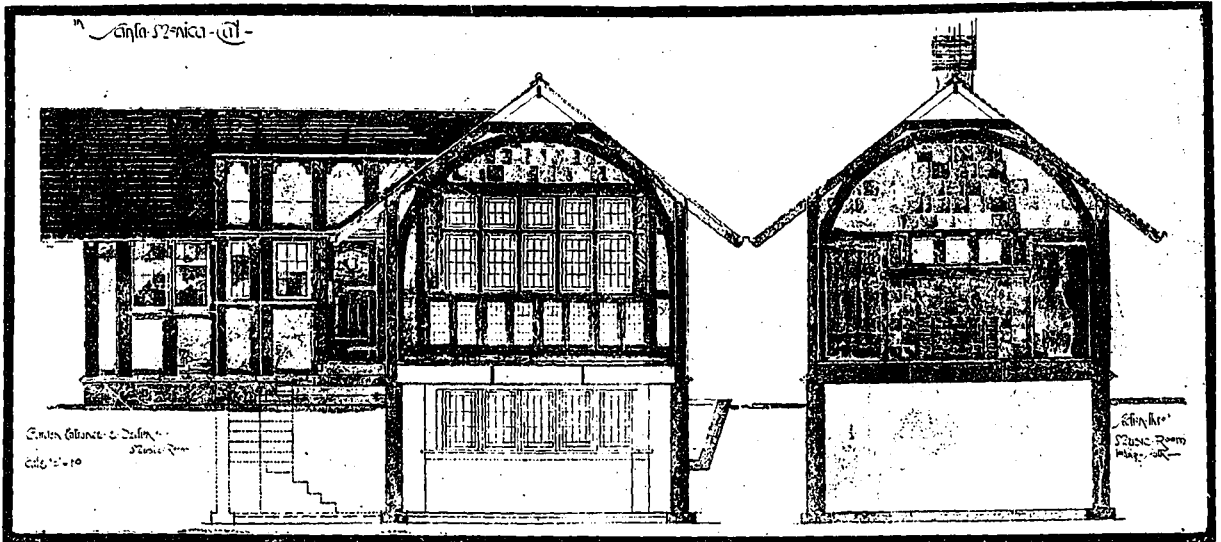
living room, hall and dining room are finished and panelled



Residence of Mrs. H. B. Kling, as It is Seen from the Roadway. R. Mackay Fripp, Architect.



Detail of Covered Porch, Residence of Mrs. H. B. Kling. R. Mackay Fripp, Architect.

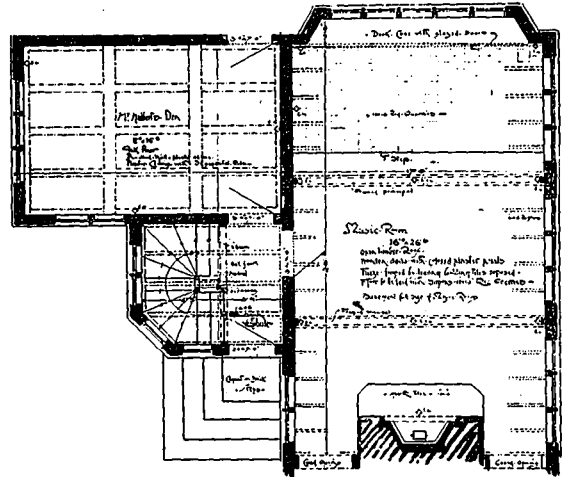


Garden Entrance and Section of Music Room, Addition to House at Santa Morica, California. R. Mackay Fripp, Architect.

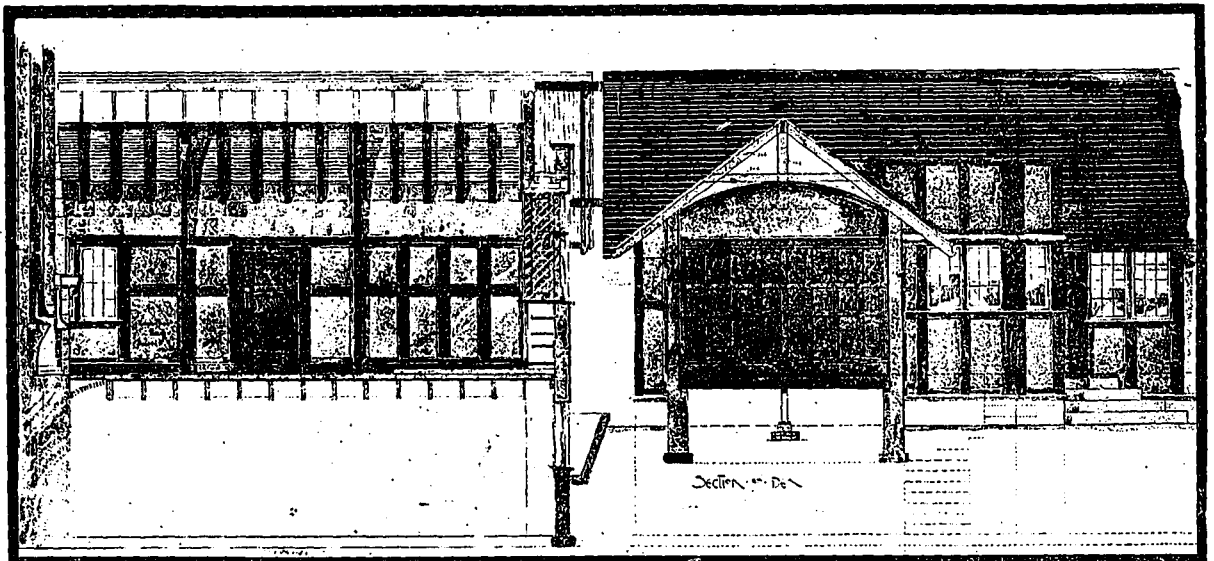
walls; the beams, fixtures and floors being stained and waxed. The residence of Mrs. Kling differs from this house in construction in that the walls are of hollow terra cotta tile to which the plaster is directly applied, and also in the half-timber work which affords a holding for the sash and door frames, and which being one and a half inches thick and rebated is not used merely for effect. The interior is finished throughout in a handsome manner with scraped oak and native woods, while "Rockwood" tiles and Tiffany glass are introduced in the architectural scheme. The covered porch, a photographic detail of which is shown, is partially enclosed and paved.

Included in Mr. Fripp's British Columbia work are several very interesting structures. One in particular, the residence of Dr. Richardson, situated at the corner of Harwood and Bidwell Streets, Vancouver, with its series of small gables and well distributed windows, being decidedly picturesque in design. This house commands an exceptionally fine view of English Bay and the plan is wholly dictated by the site, the entire width of which is occupied by the building. The exterior is covered with shingled stained a soft brown, and the windows throughout are broken in small panes with

white painted sashes. Overlooking the waterfront is a large porch covered by an upper extension which is sup-



Floor Plan, Addition to House at Santa Monica. R. Mackay Fripp, Architect.



Wall Section of Music Room and Section of Den, Addition to House at Santa Monica. The Wall Scheme in the Music Room is Carried Out with a Strapped Dado Stained Brown and Set In with Light Royal Blue Plaster Panels, the Frieze above being Formed by Leaving the Red Building Tiles Exposed. R. Mackay Fripp, Architect.



Residence of Dr. Richardson, Corner of Harwood and Bidwell Streets, Vancouver, B.C. An Interesting House Built of Native Wood. The View to the Right Shows the Large Verandah, Which Gives the Owner an Exceptionally Fine Outlook Over English Bay. R. Mackay Fripp, Architect.

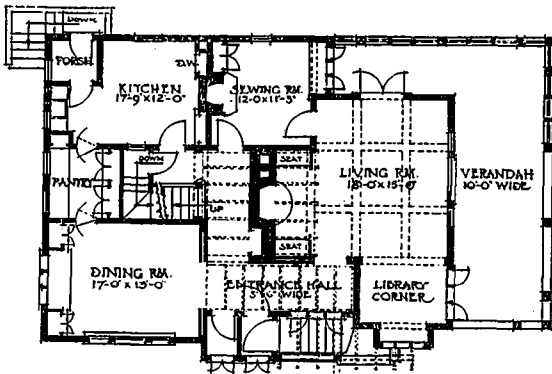
ported by heavy square timber posts. The plan of the house in general is very compact in its arrangement and the living and dining rooms are panelled in native woods. A feature of the living room which has a beamed ceiling is a large brick fireplace with built-in seats on either side, and also a library corner which is situated in an alcove adjoining the entrance hall.

The residence of Mrs. A. E. Hepburn, which is located in the same city in the corner of Pendren and Broughton

position. The timber work exposed to view is left as taken from the saw and stained. The interior work, such as the ceiling, beams, wainscoting and moulding is carried out in select native woods scraped and stained, and the tiling, grates and hardware throughout are of special design. The illustration of the hall gives a very excellent idea of the character of the interior, and shows the splendid results which are obtained from indigenous woods.

An attractive country house, farther out from the city, designed by the same author, is the residence of H. C. Janion, which stands on a three-acre site just off the New Westminster road. Much of the character of this house results from the arrangement of the roof lines, and the interesting distribution of small windows. The lower portion of the house is finished with brown stained clapboards, while the second story is covered with shingles of a harmonizing tone, and finished with cement plastered gables. A noteworthy feature of the plan is the living room and dining alcove which are combined in one interior. At the end of the room is a large fireplace flanked with seats and bookcases, while in the dining room end is a fixed sideboard and a smaller fireplace set in between built-in china cabinets. These fireplaces are built of brick and are unique in design. The woodwork is stained bog oak and the walls are finished with rough plaster colored a dark seaweed green.

The bungalow of B. S. Walker is located on Earls road, West Collingwood, a suburb of Vancouver, on a site that slopes rapidly from front to back. It was originally a small building which was recently enlarged, the original portion of the structure being converted into a kitchen, rear stair-hall and pantry. The plan in general provides for roomy interiors that are compactly arranged. The exterior is principally covered with cement stucco with



Ground Floor Plan, Residence of Dr. Richardson, Vancouver, B.C. R. Mackay Fripp, Architect..

streets. is somewhat similar in plan to the house just described; the porch entrance and hall, and the position of the den and drawing room all being arranged to meet the condition of the site, and to give the various rooms a desirable prospect. Dark overburnt brick, clap-boards and cement stucco are the materials used in the external com-



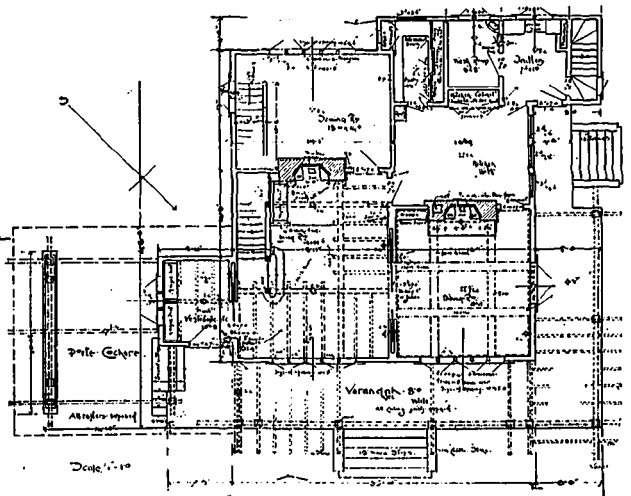
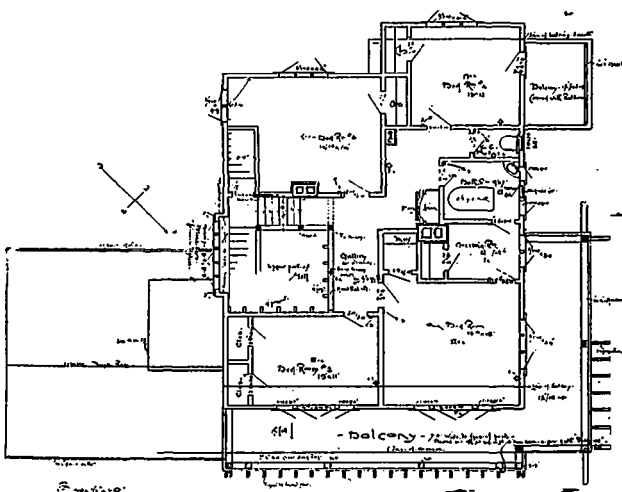
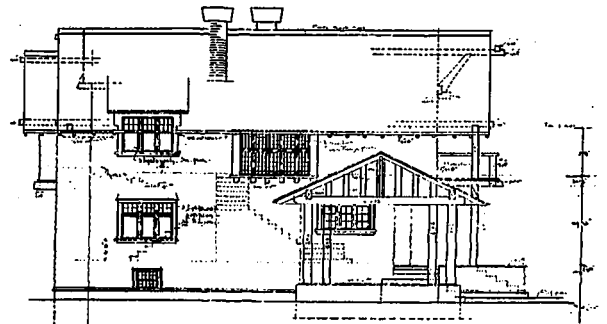
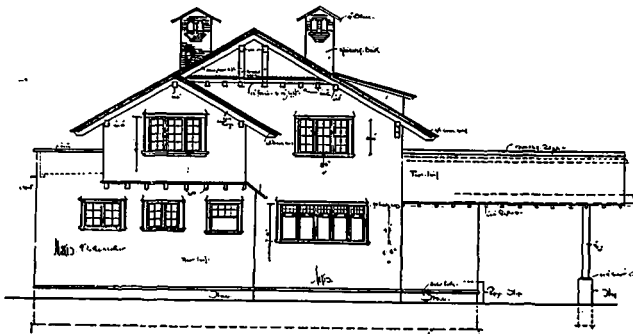
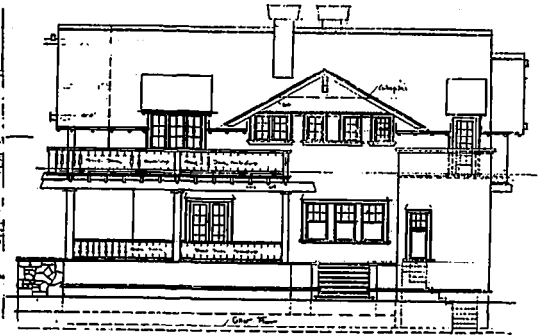
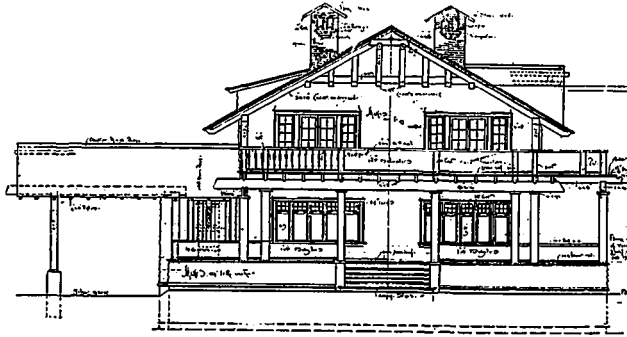
Living Room and Detail of Ingle Nook, Residence of Dr. Richardson, Vancouver, B.C. R. Mackay Fripp, Architect.

ging. By this means most of the external walls have been uncovered from the floor to a height of 3 or 4 ft., and there has been revealed a building about 250 ft. long (east to west), and 150 ft. across the transepts.

The plan is cruciform, with a nave 140 ft. long by 75 ft. wide, transepts 40 ft. wide, and presbytery 40 ft. wide.

dressed Cæn stone; the lower parts of the columns are richly moulded, and have a carved leaf on the external angles of the plinth. Several other buildings are indicated, such as cloisters, frater, chapter-house, etc.

On the east of the north transept there are three small chapels, one of which leads into a vault built of nicely squared chalk blocks, and in the wall of another

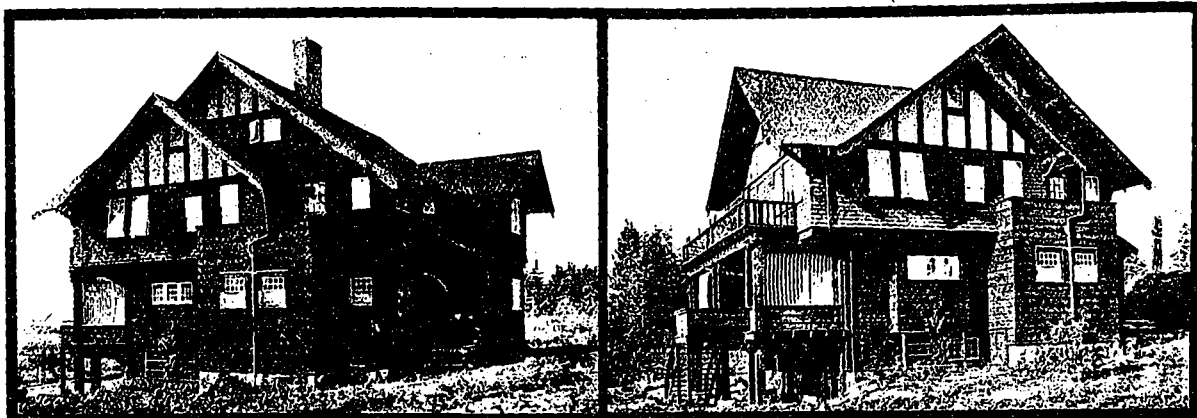


Elevations and Floor Plans, Frame Residence of E. L. Sproatt, Burnaby, B.C. The Exterior of this House is Stained in Three Tones of Forest Green to Harmonize with its Wooded Site. The Lumber Used was Cut in the District, and the Foundation and Chimneys are Built of Water-Worn Stone taken from a Nearby Creek. R. Mackay Fripp, Architect.

At the junction of the nave with the transepts there was a square tower of 40 ft. by 40 ft. base, and of which there remain two splendidly preserved rectangular bases to clusters of columns that supported the tower. These bases are about 8 ft. by 5 ft., and are built of finely

was found a stone coffin with a lead shell containing some bones.

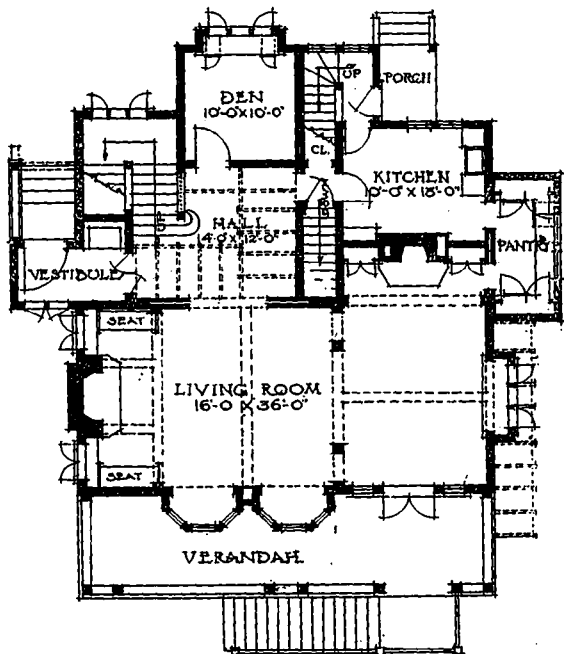
The foundations are of roughly squared chalk blocks set in a mortar containing abundant shells. The walls are built of flint and Kentish ragstone, and are lined



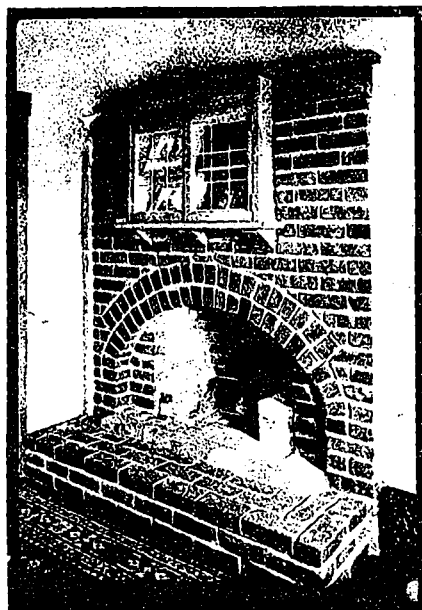
Country House of H. C. Janlon, Situated off New Westminster Road, Vancouver, B.C. R. Mackay Fripp, Architect.

internally with plaster. Some fragments of widow trac-

In the floor of the presbytery (just opposite the high altar) were found two large graves, one containing an elegantly carved and painted effigy (of greensand) of



Ground Floor Plan, Country House of H. C. Janlon. R. Mackay Fripp, Architect.



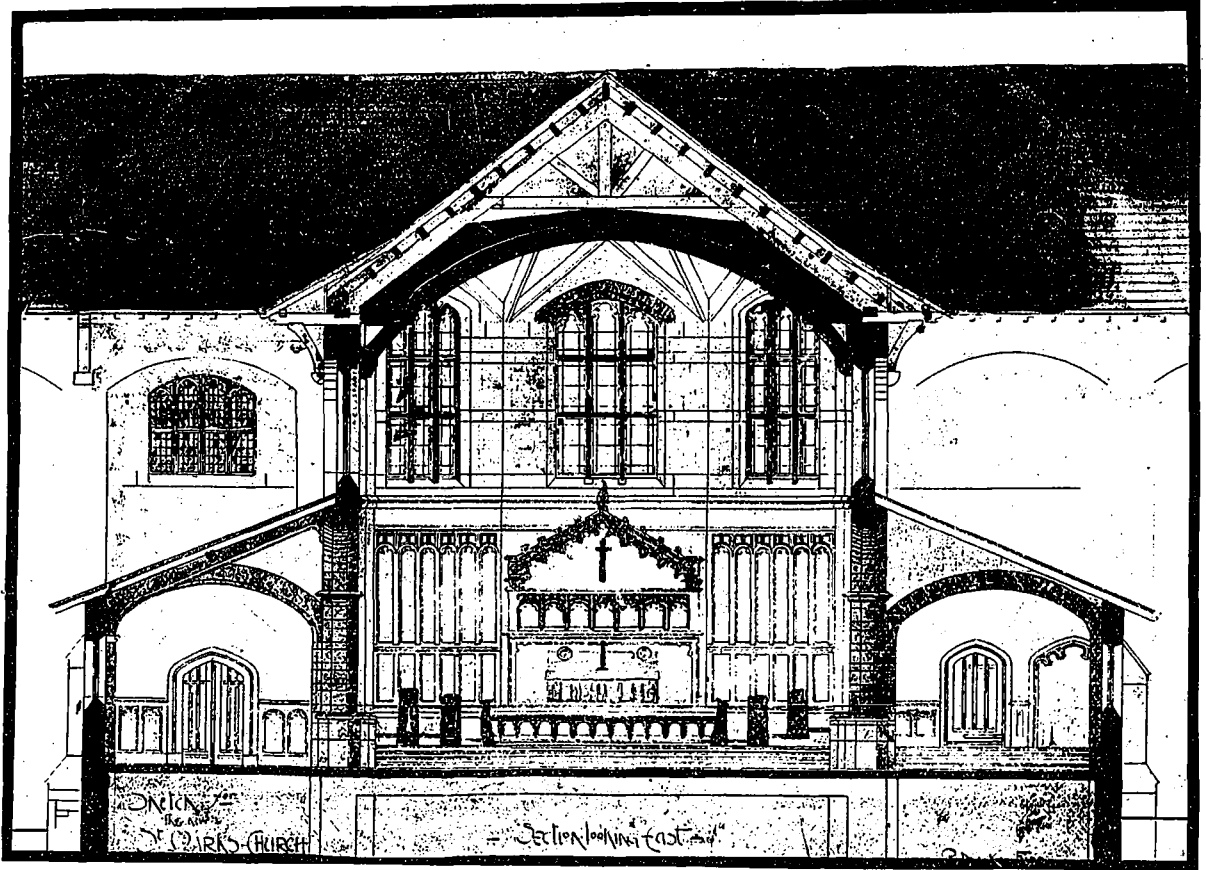
Fireplace in Bedroom, Residence of H. C. Janlon, Vancouver, B.C. R. Mackay Fripp, Architect.

ery look like firestone, whilst' other mouldings are in bathstone.

a knight in armour, cross-legged, and dressed in the fashion of about the beginning of the XIVth century.



