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To Architects and Plumbers.

THE EUREKA FRESH-AIR INLET VALVE.



The accompanying cut represents a fresh-air inlet, the object of which is to prevent the escape of sewer gas and also ventilate the drain. The rubber ball is suspended from the top of the chamber with a brass chain. A slight back pressure of air forces the ball against the iron seat formed in the chamber. It has been tested and found to act well.

Where the ordinary vent cap or goose neck is used, there is nothing to prevent the outflow of sewer gas.

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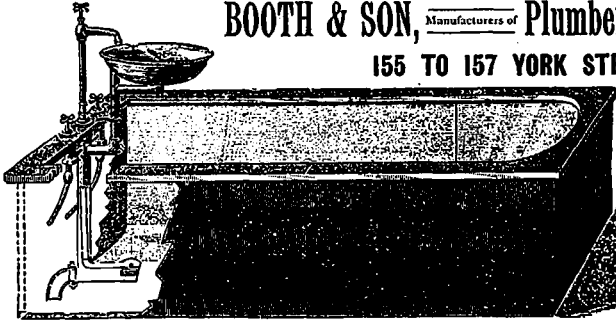
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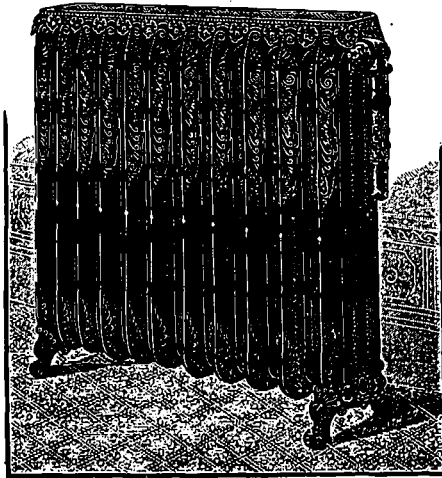
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Points of Advantage.



THE accompanying illustrations represent a new Radiator for Hot Water Heating, novel in method of operation, construction, and design; and we respectfully ask for a candid and critical judgment of the following claims:

THE WATER is introduced at the top of the Radiator, the purpose sought being to secure positive circulation by allowing the atoms of water to sink as their density is increased by parting with heat, without being disturbed by ascending particles of heated water.

THE VALVE, which is an integral part of each Radiator, is simple in operation and not nearly as liable to get out of order as that usually supplied. It has an open way, and may be operated without stooping and by a single movement of the wrist.

THE DESIGN is capable of the largest variety of treatment by the decorator. It may be simply bronzed in one or two colors, or it may be treated to correspond with either floor or wall ornament. The top has been worked into the general design, and while affording ample base for ornament, is not so objectionable to the critical eye as the heavy cornice top which has so long offended correct taste.

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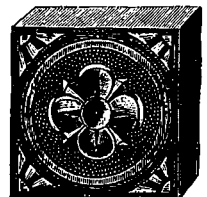
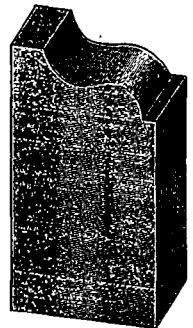
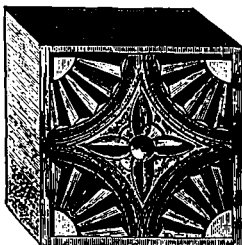
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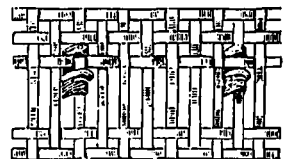
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CAN OR CARGO LOTS.

Table listing various building materials like mill cull boards, shingles, and steel siding with their respective prices.

YARD QUOTATIONS.

Table listing yard quotations for mill cull boards, shipping cull boards, hemlock cantling, and various types of lumber.

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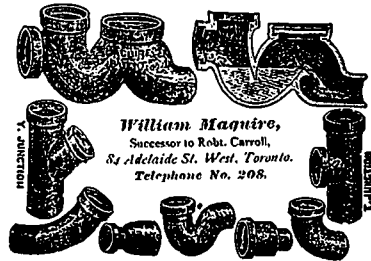
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Table listing prices for pressed bricks: Plain brick, Ornamental brick.

Table listing prices for stone: Common Rubble, Large flat, Foundation Blocks.

Table listing prices for slate: Roofing, red, purple, unslating green, black slate, Terra Costa Tile, Ornamental black slate.

Table listing prices for paints: White lead, zinc, red lead, venetian, vermilion, Indian, yellow, yellow chrome, green chrome.

Black, lamp.....	15	24
Blue, ultramarine.....	15	25
Oil, linseed, raw (q Imp. gallon).....	68	70
" boiled.....	72	75
" refined, ".....	78	80
Patty.....	2 1/2	2 1/2
Whiting, dry.....	75	1 00
Paris white Eng., dry.....	1 25	8
Libbary, Am.....	6 1/2	8
Sienna, burnt.....	15	20
Umber, ".....	1 1/2	12

CEMENT, LIME, etc.

Lime, Per Barrel of 2 bushels, Grey.....	40
" " White.....	35
Plaster, Calcined, New Brunswick.....	2 00
" Nova Scotia.....	2 00
Hair, Plasterers', per bag.....	1 00
Cement, Portland, per bbl.....	3 50
" Thorold, ".....	1 50
" Queension, ".....	1 50
" Japanee, ".....	1 50
" Hull, ".....	1 50

HARDWARE.

Cut Nails:

American Pattern, 1/2 inch, per keg.....	4 40
" " 1 1/2 inch, per keg.....	2 54
Canadian Pattern, 1/2 inch, per keg.....	3 50
" " 1 1/2 to 1 3/4 inch, per keg.....	3 30
" " 2 to 2 1/2 inch, ".....	3 40
" " 2 1/2 to 3 inch, ".....	3 15
" " 3 inch and larger.....	2 50
Steel nails low, per keg extrm.....	5 90
Finishing nails, per keg.....	5 30
" 1/2 inch, ".....	4 75
" 3/4 " ".....	4 50
" 1/2 " " and larger.....	4 20

MONTREAL PRICES.

Lumber, etc.

Ash, 1 to 4 in, Bl.....	\$13 00@18 00
Birch, 1 to 4 inch, M.....	15 00 25 00
Basswood.....	12 00 20 00
Walnut, per M.....	50 00 100 00
Butternut, per M.....	22 00 40 00
Cedar, flat.....	00 04 00 06
Cherry, per M.....	60 00 80 00
Elm, Soft, 18.....	15 00 17 00
Elm, Rock.....	25 00 30 00
Maple, hard, M.....	40 00 25 00
Maple, Soft.....	15 00 18 00
Oak, M.....	40 00 05 00
Pine, select, M.....	25 00 40 00
Pine, 2nd quality, M.....	20 00 25 00
Shiraz Culls.....	12 00 15 00
Mill Culls.....	8 00 10 00
Lath, M.....	1 50 1 93
Spruce, 1 to 2 inch, M.....	10 00 12 00
Spence Culls.....	4 50 6 00
Shingles, 1st quality.....	2 00 3 00
" " " and.....	1 25 1 50

Cement, etc.

Portland Cement, per barrel.....	\$ 2 70@ 3 00
Roman ".....	2 70 3 00
Fire Bricks, per M.....	20 00 30 00

Cut Nails:

Hot-cut Am. or Can. pattern, 3 inch and above.....	2 75 \$2 85
Hot-cut Am. or Can. pattern, 2 1/2 inch and above.....	3 00 3 25
Hot-cut Am. or Can. pattern, 2 1/2 and 2 inch.....	3 25 4 20
Am. pattern, 1 1/2 and 1 inch hot-cut.....	3 50 5 50
Can. Pattern, cold-cut, 1 1/2 and 1 1/2 inch.....	4 25 5 50
" " " 1 1/2 inch.....	3 75 5 05
Finishing Nails, per 100 lb. keg, 1 1/2 to 1 1/2 inch.....	75 cents
Finishing Nails, per 100 lb. keg, 1 1/2 to 1 1/2 inch.....	Hot Cut Nails.
Finishing Nails, per 100 lb. keg, 2 inch and up.....	

Paints, etc.