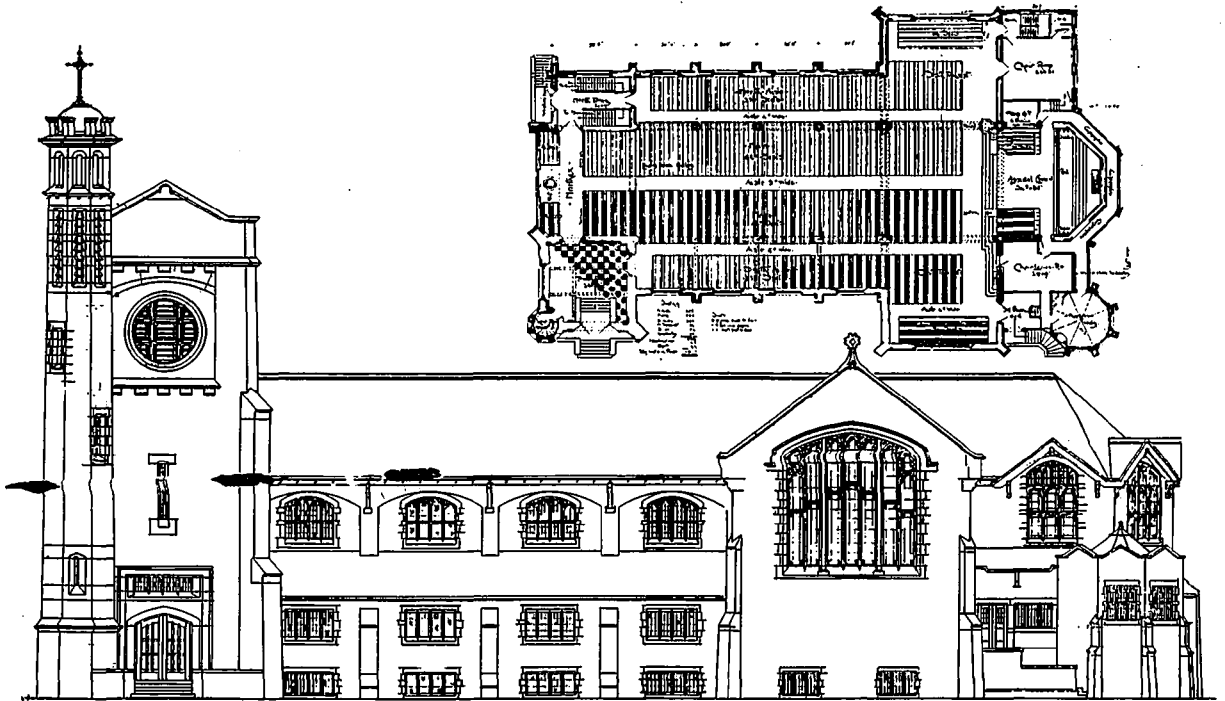
Living Room and Dining Alcove, Country House of H. C. Janlon, Vancouver, B.C. The Woodwork in this Interior is Stained Bog Oak and the Rough Plastered Walls are Colored a Dark Sea-Weed Green. Note the Open Fireplaces and Built-In Cabinets. R. Mackay Fripp, Architect.



Sectional Elevation, Competitive Design for St. Mark's Church, Kitsilano, B.C.. R. Mackay Fripp, Architect.

The pigments and goldleaf on the knight's shield were perfectly fresh, and the knight bore the arms of the De Luci family (i.e., a pike, Fr. luce). The head was

missing, and the effigy was found tumbled in the grave (the top of which it once probably adorned), where it was no doubt thrown at the time of the destruction of



Elevation in Second Avenue

R. Mackay Fripp - Archt.

Longitudinal Elevation and Floor Plan, Competitive Design for St. Mark's Church, Kitsilano, B.C.

the abbey. The floors show large numbers of encaustic tiles of various designs, and some sepulchral slabs of Wealden marble; one of an abbot in the XIIIth century, and another one that had once had the monumental brasses of a woman.

The abbey was founded in 1178, by Richard de Luci, who received the grant of a manor from Henry I., was a trusted friend of Stephen (in whose reign he was Constable of the Tower), and Chief Justiciar of England for Henry II. He gave up this latter office to become one of the first canons of the abbey as an expiation of what he considered to be his share of the murder of Thomas a Becket. Richard de Luci died here in 1179, and was buried in the quire of his church, but his grave has been ransacked long ere this, and its position is now unknown.

The history of the abbey is rather obscure, but what there is, is of the usual kind; want of money, charges of extravagance against the abbot, lawsuits with other religious orders, *et hoc genus omne*, until the building was suppressed by Cardinal Wolsey for the endowment of his college at Oxford. It is interesting to note that at the west end (main doorway) the excavations have revealed a bed of ashes containing what was molten lead, suggesting that a bonfire had been lighted here under the large archway which had melted the lead from the roof. What the fire would not bring down was probably attacked with pick and crowbar; in any case, what was the site of the Augustinian Abbey (second in value) in Kent was completely obliterated by rainwash and vegetation, and all knowledge of it lost until a year ago.



THE CITY OF THE FUTURE

By L. CORNFORD

"Its Chance of Being" as set forth in a paper read before the recent Town Planning Conference held at London, England.

THE INEXHAUSTIBLE TREASURES of the past lie open to the dexterous pilfering of that chartered thief, the artist. The needs of man remain unchanged since the first civilization, and in every age he has found the ultimate expression of his desire. Architecture is the concrete secretion of the mind. You shall tell a man by the token of the house in which he dwells.

His highest aspiration is worship; and, according to the nature of the god he served, are the temples of his devotion. The Egyptians approached their deity amid groves of gigantic columns, lotus headed; the Greeks wrought the fane of the immortals to the needlepoint of perfection. There they stand to day, the marble monuments of faultless achievement, high uplifted on the haunted hills of deathless story, an eternal witness to the divinity that dwells in man.

The Roman stole from the Greek, and built as he lived, that his work might endure for ever. So deep into the living rock did he grave his record, that to-day we are still smelling out the legend, whose significance not all the fiery makers of the Renaissance could exhaust.

The Northman owed his Gothic to the Roman, whom he submerged, but whose spirit he could not overwhelm. The Gothic grew from out the Roman, and increased and died, as a tree might spring from amid the fallen columns of an antique temple, and tower into the sunlight, flourishing greatly, until its vigour passed and the foliage withered, and the strong limbs put forth no more leaves.

If those who build the city of the future will take what what serves their need from the cities of the past, what they shall build will be a new thing answering to the new need. But when all is said, the likeness of the temple of the city of the future cannot be foreshadowed, unless the religion of the future be first understood.

As in the building of temples, so in the raising of monuments to the lesser divinities, the gods of law, of learning, of healing, and of art. According to man's conception of the place occupied in the spiritual order of dignities, so will he mould the building which is at once the instrument of his activity and the symbol of his emotion.

The past, which remains our instruction and our hope, displays in all the wistful silence of antiquity, the Roman house of the many chambers and the flowered quadrangle, the Roman villa set among the vineyards and the corn, the discreet and peaceful mansion whereto the ladies and the gailants who dwell for ever in Ser Boccassio's pages, fled from the plague-struck city. In a later age, the town houses of France and of Germany, the castles and the hunting lodges, witness to a high and an urbane civilization. In our own country, we preserve what we believe to be the most beautiful houses, great or small, in the world. But the most of them are relics of a happier time.

To come to the present, what the plain citizen, the humble man of heart, honores for in this Conference, is that he may at last obtain his modest desire—a fit home in which he may worship his domestic gods in peace. And here,—if I may venture to suggest it—lies the kernel of the matter. The State is made up of individuals. The unit is the family. When all that is implied in that sacred and immemorial cult be rightly and beautifully expressed in architecture, the rest will follow. When Mr. Smith possesses in peace his own solid little home, he will attend to the town hall.

What are the chances that he will ever get what he wants? In other words, what chance has the ideal city of coming into being?

Now there are three enterprises in this life which cannot be achieved by a committee—love and war and art. We are here concerned with the third—with art. In art there must be one man who is wholly responsible for the job. The plain citizen, who is sincerely eager to recreate his town, or his city, or his village, or his house, must before all things recognize the eternal fact, that it is perfectly useless to entrust the business to a department, or a council, or a committee. It must be done by one man. The business of the department, or the council, or the committee, is to arrive at some general agreement with regard to what it is they want done. They must then call in the professional to do it. Indeed, if they be wise, they will call him at the beginning, and ask him what it is they want done. For a committee commonly owns no more than a vague notion that it wants something. It must be so, because collective intelligence is always inferior to individual intelligence.

The future of English cities, of English towns, of English villages, does not depend upon the collective groupings of popularly elected bodies, but upon their ability to recognize the fact of their own natural, but fathomless, ignorance.

We read to day in the newspapers a deal of edifying reflections upon the beauty and the necessity of design, the holiness of fresh air, the salutary effect of living like an intelligent person, instead of like a filthy savage. But the artist has known these things always. He has always known what was wanted. But he has not been allowed to provide it.

The chances that the ideal city of the future will ever come into being depend upon that freedom of the artist which can only be conferred upon him by the layman.

SMOKE CONSUMING FURNACE.

VERY EXCELLENT RESULTS tending towards the abatement of an evil common in almost every thriving community, are being met with in Carlsbad, Austria, through the agency of a smoke-consuming furnace, which is the invention of Alvis Sichert, a local architect. According to recent report, this furnace has proven so satisfactory in practical use that it is being widely adopted

in the equipment of buildings of both a municipal and private character. The invention itself is a simple one, but so effective is it in operation that the poorest quality of Bohemian coal may be used with a combustion 84.7 per cent. without practically any smoke or soot resulting. One feature of the furnace is that it creates a draught of hot air which is driven down on the fire from above, and in this manner beats back the smoke as it endeavors to rise and consumes it completely. The coal is placed in a feeding box and slides therefrom over an inclined grate to a flat grate, until the whole surface of the two grates is uniformly covered. The inclined grate is provided at its upper half with narrow air apertures like a polygonal grate, and at its lower half with wider longitudinal apertures. The flat grate likewise has longitudinal apertures. The fire is started on the flat grate and forms an intense flame jet which extends over the inclined grate to the flues. During this operation the coal on the upper half of the inclined grate up to the feeding box gives off its gases and slides gradually downward on to the flat grate as the combustion on the latter proceeds, thereby continuously replacing the consumed coal. The necessary air is supplied to the grate through an air valve and this can be regulated in accordance with the degree of heat to be attained. In the ash pit immediately beneath the flat grate are the inlet openings of the air-supply passages for consuming the smoke. Through these passages the air previously heated in the ash pit enters the ascending passages, passes into the arched passages, is heated therein and passes through apertures directly into the combustion chamber and combining with the flame produces a perfectly smokeless combustion. By this procedure all particles of smoke, soot, and sulphur from the coal are entirely consumed. The flame burns quite white and passes out through the flues as a smokeless flame into the chamber in which it is to be used for any special purpose.

Moreover, in combination with each of the ascending flues, a further air supply passage is provided for the direct supply of external air, so that in the case of coal containing a large amount of sulphur a sufficient quantity of air may be supplied through the ascending flues to the arched flues and through these to the combustion chamber, when with a low fire the valve is to a great extent closed. The passages can be controlled by dampers. If the grate surface is quite covered and an intense fire is required, the valve must be fully opened. By this means, a large quantity of air enters the ash pit and passes through the air flues into the arched flues above the fire.

This process keep step with the development of the fire in the combustion chamber. When a slower fire is desired, the valve is more nearly closed, the supply of air is less, and, therefore, the fire is lowered. With a slower fire less smoke is produced and less air is required to burn it.

expressing its essential life and government, like the plan of the mediæval cathedral, only more subtle in its conception, for there is in it the additional element of growth, may be—indeed must be—predetermined for the perfect whole to be achieved. So far, therefore, it will of necessity be the work of the master mind among us. But within the plan, as within the cathedral, there is room for many artists, if each is working with the same end in view. And the faith that is required is the ardent desire to interpret in its highest terms the character of the civilization, the ideas and aspirations of the citizens. Our art at every epoch, from its limitation which are at the same time the sources of its strength, must always be a reflection, more or less complete, of the civilization of the moment. All that we as architects can do is to ensure that it reflects the best rather than the worst, the more refined rather than the more vulgar elements.

The first step is to come to some clearer conception of the meaning of this new growth, of the people who will cause it, of the kind of life they will live, and of the hopes they will entertain or we may entertain on their behalf. We have all seen during the last thirty years the fruitlessness of trying to impose one alien set of ideas after another upon a new condition of living.

It is a consistent and truthful expression of character which gives the charm and permanent value to the older parts of our towns. Where we have, as in York, narrow winding lanes, overhanging barge boarded houses, we feel at once the character of the life of the Middle Ages—the close, intimate, neighborly life crowded within the city walls.

Or take the stately squares of Bloomsbury and the West Central portion of London—the most liberal town planning yet achieved in England. We see that such a neighborhood corresponds truthfully to an era of greater leisure, to a culture more reposeful and refined.

Still later districts in the despised plaster period, districts of formal villas set in what are now faded London gardens with their trellis arbors and verandahs, their cement vases and broken statues, represent an idea of refinement and detachment. We can see that the haphazard muddled buildings of the late Victorian period, the vast sporadic growths of no particular character which have surrounded our towns and villages, were the outcome of a new class of society with new needs attempting to accomplish its own desires.

Now I take it that the main difference between this period and the one on which we are just entering is that education has now had time to bring about, if not a better, at any rate a new standard of taste, and that the futility of disorganized individual effort has at last been clearly realized. In Germany, apart altogether from any questions of art, the value of organization in building development has been understood and practiced for several decades. We are ourselves only just beginning to see that for the benevolent despotism of the great landlords, which till the middle of the nineteenth century was fairly successful, we must substitute an organized democracy if we are to have anything but chaos. The *laissez faire* period of town growth corresponding to the last half of the last century has proved its wastefulness as well as its hideousness; hence our town planning bills and our co-operative suburbs. The note of the new period therefore is organization the suppression of rampant individualism for certain general amenities. And if the amenities at present most shrilly called for are greater air and greater garden space, it does not follow that they will stop there. Further refinement in building, quieter exteriors which will better compose with the general schemes, more simply shaped and better proportioned rooms which will permit of more refined furnishings, are but the next step in the same direction.

If the house of the future suburb is on the one hand to express something of the new submission of the individual to the community, and on the other hand to answer



THE IMMEDIATE FUTURE IN ENGLAND

By PROF. C. H. REILLY, M.A.

An abstract of a paper read before the International Town Planning Conference, dealing with the subject of "Cities of the Future."

IT WOULD BE TEMPTING in discussing the city of the future to dream of the time when, in the perfect town organized for all human activities and pleasures, our art of architecture shall have found its final and noblest expression. For the town of the future, like the cathedral of the past, will be the handiwork of many artists inspired by one faith. I do not conceive it in its most perfect form as the work of one brain, however complete its government. Its main structural lines or plan.

to a more exacting and refined, if less sentimental, taste, it is obvious some new departure must be made. The question of evolving a new type of small house answering to these requirements is indeed the most pressing architectural problem in the city of the immediate future.

As in the suburbs we have passed through the period of eclecticism and caprice, and are approaching one of greater restraint and refinement, so in the centre a further suppression of the individual taste for the good of the common whole is necessary. The government of the future city could aid the movement by exercising a wiser and stronger control, not so much of design, for that is a shy thing, apt to wither under official restraints, but of such general things as bulk and colour, which more than anything else affect the massing and composition. Colour has a special importance, for if the buildings and streets in all big towns are approximating to a common ideal there must nevertheless always be a local and sympathetic colour arising from the nature of the site, of the atmosphere, and of the materials available.

When the idea of the town, as an organized entity, at once the result of and the perfect means whereby the best energies of its citizens can do their appointed work, is realized, it will grow in the minds of all until it is conceived as the ultimate work of art, to the making of which, as architects, it is our high fortune to be called."

EFFECT OF FROST ON FRESH CONCRETE

IN VIEW OF THE FACT that freshly-mixed concrete, which has frozen and again thawed before setting in place, is commonly believed to be useless, a number of experiments for the purpose of testing this point have recently been conducted by Prof. H. Burchartz, at the Royal Testing Station of Gross-Lichterfelde, Berlin. The results show that mortar and concrete, if allowed to warm up again to the ordinary temperature before setting in place, are very little affected by a few hours' freezing. The setting time is little altered, although, if the temperature of laying the mortar is low, the setting is, of course, greatly retarded. Prolonged freezing, continued for several days, prevents the mortar from hardening properly, dry mixtures suffering more than wet. For example, 28-day strength of 1 : 3 briquettes was found to be only 40 per cent. of its normal value after 3 days' freezing (followed by thawing) if mixed comparatively dry, but 62 per cent. of its normal value if mixed wet. The effect on 1 : 5 concrete was still greater, the strength of the dry concrete falling to 14 per cent., and that of the wet concrete only to 67 per cent. Against this, however, must be set the much greater strength of the dry concrete under normal conditions, the difference quite compensating for the apparent advantage of the wet mixture.—*Cement Review.*

BARREN JACK DAM, NEW SOUTH WALES

THERE IS NOW UNDER construction, says Cement Age, on the Murrumbidgee River in New South Wales, a masonry dam for irrigation storage purposes which ranks among the large storage dams of the world. This structure, known as the Barren Jack Dam, is being built by the Government of New South Wales under the direction of Mr. L. A. B. Wade, M. Inst. C.E., chief engineer for rivers, water supply and drainage of the Public Works Department. Barren Jack Dam is very similar in design and dimensions to the Roosevelt dam, recently completed on the Salt River project of the United States Reclamation Service. The dam is of cyclopean concrete with "plums" of the granite of which the sides of the gorge are formed. The base of the dam is 163 feet wide and 20 feet high, with vertical sides. At this point the gravity section begins with a width of 145 feet, the reduc-

tion being wholly at the down-stream side. Above this base the up-stream face has a batter of 1 in 20, and the down-stream one slopes at 1 horizontal to 1½ vertical up to 60 feet below crest. Above this the upper face is curved to a gravity section so as to finish with a width of the dam at top of 18 feet. The maximum depth of water behind the dam will be 224 feet, and the capacity, which approximates to that of the Assuan dam before it was raised, will amount to 33,380 millions of cubic feet. When the dam is full the main river will be backed up for 40 miles, and two important tributaries, 24 miles and 19 miles, respectively. These consequences involve diversions of roads, reconstruction of bridges, etc., and, including the 26-mile material railway, account for the total estimate for the dam at \$3,680,000.

RATHER A UNIQUE METHOD of displaying the State's resources in building materials is about to be adopted in the Californian city of San Francisco, where the State Mineralogist is arranging for a permanent exhibit in the shape of an arcade to be built on the third floor of the Ferry Building. This novel feature, which is to occupy the space between the main office of the State Mineralogists' Department and the Mineral Bureau, will be constructed entirely of native products contributed principally by Californian industrial and manufacturing interests, who will also in a number of cases furnish the necessary workmanship to carry out their part of the project. Up to the present time over twenty-eight different materials have been selected, including brick, terra cotta, cement, various colored granites from all sections of the state, California-made glass, gypsum and stucco, infusorial earth fire-proofing and deafening products, and local quarried lime stone. Native marble will also be extensively used, while a number of other materials will be selected to augment those already chosen. The design for the arcade, which is said to be attractive in its architectural treatment, is the work of a local architect. The main arch will be executed in terra cotta, and of the other two important features of this character, one will be constructed of granite and the other of sand stone. The idea in itself suggests the advisability of a similar undertaking in connection with the Canadian National Exhibition held annually in Toronto. A carefully conceived permanent structure displaying in a practical way the Dominion's wealth in this respect and erected for the sole purpose of exhibiting Canadian building materials and appliances would not only prove to be a noteworthy attraction in a general way, but would deeply interest thousands of prospective owners who annually attend this important event, and thereby serve to educate the people to adopt in their proposed buildings, products of the home market. Material firms and large contractors in Canada can well consider the advantages of such a step as the proportionate cost would be quite small, and a suitable site would, in all probability, be provided by the Exhibition Board, who, of course, would naturally become the real possessor of the building.

THE SHRINKAGE OF CLAYS is very different in various clays. If the shrinkage is very great there is considerable danger of cracking and warping. The shrinkage can be lessened by the mixing of sand, brick dust or grog. The shrinkage can be divided into two kinds—the drying shrinkage and the fire shrinkage. The fire shrinkage varies considerably also, and depends a great deal on the temperature at which the clays are burnt. In some cases the shrinkage by burning is not noticeable; on the contrary, the clays expand. This is due to a very high percentage of sand or silica in the clay. The size of molds and dies should in every case be very carefully calculated with the drying and burning shrinkage, so that the clay product, after being burnt, will show the right dimensions.—*Tonwaarenfabrikant No. 16, 1910.*

CONSTRUCTION

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Ivan S. Macdonald, Editor and Manager

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CURRENT TOPICS

BY THE RECONSTRUCTION of the Waterford Bridge, Ireland will shortly have one of the most important ferro-concrete structure of its kind in the United Kingdom. The new St. John Bridge, Kilkenny, is another recent structure of this type. The Kilkenny bridge has a 140 foot span and successfully withstood a test of 200 tons dead weight which rested on the bridge for several days.

* * *

ACCORDING TO STATISTICS published by Georges Risler in a French Review, London with 14 per cent. free space, has a percentage of 1.9 per cent. deaths from tuberculosis; Berlin, with 10 per cent. free space, has 2.2 per cent., and Paris, with 4.5 per cent., shows a death percentage from consumption of 5.1 per cent. This would seem to prove that the sums spent in providing parks, play grounds, etc., are well repaid by the improved health of the city. In Paris itself the districts around the Champs Elysees, which are surrounded by woods and parks, show a death percentage from tuberculosis of only 1 per cent., while the congested areas show 10.5 per cent.

* * *

THE CEMENT BLOCK TOWN is at last to become an accomplished fact. At Metlanc Falls, the new town in Steele County, Washington, every store, office, business building and dwelling now being built or to be undertaken in the future will be veneered with cement blocks, a product of a million dollar plant under construction at the present time. The sidewalks and curbsings will also be of cement. As to what the general architectural effect will be, remains to be seen; but at least the town in itself will be consistently concrete. The factory, which covers thirty acres, will be in full operation by February next. An electric plant costing \$350,000, designed to generate 10,000 horse power is also nearing completion.

SEVERAL MONTHS BACK the municipal council of Yarmouth, Nova Scotia, invited contractors to submit tenders for the erection of a solid brick fire hall in the north part of the city. According to the aldermen all bids were excessive, so the city decided to purchase all necessary materials and build the structure by day labor. The work is being carried out under the supervision of a foreman engaged by the week, and last reports indicate very satisfactory progress in every way. This is the city's first venture of the kind, and as to whether its experience in this case will justify future undertakings of a similar nature remains to be seen.

* * *

A BRITISH MANUFACTURER, according to U. S. Consul Halstead, Birmingham, has constructed a water-cart propelled by steam, with a water-containing tank 13 feet in length by 4 feet 6 inches in diameter, built of steel plates three-sixteenths of an inch thick, strongly braced and riveted, with a total capacity of 1 200 gallons. This tank is divided into two sections, one with a capacity of 1,000 gallons for street-watering purposes and the other a 200-gallon section for water for the boiler. There are two independent spray boxes at the rear with a spray that can be adjusted from 4 to 30 feet. It is calculated that with a medium spray the wagon can water 2 miles of road without refilling.

* * *

IN CERTAIN PARTS of South America, the houses of the poor are constructed of a vast variety of odds and ends, and frequently exhibit much ingenuity in the making. They are rambling one-story buildings, with a framework of odd bits of timber, the rest made up of scraps of sheet iron, mud, straw, old kerosene tins, and what-not. To a considerable extent the adobe house is in use—that is, one built of straw with a timber framework. For a better grade of house sheet iron is largely employed, and in brick and masonry houses sheet-iron roofs appear to be supplanting tiling. In the timberless regions of Argentina lumber, either native or imported, is too expensive to be used for anything except the interior finish of a building.

* * *

ON THE BANKS OF AWBEG, between Mallow and Fermo, County Cork, Ireland, says the *Strand Magazine*, is a remarkable edifice known as "Johnny Roche's Tower." It was built solely by the labor of the man after whom it was called, an absolutely unschooled individual, who occupied it for a number of years. Roche also erected a somewhat unusual mill, constructing the water-wheel after a special design of his own. Although this eccentric person died twenty years ago, his buildings are still a subject of curious interest. His last act was to build a tomb in the middle of the river's bed, but owing to the fact that his less original relatives deemed the last resting-place he had chosen an un-Christian sepulchre, he was buried elsewhere.

* * *

BUENOS AYRES SETS AN EXAMPLE to the entire world as to what can be accomplished in the way of civic improvements by a few years of ceaseless activity. During the past nine years, according to the report of Senor Carlus Thays, Director of the Public Park Board of the Argentine capital, much has been done to materially add to the typography and natural advantages of the Argentine capital. In addition to planting over 142,000 trees during this short space of time, over 80 well distributed parks have been opened throughout the city. The principal part is the great Plaza Del Congresso, situated in the heart of the metropolis, which was carried out simultaneously to the development of the beautiful botanical garden. The trees are planted throughout the parks and along the system of driveways, pines of Neuquen (*Araucari imbricata*) alternating with palms, (*Cocos australis*) from from Misiones territory.

A *SMOKE CONSUMER* and fuel economizer, the invention of a Rotherham, (Eng.) man, has just been successfully demonstrated in a test recently conducted before the municipal official of that place. The test, which was carried out at municipal works, established the efficacy of the device beyond peradventure.

Coal was fed into the furnace of a boiler generating steam with the usual result, the emission of black smoke from the chimney; then the "consumer" was put into operation and the effect was at once apparent. In the place of the black defilement there was only a slight trace of the products of combustion. The change is affected by an arrangement of a series of devices so placed in the flues as to intercept the smoke and cause it to be ignited by the flames of the fire. Two air circulators are so placed as to allow the desired quantity of external air to be circulated among these devices, causing the smoke to be properly ignited and consumed around the boiler flues before entering the chimney. There is nothing to get out of order, and the claim is that a saving of fuel is effected. An important claim is that the apparatus can be affixed during a week end to almost any type of boiler. As to fuel economy, the experiments are not yet completed.

* * *

DOMESTIC CONDITIONS are evidently about to take a new turn if a scheme now projected in the suburbs of London (Eng.), to build 123 houses without kitchens is eventually carried out. The idea is a rather Utopian one, based upon a co-operative system, so that more leisure will be given to house-keepers for more mental and physical recreation, and for the better care and training of children. Householders, though living separately in their own houses, will be able to avoid much household drudgery and cooking, and the expense and trouble of servants by getting such meals as they require sent to their houses from a central hall or by taking their meals in the common dining-room there. Not only are kitchens to be omitted, but the purpose of the home, according to the scheme to be worked out, is to be further perverted by establishing central billiard halls, recreation rooms, library and nurseries. A cursory examination into the project would seemingly indicate that it holds every incentive for a man to stay away from his immediate family; while, as for women, with a convenient *creche* in the neighborhood, they would find little else to do but graduate in the ranks of the militants. While the scheme itself is not impossible, it has a strong "Bellanic" flavor, and is a good thing for any sound and healthy community to leave alone.

* * *

EXPERIMENTS TO PRODUCE IRON and steel from native ores by the electric process which have been made in Norway, partly by Government aid, during the last three or four years, have given such promising results ~~that the process is now being greatly extended, and the~~ industry now promises to become one of considerable importance. Up to the present time, Norwegian iron ore has in many cases proved to be of such a poor quality that smelting by the old process was found profitless. Concerned in the projected development in this field, is a company styled the Hardinger Electric Iron and Steel Works, which has practically completed organization. This concern will locate its plant at Ullensvang in Hardinger on the west coast, with the object of producing iron and steel from Norwegian ores by a patented electric process of Swedish origin. The company has secured electric energy from the adjoining water power at Tyssø for a period of thirty years, at a cost of \$8.04 per horse power; the plant, when operating to its full capacity, requiring 4,200 horse power. Another concern which will also enter this particular field is a company known as the Det Norske Aktieselskab and Elektrokemisk Industri, which is now in process of organization, and with which is identified a large number of influential and successful capitalists and business men.

THAT CONCRETE STRENGTHENS with age is now generally conceded, says a writer in a Northern daily; but there are still in many quarters grave doubts entertained as to the durability and immunity from rust of the embedded steel bars. And it is right that this should not be taken lightly on trust. In a building of reinforced concrete the steel upon which the stability of the structure is dependent is buried deep out of sight, and cannot be easily examined, and if there were the least possibility of the bars slowly rusting to breaking point, and of the brittle concrete consequently snapping without warning, the use of the material would have to be condemned whatever its other advantages might be. But evidence is accumulating to prove the reverse. In the construction of St. Paul's Cathedral iron chains were used, and were bedded in hydraulic lime. There was occasion a year or two ago to uncover portions of these, when it was found that the iron was as bright as on the day when it was covered over. To go still further back through the centuries, the Romans used hydraulic lime concrete very extensively in building the Pantheon and the domed baths of Caracalla and Diocletian. In places iron ties were used, cast into the concrete, and, although the projecting parts of such ties have long ago rusted away, concrete blocks are to be found with the ends still embedded, and an examination of these shows that, even after the lapse of some two thousand years, the iron is perfectly preserved from rust. In all the cases above referred to, the concrete employed was made not of cement, but of hydraulic lime, and no one will question the overwhelming superiority as a protective agent of concrete made from modern high class cement. It would almost appear, then, that even in face of the importance of unerring certainty in this matter, the case for the immunity of reinforcements from rust is sufficiently established.—*Building World*.

* * *

SOME INTERESTING DETAILS concerning ancient methods of brick-making are given in a brief digest by the *Slate Trade Gazette*, of a lecture delivered recently by Mr. A. B. Searle, before the Royal Society of Arts. According to the lecturer, the manufacture of dried bricks in primeval times involved a large amount of physical labor, as the clay paste had to be beaten into a mass a few inches thick, and then trodden until it became homogeneous and uniform in composition. This was the method employed by Egyptian brick-makers, and was still used in many important steel works in the manufacture of bricks for special purposes. The greatest discovery of the ancient Egyptians was the introduction of chopped straw, the primary object of which is twofold: (1) To enable the workmen to develop the distinctive natures of the clay paste and obtain maximum plasticity; (2) the insoluble portion of the straw taken from the liquid used in making the paste served as a non-plastic medium, which enabled the bricks to dry without cracking. An American engineer discovered this five years ago. In the light of this knowledge the full extent of the punishment of the Israelites, when they were ordered to make bricks without straw, could be realized, for it meant they had to make from one and a half times to twice as many bricks to get the same result. Whereas the Egyptians in their moulds only made one brick at a time, Central Americans used to make several. In the latter case, a rough wooden frame about 24 in. long, 24 in. wide, and 9 in. thick, with a partition across the middle, was used. This was filled with paste, and, when removed, left two bricks, about ½ in. apart. Even so the process was a slow one, and a man seldom made more than 150 bricks per day. The bricks were allowed to remain in the air until sufficiently dry, and were then turned on their edges for the sun to beat upon them. Such bricks, under favorable conditions, would last for a long time; indeed, in the absence of frost or moisture, they would last indefinitely.



DEVELOPMENT OF SINGLE STORY SCHOOLS

By HERBERT M. CLARK

The Manor Lane School, Lewisham,—a modern example in London, England. Provides accommodation for 817 children. Features of its design, plan and ground space.

THE WORK OF A BODY which builds, equips and maintains schools sufficient for the instruction of upwards of 900,000 children in the county of London, England, may surely furnish us with valuable ideas. And though much of the theory and many of the practices, however desirable at first sight they may seem, cannot profitably be adopted here both by reason of the varying conditions prevalent in the two countries and of the essential differences in organization and administration, yet we cannot fail to learn something from the admirable manner in which the London County Council and its skillful architects overcome the difficulties that beset them.

They provide, in addition to the public elementary schools and higher grade schools, buildings for special instruction, such as cookery, laundry, domestic economy, and manual training in wood and metal; also schools for the mentally and physically defective, which definition comprises the feeble minded, the deaf and the blind. To this list must also be added pupil teachers' schools, industrial and Truant schools, divisional offices, and lastly the very important item—swimming baths.

In glancing at their work and remembering that it is based on an experience of thirty-five years, we may perchance find, not only new methods of reducing maintenance charges or trifling labor-saving devices worked out in detail—tested, approved and adopted—but ideas in the abstract which, amplified or transformed, we may crystallise into concrete solutions of the special problems that confront us in this country.

Twelve hundred schools are under the control of the Council. Of these a small number only has been built by the Council which, indeed, only took over the schools and all the responsibilities of the London School Board some five or six years ago. Since this transfer the Council has been directly responsible for the creation of all new schools and also for the maintenance of all schools—new and old. This arrangement makes for a thoroughness of planning and construction such we cannot hope to find when a school is built by one body and handed over to another for maintenance. In either case the ratepayer must find the money, and it is improbable that he will grumble at an arrangement which, while slightly increasing prime cost, reduces very considerably subsequent maintenance charges. Many Canadians on seeing the work might wish to voice the wearisome phrase to the effect that "the Englishman builds for the Day of Judgment." A careful consideration, however, of the special conditions goes far to justify this solidity of construction. Imagine twelve hundred schools carelessly constructed by scamped methods! One shudders to think of the maintenance bills.

Any consideration of the subject before us would be incomplete without a reference to the late Mr. T. J. Bailey, F.R.I.B.A., who for many years was the supervising architect of the London School Board, the body which preceded the London County Council. The enthusiasm and special knowledge which he brought to his task added weight to his opinions, and the Council's constructional methods of to-day are based on those principles of design which he evolved from his ripe experience.

The question of site-selection clearly illustrates one of the difficulties of the London County Council architect. Real estate in some parts of the Council's area is fre-

quently very valuable. In some central sections the cost is almost prohibitive. Yet it is just these central sections which are most crowded and which therefore require the largest schools. The excessive cost of real estate necessarily restricts the dimensions of the site, and in such cases only the smallest possible area consistent with the requirements of the school is acquired. Yet even so, the site frequently costs more than the building.

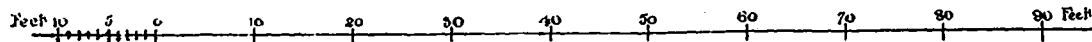
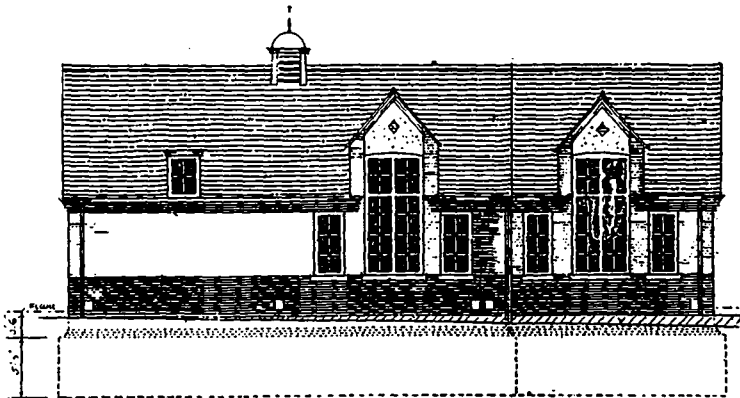
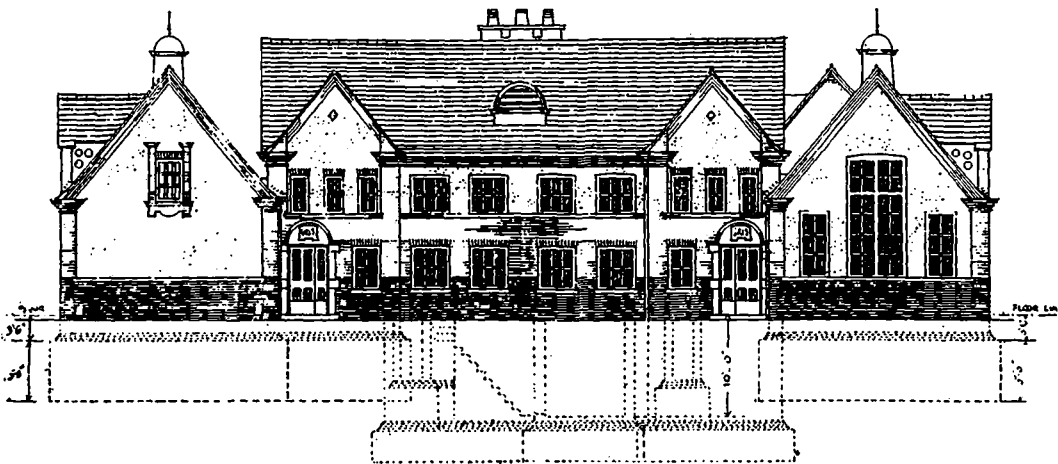
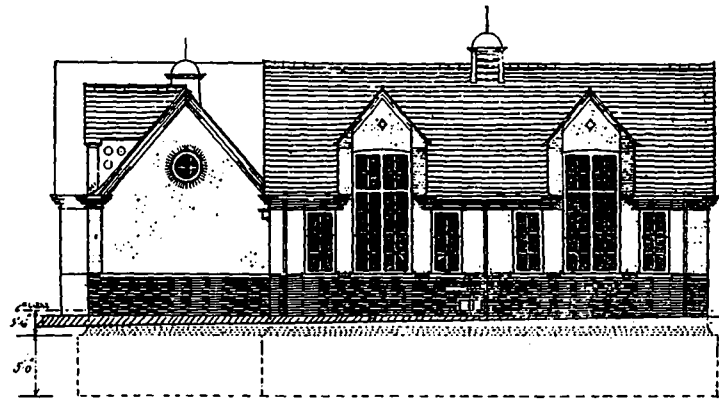
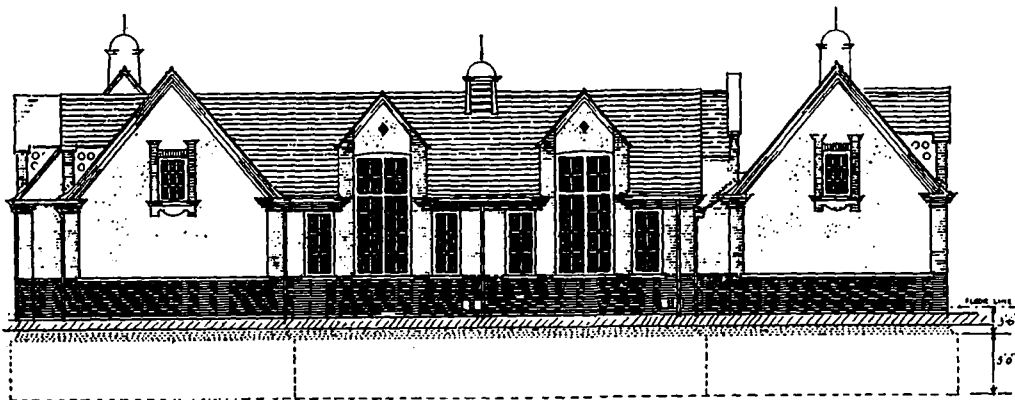
The Council is empowered by the Education Act to schedule and acquire such lands as they may require for their various purposes. Yet this does not mean that they can acquire sites as and how they please.

There is frequently strong local opposition to the site that they consider best for the purpose of a new school, which forces them to a site which they would not have chosen preferentially. Considerations of economy frequently prevail to avoid compensation or complication with adjoining land-owners. Furthermore, there is a standing order of the House of Lords to the effect that any public body demolishing more than a certain number of houses of the working class in one parish in a single session is liable for rehousing. This clause seriously curtails the practicable limits of sites in London proper, as the Council avoid responsibilities outside their own functions. Furthermore, in the crowded districts of London, where streets are narrow and houses thick, the largest schools are necessarily required and the smallest sites obtainable.

The Council's architect doubtless seeks, as an ideal site, one of about two acres, rectangular, with the longest side as a street frontage and having a western aspect streetwards. Whilst the plans of the building must secure proper provision of light and air, immunity is also sought from the noise of traffic, and an open playground space of at least thirty superficial feet for each child, of such a shape that it is available for games. The Council see no objection to girls and infants using the same playground. Where the sites are sufficiently large and level, schools of one storey only are usually built, consisting of classrooms grouped round a central hall—a feature considered essential by the Council for boys—a similar building for girls—with an infants' department as a separate building. An excellent example of this type of school is the Manor Lane School at Lewisham, which provides accommodation for 817 children and infants. It is the newest example of the London County Council's schools, indeed the boys' school is not yet completed; it embodies the latest improvements in all directions, and the careful design and thoroughness of construction betray the masterly hand of the late Mr. Bailey.

The site has a southerly frontage of 552 feet 6 inches, with a depth of 166 feet 6 inches, the deduction of a fraction at the east end reducing the north frontage to 440 feet 6 inches. In approaching the school, attention is at once attracted by the excellent little school-keeper's house, which commands the entrance. A glance at the plan shows the compactness of the design. An excellent feature is the "porch," a built-out window, which enables the keeper to overlook the playground and assist in supervision.

Although the school is described as a single storey building, it would be well to state at once, in order to avoid confusion when looking at elevations and sections,



Girls' Building, Manor Lane School, Lewisham, Eng.and, of which the Boys' Structure is an Exact Counterpart, both in Design and Plan. The Upper Drawings Show the North and West Elevations; and the Lower Ones, the South Façade and West End of the Building.

that there is a "mezzanine," actually a partial "first floor," consisting of four rooms, reserved for the teachers.

We pass immediately to the girls' building, which is a duplicate of that provided for the boys, and renders consideration of the latter unnecessary. The plan shows roughly a central hall, seven classrooms and two cloak-rooms—and before any criticism is attempted regarding the disposition of these rooms, it must be borne in mind that practically every one of the Council's schools has required enlargement. With this probability in view the disposition has been made to allow of additions.

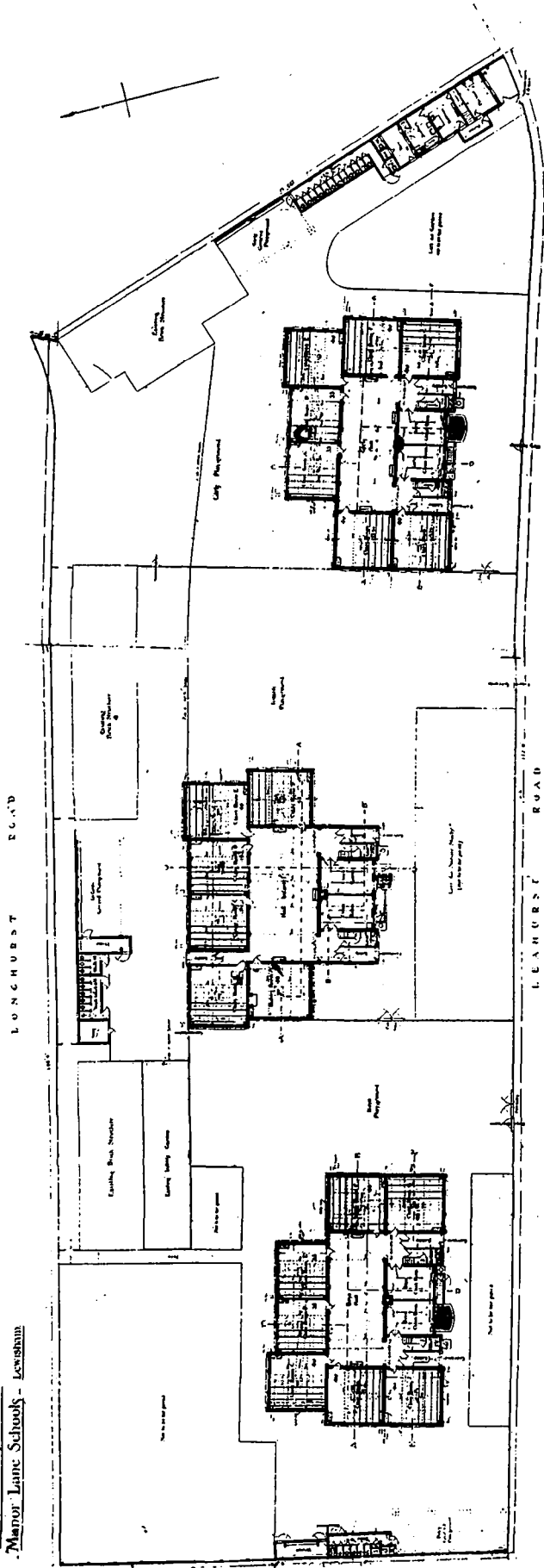
Very substantial are the walls, and the work is everywhere thorough; a liberal use of glazed bricks being evident in the dados and stairways, and concrete with a top layer of tar is employed up to the floor-boards. All brickwork is built in cement and material known as "fire-resisting"—the English equivalent of our term of "fireproof"—is used throughout.

One feature noted is that scrapers and door-mats are placed outside all doors, and all outer doors are covered with an iron "kicking plate"—extending from the bottom eighteen inches up, a serviceable addition; also that latches are very strongly made. Within the inner door and adjoining the entrances are properly placed cloakrooms, in which simple umbrella racks with channel and outlet and wash-basins are provided, with a double hook for each pupil. Each cloakroom has a coil of heating pipes, and ventilation is provided by an air inlet under windows and a "wired" door panel. The main hall is some fifty feet by twenty, and the classrooms and corridors open on to this by doors which swing both ways. It is carried well up above the mezzanine, and the sloping glass room is crowned by a ventilating ridge—a T-shaped opening extending the full length of the roof, which can be partially or completely closed by a handle and pinion.

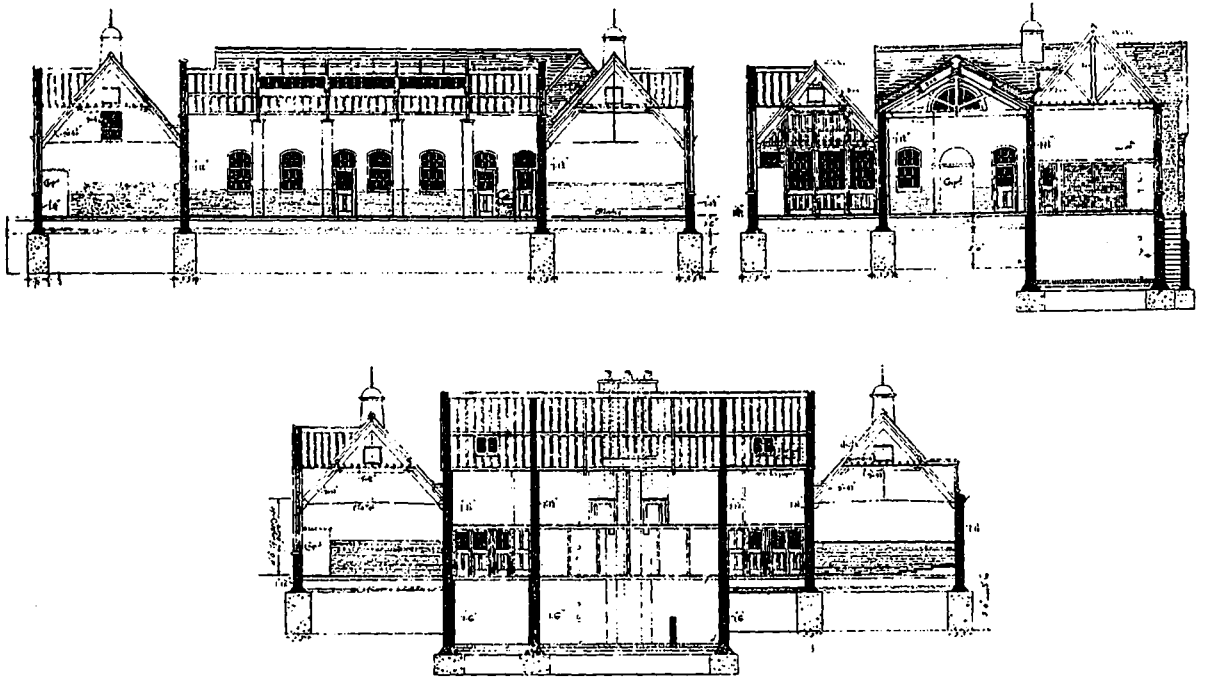
The dimensions of the classrooms are governed by what is known as the "ten-foot" system. Forty children are accommodated in each classroom which, for the sake of the teacher's voice, does not exceed twenty feet square approximately. The Council aims to provide 140 cubic feet of air space per child—boy, girl, or infant—which requires a classroom not less than fourteen feet in height; also to place the furthest scholars not more than 20 feet from the windows, getting their light from the left.

Dual desks are provided so that the teacher may get to the side of each child, and the three or four back rows are placed on steps rising five inches, for infants the stepping is four inches. A piece of glass

LONDON COUNTY COUNCIL
MANOR LANE SCHOOLS - LEWISHAM



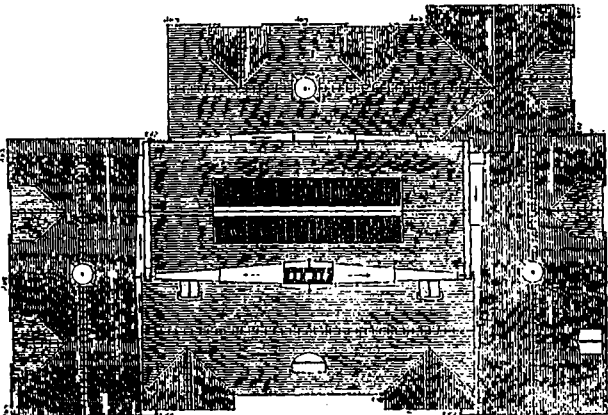
Model Ground Scheme and Floor Plans of Three One-Story Buildings Completing the Manor Lane School, Recently Erected by the London County Council at Lewisham, England. This School Affords Accommodations for 817 Children, and Provides for a Complete Segregation of Boys and Girls, in Addition to a Separate Structure for Infant or Kindergarten Classes. Each Building Has its Own Separate Play-Ground with an Allowance of at least Thirty Superficial Feet for Each Pupil; while Additional Space is Reserved for Nature Study and Athletic Sports. It will be Noted that the Lavatories, which are Modern in their Equipment, are Kept Apart from Each Respective Structure; and Attention is also Called to the Compactly Arranged School Master's House which Commands the Entrance at the Extreme Left of the Leahurst Road. The Site has an Extreme Frontage of 566 Feet, with a Depth of 166 Feet, and all Buildings are of "Fire-resisting" Construction Throughout.