White Lead, pure, 25 to 100 lb. kegs.....	6 50 7 00
" No. 1.....	5 25 5 50
" No. 2.....	4 50 5 00
" dry.....	5 25 5 75
Venetian Red, English.....	1 50 1 75
Yellow Ochre, French.....	1 25 3 00
Whiting, London, washed.....	0 50 0 65
" Paris, ".....	1 15 1 75

Oils:

Linsseed, raw.....	0 3 0 55
" boiled.....	0 60 0 58
Olive, pure.....	1 10 1 15
" machinery.....	95 1 05
" extr. oil, per can.....	3 00 3 25
" " " ".....	2 50 2 65
Spirits turpentine.....	2 75 3 10
" " " ".....	0 67 0 70

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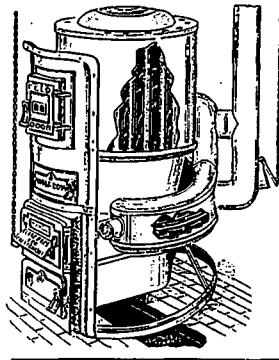
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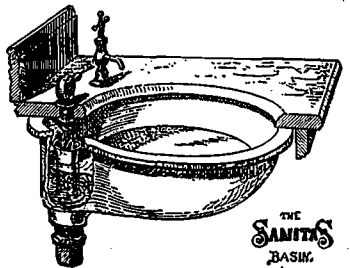
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Offers the following advantages:

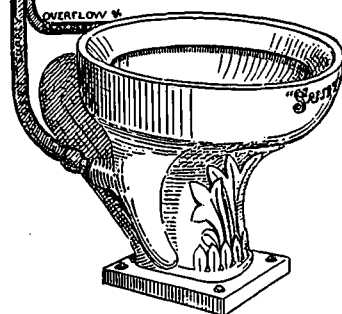
Through it waste water is completely and rapidly removed, a quick discharge, as from a small flush-tank; effected, filling the pipes full bore, and the trap and waste pipes are thoroughly scoured. It provides



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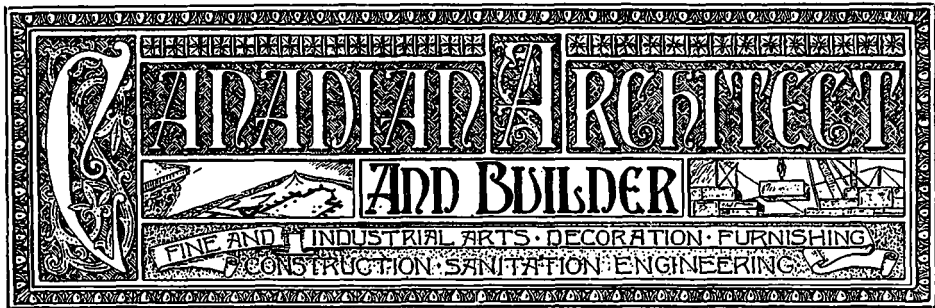
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—THE—
CANADIAN ARCHITECT AND BUILDER,

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(With a Weekly Intermediate Edition—THE CANADIAN CONTRACT RECORD),
PUBLISHED ON THE THIRD SATURDAY IN EACH MONTH IN THE INTEREST OF
ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS,
DECORATORS, BUILDERS, CONTRACTORS, AND MANU-
FACTURERS OF AND DEALERS IN BUILDING
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EDITORS' ANNOUNCEMENTS.

Contributions of technical value to the persons in whose interests this journal is published, are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

The Ontario Association of Architects has appointed the "Canadian Architect and Builder" its official paper.

The publisher of the "The Canadian Architect and Builder" desires to ensure the regular and prompt delivery of this Journal to every subscriber, and requests that any cause of complaint in this particular be reported at once to the office of publication. Subscribers who may change their address should also give prompt notice of same, and in doing so, should give both the old and new address.

OUR MONTREAL OFFICE.

IN order to further extend the influence of this journal, keep *en rapport* with everything of special interest pertaining to the science of construction within the Dominion, and serve in the most effectual way the interests of our subscribers and advertisers, we have established a permanent office in the city of Montreal. It is located in the Temple Buildings on St. James street, and being in the heart of the business portion of the city, is convenient of access. We shall be glad to welcome there old acquaintances as well as any new ones. All enquiries relating to the editorial or business departments of the paper, presented personally or by letter at our Montreal office, will receive prompt attention.

IT is not surprising to learn that the appointment of a competent street commissioner saved the city of Hamilton upwards of fifteen hundred dollars in one month. On the same principle, we hesitate the opinion that in the erection of buildings costing \$10,000 and upwards, the interests of economy and faithful workmanship demand the supervision of the work by a competent clerk of the works. The buildings erected in Canadian cities in future will be, it is fair to assume, of a more costly and important character than heretofore, and something more than the periodical inspection of the architect will be found necessary for the protection of the client's interest.

THE enquiry into the causes of the St. George bridge disaster in the courts of Toronto, is one of the most remarkable in its importance as well as in its attending circumstances that has ever engaged the attention of a Canadian judge and jury. Its great importance lies in the fact that upon the verdict hang heavy claims for damages brought against the Grand Trunk Railway Company on behalf of persons to whom suffering and loss were caused by the accident. The investigation which was recently brought to a close occupied a period of ten weeks, during which time 122 witnesses and 137 experts underwent examination. At the conclusion of all this testimony, the judge requested of the jury answers to 37 questions which he had prepared bearing upon the case. One of the most important opinions expressed by the jury is that the railway company was guilty of negligence in running the train at an unreasonably and improper speed, viz., about 50 miles per hour, using a tire too thin, and not applying the brakes at the proper time, and that the result was caused by such negligence. The matter will be further argued before a decision is rendered, and is likely to be carried eventually to the Privy Council.

WE very much regret that the difficulties between the Toronto master builders and their late employees appears to be no nearer solution than at its beginning. Indeed, to all appearances, the breach between the parties to the dispute has widened. Both have refused the offer of mediation made to them through the City Council. It may possibly be that they can show satisfactory reasons for so doing; if so, the public would seem to be entitled to know them. The workmen were the first to refuse to take part in a conference for the adjustment of the dispute, and it may be that in consequence the masters felt themselves called upon to pursue a similar course. If only the parties directly connected with the strike were affected by it, they might well be left to continue the struggle as long as it suited them to do so. But when their conduct affects in the most serious manner the prosperity of the entire community, the laws should be so adjusted as to compel them to submit their differences to an impartial tribunal for settlement. Such a tribunal should be composed of judges of the Superior Courts or persons similarly placed in a position to pronounce impartially upon the matters in dispute. Before such a tribunal, upon the occurrence of a disagreement, both the parties thereto should be compelled to send a representative to present their case, and by the decision of the Court they should be compelled to abide. Simultaneously with the establishing of such a court of arbitration, it should be made a punishable offence for any body of men to inaugurate a strike. It is time that the Government should provide some such means as this to remove the possibility of the present annually recurring disputes.

NOTWITHSTANDING all that has been written on the subject, the terms of architectural competitions announced by clerical and other corporations in this country, grow more and more ridiculous. The latest estimate of the value of an architect's time and ability comes from the church wardens of St. Paul's Cathedral, London, Ont. These gentlemen gravely

announce by advertisements in the daily press that "It is the intention of the vestry of St. Paul's Cathedral, London, to enlarge and improve the Cathedral at an expenditure of from \$30,000 to \$35,000. Competitive plans for said work will be received by the church wardens until the 10th day of May, 1890. Vestry do not bind themselves to accept any plan. In event of one being accepted, the second best by vote of Vestry to receive \$50." The italics are ours. Truly a magnanimous offer! We would advise all unemployed architects, if any there be, who are blessed with a passion for labor for its own sake, irrespective of either glory or reward, to submit designs in this competition for the approval or otherwise of the trained (?) judgment of the gentlemen composing the vestry of St. Paul's Cathedral. Joking aside, we regard as nothing short of contemptible the conduct of church officials who, forgetting the precept, "Render unto Caesar the things that are Caesar's," are seeking to make use of the products of the architect's brain without making him compensation. There would seem to be need of greater harmony between the preaching and practice connected with the church in question. So far as the architects are concerned, it is a foregone conclusion that not one of them who is in the least degree entitled to the name will have anything whatever to do with the so-called competition.

THAT accidents to life are not more frequent than they are is almost sufficient proof without other evidence that there is a merciful and all powerful ruler of our destinies. Man certainly takes but few precautions to preserve life, and if a life was sacrificed for every piece of reckless disregard of statistics which is exhibited by man, a very few weeks would convince us all that it would be necessary to do something to remedy an evil which resulted in many deaths and much suffering. There now stands, or did stand a few days ago, in the town of Barrie, Ont., a brick wall of one storey in height, with three openings in same which is carried on a rotten breast-sumner supported at both ends by brick walls, and at two intermediate points by light turned wooden columns, which are not under the centre of the wall, but rather to the inner edge. This wall has been the front wall of a two storey building which has lately been burned. The owner has apparently not made up his mind as to what he will do with what is left of his building, and in the meantime allows the above wall to remain, hazarding the lives of those who may pass along the sidewalk beneath. It seems incredible that a man endowed with common sense will allow a danger so threatening to stand on the very edge of a sidewalk along which many persons pass each day. The town council or some of its officials should have sufficient knowledge to be aware of the danger, and have the same remedied at once. It should not be argued that the fact of the wall having stood thus far, is a guarantee that it will not fall. It is possible and very probable that it may fall or be blown down, and therefore it should be removed at once.