Longitudinal and Cross Sections, Girls' Building, Manor Lane School, Lewisham, England.

48 inches by 36 inches, blackened at the back, has been found to be the best blackboard. The cardinal points with the needle indicating the north, are placed on the light ceiling of each room. They are stamped out of black paper and are attached when the ceiling is being finished. A picture-rail is also provided for the hanging of maps, etc. To eliminate accidents as far as possible, and to reduce the cost of breakages, the lowest panes of glass doors and glass partitions are wired and bedded in wash leather which is held in position with cups and screws. The windows are carried up to the ceiling, and

attention has been paid to this matter, for the beneficial effects of good ventilation on both teacher and class are indisputable. Many systems have been tried—and found wanting. The opening of windows as a means of ventilation is in most cases rendered impossible on account

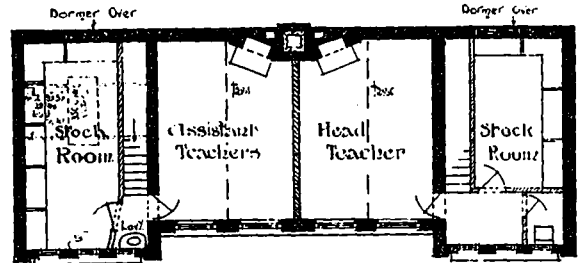


Roof Plan, Girls' Building, Manor Lane School, Lewisham—Showing the Skylight and Ventilating Ridge over Main Hallway.

subsidiary lighting through a bull's eye window at the back of the room is also arranged.

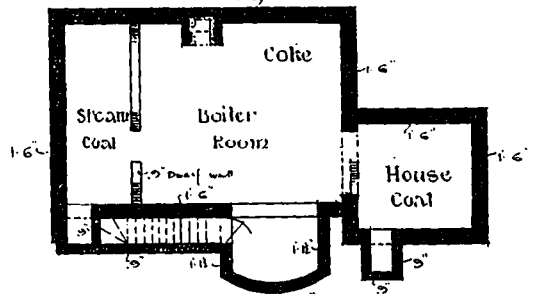
The general appearance of the classroom is bright, business-like and satisfying. It gives the impression that the teacher should make all pupils hear well without effort and without unduly taxing his voice, and that he should have his class well in hand at all times.

A word is here necessary concerning the Council's policy with regard to heating and ventilating. Much at-



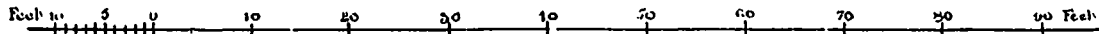
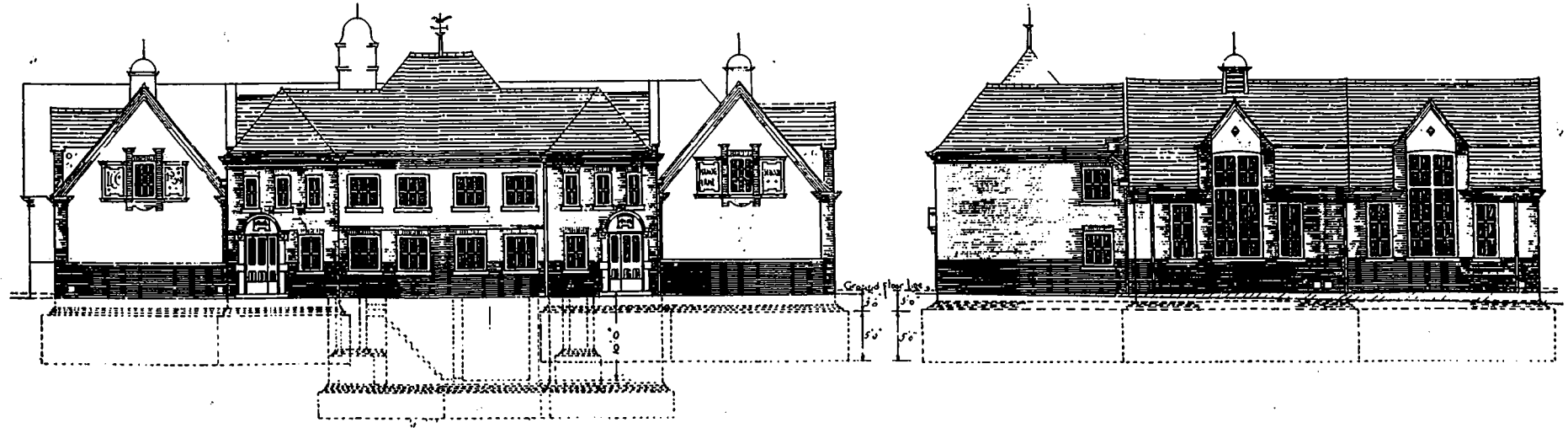
First or Mezzanine Floor, Girls' Building, Manor Lane School, Lewisham—Showing the Accommodation Provided for the Teaching Staff.

of the noise of traffic in asphalted streets in the proximity. The Plenum system has not given much satisfaction. In one school, in a manufacturing section of London, the

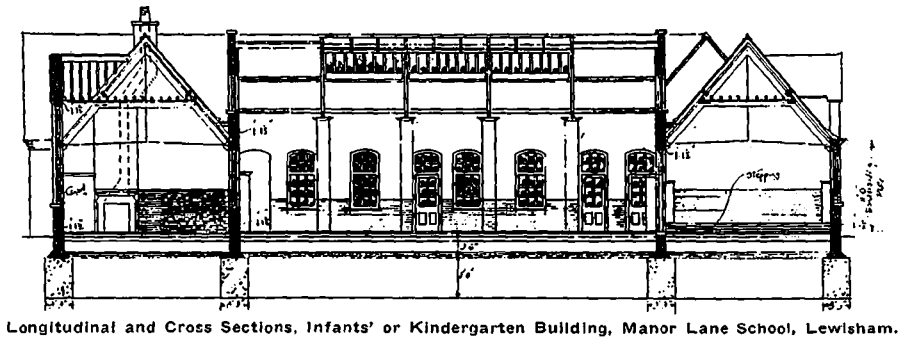
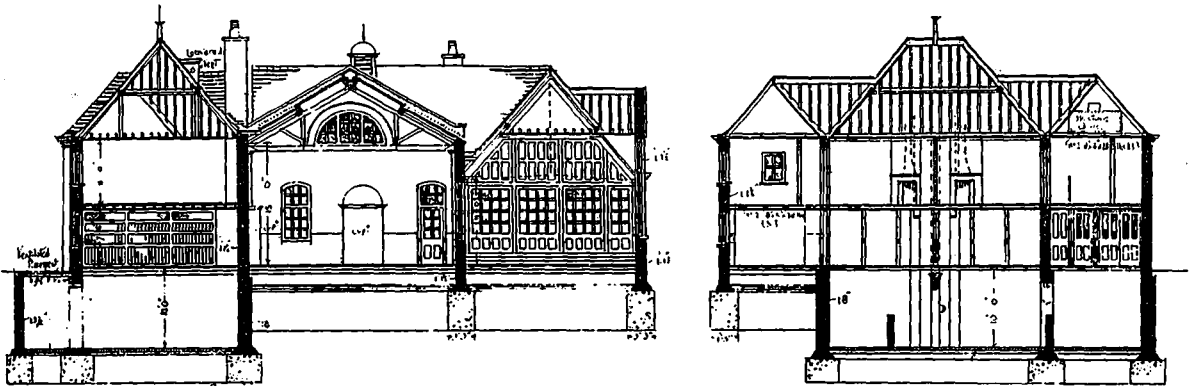


Basement Plan, Girls' Building, Manor Lane School, Lewisham.

flues were black with dirt after running the first day's work, while black balls of moist grease, the size of shot, were scattered over the rooms and its occupants. This,



North, West, South and East Elevations, Infants' or Kindergarten Building, Manor Lane School, Lewisham—Both this Building and the Boys' and Girls' Schools, it Might be Well to Mention, while Strictly One-Story Structures, have a Partial First or Mezzanine Floor for the Teachers' Use, Hence the Upper Window Seen in South Elevation.

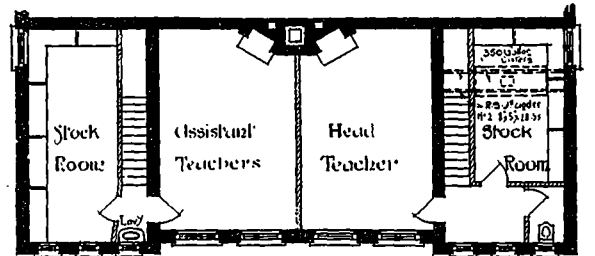


Longitudinal and Cross Sections, Infants' or Kindergarten Building, Manor Lane School, Lewisham.

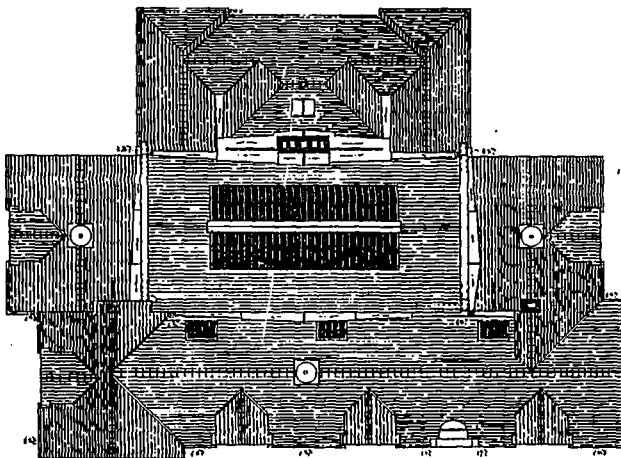
it is true, was not the fault of the Plenum system, but it has also been found uncertain in practice; as where it has been a complete success in one case, it has proven a failure in another under exactly similar conditions. The late Mr. Bailey tried trunks from the ceiling line of each room gathered into groups with a single outlet equal to the combined area of the group, and with a coil of hot pipes in it to produce an upcast. This had the desired effect as far as ventilation was concerned, but it could not be recommended for schools of more than one storey on account of the sounds from lower rooms being conveyed

pipes round the walls just above the floor, to which are connected a couple of radiators in each room. In the hall there are six radiators.

For ventilating purposes there are two air shafts placed at the back of each room, the air entering through a grate



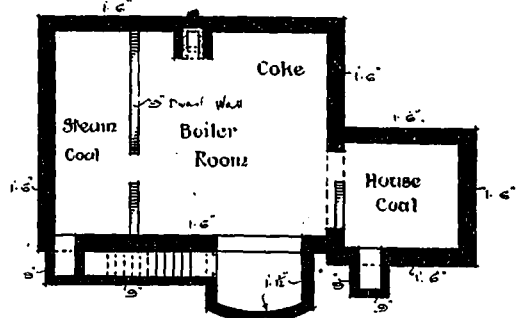
Mezzanine Floor, Infants' Building, Manor Lane School, Lewisham.



Roof Plan, Infants' Building, Manor Lane School, Lewisham.

to the rooms above to the disturbance of classes. Fresh air shafts known as Tobin pipes were introduced for inlets of fresh air, and a separate flue built in the chimney stack with opening at ceiling line for extraction, but the heat of the room frequently converted the extract shaft into an inlet shaft with confusing results. No one realized better than Mr. Bailey the excellent ventilation provided by a grate fire.

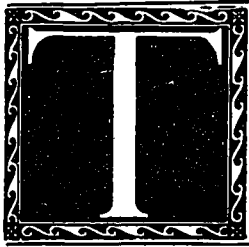
ing some eighteen inches square, which opens on to the playground and is placed sufficiently above the level of the ground lines to prevent the entrance of dust, etc. Inside the room the shaft, which is provided with a



Basement Plan, Infants' Building, Manor Lane School, Lewisham.

The method of heating adapted in the Manor Lane schools consist of a low-pressure hot water syste:

wooden door to permit of cleaning, is carried up some six feet above the floor line, the opening in the top is grated
(Continued on page 78.)



THE NEW MUNICIPAL BUILDING NEW YORK CITY

Important edifice now being built to house the various civic departments of the American Metropolis. Some facts concerning its design, dimensions and constructive features.

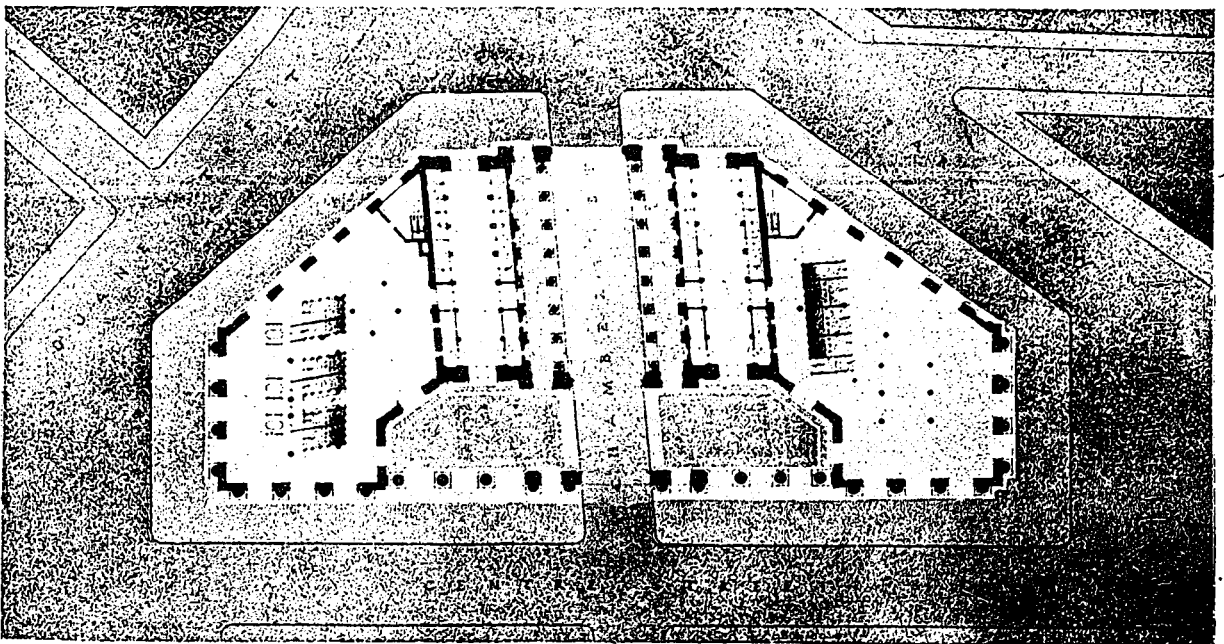
NO PROJECT in the building line in New York City during the past few years has excited more general interest than the new City Hall which is now in the course of construction at the junction of Park Row, Centre and Durane streets. This can be said both on account of its designs and extreme dimensions, and also because of certain constructional features which the undertaking involves. Rising to an extreme height of 615 feet, the building when completed will be well in scale with many of the mammoth office structures for which New York is already noted; and the importance attached to its erection is attracting no little attention in architectural and engineering circles both on this Continent and in the countries abroad.

In plan the building covers a six-sided or semi-octagonal area, giving a frontage on Centre street of 375 feet by an extreme depth of 165 feet, while in elevation, as will be seen by the accompanying drawings, it will attain a height of 40 stories, 15 of which will be in the form of a central tower rising from the main roof. The lower portion of the structure, which is bisected by Chamber street (which runs on a slightly diagonal line almost directly through the centre of the site), will be joined by an arch of forty foot span with a crown just beneath the fourth story, above which the floors will continue through in an unbroken manner from one extreme to the other. From the street line to the main roof of the building is 357 feet and above this the tower extends upwards to a height of 203 feet.

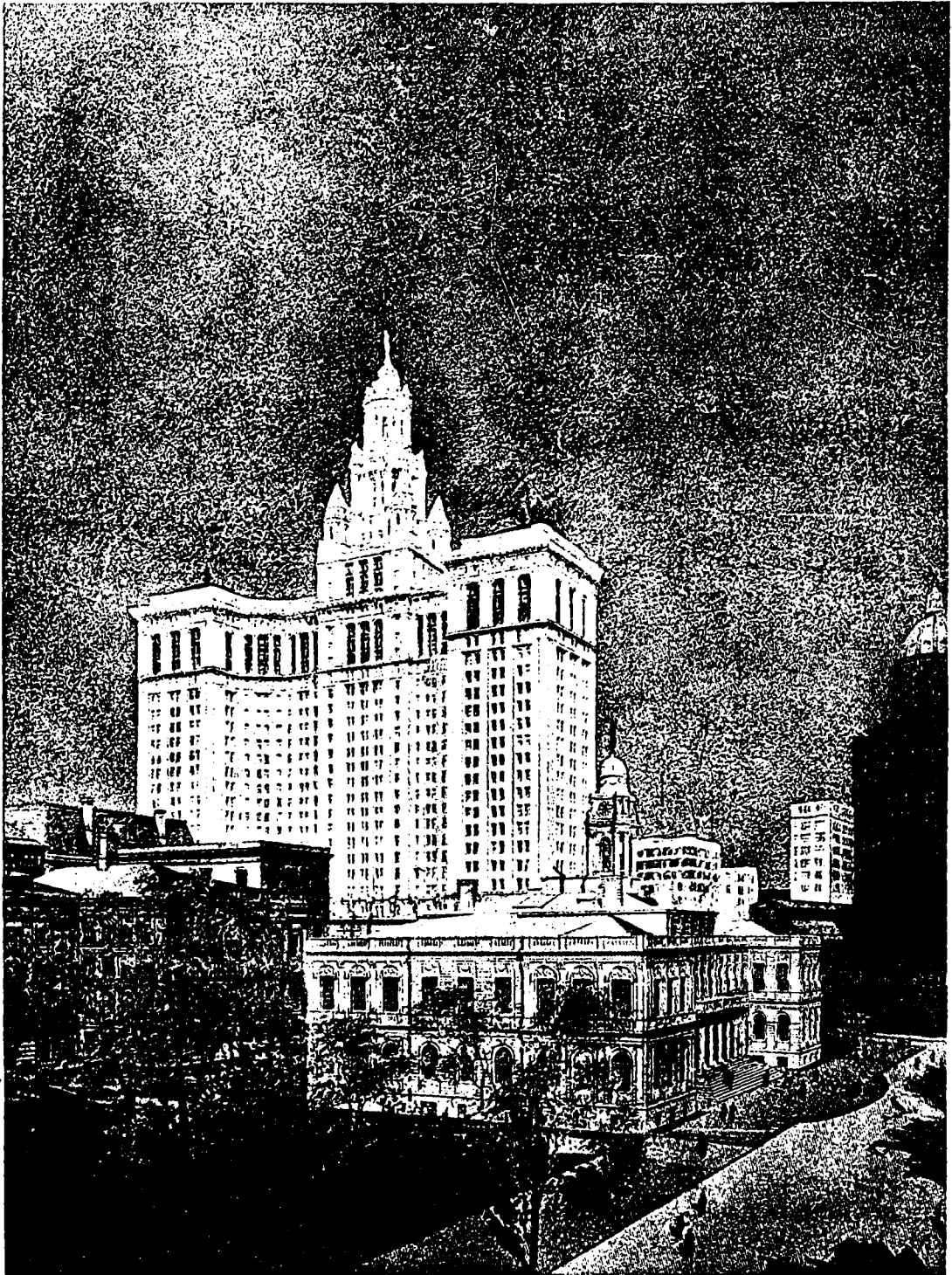
Allowing for the effects of wind pressure, it is estimated that the total weight of the building, including its contents, will be 330 million pounds, the whole of which will be carried by rivetted steel columns.

The portion above the street level will comprise public rooms and offices, the construction up to the fortieth floor being of the fire-protected steel cage type, the enclosing walls faced with granite, and the main steelwork cased in brick, terra-cotta, and concrete, according to position. Beyond the fortieth story, the tower will be continued in the form of a masonry lantern, 35 feet high by 25 feet diameter, to be surmounted by a statue 25 feet high.

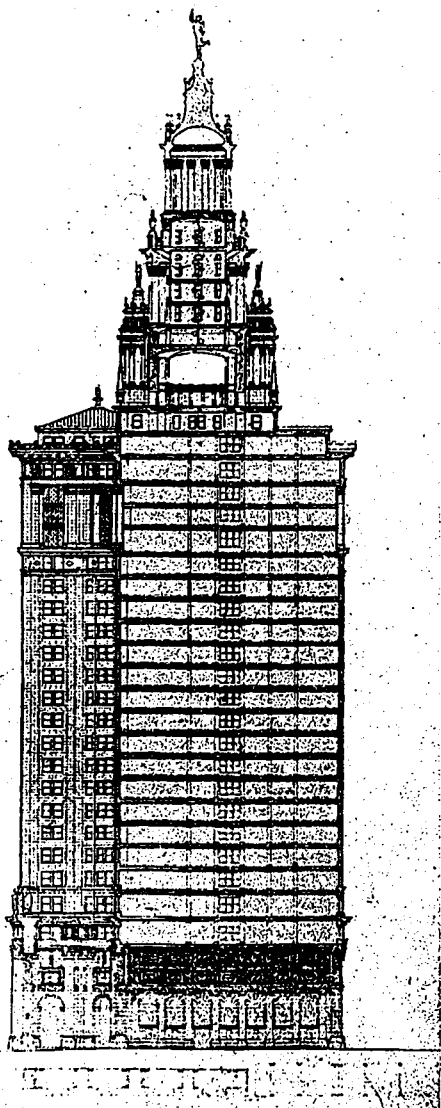
Of more than usual interest is the foundation work, which in itself comprises a gigantic engineering undertaking. In the original specifications it was provided that the columns should be based upon concrete filled caissons sunk to solid rock, but as the rock is not encountered along the northern side of the site nearer than 200 feet below the street level, it was afterwards agreed that 38 of the caissons should be sunk to the depth of about 77 feet, where they find a bed of compact sand, to which the loads will be transferred at the rate of six tons per square foot. The remaining caissons are sunk through water, quicksand and gravel to solid rock at the maximum depth of 140 feet below street level. Owing to the fact that space is provided for a station to be constructed on the Rapid Transit Subway, both the basement and sub-basement are considerably in excess of the ground dimensions of the building proper. One difficulty was met with in the



Ground Floor Plan, New Municipal Building, New York City, Showing the Position of Chambers Street, which Bisects the Lower Portion of the Structure, and which is Arched Over Just Beneath the Fourth Floor Line. McKim, Mead and White, Architects.

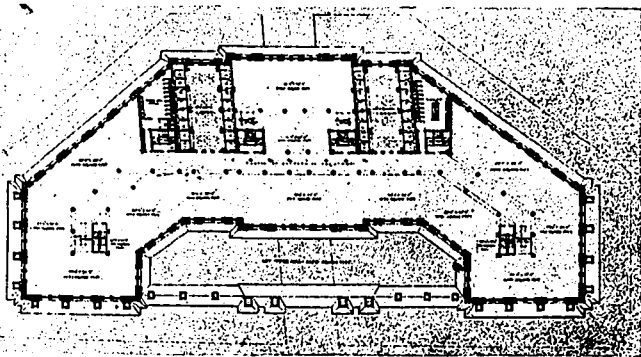


Design for the New Municipal Building, Now being Erected in New York City at the Intersection of Park Row and Centre and Duane Streets. The Importance Attracted to This Structure, Owing to the Vastness of its External Dimensions and the Constructional Features Involved, is Attracting no little Attention in Architectural and Engineering Circles, both on this Continent and Abroad. McKim, Mead and White, Architects.



Cross Section, New Municipal Buildings, New York City. McKim, Mead and White, Architects.

various curved tracks which interfered to some extent with the symmetrical arrangement of the columns, and it was necessary to provide a special system of large girders in the floor above for the support of the superstructure. The upper basement floor will be occupied chiefly by halls, passages and stairs for the use of railway passengers. The basement story also provides space for the in-



Typical Plan of Upper Floors, New Municipal Building, New York City. McKim, Mead and White, Architects.

stallation of mechanical plant and for storage purposes.

As the Municipal Building is in the immediate vicinity of the Brooklyn Bridge terminal, the Hall of Records, and the World Building, all with comparatively shallow foundations on sand, the responsibility attaching to the design and execution of these foundations was naturally very

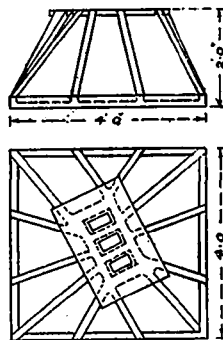


Fig. 1.

great, and fully justified the exceptional care taken by all concerned.

Owing to the exceptional depth penetrated, the working pressure reached something like 40 lb. to 42 lb. per square inch, inevitably involving risk to the men employed, in spite of the most elaborate precautions for guarding against caisson disease. The working-chambers of the caissons for the Municipal Building were made of reinforced concrete with the exception of ten in timber and sixteen in steel. The largest caisson measures 31 feet by 26 feet in section, and carries five columns with the aggregate load of nearly 5,000 tons.

Owing to the great depth attained, the skin friction on the caissons reached about 650 lb. per square foot, and to overcome this, enormous loads were necessary, amounting in some cases to nearly 1,000 tons made up of cast iron blocks. The caissons were filled with concrete in the proportion of 1 : 2 : 4, mixed wet.

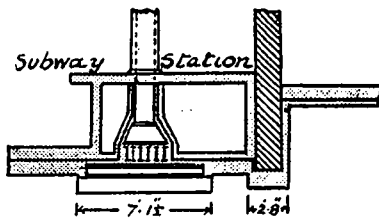


Fig. 2.

The magnitude of the foundation works, and the need for prompt execution, were responsible for the employment of from 800 to 900 men, and an extensive installation of plant, including steam boilers and engines with the collective capacity of over 1,200 horse-power, air-compressing machinery, pumps, cranes and hoists, concrete mixers, and other appliances. One novel feature of the plant was a pump sunk to the depth of 75 feet below street level for the removal of subsoil water, which was forced up to foundation level for use by the contractors.

Many of the principal columns carry loads of 1,000,000 lbs. and upwards, the greatest load being 5,475,000 lbs. on column No. 73, with the sectional area of 521.5 sq. in. All the columns are machined at each end and provided with cap plates, 3/4-in. thick. They are placed upon cast steel or cast iron bases, the largest of which measure 6 ft. sq. at the bottom, and all are finished at the top by a planed surface. Most of the bases are symmetrical, but in several cases, owing to the oblique arrangement of the columns, the

upper surface is set at an angle as illustrated in Fig. 1, which may be taken as a typical instance, although the special bases vary considerably according to the necessities of different cases.

The column bases are placed on distributing beams transmitting their load to grillages over the caissons. Fig. 2 represents a column base and grillage in the Subway station, and incidentally shows the manner in which the lower part of the column is protected against fire.

Some of the column loads are so heavy that duplica-

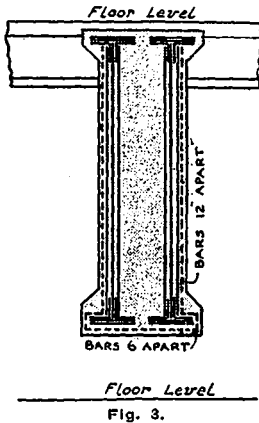


Fig. 3.

tion of the distributing girders is necessary, as illustrated in Fig. 3, where the distributing girders are connected by cast iron separators, and the grillage beams by separators formed of piping and tie-bolts. As a further precaution, the distributing girders are provided with double cover plates on the upper and lower flanges.

Although most of the floor beams are of quite ordinary dimensions, the building contains some very large girders, with the web ranging from 44 in. up to 120 in. deep. One of the triple plate girders parallel to Chambers street is built up of three web plates, 124 in. deep by $\frac{3}{8}$ in. thick, each with four 6 in. by $\frac{3}{4}$ in. flange angles, six 16 in. by $\frac{3}{8}$ in. flange cover plates, and two 122-in. by $\frac{3}{8}$ in. web stiffening plates. Fig. 4 is a section showing the fire protection of two large girders by means of concrete, reinforced near the outer surface by $\frac{1}{4}$ in. diameter bars, a method also insuring protection against rusting.

Several of the heavy girders mentioned are employed for the support of columns in the upper part of the building. A remarkable structural member applied to the

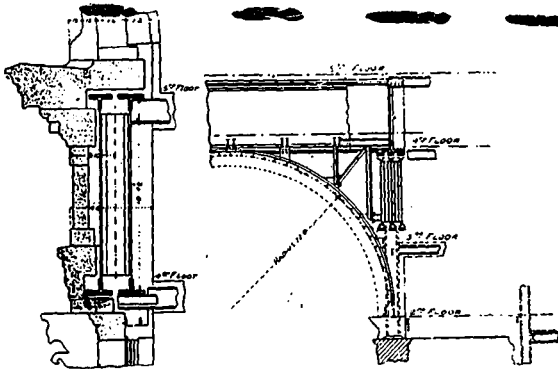


Fig. 4.

Fig. 6.

same purpose is the truss, of which a drawing is reproduced in Fig. 5. This member is 50 ft. long from centre to centre of the main columns, and 26 feet deep all over. Extending from the third to the fifty story, it carries two loads of 3,204,000 lb. and 1,029,000 lb., respectively, concentrated at two points. The truss is protected against fire by a casing of concrete, filling all interior spaces, and being of the minimum thickness of 3 in. outside the projecting parts of the steelwork.

Fig. 6 is a drawing which shows the construction over Chambers street between the second and the fifth stories, the arch being added for architectural effect.

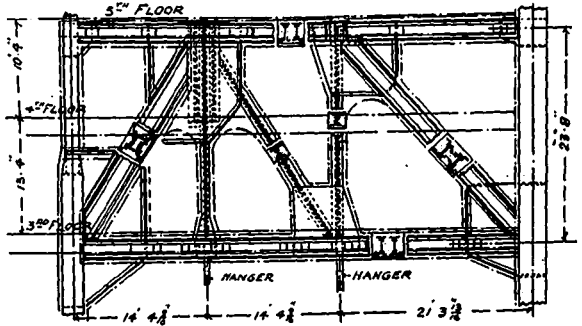


Fig. 5.

Fig. 7 is a section typical of the girder and masonry construction in the principal facade of the building, and Fig. 8 represents the cantilever arrangement for carrying the heavy masonry cornice and parapet projecting several feet at twenty-fifth floor level.

All beams, girders, and trusses projecting beyond floor and ceiling surfaces are protected by concrete. Columns below street level are cased in concrete with the minimum thickness of 4 in., and above the same level by hollow tile, also with the minimum thickness of 4 in., except in a few cases where brick is employed. Hollow tile

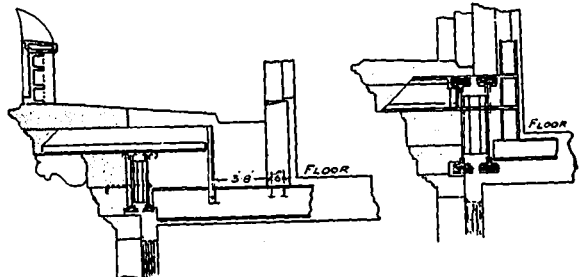
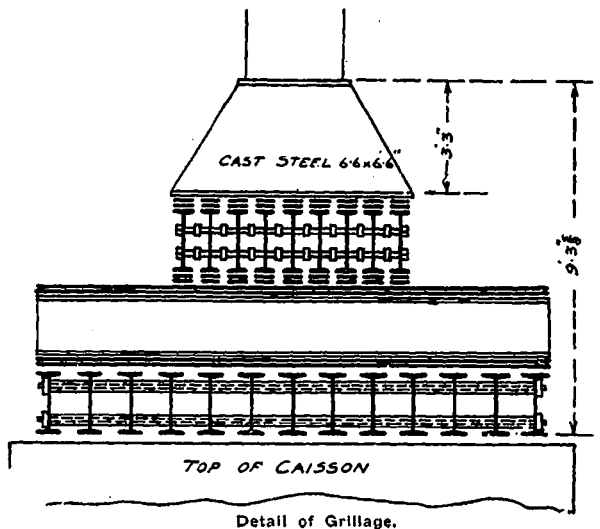


Fig. 8.

Fig. 7.

is used for most of the partitions, 4 in. thick for heights up to 18 ft., and 6 in. thick where that limit is exceeded.

The architects for the building, which will cost approximately \$9,000,000, are Messrs. McKim, Mead & White, and the consulting engineers, Messrs. Purdy & Henderson. It is estimated that the structure, when completed, will save the city close on to \$450,000 per annum, which is now being expended for temporary offices.



Detail of Grillage.



THE ARCHITECT WHAT TO EXPECT OF HIM

By ARTHUR C. CLAUSEN

"He must be a structural engineer and a mathematician, and at the same time an artist and a business man."

ALTHOUGH an architect's commission for the planning of a home or building is a very small part of the total investment, yet upon his ability depends, to a large extent, the best and proper expenditure of the entire building funds. To be successful, an architect must be versatile. He must at once be a structural engineer and a mathematician; an artist and a business man. His profession is both an art and a science. The mathematical part is mentioned here first since mathematical accuracy, both as to scale and dimensions, is absolutely necessary throughout all his work.

Drawings containing a lack of the proper amount of dimensions, or inaccurate dimensions, are useless, for workmen accustomed to following the plans without question will, if the dimensions are inaccurate, sometimes make serious mistakes, costing the owner of the home or building several times what he paid his architect, to rectify them. The contractor has a right to expect compensation for all extra work required through any inaccuracies on the drawings.

Wherever the strength of materials has to be figured, it is very necessary that the architect should know their relative strength so that they will sustain the weight which they have to carry in a safe and economical manner. Even a home sometimes presents difficult structural problems, although, of course, they are not as prominent or as vital as in the construction of buildings. The strength of materials should never be guessed at, since there are accurate ways of figuring all materials based upon previous tests and experiments. A strong tendency on the part of many architects lies in the direction of making homes or buildings far stronger than required, thus compelling the owner to pay for beams or girders which are several times as strong as necessary.

An architect must be an artist—an artist who paints with materials. All good designing is done in the head. The home is first built in imagination, the architect's drawings and specifications being only the systematic means of conveying to workmen the instructions which will enable them to build this mental picture with material. The artistic element in the designing of a home is very essential, both in making it a lasting joy to its owner and for the pleasure it affords him to receive the credit given his good taste by admiring friends and neighbors. The architect must be a man of sentiment, since sentiments enters into the planning of a home to a large extent, it being in sentiment that the home has its conception.

As an artist, the architect takes into consideration not only the harmonious arrangement and decorative features of the room within, but their outward effect upon the exterior of a home; as, for example, the windows, front entrance, the fireplace, when built on an outside wall; and not only the artistic grouping of doors and windows is considered, but their practical arrangement also, so as to preserve wall spaces in appropriate places for such wall furniture as pianos, bookcases, beds and bureaus.

He must be a thorough business man; a man of unquestionable integrity, especially when he is called upon to superintend the construction of a home or building. In this capacity, he is sole arbitrator between the contractor and the owner. He must not only be tactful, but very

frank and fair, with all concerned. Sometimes he is put in the very embarrassing position of having to decide against his client in favor of the contractor; but more often the decision is in favor of the client and against the contractor. When disputes arise between contractor and owner, as they frequently do, his decision must be entirely impartial.

Some people have the wrong impression that an architect's decision should invariably be in his client's favor; but such is not the case. An architect should always go on the principle of an owner paying the proper price for everything obtained, and the contractor's giving him everything that he pays for. Neither should be allowed to take undue advantage of the other. The architect who will for a price, allow a contractor to put inferior materials into a building, or who will specify certain inferior materials for a commission, is not worthy of his profession. Such a man, in the first place, has not sentiment enough to properly plan a home. His very pride, alone, if he is a man of quality, would rebel against the idea of inferior materials or workmanship going into monuments of his ability. The homes and buildings which he plans and designs are the foundation-stones on which rest his reputation. The stronger that foundation, the more secure the reputation. If the foundation becomes weak and rotten with corruption, his reputation soon crumbles and falls.

Now that the reader knows in a general way what an architect is, or should be, it is an easy matter to deduct from this what to expect of him.

After consulting with an architect, either by correspondence or in person, and having frankly informed him of the amount you wish to spend, the location of the house and your general idea as to its plan and design, your architect should give you his price for the preparation of the complete plans, specifications and details. Prices are sometimes quoted on the percentage basis; a certain per cent. on the final cost of the house being the architect's commission. The most satisfactory way, however, for both architect and client, is to have a definite price agreed upon. This will remove entirely any question of the architect's trying to increase the cost of the house in order to increase his commission; and it should be thoroughly understood between architect and client that the architect is to provide all necessary drawings for the complete, convenient, and proper construction of the house or building.

Cases have been known where the architect has claimed that his price included the furnishing of only one set of plans, and where he has charged exorbitant prices for additional sets. Such a man, of course, is not dealing with his client honestly. He is taking advantage of his client's ignorance. In the first place, it is his duty, as an advisor, to inform his client of all the pitfalls into which he is apt to run, and not to deliberately make them for him.

No building, no matter how small, can be built conveniently with less than three sets of plans. The owner should have one at his home, as a matter of convenience in keeping track of and following up the work, taking estimates on various items, etc. There should always be one set of plans at the building during its construction, so as not to inconvenience the foreman at any time. Since the mill requires a set of plans for a considerable length of time during the construction of the home, in order to get out the various items of mill-work and deliver them as they are needed, an extra set should be provided for this purpose. When the home costs over seven or eight thousand dollars, there should be provided additional sets, as the size or manner in which the building is being constructed may require.

Never consider an architect's estimate of cost as ac-

curate. It cannot be, except by coincidence, since he has not the gift of prophecy and can only state approximately what the lowest bid will be from several contractors who may vary in their estimates over twenty per cent.

One of the principle advantages of employing an architect is that both the planning and building of a home are reduced to a system. In this profession, as in all other professions or trades involving a multitude of details, system means economy. Few people have the slightest idea as to how much thought and time is put into the preparation of the plans and specifications for the construction of a modern home. Give your architect time. Plans cannot be made with a rubber stamp. Every home is a problem in itself, and it takes time to work out the best solution of it.

Employing a competent architect should mean to the home-builder: 1. Saving of time and worry. 2. Saving of cost through the application of system. 3. Substantial construction. 4. Home-like arrangement of rooms. 5. An attractive home. 6. The advantage of taking competitive bids, thereby reducing the cost and of letting the contract on a business-like basis. 7. Having three or more sets of accurately prepared plans and specifications to work from. 8. Knowing just what will be included in the finished structure, thereby saving a long list of extras for things that could not be possibly covered in a rough pencil sketch.

Planning a home is like selecting a wife. What suits one man seldom suits another. Each must choose according to his own taste. To the uninitiated, the planning and building of a home or building is a very difficult and complicated matter. A right mental attitude, however, toward success in such an undertaking, as in all other things, will reduce the problem to a minimum.

SINGLE STORY SCHOOLS—Cont'd from page 72

to prevent the insertion of rubbish, and is provided with a lid which is held open by a bolt and can be used to close the ventilator entirely. For the extraction of foul air each room has a roof ventilator connected by flues, with a turret rising well above the roof ridge, a method which seems to answer its purpose well. Note that the space below the stepping is both heated and ventilated, rendering the rooms more wholesome and sanitary than would be the case otherwise.

In the infants' school the heating and ventilating is the same, except that in the babies' classroom, with which each infant school is equipped, provision is invariably made for an open grate fire in addition. Indeed, the infant school differs very slightly in construction from the girls'; the door handles, of course, are lowered and the height of glass panels diminished from 4 feet to 3 feet 3 inches.

The basement consists of the boiler room, the space for coke, and a dwarf wall assists the storage of steam coal. Space is also provided for house coal. Note that the glass grating, or window, which gives light to this basement, is of such size that when removed it leaves an opening sufficiently large for the removal of the boiler without structural demolition, should a change of boilers be necessary.

The staircases in the Council's schools are never less than 3 feet 9 inches nor more than 5 feet wide, with flights of not more than seven or eight steps. These run direct, and have ample landing space. The treads are about 13 inches, and the risers six inches. The staircase landings have doors which swing outwards, and are without locks and unfastened so that, in case of emergency, no obstruction is offered.

On the first floor, or mezzanine, the accommodation provided is exclusively for the teachers. It consists of four rooms, one for the headmaster, two for stock purposes, and the assistant teachers' room, which is adjoined by a lavatory and has an open grate fire, together with a

gas cooking range on which the teachers can prepare their meals. This range is mounted on a stone base, and an enamelled plate is placed behind it on the wall to catch grease. Such is the completeness of the system evolved by the Council.

In its system of playgrounds the Council provides for an average space of from thirty to thirty-five superficial feet per child. A greater area than this tends to promote undue roughness and increases the difficulty of effective supervision. When a greater tract is available, the excess area is fenced off and used only as an athletic field when such events are scheduled. Frequently, of course, this "thirty feet" is not available; indeed, in some crowded parts of the city ten to twelve feet has to suffice. In these cases provision for the boys and infants is made on the ground level, and a roof playground is provided for the girls. It is interesting to note that these roof playgrounds are not entirely walled, but have lengths of railings or panels fitted with iron grilles, experience having shown that the natural curiosity of the child to see what lies beyond a solid wall, often otherwise leads to serious consequences.

The playgrounds are tar-paved and properly drained, and all existing trees are carefully preserved. In the Manor Lane schools a small area in each department is left impaired for "nature study," and a portion is also left for a garden. Another portion some 50 x 20 feet in an angle facing south-west is roofed in, with sides enclosed and a seat placed against the wall at the back.

There are no lavatories in the main building for children; these are in the open playground at a reasonable distance, the number provided being two per cent. for the boys and rather more for girls and infants.

The work here, as elsewhere, is most thorough and substantial. The rail gate to the lavatories, which is locked at night, rests on a steel pin revolving in a gun-metal bush; the cup being inverted, uppermost, with the pin below—a variation of the old method. The groups of lavatories are covered by a corrugated galvanized iron roof. To each half door of the lavatories a heavy galvanized chain is attached to prevent doors being swung back too far and injuring children. All screws susceptible to the effects of weather are brass or copper. No iron is used, and therefore there is no corrosion. Indeed, the flap windows of the teachers' wash rooms in the main building have phosphor-bronze hinges, which are practically indestructible.

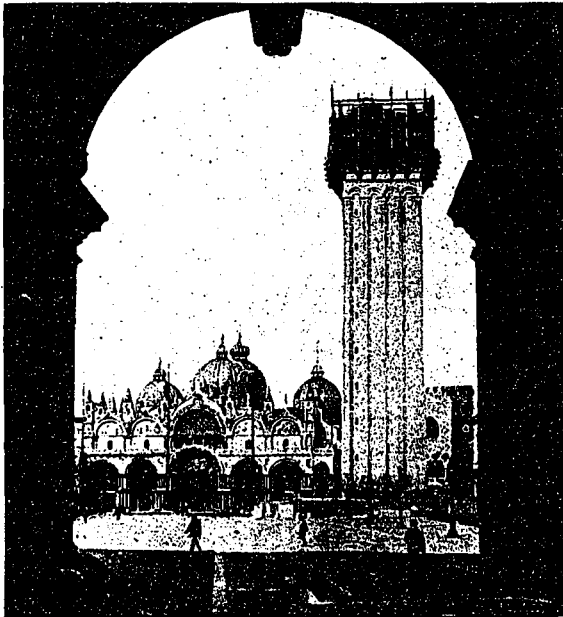
A study of the plans, elevation and sections will reveal many interesting points that cannot be touched on in the space at my disposal, which permits consideration of one type of school only. The measurements and foundation lines are exceedingly interesting, and are well worth studying. The appearance of the finished building is most satisfying, being plain and unpretentious, yet solid, workmanlike and not without beauty of line. There is a growing feeling that the aesthetic should be insisted upon in these school buildings by the introduction of beautiful tiles or enamelled bricks in the interior, in order to assist in the cultivation of a love of beauty in the child. The question of cost, however, will probably debar much progress in this direction for some time. The cost is already considerable. An unofficial but practical and trustworthy estimate places the cost of the Manor Lane schools for the accommodation of 817 children at \$100 per head—say \$82,000—which includes buildings, heating and lighting, but not site. A heavy prime cost perhaps, but not excessive, when one considers the increase in the cost of building in London in the last few years and the extraordinary solidity and completeness of construction. Prime cost is directly related to the maintenance bill. What is the maintenance bill of a modern London County Council school? The assistant architect of the Council informed me that in *fourteen schools* completed under his direction ten years ago, *not one penny* has been spent for maintenance, except for broken panes of glass. Can we make a proportional showing to compare with this?

THE RESTORATION
OF THE CAMPANILE
OF VENICE

Task of Rebuilding Famous Old Tower now nearing completion Bell of San Marco to again ring out on April 25th, 1911.

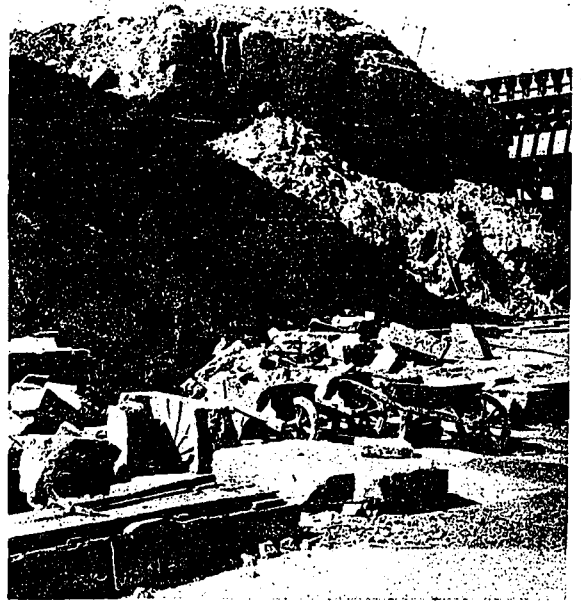
THE TASK OF REBUILDING the Campanile of Venice is now nearing completion, and the "City of the Gondolier" is about to again assume its much wanted appearance. But little remains to be done, save the mellowing touch of time to bring the tower back in full consonance with its surroundings; and it is confidently expected that the bells of San Marco will break their nine years' silence and again ring out on St. Mark's Day, April 25, 1911.

The restoration of this famous tower—which collapsed



The New Campanile, Venice, as it Appeared Three Months Back, Ready for the Placing of Its Pyramidal Apex.

an angel with spread wings. The foundations of the ancient buildings were found to be good but none too wide, so that considerable strengthening had to be effected. No



The Base of the Old Campanile a Few Days After the Collapse.

scaffolding has been used, a sliding platform being contrived to rise with the progress of the building.

The Inner and the Outer Shafts.

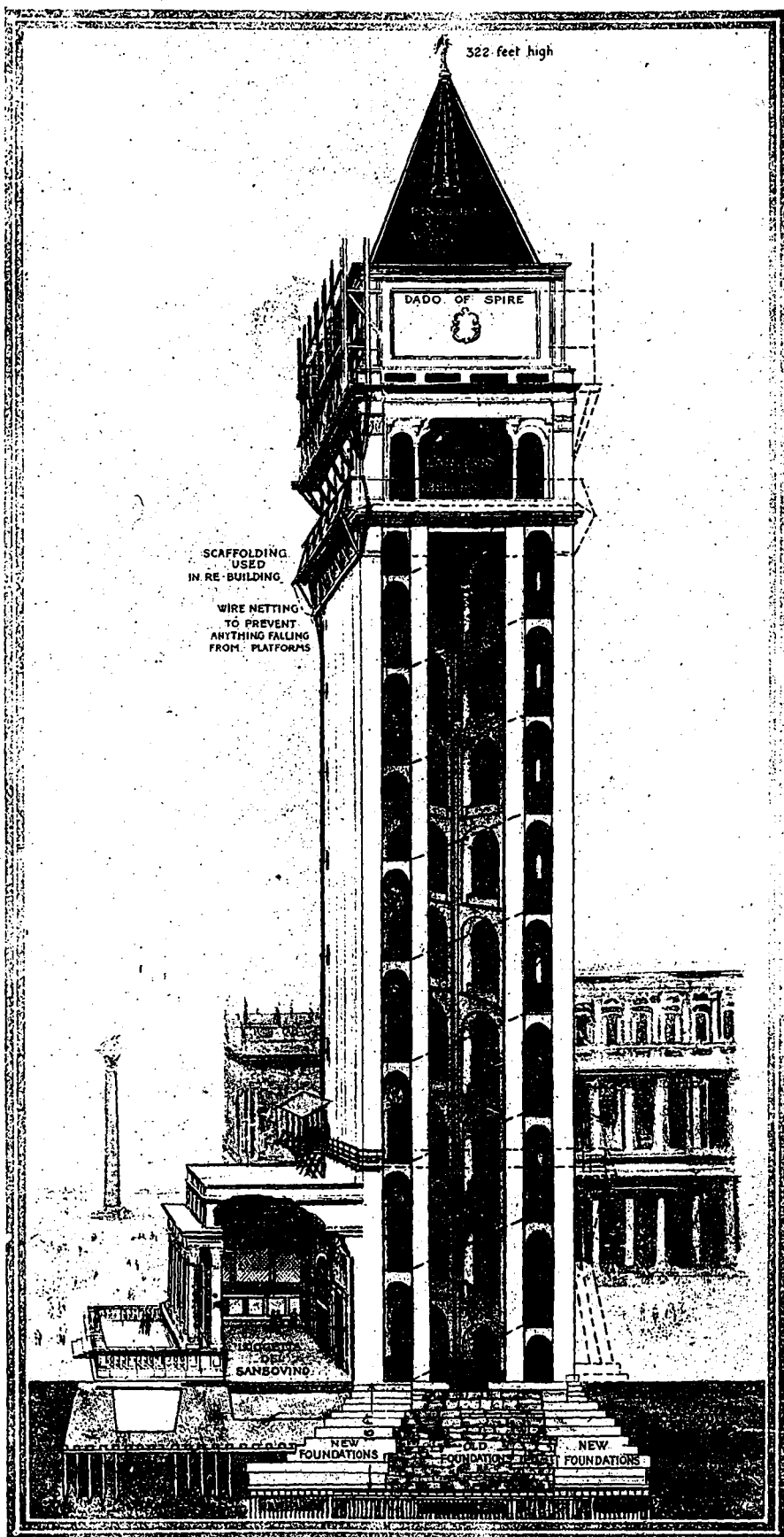
The shaft, which was completed last December, is composed of an inner and an outer shaft between which mounts the inclined plane which leads to the bell chamber. The walls of the outer shaft are 6 ft. thick and the inclined plane is lit by thirty-six windows. In the new tower the shafts are bound together by iron rods, and the pilas-

sudden! ~~July 14, 1806~~ ~~For~~ a proud existence of 1,014 years—has proved a greater undertaking than anticipated, some of the details presenting technical difficulties. The intention was to reproduce the old tower as faithfully as possible, and with that object in view the bricks, of which there are over a million, were specially selected and laid. The bricks are each 12 in. long, 6 in. wide, and 3 in. deep, and the clay is twice mixed to secure homogeneity. These bricks, however, contained salt, which threatened to turn the tower white, and such an outcry was raised among the Venetians that the work was suspended while an inquiry was held. It was found that by prolonged soaking in water the salt was removed.