THE Ontario Architects' Act, as passed by the Provincial Legislature, does nothing at all to prevent the execution of bad work in the construction of buildings, and although it professes to be for the protection of the public, the Government eliminated a clause in the draft of the Act, which was the one practical clause for this object. Architects may be thoroughly qualified, and about the work of qualified men there need be no question, but unhappily architects are not employed to carry out or superintend one half of the buildings that are erected; these buildings are carried out by men who must be looked after, and it is with this object that Inspectors of Buildings are appointed, and that plans for all buildings must be submitted for their inspection before the buildings are allowed to be proceeded with. The system of inspection, or rather the means by which the inspector gets his first information about a building, differ materially in almost every city. In some places it is necessary to deposit on a certain day of the week, prior to the meeting of a committee, a copy of the plans, elevations, etc., and of the specification. In others, the drawings only need be deposited; and in others a regular form must be filled up which will give the fullest description of the house or whatever the building may be,

the materials of the construction, sizes of timbers, etc. In Toronto there is no system worthy of the name. The only thing approaching a system is the permit book, which does look business-like, but as to the rest of the proceedings for the "protection of the public," the following conversation, which actually took place at the Toronto City Hall when some plans were brought down for inspection during the past month, will serve to show how the "public" of Toronto are "protected." Architect's Clerk—"Good morning Mr. —!" Inspector—"Good morning, sir!" A. C.—"Want you to have a look at these plans, please." Insp. (opening out roll)—"Oh! Ah! Nice job this! What is it to cost?" A. C.—"About \$5,000 I suppose." Insp.—"Well, I suppose your boss knows how to make a plan?" A. C.—"I guess so." Insp. (to his clerk)—"Guess it's all right; make out a permit Mr. —." (Permit made out, plans signed in name of City Commissioner, building proceeded with forthwith). The time has come when we should have a system of inspection of plans if there is to be any inspection at all, and the very variety of systems in vogue in various cities shows that inspection is not an easy matter and that there is a great difference of opinion as to the best method of procedure. Now it is putting a qualified architect to a great deal of trouble when he is obliged to submit his drawings for inspection just as if he were some ignoramus who knows nothing whatever of building but nevertheless makes an attempt at it, or as if he were no better than the unqualified dabblers in the profession. The mere mention of the name of a fully qualified architect in connection with plans ought to be a guarantee for the proper construction and management of a building, and it may be that this was the reason why the Inspector in the conversation above, passed the plans without more ado. He knew the architect was incapable of doing anything which he could point out as wrong. But there is a looseness in this procedure which requires correcting. A good man's name might be used in order to pass absolute death-traps, with which he had nothing to do. But civic committees have apparently found it impossible to draw the line, and good and bad must submit to the same regulations. Even this is better than having no regulations.

Of all the systems we know actually in use, we think there is no better at present devised than that of submitting plans (for inspection only, not for filing) together with a form of specification, filled up in the form of questions and answers, the questions being printed and the answers written in by the architect, this form to be filed and used by the Inspector in his visits to the building. When the drawings are taken down and left, together with this form, the Inspector, who it is presumed is a duly qualified person, has his regular appointed time for examining all that have been submitted. His work cannot be hurried, and it is far better that it should be the understood thing that the answer respecting the drawings will not be given till the next day. In one place we know of where it was necessary to deposit tracings of the drawings, it was the rule to leave them at the Inspector's office before five o'clock every Thursday. If a permit was required during that week, the Inspector made his examination on Friday and made up his report on all the plans submitted for the meeting of his committee in the evening of the same day. If he reported such and such things were amiss or not according to the by-law, these drawings were sent back with a memorandum to have them altered accordingly, and if the matter was a slight one, the Inspector could pass them when submitted to him as altered any day afterwards. If, however, the alterations necessary entailed, as it might in the hands of builders' clerks, the remodelling of the place, the passage of the plans was thrown back a whole week. Now in this way, the architect who knew his business had no trouble except that of preparing a tracing, whereas the man who did not know how to build soon found it necessary that he should either learn how or give it up. Undoubtedly the position of Inspector is one in which a disagreeable man can make himself very obnoxious. The choice of Inspector must always be made with the greatest care, and his duties and the limitations of his authority very clearly defined. He must be a man of high principle, above bribery and corruption, for we have known a case where an architect, do what he

would, never could get his plans passed without endless trouble and annoyance, until at last he learned from the Inspector himself that the reason was "he had done nothing towards smoothing the way." In another case a scallawag "architect" paid the Inspector to annoy a good architect who had recently set up in the neighborhood.

As to the form of specification to accompany the application for a permit, the one in use in Montreal is as simple and clear as need be, although it is a question whether it is any use supplying answers to questions which, unless the Inspector is a model, he is not the least likely to look at. There are two forms in use in that city, one for new buildings and one for alterations to existing structures; and in about two dozen questions a thorough description of the method of construction, thicknesses of walls, dimensions of joists, etc., etc., is elicited. We doubt if the Inspector takes the trouble to calculate the strains and weights that each floor is likely to be subject to, so as to ascertain whether the specified sizes of joists are sufficient, but undoubtedly if he passes such a description and they ultimately prove insufficient, the blame must in a measure rest upon him, because the manner in which the building is to be occupied or the purposes for which it is erected are described at length. Without doubt a very efficient form could easily be drafted, and by the aid of practical and unbiassed minds a good scheme could be worked out, whereby the least trouble would be given to qualified architects, while at the same time jobbing practitioners would be hindered from endangering the lives of the public. Looking round about us we see many buildings going up at the present time which would never have been allowed to be carried out in their present forms if there had been a responsible Inspector to examine the plans. We do not want a good-natured man, who sometimes likes a little bit of bullying, and who if you go to work in the right way with him, will pass any kind of construction without examination. What we want is an educated, practical architect, who knows his duties and fulfils them impartially.

ON page 41 of a pamphlet entitled "The Record of the Mowat Government; 18 years of Progressive Legislation and Honest Administration; 1872-1890," is the following statement relating to the erection of the Parliament Buildings: "Indeed, after the discussion, all that was left of the matter was the statement that the architect of the works was an American, though the fact was that he was born in England, and had of late years been residing in Buffalo. He secured the appointment after a fair competition, expert judges deciding that his plans were the best." The last sentence is a glaring and deliberate falsehood. In fact the statement should be characterized by the use of a word of three letters. Mr. Waite did not secure the work after a just competition, and the fact that he secured the work is proof sufficient that the competition was not a fair one. We do not know how the expert judges, who were the Hon. Alex. Mackenzie, Messrs. W. G. Storm and R. A. Waite, could decide that Mr. Waite's design was the best sent in, as Mr. Waite had no design in or he would not have been one of the experts.

The facts are that there was a competition in the year 1880 when thirteen sets of plans were sent in. Six of these plans were sent from the States, seven from Canada. Three designs, all from Canada, were awarded the three premiums, the winners of the first prize being Messrs. Gordon & Helliwell, of Toronto. Two designs were placed first and second in merit, but were not considered as entitled to the premium, as they exceeded the money limit very materially. These designs were submitted by Messrs. Darling & Curry and Smith & Gemmill. The Government at first decided to erect a building according to the plans of Gordon & Helliwell, but finally determined to have Messrs. Gordon & Helliwell, Darling & Curry and Smith & Gemmill compete a second time to determine which of their plans would be most suitable. This competition was held, and it was then determined to ask Messrs. Gordon & Helliwell and Darling & Curry to prepare a full set of working drawings with specifications, that the work would be tendered for and the relative cost

of the two designs arrived at to a certainty. These two firms did make such drawings on the distinct understanding that one or the other would be selected to erect the building, and that the defeated competitor would be paid a fair compensation for the preparing of their design for tendering. Working drawings were prepared by these two firms, and tenders were received as follows: Messrs. Gordon & Helliwell's design, furnished complete, \$542,000; Messrs. Darling & Curry's design, \$612,000. The Government decided that the Province was not in a position to expend that amount of money, and abandoned the erection of the building for a time.