The tower is quadrangular, nearly 40 ft. square at the base, and 350 ft. high, including the pinnacle in the shape of a pyramid, the summit being crowned by the figure of

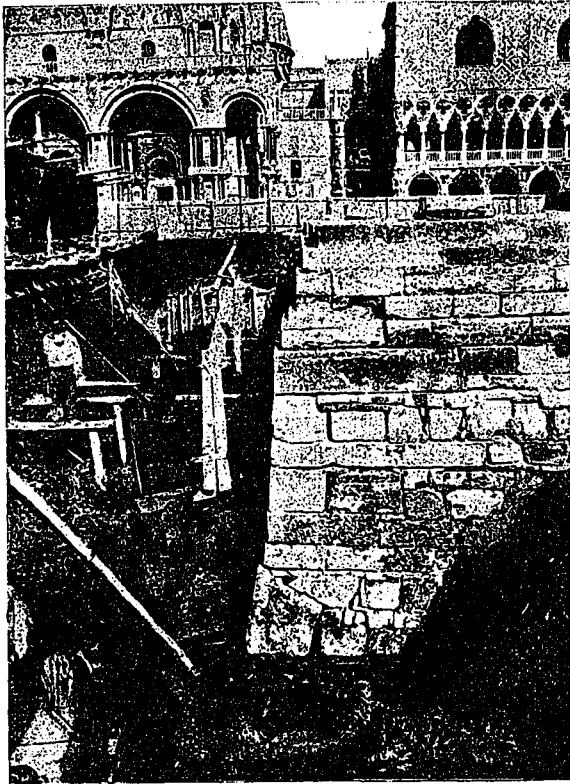


The Original Loggette, Showing Its Sadly Damaged State, Following the Fall of the Tower.



Sectional View of the New Campanile, Venice, which is Now in the Final Stages of Completion. This Illustration Gives an Accurate Idea of the Substructural Work Carried Out to Increase the Size of the Old Foundation, Which Was Found to be of Insufficient Width.

ters at the angles of the inner shaft are similarly united. This will cause any future fall of the tower to be as one mass instead of a gentle subsiding.



Excavating the Ground Around Foundation of Campanile, Preparatory to the Work of Restoration.

Careful searching among the ruins of the old Campanile resulted in the finding of nearly all the fragments of the beautiful bronze doors, statues, and bas-reliefs of Sansovino's famous loggetta, which has been restored with wonderful care and devotion. The estimated cost of the present tower is over 2,000,000 francs, this sum having been raised by public subscription and a large grant from the state.

When the tower fell, of the five bells only the largest was not broken; the other four have been replaced and were presented to his beloved Venice by Pope Pius X. The lions of St. Mark, which originally occupied the centres of the north and south sides of the attic and were defaced during the French occupation, are to be replaced.

Appearance of the Tower.

The tower has a strangely hard and new appearance against the soft, time-mellowed facade of the church of St. Mark with its wild horses and curious oriental-looking domes, and seems almost as incongruous as the large steamboats and motor launches which have now challenged the supremacy of the graceful gondola on Venetian waterways. The Venetians were, however, wise to rebuild the Campanile, for the long, low lines of the surrounding palaces need this sky-piercing shaft to complete the effect even as London needs the dome of St. Paul's to lift its sombre roofs in an upward effort.

The bells of the old Campanile were shattered by the fall of the tower, but they have now, as stated above, been replaced by the generosity of the present Pope. They

were cast on St. Mark's Day, April 25, and will again be solemnly rung from the tower on St. Mark's Day of next year.

Entering the archway at the base of the tower one ascends by a series of sloping ways made of reinforced concrete. The interior brickwork is a marvel of fine setting, and when struck with the hand a portion of it will resound like a drum. Reaching the present summit one is able to examine the progress with the stonework of the dado, which in turn will support the pyramidal apex of the tower. On the summit of all will be fixed a gilded figure of an angel pivoted at the head of a pendulum, so that when wintry winds sweep over the Venetian lagoons the strain upon the tower on this figure will be reduced to a minimum. The view from the summit of the tower is a fascinating and in some respects a surprising one, for from this elevation none of the canals are visible, and the only one of the innumerable bridges which one can discern is the Ponte del Lovo. A Venetian corruption of the Italian word, Lupo, which signifies a wolf.

"By kind permission of Professor Giuseppe del Piccolo, chief superintendent of the reconstruction of the loggetta, I was permitted," writes a correspondent of *The Sphere*, "to witness the remarkable work which has been accomplished within one of the arcades of the Doge's Palace. Here, within the shadow of the beautiful staircase which mounts to the upper story, and within sight of the window from which Silvio Pellico looked out during his many years of confinement, there has been pieced together with infinite pains the wonderful Renaissance facade of Sansovino."

The Reconstruction of the Pillars.

To give an example of the method which has been pursued one may take the case of three columns of *breccia corallina* which form part of the facade facing St. Mark's. One has been put together in thirteen pieces, another in thirty-two pieces, while a third was so much damaged that it has had to be replaced by a block of Asiatic marble known as *sette basi dorato*, so called from a block of this marble having been found in a villa near Rome belonging to Settimio Basso, a Roman consul.

U.S. Consul Albert Halstead, of Birmingham, in a recent report, calls attention to the announcement by a British journal of a new rust-proofing process for iron and steel. The article is boiled in 1 gallon of water to which is added 4 ounces of phosphoric acid, and 1 ounce of iron filings. A black noncorroding coating is produced. No explanation, however, as to the exact formula of the preparation itself is given.



Widening the Foundation, Showing the Old Masonry Work and the Piling for the New Section.



THE NEW YORK CEMENT SHOW

By WM. SNAITH

Interesting decorative scheme and outstanding features of important event as described by the Secretary of the Canadian Cement and Concrete Ass'n.

THE DIRECTORS of the New York Cement Show decreed that "Cement is King" and they adorned his temporary palace in Madison Square Gardens with paintings, hangings and statuary, provided music for the amusement of his loyal subjects, lectures for his lieutenants and dinner and discussions for the captains of his industry.

This year's show was probably the greatest exhibition of cement products ever assembled under one roof, and it proved a revelation to the most enthusiastic and optimistic believers in concrete construction. A magnificent collection of nearly five hundred photographs of European and British work in reinforced concrete lent an international air to the affair, while in the exhibits every part of the United States was represented.

Addresses and lectures, illustrated by stereopticon views and moving pictures, by men of prominence were given twice daily in the Concert Hall of the Garden. Every afternoon and evening those who attended the show were treated to a concert by Sousa's Band. This being the first time this organization has ever taken part in anything in which it has not been the premier attraction, it can be pardoned if it failed, with such music as Wagner's Evening Star Song, to drown the concerted efforts of a battery of mixers, tampers and block machines and the cement gun.

Madison Square Garden was most attractively decorated for the occasion. The ceiling was draped in green and white bunting—a restful and beautiful combination. At either end of the hall were large painted canvasses showing beautiful scenes, with walls and columns and arch bridges tacitly understood to be of reinforced concrete. The bandstand was draped with a profusion of flags. A peculiarly pleasing feature lay in the uniformity of the stalls of the exhibition. Stately columns and walls surmounted by gratings divided the floor space into symmetrical sections. The signs were an excellent imitation of concrete and were all the same size, forming an appropriate background, suspended from the tops of the columns. In addition to the ceiling clusters and lights, each of the stall columns was surmounted by triple cluster globes of high illuminating power. Everybody was interested in concrete, knowingly or not; and no one could walk through the broad aisles without finding many things to stop and look at. The farmer found a model of a farmhouse—barns, silo, fence posts—all made of concrete. Model houses complete in every detail of structural and artistic effect were in evidence on all sides. The manufacturer saw a panorama of a cement mill in operation by day and night, showing not only the working of the plant, revolving kilns and moving trains, but the surrounding country in various lights and colors as the day changed to night. Let us quote a paragraph or two showing the aspect of the show to "feminine eyes," which is reproduced from the daily bulletin issued at the show by *Rock Products*:

"Most beautiful of all exhibits are those which show the artistic possibilities of cement. Classic fountains modeled with all the art that characterizes the productions of the most famous sculptors can be seen in the purest of white cement. Stately columns and pedestals, garden benches and beautiful tables, sun dials and vases, flower boxes and urns, as well as the most exquisite statuary, are here. Grinning gargoyles, fascinating elves, coquettish cupids, grotesque dragons, every famous type of antique and modern decorative art, all are shown, and

in every detail are as perfect as though wrought in the Carrara marbles of Italy.

"Color is not wanting in the exhibits, for cement lends itself most admirably to the soft green tones so favored for garden decoration, and to the warm red and brown hues used in decorative architectural works. Like a bit of old Nuremberg is a circular bas-relief tinted by some truly artistic old German visitor who, enchanted by its beauty of modeling, asked permission to tint it with some especially fine pigments, which he had years ago learned how to use in the quaint old German city.

"The Cement Show is a show that will be remembered for its instructive features as well as for its artistic qualities. Every woman who attends it will build "castles in the air," and every castle will be of concrete products! The woman of means who is fortunate enough to own a country estate will plan Italian gardens, a pergola, or some other artistic improvement for her property.

"The woman whose ambition is to own a cozy home in some suburban section will start to draw floor plans of "her concrete house," and dream happy dreams of a cement cottage that will boast of a red cement tile roof and a spotless kitchen laid in cement tiles. Fond fancy may even add cement window boxes, glowing with scarlet posies."

From the professional standpoint three things appear of striking importance, the development of water-proofing, metal forms, and the Edison poured concrete house. Water proofing may be done in two ways. The concrete may be made impervious to water when made by mixing in it the correct amount of water-proofing material; it is important that the strength of the concrete should not be impaired by the addition. The water proofing material may be applied in the same way as paint, and by its presence prevent water from entering. Both methods were well represented and demonstrated practically in ingenious ways. There were several systems of metal forms. This would appear to be a logical development of the concrete industry, the combined result of the necessity for standardization and the steady upward trend of the price of lumber. In every case these systems can show records of having been applied successfully for several years in actual building construction. The model of Edison's poured concrete house attracted the critical attention of the expert and the interest of the ordinary spectator. The moulds for an entire house are not yet complete, nor has the inventor, so far, attempted to pour a house. His experiment in this latter regard has now been deferred till spring. The examples of work done in the way of decorative pieces for the house were remarkable. With 1½ inch aggregate in slabs about two inches thick the finest lines of the ornamentation were intact throughout, and the broken ends showed the aggregate within 1-32 inch of the surface.

One of the Portland cement companies showed the application of cement in producing pleasing garden effects, and incidentally disclosed how thoroughly wooden construction is competed with as regards landscape decoration. The main feature was a pergola the full length of the exhibit. Supported on six satyr-headed pillars were the massive beams carrying the lighter crosspieces. The grain was brought out so perfectly that it is safe to say that many of those who saw it left with the impression that it was wood throughout.

There were many valuable and interesting papers read at the convention meetings, but the one of most interest to the greatest number was the lecture on the Panama Canal by the Hon. Martin B. Madden, of Chicago. It was illustrated by moving pictures showing a number of operations in the construction of the canal across the Isthmus of Panama. In the course of his remarks, he outlined the course of the United States Government in undertaking and preparing for the work, and gave as his opinion that the canal could never have been built had it not been for the modern development of concrete construction.



THE CITY

BEAUTIFUL

By F. W. FITZPATRICK

Architects the real obstructionists to its advancement. Should work along co-operative lines. How the building department can assist.

HOPEFUL signs are everywhere seen of an awakening of our cities to the fact that, even as great commercial or even manufacturing centres, they need not necessarily be ugly. Municipal societies are bending every effort toward beautifying the existing cities and toward the sane planning of additions and growths thereto, and few cities are there now, where some club, or board of trade or other body of representative citizens has not made a comprehensive plan for a civic-centre, the widening of certain streets, the creation or reclamation of certain parks and boulevards. In some cities huge sums have already been expended in the work of building up to such a plan. It is a good investment. Our railroads appreciate that and are no longer stingy in providing beautiful stations and surrounding them with parking, handsome approaches, fountains and what not. The city government themselves realize that doing things properly, paying some attention to the æsthetic as well as the more essentially practical end of municipal work and "improvements" is sound policy and meets with the favor of the people. Paris has spent millions lavishly to virtually replan and rebuild itself and with such great advantages to its own interests, and such profit to the property owners, that it is beginning another period of artistic "Renaissance" that will involve the city's expenditure of over \$100,000,000. Our cities have seen all that and, though a bit timidly, are doing something, some more but all a little, in the same direction.

Now, strange as it may seem, the real obstructionists in this movement are the architects. It is a bit paradoxical, too, for the movement was seconded if not started by them, they preach it loudest, you'll find them in the van, probably chairmen and presidents of those very societies or clubs that are making the greatest headway. And, worst of all, they don't seem to know or realize that they are arch offenders. And it all springs from an overdose of the ego. Each architect wants to do something individual, characteristic, he cannot and will not merge himself into and for the benefit of the whole, the common good.

Of what use is it to plant beautiful, wide streets, keeping all the wires underground, prohibiting unseemly signs, and all that sort of thing if the buildings lining those streets are at daggers' points to each other? A city is, after all, but an aggregation of buildings; without them there is no city; and whatever its plan, however gorgeous its parks and noble its streets, its buildings are its chiefest feature, and it is beautiful or ugly exactly as are its buildings. Taken individually, many of our latest buildings in every city are beautiful, as isolated units they are well designed, but not the slightest effect has been made to blend them into the surroundings, no consideration has been given the city, the *ensemble*. True, most of our cities are suffering from an inheritance of appalling freaks and "impossible" buildings, bequeathed from former generations; nevertheless, the suggestion of a Denver editor is pretty pat, that "every architect should be placed under bonds to keep the peace between buildings." That so many of our existing structures are monstrosities should be but an added incentive, the task being that much harder, to our architects to so build all about them as to minimize rather than accentuate their ugliness, to adopt tones and colors in the newer buildings that will at least not scream at each other or the old ones and to so plan the new, generally

much taller buildings, too, that they may divert attention from the old without challenging unfavorable criticism themselves.

All this is possible, but, strange as it may seem, you may preach it to the architects until doomsday and never get them to budge one inch. You have to compel, force them into it. So with fire-preventive construction, with sanitary plumbing, with sensible heights of buildings—compulsion was our only salvation. We might have waited twenty years for the architects to do safe building of their own volition and then counted those who would do it on the fingers of one hand; by making strict building laws forbidding anything but fire-resisting buildings in certain districts we have secured the desired end in less than five. In some European cities building restrictions are such that a cornice line, the height of buildings, is maintained for blocks, whole streets, colors must be uniform, in fact so much regulation is the order that beauty (the aim of it all) is overstepped and almost dismal monotony is the rule. I do not suggest such ultra-regulations, but we should have something to keep things a wee bit more in consonance than they now are.

Some, the hypercritical, will again sling "paternalism" and start up declaiming some spread-eagle talk about "individual rights," etc., etc., for there has been opposition to every move made for the improvement of our cities. Less than thirty years ago one of the loudest howls I ever heard went up when cities began to build the sidewalks and charge the property with the cost. The good citizens wanted to retain the right to make them of wood, of stone, of brick, of anything they thought best and at any level so that you were going up and down steps and ever walked with greatest danger of your own neck and other portions of your anatomy. "Liberty" and "rights," nonsense!

What I do clamor for is just a start at a beautiful city by compulsion. Let us begin with only the more important buildings, say those costing over \$50,000, at first. Let it be part of the building department's duty to examine those plans not alone to see if lot lines are preserved, the proper materials for safety specified, the thickness of walls correct and all that, but further that that building will not too riotously clash with the others in the same block. Not necessarily must the color be the same as that of the other buildings, but a certain harmony must be preserved, a style that may differ but yet blends in, a higher or a lower structure, but with some lines bound in with its neighbors. In other words, something to compel that those buildings be designed as part of a whole and not an isolated, absolutely independent unit. What I've been trying to get at is to remove the curse of the "twenty-five feet" idea. Go along our streets and the impression you'll get of each block is of a huge plate of cake, not one, nice, well-iced cake, but a sort of "Washington pie" affair made up of slices of pound, sponge, raisin, every imaginable cake, all sizes and conditions, jumbled together, each piece good in itself, but the whole an unappetizing mess.

"A pretty big duty to saddle upon the building department," say you. Granted, but in nearly every city there is some architects' association or some architects' club. Let the city invite that association to appoint a committee, say five of its most able men to assist the building department. As individuals, architects will kick up all sorts of shins and try to outwit the building department, but once make them a part of that department, give them an official status and official obligations and they'll turn things upside down to keep the other fellows and each other well within bounds, towing the line. It's a queer trait, but human.

Even if the building department can but suggest and not order that this or that be done to conform to a general scheme, an entire effect, it will bear good fruit, so good that the authority will soon be enlarged and made

(Concluded on page 85.)



Residence of W. T. White, 39 Queen's Park, Toronto—An Attractive Brick House which is Designed to Fit in with the Natural Feature of an Interesting Site. Geo. W. Gouinlock, Architect.



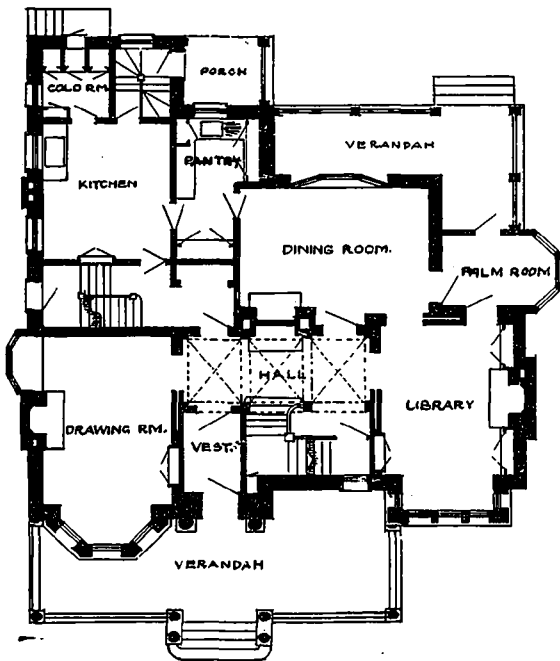
Corner in Drawing-room. Residence of W. T. White, 39 Queen's Park, Toronto—Showing Detail of Fireplace and Adjoining Bay. Geo. W. Gouinlock, Architect.



**RESIDENCE
OF W. T. WHITE
TORONTO**

Attractive brick house at 39 Queen's Park, which is designed to take advantage of the natural features of its site.

ONE OF THE MOST troublesome tasks of Canadian architects in domestic work is the designing of a home for a colorless site. Our cities and towns have grown so rapidly, that it is very often necessary for those who would build to suit their more aesthetic taste, to go to the suburbs to find the environs necessary to give the home the desired setting. To build within the limits of a city like Toronto to-day, means very often that the owner must be satisfied with a treeless lot on a treeless street. Queen's Park, however, is an exception in this regard, and in the summer months when the trees and foliage are at their best, it would be difficult to conceive of a centrally located district in any large city where nature has been more generous or where the natural features have been more reverently preserved. Of course, land values in this somewhat down town district of Toronto are quite high, yet the additional cost in this respect seems to be more than compensated by the beautiful old elms and oaks that have been permitted



Ground Floor Plan, Residence of W. T. White, 39 Queen's Park, Toronto. Geo. W. Gouinlock, Architect.

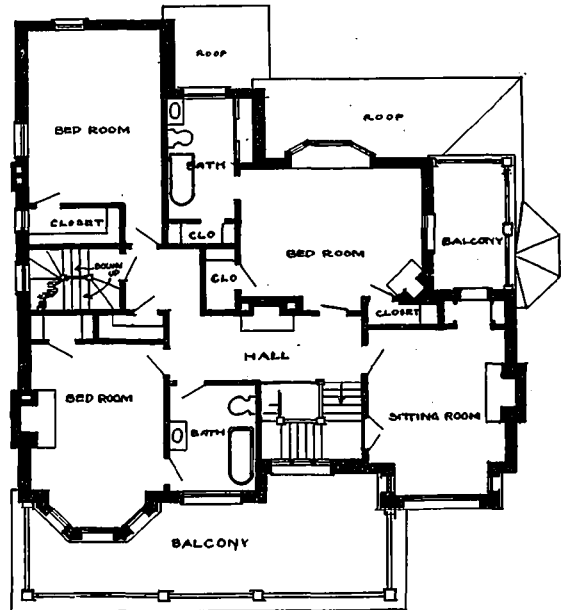
either by chance or design to hold their lofty heads to the breezes, and that make this thoroughfare one of the most ideal residential streets in Toronto.

In this connection herewith is shown a photographic reproduction of the residence of Mr. W. T. White, 39 Queen's Park, as it is seen at the height of the summer season. Situated back from a beautifully kept hedge such as one is wont to see in old England, and nestling behind two old seers of the forest, this house gives an adequate idea of the natural features which abound in the immediate vicinity.

The exterior walls are built of red brick laid up in white mortar joints; and the design with its prominent bays and deep verandah and balcony, is such as to ad-

mirably fit in with the splendid advantage which the site offers.

On the ground floor, the plan is arranged, so that all rooms open from a central hall finished in hardwood and having a groined ceiling. At either end of the hall is the drawing room and library with the intervening space at the front of the house taken up by the vestibule and main staircase. Both of these interiors have large fireplaces and windows overlooking both the front and side lawns, the prospect being most agreeable on all sides. In the dining room is a built-in sideboard, while adjoining both this interior and the library is a palm room terminating a semi-octagonal bay. Opening from the latter room is a large verandah spanning the entire width of the dining room, which overlooks the rear garden. The kitchen which is conveniently connected to the dining room by a



Second Floor Plan, Residence of W. T. White, 39 Queen's Park, Toronto. Geo. W. Gouinlock, Architect.