In 1885 the Government obtained a vote of \$750,000 for the erection of the building, claiming that that amount was amply sufficient, as they had tenders of \$542,000 and \$612,000 for two buildings either of which would serve the purpose of the province. Up to this time the Government architect had been consulted as to the proceedings taken after the experts in the first competition had handed in their report. By the way, we may here remark that this report has never been made public, a most unusual thing, as all such reports are published for the information of the competitors. Mr. Waite, however, without any authority whatever, informed the *Mail* of the substance of that report, and that paper published the information received from him on the 4th of December, 1880. It embraces nearly one and three quarter columns of matter, and any one who desires may by reading the article get a fair idea of the substance of the report. Immediately after the session of 1885 the designs of Messrs. Gordon & Helliwell and Messrs. Darling & Curry were entrusted to Mr. Waite that he might report as to which of the two was the more preferable. Why the Hon. Alex. Mackenzie and Mr. W. G. Storm were not associated with him we do not know, but presume that the Government have such knowledge. Instead of Mr. Waite reporting in a few weeks, as he might have done and should have done, he did not hand in his report until eight or nine months had elapsed. It may be that the difficulty of deciding between the two designs required that amount of time to determine their respective merits. It is, however, surmised that the delay was rendered necessary that Mr. Waite might worm himself into the confidence of some members of the Government, and also quietly impress upon the Government that in his opinion neither of the designs was suitable, and that he was the only architect on this continent capable of carrying out such an important work. It is also surmised that before sending in his report he had in the kindness of his heart prepared sketch plans which he approved as being much superior to the designs then in his possession. It may be that this is the competition which Mr. Waite entered and which was so fairly conducted by competent judges. We have been informed that he sent in a report condemning the designs of Messrs. Gordon & Helliwell and Darling & Curry. This report, like the first one, has never seen the light of day, nor has Mr. Waite condescended to furnish an epitome of its contents further than to circulate statements which were false.

It would seem that Mr. Waite was employed upon the preparation of his design for months before the fact became known, the Government not having the common decency to inform Messrs. Gordon & Helliwell and Darling & Curry that they had decided not to erect the provincial buildings according to either of their designs before giving Mr. Waite the commission. This courtesy to the Toronto architects was more than due, as they had prepared their designs at a large outlay to themselves, and had waited the convenience of the Government for some five years. Mr. Fraser, in making explanations to the House as to the payment to them for their rejected designs, claimed great credit to himself and the Government for the way in which he had shelved them at a small expense to the province, and showed that if compound interest for the five years was deducted from the amount paid, the actual payment would be very much reduced. This is an example of an economical and "honest administration," which is sufficient to cause a none too scrupulous man to blush for shame. Now, the Canadian architects were forced to design a building to cost within

\$500,000, or as near that amount as possible. The English born architect residing in the States was not limited in cost. His design will cost \$2,000,000, and then be only an ordinary non-fireproof building. The fact that the first contract let exceeded the appropriation, shows how little care was taken to erect a building within the means of the province, or what the Government stated at first was within the means of the province. Mr. Waite's design was never submitted to an expert, for the very good reason that it was never in a position to submit until after the construction of the building was commenced. It is a doubtful matter if the Ontario Government even knows at this date exactly what they are to receive when the completed buildings are handed over to them. The conduct of the Government when dealing with the Canadian architects is in very strong contrast with their method of dealing with the Buffalo individual. In the one case everything must be arranged for, even to the laying of the gas and water mains from the city mains over to the building, so that the total cost of the building may be ascertained with the exception of the cost of the furniture; in the other the work is let piecemeal, and no idea of the total cost is obtained except the estimates of the architect, who may have furnished the Government with an accurate and reliable estimate, but such estimate cannot agree with the amount stated by the Government as being sufficient, as Mr. Waite has stated to outside parties that the cost of the building would be not less than \$2,000,000. The above is a statement of the main facts of the Parliament Buildings business up to date. That the Government does not consider their conduct above reproach is shown in the pamphlet which they have issued. If they considered that what they have done was done in the interests of the province, they would not stoop to so low a level as making glaring and misleading statements with the purpose of deceiving the people. We hope that the pamphlet is not so barren of truth in all its pages as is page 41. One such falsehood should be sufficient to satisfy the highest ambition of any modern Ananias.

SOMETIME ago the Church of England appointed a committee to formulate a scheme whereby church architecture might be improved. It was felt that many of the churches which were being put up in different parts of the country might be very much improved in their architecture if some care was taken to select artistic designs. What this committee has done we do not know, but we suspect that it found the task too heavy a one to overcome. The Presbyterian Church has also appointed a committee with the same object, but little has been done, and it is very doubtful if anything will result from their attempt to improve the architecture of their churches.

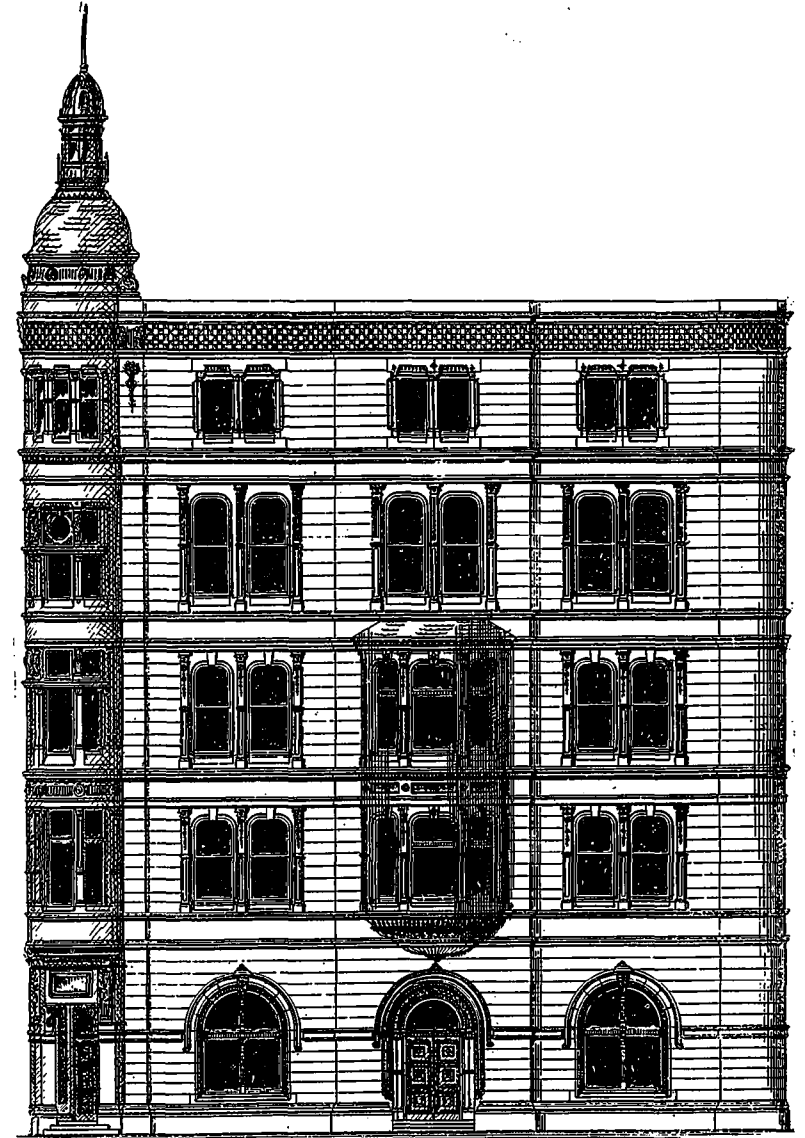
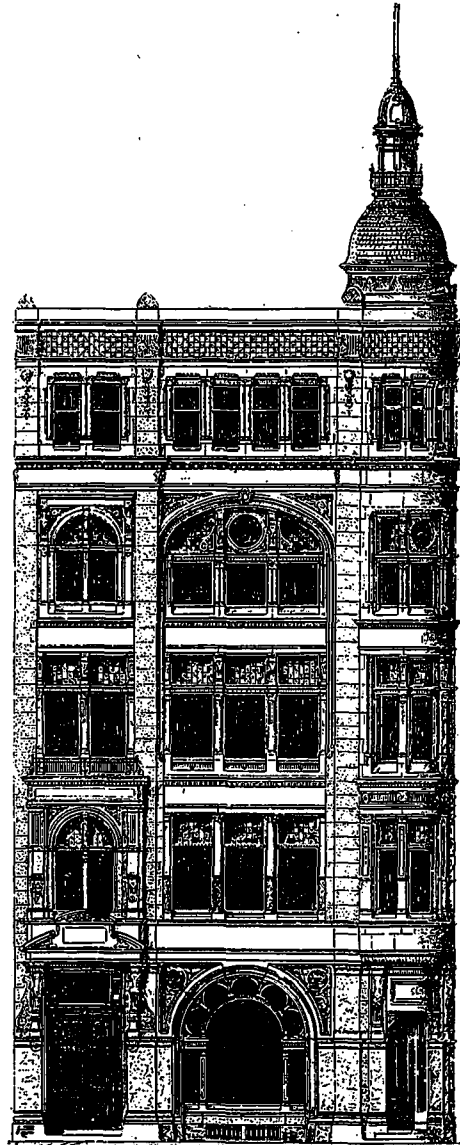
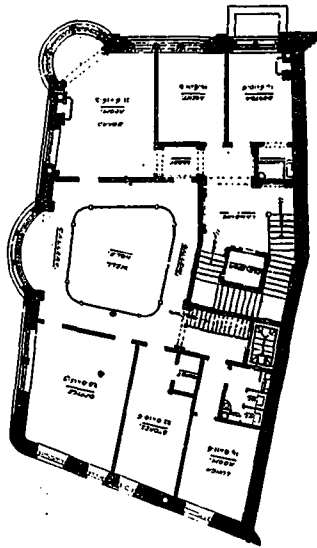
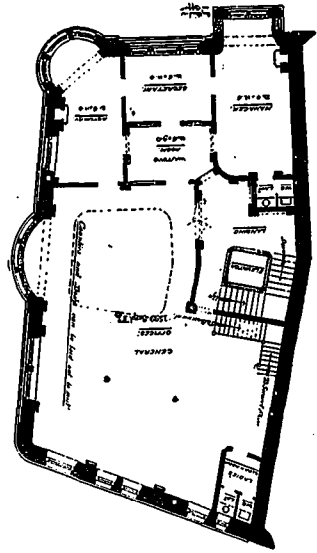
It is an undeniable fact that ninety per cent. of our churches are entirely devoid of any artistic quality, and the greater number of the remaining 10% are not what they should be. The reasons for the inferiority of church architecture are many. In the greater number of instances, the congregation are unable to build an expensive or even a moderately expensive structure. They must be satisfied with such a building as will accommodate their members and they can afford to erect. In a few instances they are satisfied with this, but generally they desire to have what they believe will be a beautiful building, and they erect one which may be very much designed, but which is simply ugly on account of its many useless and extravagant features. In the opinion of many, a building of simple parts is devoid of artistic merit, while the building of many parts is one of beauty. A building of simple, well-proportioned design looks so simple to the ignorant individual that he at once assumes that he could design one of equal merit, and that consequently it does not amount to much. The building of many lines, no matter how badly proportioned or how inharmonious, puzzles the same individual, and he immediately worships what he does not understand and believes he could not do. What a blessing it would be if the unnecessary architectural features on our churches, yes, and on our homes, were done without, and their cost devoted to other purposes of a legitimate character.

The impression is also prevalent that the services of an archi-

tect are not required when there is little money to be expended, that they are only necessary when a costly and elaborate building is to be erected. This is a mistake. The cheaper the building the more care should be taken with its design, and a competent architect should be able to design a small and simple church that would not cost much more than the very plainest and ugliest building which could be erected, plus his fees. Now the trouble lies in the fact that the congregation look upon money paid to an architect as so much lost, and the architect does not care much for the work of designing a cheap building, as it requires much more time and study than it would if money were more plentiful. The consequence is, that the thoroughly competent architect cannot afford to design such building at the remuneration that he can more costly structures, and he refuses to do the work, consequently such work goes to the incompetent, who are prepared to do it for the usual commission or very much less. The building committee cannot discern any difference between one architect and another, so they employ the cheap article. They have another reason for employing the incompetent man, for he will work into the building, provided he is able, all the pet ideas of the members of the committee, thus giving each member of the building committee the opportunity of claiming to have designed the building. The competent man will not do this, and therefore he is in their minds outside part, besides being more expensive. It is useless to hope that affairs will improve very much until our people have some artistic perception. They all would like beautiful things, but they do not know what constitutes beauty. They have also an idea that art after all is a commodity which can be bought if they only pay enough. Believing this, they strive to obtain bargains, and not knowing the pure article from the counterfeit, purchase the counterfeit. Here and there a church of artistic proportion is erected. Such buildings will have an influence for good, and as more are built the artistic education of our people will be advanced.

The Vestry of St. Paul's Cathedral, of London, desire to improve the Cathedral. Instead of making intelligent enquiries to find the architect best able to do the work they desire to have done, they advertise a competition of such a character that no competent man, or in fact any man who respects himself or his profession, will have anything to do with it. The result will be a set of designs sent in from the least competent men, from which one will be selected; and the one selected will very possibly not be the best one submitted, as the Vestry is to be the judge of the respective merits of the designs. One would have expected something better from a city of the size of London than an attempt such as this to secure a design for alterations to an important building.

We have still another example of the methods adopted by church building committees to select an architect. A Presbyterian congregation of West Toronto Junction desired to build a church to cost about \$30,000. The first thing they set about doing is to select an architect, and the method adopted was to put the work out to tender and obtain the man who would do it for the smallest remuneration irrespective of qualification. It matters not one iota to them whether the lowest bidder was competent or incompetent so long as he claimed to be an architect, and could show a set of plans. The full commission would be, say, \$1,500, and if they could get it done for \$600, well, it was just \$900 saved in hard cash, though it might be that the return would be a building intrinsically worth only \$25,000, or even as low as \$20,000, for an expenditure of \$30,000—the result, \$900 saved, \$5,000 more or less lost, and an inartistic building. The building committee first offered the work to an architect at the Junction if he would do it for \$400. He refused this offer, but made a proposal to do the work for 3½%. This offer was cut under, so we are informed, by one of the principal firms of Toronto, who were again cut under by a firm claiming to possess all architectural knowledge and willing to work for little or nothing. The work is being done for 2% net, although there is some understanding that the building committee will pay 5% and the architect will give a subscription of



COMPETITION FOR OFFICE BUILDING FOR THE SUN LIFE ASSURANCE CO., MONTREAL.

SECOND PREMIATED DESIGN.—M. T. THOMAS, ARCHITECT, MONTREAL.

3% to the building fund. The building committee may have done a good stroke of business, but we are of the opinion that they will receive about 1% of work in return.

This effort on the part of building committees to cut down fees of architects results in the erection of unstudied designs. The architect gives as little as he can for the little that he is offered, and thus gets even with his employers. The architect who takes a pride in doing his work as thoroughly as he can, and who devotes much time to the study of it in all its details, cannot compete with the man who is content to impose upon the community his first conception in an exceedingly crude form. Plans of the cheap architect are very much like store clothes, they may be showy and cheap, but they are not such as will result in a substantial or artistic building. Designs which are turned out like boots and shoes out of a shoe factory, are dear at any money. This difference would be more discernible if it were not that some architects of reputation, while they charge full fees, do not give value in return, but slur their work in a most disgraceful manner. These men are not working because of any love of their profession, but because they must earn a living, and the sooner they can make a competency the better, even though they do not give a fair equivalent. Generally speaking, this species of the architect gains the good opinion of the multitude, because it is money with him first and last, and he cares not what he does so long as he meets with the approval of his clients, be they ever so wanting in a knowledge of the aesthetic. He is prepared to work in all their whims, even though his reputation, such as it is, may suffer. A client should employ an architect not because he will approve of his client's notions, but because he knows his business, and insists on working honestly for his client's benefit even though pet ideas must be overlooked.

THE attention of the Dominion Government is called to the fact that the proper amount of duty, based upon the cost of the buildings, as provided for by the tariff, has not been collected upon the plans of American architects entering Canada. From a seemingly reliable source we are informed that not one dollar has been paid at the port of Toronto in the shape of duties on Mr. Waite's plans for the Parliament Buildings or the Canada Life Assurance Company's building, while in the case of the Canadian Bank of Commerce building duty was paid on an estimated cost of about \$60,000, while the actual cost cannot have been less than four or five times that amount. It would appear as though Mr. Waite might claim among his other accomplishments as an "expert" that of being an expert smuggler. Plans for the Toronto Board of Trade building paid duty on an estimated cost of \$200,000, which sum, however, will be largely exceeded. The Government should take steps to secure to Canadian architects the protection which the tariff was designed to afford them, and to the country the revenue of which it has been and is being defrauded. The authors of the plans for the buildings we have mentioned are well known, the approximate cost of the buildings can be determined, and if the plans have not paid duty they should be compelled to do so now.

A CORRESPONDENT of the Toronto Globe who misappropriately styles himself "Canadian," attempts a defence of Mr. Waite and the Ontario Government with respect to the erection of the new Parliament Buildings. Did our space permit, we might easily show the weakness of this effort to defend conduct that is simply indefensible. We content ourselves with repudiating the statement made by this writer that "if Toronto architects would do better work, we should not need to go elsewhere." The writer asks how many brick walls have lately tumbled about our ears? We have directed attention to one in another column, but singularly enough the architects are Americans, not Canadians. It is reported that owing to the condition of affairs on the new Toronto Board of Trade buildings, the American architects in question have been dismissed and the completion of the work placed in the hands of a Mr. Kent, a Buffalo architect, and a cousin of Mr. Wellington, one of the experts appointed on behalf of the Board of Trade to report as to the condition of the building. It is further reported that it will cost the Board of Trade upwards of \$50,000 to make good the defects in construction. No such loss has yet resulted from the employment of a Canadian architect, and we are justified in saying that the proportion of competent men in the profession in Canada is equal to that to be found in the United States or elsewhere. Competency and incompetency are to be found in any country. The man who insinuates, as does "Canadian," that Canadian architects are all incompetent, while American architects are all competent, may be written down either a fool or a knave.