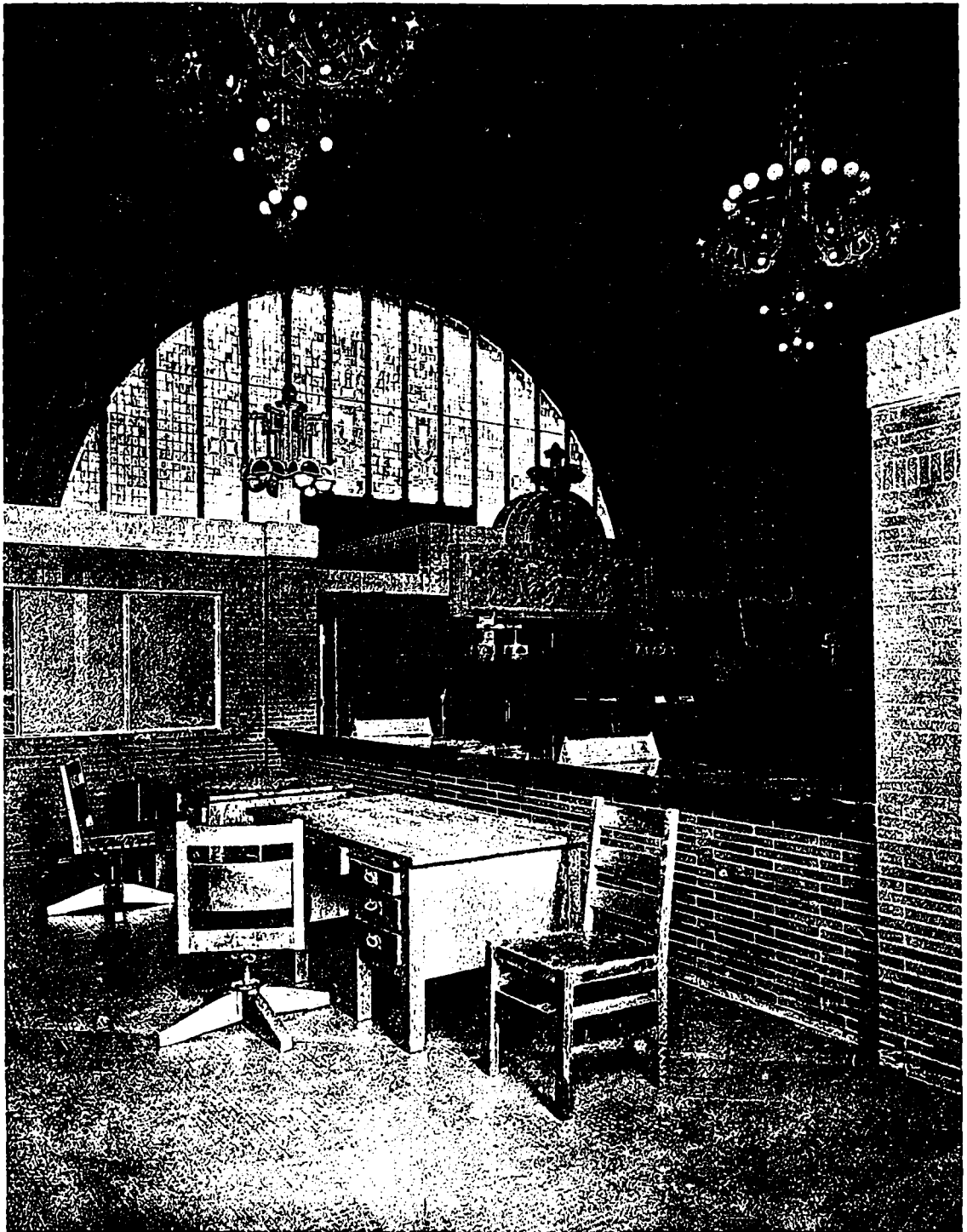
large service pantry, is compactly arranged and can be reached either from the main hall or the rear porch.

Up stairs are three large bed rooms with built-in wardrobes, two modernly equipped bath rooms, and a sitting room having an open fire-place and a door leading into an enclosed rear balcony. The floors throughout are hardwood, and the appointments are such as to produce a full degree of harmony in the general scheme.

The designing and supervising architect of this house was Mr. Geo. W. Gouinlock, Toronto.

THE CITY BEAUTIFUL.—Cont'd from page 83

to apply to all buildings of whatever cost. My contention has always been that the true province of a building department was to not only direct the practical, the safe construction of all buildings, but also to thoroughly censor the design. We legislate against dangerous things, we forbid certain manufactories within a city, we bar certain smells, unnecessary noises, why limit our authority to the prevention of offenses against our noses and our ears? Surely our eyes deserve some consideration, too. The "opposition" will add that it would be a shame to have an ex-builder or plumber or carpenter paw over their plans and direct changes in their designs. If the calibre of the building department is not high whose fault is it? Raise the pay, raise the requirements so that a real architect may be secured for that job, and then give him an "advisory committee" and skilled help.

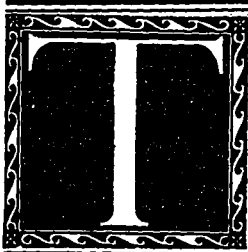


Interior of the Farmers' National Bank at Owatonna, Minn. A Striking Illustration of the Possibilities which Brick Offers for Architectural Effects in Wall, Counter and Partition Construction. Note the General Treatment and the Rich Tone of the Entire Scheme. Louis H. Sullivan, Architect.

BRICKS

A DEPARTMENT DEALING
WITH THE ARCHITECTURAL
AND CONSTRUCTIVE
POSSIBILITIES OF BRICK

BRICK HINTS FOR THE ARCHITECT-BRICK
POINTERS FOR THE CONTRACTOR-BRICK
SUGGESTIONS FOR THE MANUFACTURER



THE CANADIAN CLAY-WORKERS' CONVENTION

Eighth annual meeting proves to be a notable event. Replete with interesting addresses and spirited discussions on various economic and technical phases of the industry.

THE EIGHTH ANNUAL CONVENTION of the Canadian Clay Manufacturers' Association, at the Prince George Hotel, Toronto, December 14-16, was by far the best attended, most representative, and most promising in the way of organization and actual accomplishment, of any meeting that has yet been held by this progressive body. Replete with instructive paper and enlivened by subjects and discussions on various technical and economic phases of the industry, the members in attendance found much to interest them during the three days the convention was in session. From the opening meeting on Wednesday afternoon, December 14th, when addresses of welcome were made by Messrs. William Pears, of the Toronto Builders' Exchange, and C. A. Millar, of the Standard Brick Company, until the close of the convention, the proceedings throughout were characterized by a business-like earnestness that crowded into the time available much that should be of genuine value and assistance to those present.

President McCredie, in his annual address, referred to Toronto as an ideal convention city. He had been informed that it was the largest brick-making centre in the Dominion, and it was to be hoped that the convention would be permanently located there. The past year had been a most prosperous one, and present indications were that manufacturers would be out of stock before the opening of next season. Many have orders that will carry them well into 1911. During the eight years of its existence, the Association had accomplished much. It had been a great benefit to its members, not only in helping to solve the many difficult problems encountered in their work, but also in developing a spirit of co-operation where acute competition and rivalry previously existed.

As regards the technical education, the attitude of the Association was indeed gratifying. While there was little apparent in the way of actual results, he felt certain that the members, owing to the firms' stand taken in this matter, would soon see a properly equipped school of ceramics established at Toronto or Ottawa. As clay workers, he said the members have not done as much for the promoting of the industry as they might have done. They have been plodding along the beaten path, trying to fill orders, without adopting the more aggressive methods. In support of his contention he referred to a convention of a rival industry held sometime ago at London, Ont., and the amount expended for publicity and exhibit purposes. The clay-workers did not appreciate as fully as they should the importance of their products, for which Canada, in its great up-building and development, offered a vast field. Many things were to be learned by a gathering such as is held once a year. There was still to be solved the problem of economical burning, and this would not be worked out until they had a continuous kiln for the small brick-maker. This in itself offers a field that may well engage the attention of the Association until it had learned to operate their plants without wasting fuel. The speaker concluded his remarks by thanking the machinery men for their help and interest in the Association's affairs. He felt sure that the Association owed them more than the members are willing to admit.

The report of the secretary-treasurer, Mr. O. D. McKinnon, showed the affairs of the Association to be in a most satisfactory condition, with all expenses for the year fully liquidated and a cash balance on hand.

Technical Education

Following the president's address, considerable time was taken up with a discussion on technical education. This was participated in principally by members of the special committee appointed at last year's convention to go fully into this important matter. Mr. J. S. McCannell, of Milton, Ont., dwelt upon the commercial and industrial advantages that have accrued to Germany, owing to its splendid system for technical training. With every new industry, the German started in at the bottom and studied every detail in connection with the education of the workmen required. There was no subject of more vital importance to the clay workers of Canada as they had all experienced the difficulty of obtaining good men. Mr. McCannell also referred to the work of the Royal Commission on Technical Education, whose investigations, he believed, would be of much benefit to the commercial and industrial interests of the Dominion.

Mr. S. J. Fox, M.P.P., stated the effort to secure more adequate advantages in this connection was not new. Some little time back, he was a member of a committee appointed by the Ontario Government to visit the School of Ceramics at the State University in Columbus, Ohio, with a view to submitting a report on the advisability of establishing a chair of ceramics at the local University. The recommendation of the committee was favorable, but no definite action has yet been taken in the matter. Mr. Fox urged the Association to send a resolution to the Dominion Government. In his opinion, the clay workers had every right to consideration, as the combined values of their plants and deposits were one of the country's most valuable assets.

In keeping with the general sentiment of the members in this regard, a resolution was adopted to the effect "that this convention heartily approves of the Technical Commission appointed by the Dominion Government, and would urge upon the Commission the necessity of considering the interests of the clay-workers of the Dominion, and would suggest a formation of the department for the study of ceramics, as it is one of Canada's largest and most important industries."

A committee was appointed to wait upon the Commission at its next sitting in Toronto to urge the necessity for prompt action.

Among other business which came up for consideration were two amendments to the constitution regarding the election of officers. One was the proposal to make it compulsory for the president-elect to have two years' experience; and the other was to appoint the executive from past presidents. Considerable opposition, however, developed regarding any change, and it was finally decided to leave the manner of electing officers practically as it stood before.

Papers and Discussion

The second day of the convention was taken up almost entirely with papers and addresses, covering a wide range of subject matter. These were in capable hands, and at no time throughout the session did interest in the proceedings lag. A most valuable and interesting talk was given by Mr. E. Biglow, of New London, Ohio, who was invited by the Association to address the convention on the subject of "Tile Manufacture." In the course of his remarks, Mr. Biglow explained in detail the process of manufacture regarding this particular branch of the industry. He laid stress upon the necessity for care in the preparation of clay in the manufacture of this tile, and also pointed out the importance of proper kiln construction in the successful operation of a plant. It was to the interest of the manufacturer to use only the very best material. Personally, he favored the use of long arched brick, twenty-two inches long, for the top of fire boxes, also large blocks for the side of fire boxes. The kilns should be lined with nine inches of fire-brick laid mostly as headers with through joints and good fire-clay. Referring to water-smoking, the speaker stated that this process required close attention. After the tile is dried the heat should be increased until it is all through the kilns. The kiln should not be allowed to settle until there is a white heat at the bottom. This could be avoided by proper care in firing.

At the conclusion of Mr. Biglow's address, a paper on "Kiln Construction" was read by Mr. J. H. Warwood. Kindred subjects were also dealt with by Mr. J. W. Ball, Toronto, and Mr. B. Broadwell, Kingsville, Ont. The former gave a paper on "Kiln Troubles" and the latter on "Kiln Design." Both Mr. Ball's and Mr. Warwood's papers are reproduced in full in this issue.

Plant Equipment

Plant equipment was taken up in addresses made by Mr. Charles A. Millar, of the Standard Brick Company, Toronto, and Mr. A. M. Wickens, of the Canadian Casualty & Boiler Inspection Company, who selected as their respective subjects "Electrical Installation" and the "Advantages of Steam Equipment." Both of these addresses proved exceedingly interesting, and they provoked considerable discussion at the close of each speaker's remarks. According to Mr. Millar's contention, electricity offered the brick-maker many advantages, in that it was not only economical and reliable, but also because it helped greatly to keep the plant clean and presentable. It was superior to steam equipment in many other respects as well. During the year there were no shut-downs; no waste of power. The simple operation of a switch started everything at once. It was quite possible to dispense with the services of an engineer and fireman. Regarding installation, Mr. Millar gave the members the benefit of much practical and useful information. Motors should be placed on a perfectly dry bed, preferably hollow. Induction motors with a voltage of 550 were the best, in his opinion, for the heavier class of work. Electricity was not only a reliable agency, but it also assured the manufacturer steady and uniform power. Besides, it had both safety and comfort as well as economy in its favor. As to cost, a 50 h.p. motor could be purchased for from five to six hundred dollars.

Mr. Wickens, in speaking of the "Advantages of Steam Equipment," stated that while electricity as a motor power was perhaps satisfactory in small yards where only natural means for drying were adopted, he was strongly of the opinion, that where the output is large, and artificial means of drying were employed, an up-to-date steam plant would be the cheapest to operate. It was unfair to compare up-to-date electrical equipment with an ordinary steam plant. If electricity is used for power, and steam for drying, the cost of coal should be added to the cost of power, because in the case of a steam plant the drying could be done by the exhaust steam from

the engine. Where steam is employed the best results are obtained where the combustion is most perfect. In order that this should obtain, it is necessary to mix the coal and air together, because it is the oxygen in the air combining with the carbon of the coal that makes combustion and brings the heat from the coal. One pound of pure carbon has 14,800 B.T.U. of heat and the ordinary mine run of coal contains from 12,000 to 13,500 B.T.U. For perfect combustion, one atom of oxygen in the air combines with two atoms of carbon. The chemical result is carbonic acid gas and an incandescent fire that requires 12 pounds of air per pound of coal and represents 14,500 B.T.U. In practice it is necessary to supply double the required amount of air because of the fact that it is impossible to thoroughly mix the air and coal. The consequence is that unburned oxygen passes through the furnace. If the quantity of air is diminished one-half the amount required, then one atom of oxygen only combines with one atom of carbon, and the result is oxide gas. The number of heat units one pound of this gas will supply is only 4,800 B.T.U. It gives a bright looking fire, but only one-third of the heat that it is possible to generate. Coal to be used to the best advantage should be burned rapidly; not less than from 10 to 12 pounds per hour per square foot of grate surface. The grate surface should be so proportioned that this speed of combustion can be maintained with the fire from 8 to 10 inches thick. The more dense the fire the more chimney draft is required to supply the grate with air. The coal should be evenly spread and fresh fuel put on the thinner places to maintain a level fire. The air should enter under the grates, and all checks and cracks in the boiler or kiln walls should be repaired and made tight so as to avoid loss in heat. The boiler should be set so that the escaping gases have abundant room to roll as they pass along the smoke stack. Cramped flues and furnaces fail to give up a large percentage of their heat. Mr. Wickens believed that a well-designed and well-kept steam plant had many economic advantages in its favor.

During the session Mr. Biglow and Mr. McCredie gave their experiences in the manufacture of hollow clay blocks, and a paper was also read by Mr. H. E. Hunt, of Toronto, on "The Proper Care of Moulds."

The annual banquet of the Association was held at McConkey's on Thursday evening. Covers were laid for fifty and a sumptuous repast and witty and interesting speeches made the affair a most enjoyable one in every way. Mr. J. W. Ball, of Toronto, presided as toastmaster, and addresses were given by Mr. Wm. McCredie, C. A. Millar, B. E. Bechtel, J. S. McCannell, S. J. Fox, M.P.P., G. F. Hamilton, Henry Simpson, A. Berg, Geo. Crain, Alfred Wagstaffe, G. P. Merks and others. A feature of the menu was a fine moose ham supplied by Vice-President John L. Minor.

Piece Work and Day Work

The convention closed on Friday morning, following a discussion on the relative merits of "Piece Work and Day Work," which was participated in by Messrs. J. S. McCannell, S. J. Fox and W. H. Freeborn. In the course of his remarks, Mr. McCannell stated that it was impossible perhaps to apply either day work or piece work, or still further the bonus system, and say that any one is the best. What might be considered the best in one plant might not work out at all in another. Employees could not be expected to make a success of either piece work or day work, unless the plant is kept in first class running shape. With day work a workman is sure of his day's pay, but he had no incentive to spur him on to his best efforts. A system that can be worked out so as to be agreeable to both parties undoubtedly offer an advantage to both the employer and the employee. On piece work an employee is encouraged to apply himself diligently as he is working more for himself. The harder he works the more he makes. If he gets more work

out of the machine, he is reducing the cost of his product, and his employer shares in his gain also. With piece work there should be a definite idea as to what the work is worth. Both parties should have confidence in one another, and there should be an understanding that if a good day's pay is made, the work should not be cut down. The speaker believed the inducements were greater for the piece worker to take better care of his machine than the day worker. A gang of men would sometimes overlook defects in the working of a machine that would in all probability be taken into consideration if they were on piece work. A system that will keep machinery to its maximum outputs effects a saving in more ways than one. Less capital will be required as less machinery will do the work. As a point in question, Mr. McCannell cited a factory that turned out more work in a week working nine hours a day with the Saturday half-holiday than it did formerly in the ten hour day, six full days per week. With less hours of labor, the employees made more money. It was a known fact that in the times of keen competition, the firm that could produce goods at the minimum cost is serving its own interests as well as those of its employees. Where a man is employed on the day work system he has a fixed amount for his services in view, and in some cases may not be willing to risk a certainty for what he thinks is an uncertainty. In cases like this the piece work system should be fully explained, and the employees should be impressed with the fact that the object is more money and not less. In one case, a company that worked according to the piece work system installed a machine which was new to its employees. To overcome the difficulty the machine was worked two months on day work. As soon as the men understood its operation they saw that it was possible to make more money by the piece work system. Once the elements of uncertainty as to the pay is eliminated, the employees will work harder and more cheerfully and accomplish more in a shorter time than was done before. In some cases the premium or bonus system is employed successfully in place of piece work or day work. In this way the employee is sure of a stated amount each work, while the harder he works the greater is his earnings. In conclusion, Mr. McCannell stated that any part or system that will promote good feeling between employee and employer, and make an employee feel that his work is worth while and that he has a chance to make all there is in the work, is the proper system to have.

Mr. S. J. Fox, M.P.P., stated that personally he favored piece work where it could be done, but that there was a good deal of work that could not be carried out except by day labor. He separated the workmen into three classes: the careless, lazy and shifty; the steady and honest laborer; and the man who is full of energy, and who found more concern in his work than mere quitting time and pay day. With these three classes, all employed by the day, at the same work, it is very hard to pay each a different rate of wage. If they are placed at different jobs, it was then possible to grade the men so that the most deserving would get the best place and higher pay. The speaker declared that the steady and honest man was not to be despised, as he was like oil to the plant, making the working smooth. With day work, it was the employer who suffered from the shiftless and lazy fellow; while on the other hand, it was the quick and active workman who was a disadvantage, owing to the fact that the employer did not dare to pay him more than the others. The advantage of piece work was that it acted as a stimulus on the man. Each was placed on his metal and had a chance to increase his output and earn more money. It was good policy to place the shiftless man on work which he could not spoil, and not in a gang of good men. The success of a plant depended a great deal on the grading of the men, the division of the work, and the elimination of drones in all departments.

Toronto was selected as the meeting place for the next

convention, and the election of officers for the ensuing year resulted as follows: President, Robert Davies, Toronto; 1st vice-president, D. A. Lochrie, Toronto; 2nd vice-president, W. H. Freeborn, Brantford; 3rd vice-president, David Martin, Thamesville, Ont.; auditors, S. J. Fox and J. S. McCannell; executive, Joseph Russell, M.P., Toronto; W. McCredie, Lyons; J. S. McCannell, Milton; C. A. Millar, Toronto; S. J. Fox, Lindsay. D. O. McKinnon, Toronto, was re-elected secretary-treasurer.



EFFECTS IN MANUFACTURE DUE TO KILN TROUBLES

Paper read by J. W. Ball before the eighth annual convention of the
Canadian Clay Manufacturers Association.

IN THE MANUFACTURE of all kinds of clay goods that have to be subject to the process of burning, it should be the aim of each and every manufacturer to see that these goods enter the kiln in the best possible condition so that such goods can issue from the kiln in like manner. In many cases there seems to be no consideration for the quality and condition that the ware enters the kiln, the only time that notice is taken in this particular line is when the goods issue from the kiln, and then they begin to consider what shall be done, what means they should adopt when, as a matter of fact, the trouble has nothing to do with the kiln or burning. If we look carefully into some of the processes of manufacture, we shall find them of the crudest type, in many cases the materials have no preparation at all, just simply passed into the brickmaking machine. If nature has not done its work well it receives no assistance from the manufacturer, therefore, one cannot wonder that when the bricks are subject to the burning this process finds the defects and shows them up plainly. If you take some of these bricks and break them through you will find some very variable conditions; some of these particles are in solid mass as large as $\frac{1}{2}$ in. and more, and some of the finest. This erratic condition of the material adds greatly to the trouble in drying and should the bricks pass this process satisfactorily, it is very doubtful whether they will pass the burning process. You are all aware as practical men that the finer the material is ground the greater the contraction, also the density of the body is increased; the coarser the material, the less contraction and the porosity of the brick is increased. Now if you have these two conditions existing in one brick, can you wonder that trouble will eventually come. The uneven contraction will cause it to crack, and in many cases break asunder. The trouble which originated with either nature or lack of preparation of the material is laid in many cases to kiln trouble, when as a matter of fact it had nothing to do with it, only to show the defect of manufacture.

Stiff Mud Plants.

Another source of trouble found especially in stiff mud plants is that many plants making this particular brick lack drying capacity to thoroughly dry the bricks before they enter the kiln. In many cases owing to this defect the process of drying is speedily pushed to keep ahead of the brick-making machine. A stiff mud plant should have considerably more drying capacity than a soft mud plant of the same output. This is owing to the pores of the brick being closer and the brick denser with this method of manufacture. However, in many instances, the brick enter the kiln in no condition for burning, and before this operation can commence, this added moisture must need be extracted while the bricks are under an enormous pressure, especially those in the bottom. In

many cases these brick crush and crack with the weight while they are taking this hot moisture bath. This is not the only difficulty with wet brick being set into the kiln, but it has a material effect on the color, and makes them look as if they had had a special slip rubbed upon them for no particular purpose; and when drawn from the kiln the manufacturer is at a loss to understand why some of his bricks are a good color while others are not, and what caused the unsightly appearance and, in many cases, instead of going to the seat of trouble, he looks at his kiln as usual when the difficulty lies elsewhere.

Another point that perhaps is overlooked more than any other, is that in some plants where the dryer capacity is insufficient, the heat in the dryer is kept very high to try and get over the wet brick condition, so that the bricks may enter the kiln dry. These bricks come out of the dryer very hot, and are taken straight to the cold kilns and set where they have to stand for a few days and get cold again before burning operations take place. In some cases these bricks have to travel quite a long distance to the kilns in very bad weather, and are, therefore, subject to conditions altogether different from the dryer. This sudden change has a very material effect on some clays and will cause it to check on the surface and break the skin. In many cases they are called fire checks, caused by uneven firing, and this is laid to kiln troubles. Had these bricks been allowed to stand at the end of the dryer to cool off, or perhaps the dryer increased so that the heat need not have been kept at so high a temperature, they would not have been checked and would no doubt have come from the kiln in first-class condition. However, the kiln gets the blame and the burner is at fault for irregular firing.

The Dry Press Process.

Take the dry press process. Brick made by this process require great care in every branch of its manufacture if the best results are to be obtained. There is no need for me to mention any particular process which I think necessary for this kind of brick. Suffice it to say that after every care has been exercised in its manufacture, it then requires the skill of a practical burner to get the best results. A few points in this process is that the material must be prepared and the press must give enormous pressure to bring about a perfect solidity without breaking the brick through the centre. Now I wish it to be distinctly understood that it makes no difference what kind of a kiln you have, what kind of a burner you have, if this brick is not thoroughly made, it is impossible to burn it. The reasons are, that this process of brick-making eliminates that great chemical action that takes place in every other process, namely, that it has not sufficient water used in its process to cause that density and adhesiveness which water and raw material render in a plastic state. Therefore, it depends very largely upon the amount of pressure it gets to bring about this density. It is very necessary that this particular brick be manufactured under the very best conditions. Take now, for instance, bricks made by this process of not too well-prepared material. The man at the press has to be constantly changing his pressure wheel. The press cannot give the amount of pressure necessary to make good brick, therefore, the bricks pass into a kiln in a half-dense condition, and when drawn they have very little sound, and are of a very spongy nature, and no amount of burning could put into that brick the solidity and firmness the press ought to have put there. On the other hand, the brick made by this process with the material properly mixed and subjected to the right amount of pressure, can be burned successfully and will issue from the kiln with a sound, solid and homogeneous nature. It is a well-known fact in this process that the denser the brick, the easier to burn.

The above are only a few instances of the troubles that are encountered when the bricks issue from the kiln, and in many instances are attributed to the burning, which

to my mind, should not be. Let every manufacturer of brick stand at his kiln door, and allow nothing to enter his kiln but what is in a fit state, and to my mind, he will be greatly surprised at the small amount of trouble his kilns are giving him.

There is no doubt that all present know that the kiln has got troubles enough of its own without making it responsible for troubles that do not belong to it. After years of experience with all kinds of kilns and burning all kinds of goods, I have yet to find a kiln that will work satisfactorily on its own account. From the time the kiln is filled and burning commenced, until the time it is cooled down, it is always a source of anxiety on the part of the conscientious burner. Kiln troubles are many and varied and would require experience of all those interested in the business to give a full list of all troubles that are encountered in the burning of clay goods. Conditions in various parts of the country vary. It is not often you can meet conditions alike, even in two places close together, and it is a well-known fact that two kilns built exactly alike, side by side, do not work exactly the same, hence, what troubles one class of people have with their kilns, does not affect another, and so on.