ARCHITECTURAL GUILD COMPETITION.

TWO designs were sent in, in the competition instituted by the Toronto Architectural Guild for a country church in the Late Decorated style. The committee of judges, Messrs. Frank Darling, R. W. Gambier-Bousfield and S. H. Townsend, placed the design under motto "Tyro" (Mr. Charles J. Reid, Toronto.) first. We will publish the committee's report next month.

QUEBEC ARCHITECTS ORGANIZING.

ON April the 6th, a circular was issued calling for a meeting of the Montreal architects, the present time being thought opportune to form an Association. Some twenty-five members attended, and after a general discussion the following resolution was moved by Mr. M. Perrault, seconded by S. Lesage: "That Messrs. Nelson, Hopkins, Taylor, Hutchinson, Raza, Doran, Hodson, Dunlop and Kesther, Sen., with C. Clift as Secretary, be a Committee to organize, and that they be invited to communicate with the other architects in the province, and obtain their views and co-operation. The above Committee to report at a meeting to be called by the Secretary." Owing to the severe illness of Mr. Clift, his meeting of the Committee was called until may the 8th, his duties being temporarily filled by another member of the profession. The Committee are now framing a Constitution and By-laws to submit to a general meeting, which it is hoped will be called at an early date. It is a pleasure to learn that a strong feeling prevails among the architects of the Province of Quebec in favor of a Provincial Association.

CANADIAN ARCHITECT AND BUILDER SERIES OF PRIZE COMPETITIONS.

THREE DESIGNS FOR FRONT FENCE. "BROWNIE" and "Arm and Hammer" are nearly equal in excellence in their ironwork, but the wooden fence of "Arm and Hammer" is not good. It is a poor kind of commonplace in design, and not rightly applied to external woodwork. "Brownie's" wrought ironwork is both more graceful than that of "Arm and Hammer," and the design is better adapted to the material. For these reasons we have considered "Brownie" to deserve the first place. "Competitor," who contributes the only other set of designs, shines chiefly in ornamenting. His pen and ink work is perhaps better than that of the two first, but his designing is not well considered.

JOHN GEMMELL,
W. A. LANGTON,
R. J. EDWARDS.

The authors awarded first and second positions in the above competition are respectively Mr. Thomas K. Johnson, 74 Baldwin St., Toronto, and Mr. A. Ewart, 46 Beaver St., Ottawa, Ont.

ESSAY ON HEATING AND VENTILATION. It is a matter of regret that only one essay was received in this competition. It is printed in the present number. The author is Mr. L. C. Ernest Page, 201 St. John Street, Quebec.

NOTE. The author of the design awarded second position in the competition for details of a moderate cost house, is Mr. Chas. E. Booth, 139 Avenue Road, Toronto.

TORONTO ARCHITECTURAL SKETCH CLUB.

THE paper read by Mr. Edmund Burke before this Club on Tuesday, April 22nd, will be found in full in this number. After the conclusion and after a hearty vote of thanks had been tendered the lecturer of the paper, the decision of the club competition for "A Summer Cottage" was announced as follows:

Senior Section—First place, Ernest Wilby; Second place, A. H. Gregg; Third place, J. A. Radford. Junior Section—First place, J. Y. S. Russell.

The subject for the next competition was suggested by Mr. Darling, and will be the details for a large window 9 x 12 feet opening. The intention is to encourage a more thorough study of the architectural style and it should be productive of good results.

On Tuesday, May 13th, an address was delivered by Mr. W. A. Sherwood, O. S. A., on "Color in Nature and its Place in Architecture." Mr. Sherwood has made a special study of this subject, and many practical suggestions were thrown out. He pointed to Nature as the great master of color, and explained why all our color schemes should receive their motive from Nature's works.

Black and white, the prevailing colors in modern use, had most disastrous effects on the eye. In school rooms, for instance, no white plaster should be seen. The blackboards should be green with cherry mouldings and a brown border around. The furniture, and also the clothing of both teachers and scholars, should be of pleasing colors. Green, Nature's favorite color, should be largely used in decoration, its restful effect to the eye being well known. Motives could be found in Nature for every phase of architectural needs and necessities—the sky, the sunsets, the foliage of the trees, etc., each could give innumerable examples of what could be done.

Several members, including Messrs. Bousfield, Williams, Burke and Jones, spoke on the subject after Mr. Sherwood took his seat. Mr. Bousfield referred at length to the past use of color by architects of different ages and countries. Mr. J. P. Murray put a very practical conclusion to the proceedings by offering a prize to the members for the best scheme for decorating the walls of the Club room, the glaring whiteness of which had been referred to as sad examples of what should not be seen.

The vote of thanks then closed the evening's proceedings.

THE NEW TORONTO BOARD OF TRADE BUILDINGS.

THREE or four months since a portion of one of the walls of the new Toronto Board of Trade buildings gave way. Although the occurrence of the accident became known, particulars concerning it appear to have been carefully withheld from the public.

Statements which recently appeared in one of the daily papers, alleging that the accident was due to faulty construction, drew public attention to the matter, and the dismissal of Mr. Pudfin, the contractor, by the architects, followed a few days later. The latter disclaims all responsibility for the accident, and is seeking the aid of the courts for the purpose of vindicating his position.

An inspection of the building was recently made by a committee of gentlemen on his behalf, and subsequently on behalf of the Board of Trade by the well-known engineering expert, Mr. Wellington, of New York, and Mr. W. T. Jennings, City Engineer of Toronto. The result of these inspections has not yet been made known. Meanwhile all sorts of stories have been in circulation concerning the condition of the building. This was the natural consequence of the closing of the building against public inspection, and of what appeared to be a desire on the part of some of the officials of the Board to keep the condition of affairs a secret.

The work being in a sense one of a public character, we felt it to be our duty to seek to ascertain for ourselves and lay before

the casting had to be cut to fit around a beam. The cause of the accident has been ascribed by the architects to the additional weight imposed upon the building by the heavy fall of rain on the night of Feb. 4th being absorbed by the terra cotta of the floors. The rain fall on that night was 0.16, making the total weight covering the entire area of the whole building

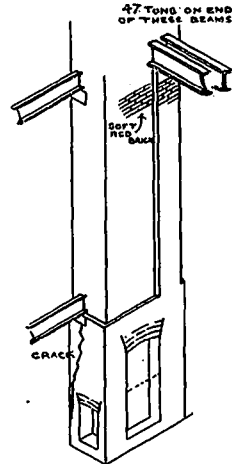


FIG 2

something less than 60 lbs, which was sufficient in the opinion of the architects to bring down the walls which fell.

A few yards northward there is a crack in the south wall of chimney on ground floor from floor to ceiling, and a walk round the chimney reveals the fact that there is something radically wrong here.

We go into the basement and find the walls only 14" thick, and set off on ground floor line to 9", and from this point run up about 100 feet. We find also on the east wall an opening 2' 0" x 2' 0" close to the ground, and a crack from floor to ceiling.

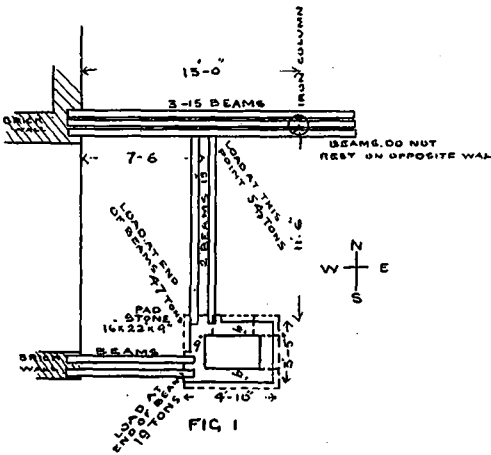


FIG 1

our readers the true condition of affairs so far as we might be able to ascertain them. Having obtained the consent of the President of the Board of Trade, we paid a visit to the building a few days ago with this object, and present below the different aspects of the case as we found them, without prejudice, leaving our readers to form their own conclusions in regard thereto.

On the east side of the building our attention was arrested by a heavy prop in a door way (fig. 5). There we noticed that something had evidently gone wrong, for the pier had been taken down and rebuilt in hard grey brick and cement. This, then, is the place where the accident happened, and we proceeded to follow it out according to the plans. On climbing the ladder to the third floor, it was found that instead of the brick walls shown on the plans, the partitions were built of terra cotta brick. But let us trace out the cause of the accident. At this point we find a load of 43 tons on end of beams, and taking the pad stone the same size as the others throughout the building—14½ tons per superficial foot. We now proceed to the ground floor, and find the size of pad stone for beams to be 1' 6" x 2' 0" x 10", and the weight on the pier 80 tons, or 20 tons per superficial foot. This pier has at some time since the accident been taken down and built in cement. The points of weakness around here have been faced up with 1½' metal castings. We are led to believe that this was an afterthought, and the reason for it is seen in Fig. 4. Another instance occurs where

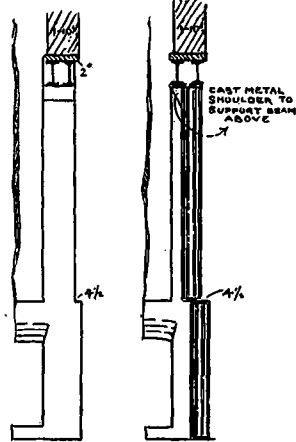
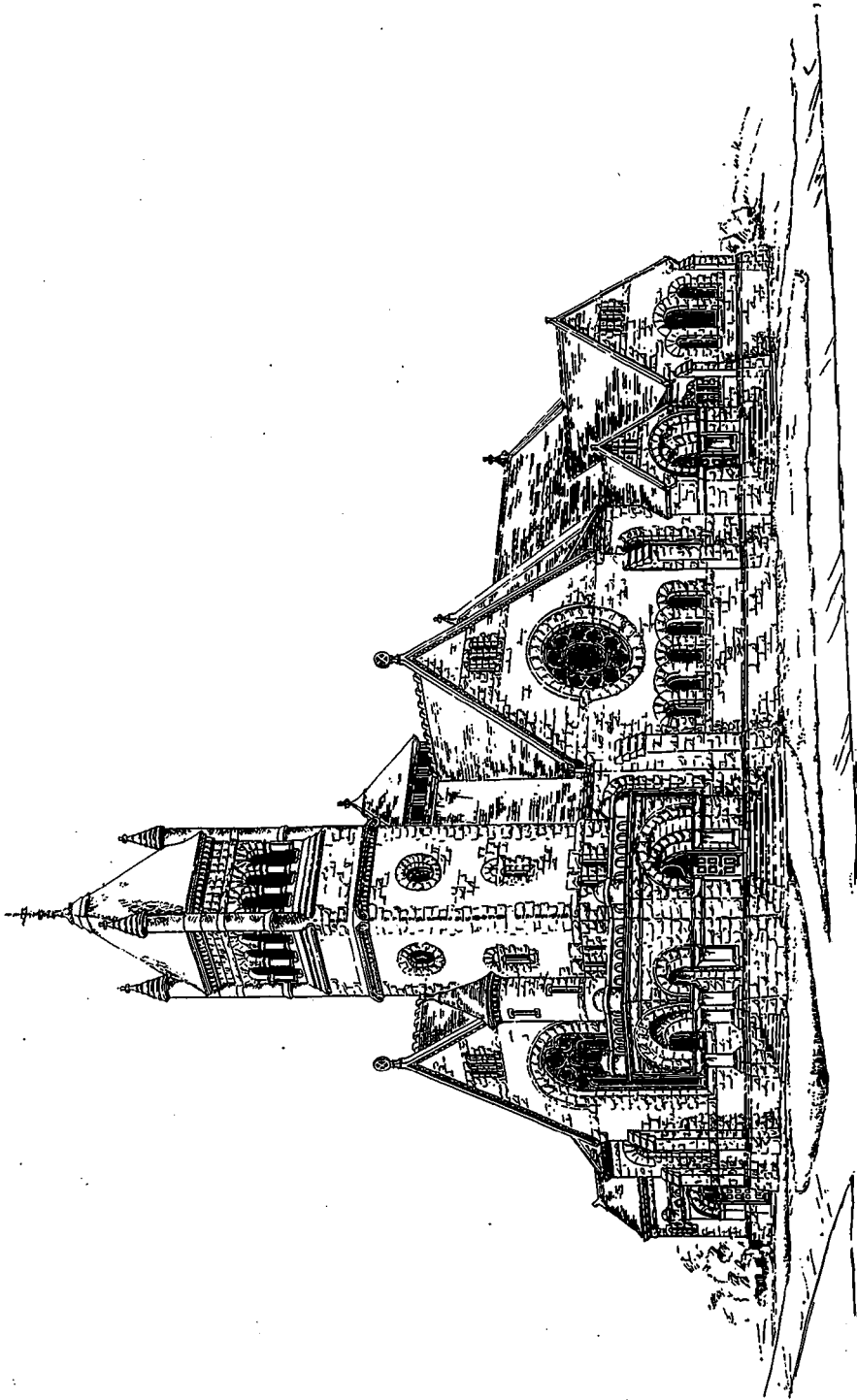


FIG 3

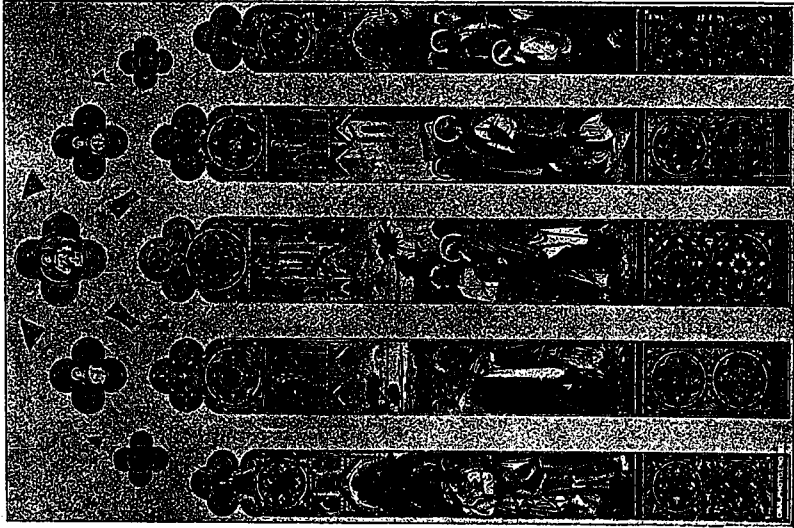
FIG 4

as indicated on Fig. 2. Upon crawling through this opening we were astonished to find another opening in the north wall, 2' 6" x 5' 0", and the top portion, as indicated by dotted line on Fig. 2, built up with straight joint, practically leaving the opening 2' 6" x 5' 0". Climbing up the inside of the chimney, we find it very rough, and on the south wall a "hog," whereby the courses are thrown 3" out of level, and the weight transferred to

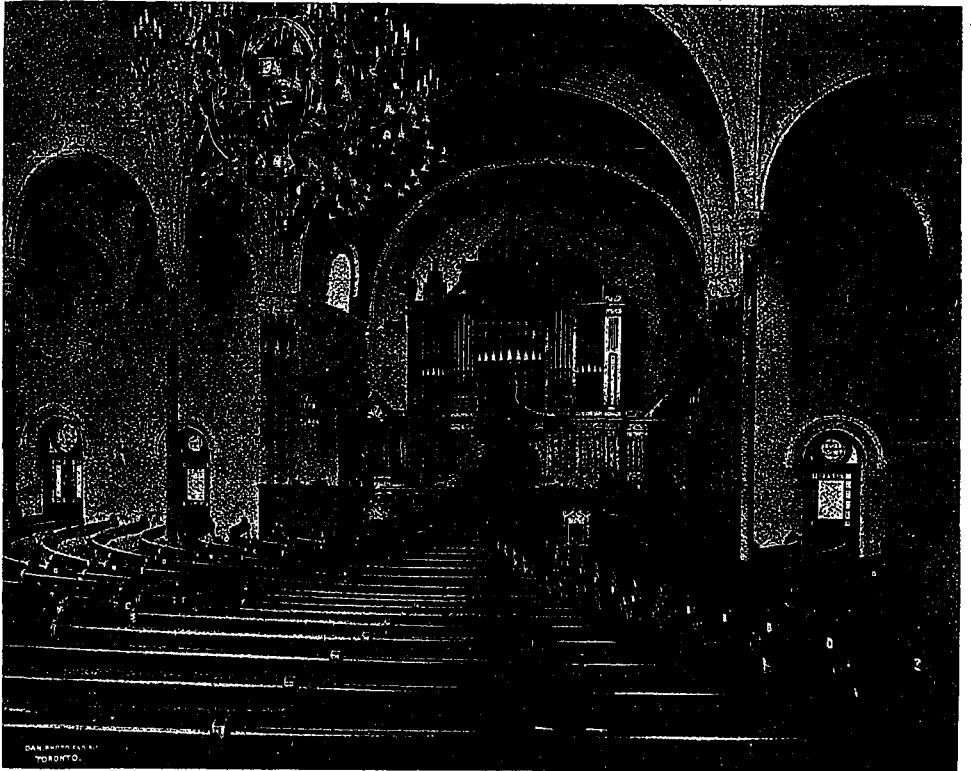


St Andrew's Church, Kingston.