Safeguards in Burning.

However, there are certain conditions that should always be taken into consideration and lines can be adopted that will be a safeguard to those interested in the business. In the burning of brick, there are certain objects to be obtained. First is the removal of the moisture contained in the material. To remove this moisture means that the burning must commence very slowly and continue very slowly until the brick has got warm right through its body. To push the burning to any extent before this has taken place means that the sudden expansion will destroy the bond and with many clays will cause what is known as blowing and speling, especially with tiles, etc. Therefore, it is very necessary that this part of the burning should be continued with due caution. The next stage of burning is what is known as the oxydization period. During this period all the carbonaceous matter is extracted from the bricks. If this period of burning is too rapidly pushed, it neglects to take away this carbonaceous matter, and during the vitrification will make itself visible by expanding the bricks, sometimes to twice their normal size, and will show black or blue core when drawn. To carry a burning kiln through this stage successfully it should be treated to a steady rising temperature, created by a regular supply of fuel, namely, small fires and often, and at all times with a good draft maintained. It is surprising how quickly a kiln can be burned when "small fires and often" is the method employed.

The next period of burning is what is known as the vitrification period when the brick changes from a perishable to a non-perishable material. Vitrification should never take place until the bricks are clear of all carbonaceous matter. It is at this period that the bricks not only receive their hardness and suitability as a building material, but also receive their color. Therefore, it is very necessary that the burner should think of these things before he pronounces his kiln finished. There are many troubles with kilns owing to negligence or carelessness on the part of those in charge. Erratic firing is one drawback. At one period the heat in the fire-box is at melting point, at other times it is far below what its normal condition should be. It is during this erratic stage of burning that you have what is known as fire-checking, for the brick are first hot, and then cold, and to make up for this cooling, the burners in many cases pile on large fires, little thinking that the amount of dead coal is only holding back the heat and allowing cold air to rush into the kiln, and playing upon the ware. You can get an example of what takes place by watching the safety valve on your boiler when it is discharging steam. The fireman opens the door and allows the cold air to pass in; the result is that the valve stops in a very short time. A point of

importance which is carried out in good practice, is that the burner who is going to put fresh coal on his fire, should always push back his live embers to the back of his grates and place the fresh coals upon the front; so that all carbon issuing from the fresh coals shall, by the mixture of oxygen as it passes over the hot embers, become ignited before passing into the kiln. This system of burning is very preferable to the other method of placing coals directly on top of the fire, as a newly made fire of this description for a short time is of no value for the generating of heat. It also gets cleaner ware, better combustion, and takes less fuel for the amount of heat generated. A point of great importance in the burning of brick, etc., is that after the kiln is finished burning, the cooling takes place. With some clays this is a very important factor, especially when the kiln has reached a temperature of dark-red heat. This is the time when air-checking takes place in vitrified ware. It is very seldom that the clay will air-check when it is at its hottest temperature. Therefore, great caution should be used at this particular stage that the heat should be allowed to escape from the kiln, and air excluded.

Another trouble that is sometimes experienced in the burning of particularly down-draft kilns, is that the heat is not properly distributed at the bottom. A great deal of this can be overcome by the regulation in burning, allowing sufficient air to pass into the fire boxes to drive the heat from the top to the bottom. Too close firing is the source of this trouble.

There are many other troubles with kilns too numerous for me to mention, and troubles that are peculiar to the person that is using his own particular kiln. A few of these troubles are lack of draft, irregular draft, back-blowing, cold spots, sooting and others, which no doubt many of those present have encountered in their experience as brick-makers. It would be too difficult for me to stand up and enumerate these troubles and to give their remedies. Therefore, I hope a few remarks I have been able to make will be of material benefit to some members of the convention.



MODERN KILN-CONSTRUCTION

By J. H. WARWOOD.

Different types of kiln and other relative merits. Paper read before the Toronto Convention of the Canadian Clay Products Manufacturers Ass'n.

THESE ARE MANY different types of kilns to-day, and in most cases each style is adapted to some particular kind of clay, or line of manufacture. In this article it is our intention to talk on the three types of kilns that are most generally in use; the round-down-draft kiln, the rectangular or square down-draft kiln, and the continuous kiln. If we are to judge the above types of kilns by the number in use and the amount of ware burned in them, we must give the precedence to the round down-draft kiln. I believe there are more of them in use to-day on the North American continent than all other types combined. The size and construction of round kilns vary to meet the requirements of the ware to be burned, but the size most generally in use and which gives the best all-round satisfaction is the 30-foot inside diameter kilns, 8-foot to the spring of crown, and seven-foot spring in the crown. The kiln should be built of good material, and lined in the parts exposed to fire with a good grade of fire-bricks; and it should be properly banded with at least six bands, three of $\frac{3}{4}$ in. x 6 in., and three of $\frac{3}{4}$ in. x 4 in. iron.

In the matter of furnaces, there are several types, and each one good for their respective purposes. Their selection is often best decided by the fuel used and the material to be burned.

The question of kiln-bottoms is something upon which I believe more thought and endeavor has been spent than on any other part of the manufacture of clay products. It has been my experience that the open or riddle bottom kiln, with an individual stack, is invariably the most successful, notwithstanding the fact that there are many that are termed solid-bottom kilns, and also another type, multiple-chimney kilns that are very successfully used in many places at the present time.

The points of superiority claimed by those who are using the round kiln are that, capacity considered, they are from twenty to thirty per cent. cheaper to build than the square kiln. Being circular in shape, the product is more exposed to

the heat, and therefore it becomes possible to burn the same clay quicker than in a square kiln, and your brick will stand up better if you are making a vitrified article. Also, the more exposed condition of the brick when set makes it possible to procure a better grade flashed brick. The importance of this may not be appreciated by many Canadian brick makers. It is the fact, however, that flashed brick is a very popular article in the United States at present, and the leading Canadian manufacturers are now making this brick. The upkeep for repairs is much less in the round than in the square kiln. In the matter of fuel consumption, which is a very important consideration with the Canadian clay-worker, it is impossible to set any fixed amount as the maximum or minimum to be used. I have burned a* times about half ton of coal per thousand to make all-hard brick, and again, with kilns which were connected or continuous, I have accomplished the same object with less than 400 pounds of coal per thousand, in which case it compared favorably with the best regularly constructed continuous kilns. With this advantage in firing kilns that are so connected, you have the opportunity to hold and handle the product until satisfactorily burned, which in smaller-chambered or a regular continuous kiln you do not.

The square down-draft kiln is an excellent and popular kiln, and in many cases the most adaptable for the needs of the manufacturer. The general constructive principles in this case follow those previously referred to in the construction of round kilns. If you desire a satisfactory and lasting kiln, good material and good workmanship are the essential features. The usual size as best adapted is 18 foot wide by 7 ft. 6 in. to spring of crown, and 7 ft. 6 in. spring of crown. If handled by a single stack about 54 feet is the desirable length, but if multiple chimneys are used they can be built much longer.

A very essential thing in square-kiln construction is to have the kiln strongly and properly ironed. There is no part of a plant that, if not constructed satisfactorily, will cost so much for repairs and cause the owner as many uneasy moments as a bad burn, which usually is the result of a poor kiln. The points in which a square down-draft kiln is superior to the round one are: It is more accessible to set and draw; the door can be made large enough to accommodate a wagon; and on account of the less exposed surfaces to the fire, where a solid-colored face brick is desired, a better-colored brick is obtained.

We have now reached a point in which we will take up the question of continuous kilns. The principle need to-day with the brick maker is that of economy of manufacture, and at no point in the process of making brick is there as much variance of cost as in the burning. Individual down-draft kilns consume from eight to twelve hundred pounds of coal per thousand, while the continuous system uses from three to four hundred pounds per thousand, which more than cuts the cost of burning in individual kilns in two.

The types of continuous kilns in use are many. The top firing and open top kiln has many supporters in the common brick trade, due to its comparative low cost of construction and the economy it effects in burning. But on account of the earth dressing, which is necessary on top of the kiln, the clinkers, dust and ashes caused by burning the fuel in the ware, it is a type of kiln that is undesirable for anything but a common product.

The next type I will mention is a close relation to the last type of kiln described, with the addition of a crown or arch which does away with the top dirt. But on account of its being fired from the top we still have the undesirable clinkers and ashes to contend with. Then we have the continuous form of kilns with the side furnace same as an ordinary down-draft. The most modern construction of continuous kilns to-day are a series of compartments equal in size to many individual down-draft kilns. So it is seen that while the continuous kilns are becoming more closely related to the individual down-draft kilns, and while they retain their fuel saving qualities, they are reaching for the individual control that the down-draft kiln possesses.

Attention in this connection is also called to the fact that while continuous kilns have been becoming more like the individual kiln in their system of handling, the individual down-draft kilns have been going towards the continuous system. I have seen old down-draft kilns connected up by flues so as to work continuous and to burn all hard brick with three or four hundred pounds of coal to the thousand.

But we must not forget that the last and perhaps the most essential feature of all burning is attention and horse sense on the part of the man behind the shovel.

THE ANNUAL BANQUET of the Montreal Builders' Exchange will be held in the Green Banquet Hall of the Windsor Hotel on the evening of January 18. The event this year promises to be a most notable one. Among the invited guests who have signified their intention to attend are Hon. L. P. Brodeur, Minister of Marine and Fisheries, and the Hon. Geo. P. Graham, Minister of Railways and Canals. It is also hoped that the Hon. Sir Lomer Gouin, Premier of Quebec, and Hon. L. A. Taschereau, Minister of Public Works and Labor, Quebec, will honor the banquet with their presence. The following have been invited to represent sister associations: Geo. L. Cains, president, Board of Trade; Lt.-Col. Robt. Gardner, president Canadian Manufacturers' Association; and O. S. Perrault, president, Chambre de Commerce; Thos. Raymond, president, P.Q. Architects' Association.

A NEW BOILER ON THE MARKET

IT IS ANNOUNCED by Steel and Radiation, Limited, that they now have patents under way for a new and improved hot water boiler, to be known as the "King." It is doubtless already known to the readers of *CONSTRUCTION*, that Steel and Radiation, Limited, includes the King Radiator Company, and that they have, up to now, been representing for the province of Ontario, Messrs. Warden King and Son, of Montreal, manufacturers of the Daisy and Viking boilers. The above announcement means that Steel and Radiation, Limited, are giving up that agency, and will henceforward make their own boilers. It is further announced that Steel and Radiation, Limited, are to have centrally located warehouses and salesrooms in both Toronto and Montreal. The location of both will be announced at an early date. It is also proposed to either purchase or build a Montreal factory, which will furnish an added capacity beyond that afforded by their two large plants at present in operation in Toronto.

NEW CONCRETE APPLIANCES

WITH ITS USUAL alert tendency to keep well to the front in the production of high-class concrete appliances, the Ideal Concrete Machinery Company, of London, Ont., and South Bend, Indiana, has just issued a series of special catalogues and circulars relating to several new products of special merit, which the company is now placing on the market. Of these, catalogue No. 8 describes the "Ideal" Sill and Lintel Machine, a machine with a number of excellent features, and which, it is claimed, occupies a broad field distinctly its own. With this machine, sills, lintels, cornices, water tables and dimension stone of all kinds, such as are used in the foundations and lower stories of large buildings, are readily, rapidly and economically manufactured, and without the aid of skilled labor. It is said to overcome the objection of some architects to block construction, on account of the uniformity in the size of blocks, for with it can be made stone of any shape or design within its maximum limits, six feet long, eighteen inches wide, and twelve inches deep, and of any fractional part of these dimensions. This machine offers a number of advantages to block makers, and especially to those who have occasion to use stone of the larger sizes.

The "Ideal" Tabique Machine is dealt with in catalogue No. 15. The tabiques are used principally in the Latin-American countries, and consist of blocks usually made of clay and straw baked in the sun. Concrete tabiques, however, are claimed to be far superior, being much stronger, waterproof, economical and indestructible. This machine makes full blocks which are 10 $\frac{3}{4}$ inches by 4 inches by 27 $\frac{1}{2}$ inches, having five oval spaces or air chambers, or five fractional blocks may be made at a time, each being 5 $\frac{1}{2}$ inches by 4 inches by 10 $\frac{3}{4}$ inches, each having one hollow space or chamber. Catalogue No. 16 describes the "Ideal" Proportioning and Continuous Mixer. This new machine promises to command the favorable attention of the larger concrete manufacturers, as it is designed to meet the universal demand for a mixer which will deliver thoroughly mixed concrete, that is flexible in operation, easily adjustable, practically self operating, and containing the unusual but necessary elements of low feed and high delivery of mixed concrete. Much time and money has been spent in designing and perfecting this mixer, and it has been put to the practical test of actual service in the com-

pany's plant, where it has demonstrated its thorough efficiency as a mixer of the continuous type, and its ability to proportion accurately either two or three kinds of material. It may also be adapted to handle as many as five kinds of material. The "Ideal" Automatic Ten-Brick Machine, another invention recently perfected by the company, and which is now being placed on the market, is comprehensively taken up in catalogue No. 17. It is built upon the famous "Ideal" face-down principle, and will turn out ten plain or faced brick at a time, all being tamped at once with a gang tamper instead of by pressure. There are a large number of individual features about this machine which will undoubtedly commend it to practical brick makers, and obtain for it a large and ready sale.

Another publication, catalogue No. 18, deals with "Tycrete," said to be the most remarkable recent development in concrete. It is a process by which absolutely waterproof concrete may be obtained by natural means, as well as marvellous decorative and artistic effects. This catalogue shows sample panels of brick and block in their actual colors, and gives an idea of the wonderful range of possibilities in the manufacture of stone for decorative purposes that "Tycrete" offers. It is claimed that architects and builders who have seen "Tycrete" products have pronounced it the finest concrete they have ever seen.

CHANGE OF ADDRESS

THE FORD IRON COMPANY, Montreal, has removed its offices from the Canadian Express building, and will hereafter be located at 485 St. James street, a few doors west of Inspector street. The new premises afford the company exceptionally splendid warehouse facilities for its extensive line of contractors', builders', and architects' supplies, which include English and Scotch fire-bricks, fire clay for brick setting, etc. The company reports a very satisfactory year's business, and it is meeting with a large demand for its glazed floor and wall tiles, which are furnished in any design or pattern which may be required.

TRADE NEWSPAPER CHANGE

BEGINNING with its January number, the *Canadian Stove and Heating Journal* will be known as the *Canadian Hardware and Stove Journal*, and will be edited by Weston Wrigley, who, for the past six years, has been editor of *Hardware and Metal*, of Toronto, and also during the past four years editor of the *Plumber and Steamfitter*. Mr. Wrigley has resigned these positions to take over a half interest with Geo. H. Honsberger in the *Canadian Trade Press*, which has published the *Canadian Stove and Heating Journal* for the past two years. Mr. Wrigley has a wide connection in the hardware, stove and heating trades in all parts of Canada, having been the prime mover five years ago in the organization of the Ontario Retail Hardware and Stove Dealers' Association. Since its organization, and in this capacity, he has promoted several hardware trade exhibitions, one of which, to be held at Peterboro, February 21 to 24, 1911, is to have exhibits of the products of about seventy hardware manufacturers in Canada and the United States. The *Canadian Hardware and Stove Journal* will be published monthly, and in addition to his editorial work, Mr. Wrigley will continue as secretary of the Retail Hardware and Stove Dealers' Association.

MORE than \$250,000,000 was expended in Building and Engineering Enterprises in Canada during the year of 1910.—Present indications point to a much more active year in 1911.

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CALENDARS

FOLLOWING THEIR ANNUAL CUSTOM, Mussen, Limited, of Montreal, are mailing to the trade a particularly serviceable calendar for general office use during the ensuing year. It is an exceedingly useful offering, and the members of this firm are to be congratulated, both on its general composition and make up. The calendar is printed on rich cream tinted paper with well selected type, and is highly illustrated with high-class half-tones of the company's products. The month, days and numerals stand out strongly and can be readily deciphered from any point of the average office. These are printed in black, with the exception of the cardinal dates, which, like the intersecting lines and the firm's name, are brought out in a vivid red. The illustrations throughout give an excellent idea of the comprehensive line of municipal machinery and supplies and contractor's equipment which the firm carries, and how well prepared they are to meet any demand that may be imposed upon them in this respect. The company has a competent staff of engineers in all departments, who are at the disposal of contractors and municipalities who may be in need of their services. Branch offices and warehouses are maintained by the company at Toronto, Cobalt, Winnipeg and Vancouver.

"CONSTRUCTION" is indebted to the B. Greening Wire Company, Ltd., of Hamilton, for being remembered with one of their splendid 1911 calendars. As in the past, the feature of this calendar is a bird's-eye view of the company's plant, to which large extensions have been recently made. This is displayed on a highly colored lithographic back, and is inset with half-tones, showing members of the four generations who have been identified with the growth and development of this important industry. The month, day and dates are printed in large bold type, while all unused date space is conveniently utilized with illustrations of this firm's products, such as foundry supplies, wire door mats, galvanized iron strands, light and heavy wire cloth, perforated metal, wire rope, steel wire chain, etc. Underneath the pad are a number of useful tables giving the size, weight, length and strength of wire, wire ropes, sheet zinc, sheet wrought iron and steel, bar iron, and also a table showing the necessary size and speed of wheels and rope to obtain any desired amount of power by wire rope transmission. The calendar is very useful in many respects, and it will be greatly appreciated by the architects and contractors who receive it.

HAMMER BEAM ROOF

THE HAMMER BEAM ROOF, most frequently found in Norfolk and Suffolk, says the *Slate Trade Gazette*, Hull, Eng., was introduced in order to obtain greater apparent height by omitting the horizontal tie-beam. The "hammer beam," which is the short horizontal beam projecting at right angles from the walls, supports a vertical post which is framed into the principal rafter, and the weight of the roof is taken low down the wall by means of a curved brace connecting the inner end of the hammer beam to a wall piece supported by a stone corbel. In Causton Church, Norfolk, the hammer beams, supporting carved angels, have beautiful mouldings carried along the wall plate, beneath which are other carved angels holding shields. The roof is further enriched with tracery in the spaces between the hammer beams, curved braces, and principal rafters. This form of roof causes a considerable amount of outward pressure on the walls, which, however, were strengthened by the massive buttresses of the Gothic period. The roof of Westminster Hall is the most remarkable of hammer-beam examples. The hall, 290 ft. long by 68 ft. broad, is, with the exception of the Hall of Justice at Padua, by far the largest

unobstructed area covered by a wooden roof of an artistic character. This unrivalled example of the carpenter's craft emphasizes the nobility of wood as a building material, as it more than holds its own against the fretted vault of stone, and has for over 500 years been the admiration of the civilized world. The study of old work is most of all profitable when it can be applied to modern structures. A plain queen post roof was recently constructed over a small mission room in the east end of London. Money was scarce and the instructions were to provide a weather-proof shed at the smallest cost. Later on, however, money was forthcoming, and the alteration from a simple mission room to a more dignified church was decided upon. A remarkable transformation was effected by removing the tie beams, queen posts and struts without touching the original roof covering. The tie beams were replaced by iron tie rods, and the queen posts by vertical queen rods. Curved arch pieces were inserted between the ends of what now became the hammer beams. The purlins which had now lost their supporting struts were trussed by means of steel rods, which are truthfully exposed between the vertical studding above the hammer beams. A small king post over the collar completed the transformed roof, thus adding to the apparent height of the structure by the inclusion of the roof in its general proportion.

TO TUNNEL UNDER ST. LAWRENCE

AN EXPENDITURE OF \$30,000,000 is proposed by the Central Terminal Company, which has asked the Board of Control of Montreal for permission to build a central station and a tunnel under the St. Lawrence River. The station will accommodate trains from the Grand Trunk, Canadian Northern, New York Central, Delaware and Hudson and other railroads. The railroads will enter the city through the tunnel beneath the St. Lawrence.

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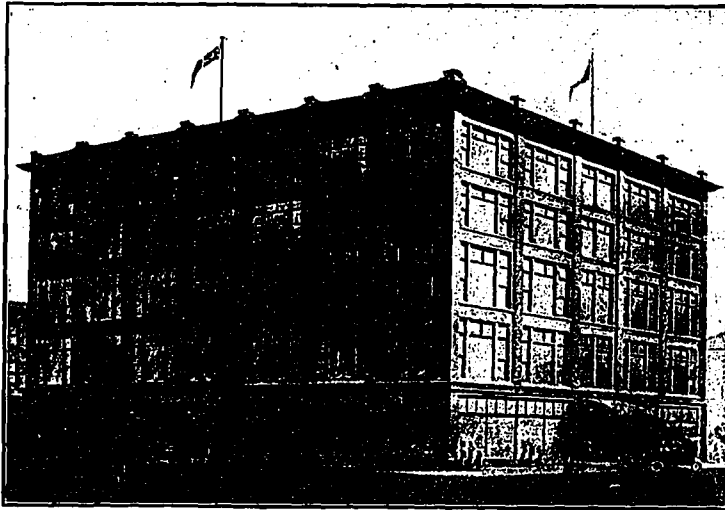
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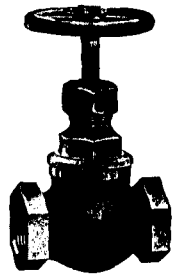
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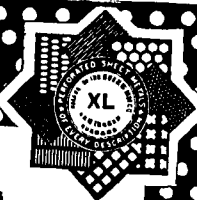
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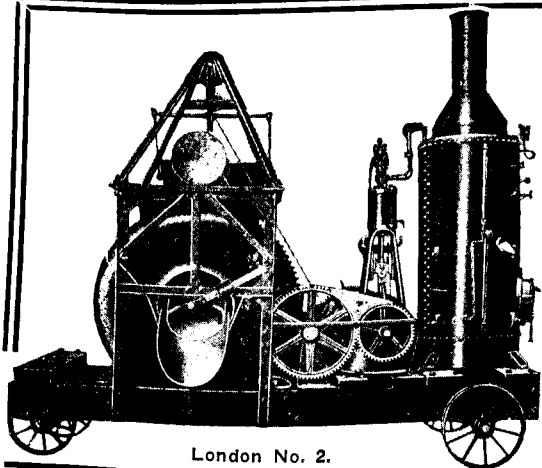
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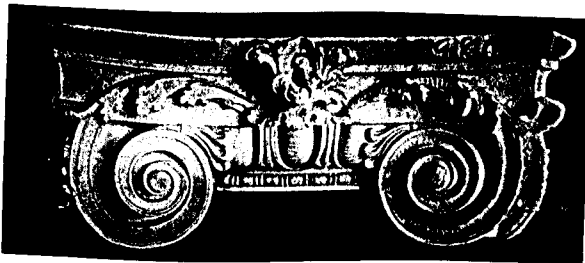
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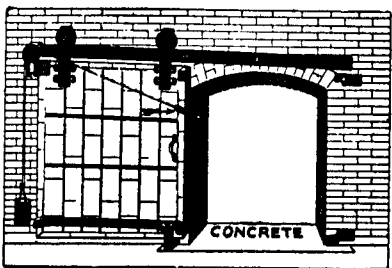
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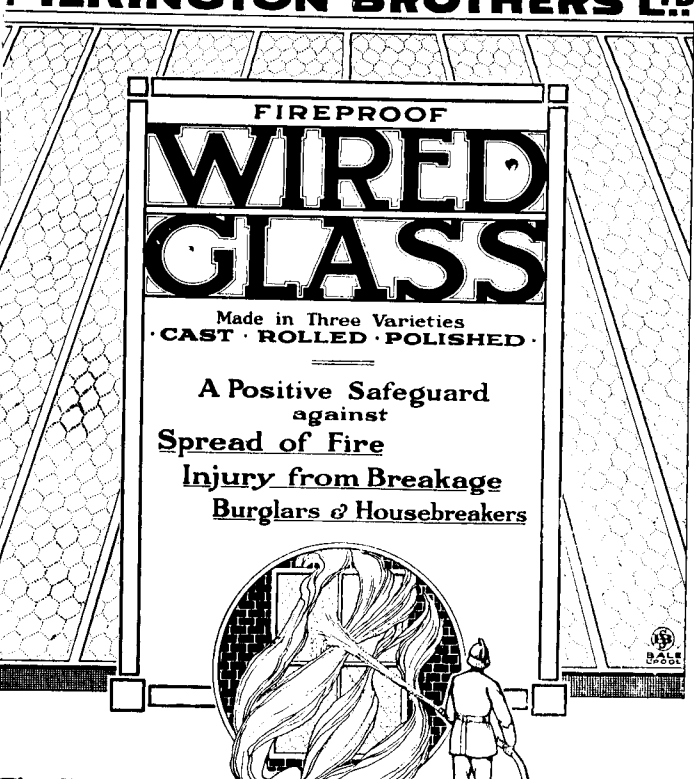
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