Power & Son,
Architects.



MEMORIAL WINDOW—ST. ANDREW'S CHURCH, KINGSTON, ONT.



INTERIOR ST. ANDREW'S CHURCH, KINGSTON, ONT.

a considerable extent to the southwest corner, which has already to carry, independent of its own weight and weight of floors, 19 tons. This probably is the cause of the crack from floor to ceiling in south wall on ground floor. The bond-stone on the west side is broken through the centre.

On the north wall of the chimneys to the depth of six courses, directly under the point where the heaviest load is transferred, as indicated in Fig. 2, there have been laid five courses of red brick that has crushed slightly under the load. One cannot see any earthly reason for this, as the rest of the chimney is built of hard, grey clinker bricks, the red brick being of a sandy nature, and much more liable to crush.

A glance at Figs. 3 and 4 gives the relative position of the face line of the superstructure with the work below. The set-off on the ground floor is $4\frac{1}{2}$ at the first floor, the $1'-10\frac{1}{2}"$ wall that is carried on the beams sets over about 2". The metal

draw a sill of something, and tons of masonry up above him. A glance upward reveals a very rough job of brickwork setting over in two or three places about $\frac{1}{4}$ of an inch, and exhibiting in consequence a somewhat rustic appearance.

Walking along the corridor, we pass an array of iron columns arranged in Indian file supporting a stretch of 54 lineal feet of masonry and fire-proof flooring. At the north end of the corridor is an iron column supporting a weight something over eighty tons on a pad stone $3'0" \times 2'0" \times 8"$.

Fig. 2 is a plan of the chimney showing the position of the beams resting on the chimney.

Fig. 2 is an elevation of the chimney, looking at it from the north-east corner, showing the openings, etc.

Figs. 3 and 4 is an elevation of the north wall of chimney, showing the way the masonry and iron columns are first set back and then set over.

Fig. 5 is an elevation of the inside wall, with voids dotted diagonally.

The above loads do not include the weight of roof, and only 70 lbs. has been allowed per superficial foot of floor, which is only two-thirds of what should be allowed.

SOME NOTES ON HOUSE-PLANNING.*

By Mr. E. BURKE.

ONE of the first essentials in a good house-plan is simplicity. As a rule, the complex plan is that which has received the least study.

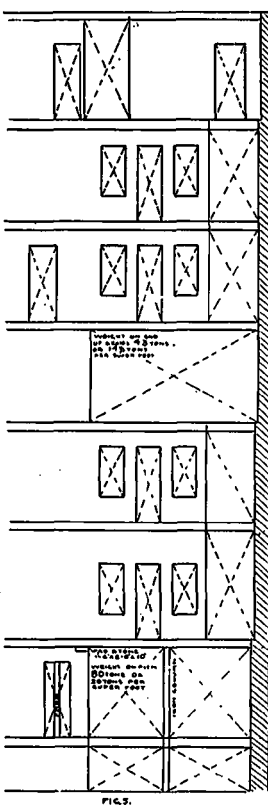
Messrs. Barnham & Root's plan for the Kansas City Exchange is remarkable for its simplicity compared with most of the others in the competition, but it was the result of most careful study, revision and elimination.

Their method of planning is to prepare several schemes, carefully compare each with the other, and finally select that which gives the greatest and best accommodation in the simplest and most direct form—having due regard, of course, to exterior effect. Usually a thoroughly good plan will compare well.

The writer, in preparing alternative plans, has almost invariably selected the simpler as being the most satisfactory solution of the problem, and has usually, in competitive work, been placed high or low in the scale in ratio to the simplicity or complexity of his planning. This point, *simplicity*, cannot be too earnestly insisted upon.

A poor plan, a crude plan or a complex one may be, and often is, a continual source of discomfort to the occupants of a house, especially to the wife, as housekeeper, and to the servants, while one which is carefully considered and thoughtfully put together, is of the most material assistance in the smooth-working of the domestic machinery.

To plan a house successfully, as Prof. Osborne in his little treatise on the Art of House-Planning, says: "We must understand the special wants and natures of the clients; and so must often, to be thoroughly successful, stand for the time being in the relation of father-confessor, to whom must be un-



FIGS.

castings that have been placed up the face of this pier are similarly set over each other, and on the east side a metal shoulder has been cast on the column to catch the I beam above. The other ends of these beams rest upon one of the flanges of the three beams that run east and west, Fig. 1. One cannot understand the reason for carrying them in this manner, for practically the whole of the load comes upon the flange of one beam. There is no reason why these two beams should not have rested upon the top of the three beams running east and west. The three beams do not cross over to the opposite wall, but are cut off short, and there is no way in which they are stayed except by being bolted through to the other beams. They are supported in a stilt-like fashion upon an iron column. The load where these beams meet is fifty-four tons.

Through one of the windows overlooking the area we saw a bricklayer at work quite innocently cutting away the brickwork in the basement and weakening the bond to insert or with-

folded all the inner life of the family, the tastes and even peculiarities of each member of it, in order that the house may be molded to them, and not they to the house."

Unfortunately, in these days of sudden wealth, we frequently have, for clients those who have practically no individual tastes or preferences, and who can only explain their requirements by referring to Mr. So and So's house as being something like what they want.

It is a very interesting study to compare the house-plans of different nationalities. Take the most familiar and accessible to us—the English and American. The contrast between English and American house plans may be accounted for, to a considerable extent, by the differing conditions of the labor market in connection with domestic service. The abundance of that description of labor in Great Britain has in the past contributed not a little to careless and diffuse planning, thereby increasing the work of the household, and necessitating a large staff of servants—and this often the case in unpretentious houses, and with incomes comparatively small.

The conditions of the domestic labor market in comparatively new countries, such as the United States and Canada, as well as the lack of means, have conduced to more careful and scientific planning—to the elimination of all unnecessary passages, extensions and roundabout ways, and to the invention of many labor saving appliances, which have been born of necessity.

Climatic conditions have also necessitated in the northern portions of

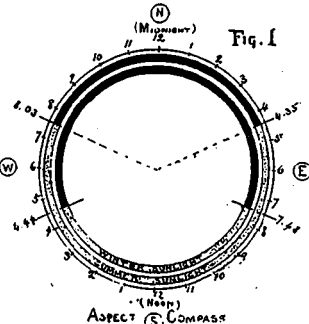


Fig. 1

* Paper read before the Toronto Architectural Sketch Club.

this continent a more compact form of house for easier heating, while the roofing problem and the avoidance of snow-traps, has been the means of clipping the wings of many a flight of fancy planning.

In planning a house, the first thing to be borne in mind is the purpose it is expected to serve—that it must be fit to live in, and secondly, with the maximum of convenience and comfort compatible with the means available. These are certain rules evolved or developed by custom or convenience which govern the science of house-planning—simple when the wants are few and the house inexpensive, and gradually becoming more complex as wealth, expenditures and desires increase.

It will probably be of most practical use for us to-night to consider the planning of houses costing from five to twelve thousand dollars, as being the class with which we in the city have most to do.

Before proceeding with the analysis of the house-plan, a few moments devoted to the question of aspect will be advisable. "Beggars cannot be choosers," no more can the architect dictate to his client the choice of a lot, neither can everybody live on the sunny side of the street.

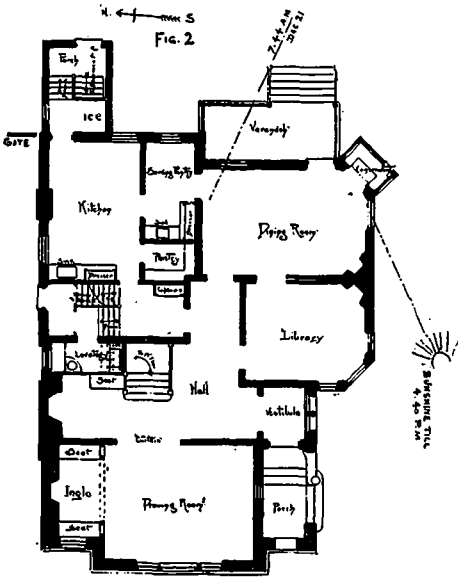
The ideal position of the dining room is on the south-east corner, the sitting or family room should be on the south side, or should have an uncovered south window; the kitchen should be on the cool side of the house and every living room (bed rooms included) should receive the direct rays of the sun during at least a few hours of the day. These are points which need to be constantly and carefully borne in mind.

The aspect compass (Fig. 1) so called by Prof. Kerr, author of the "English Gentleman's House," will be of material assistance in so lying out the plan as to obtain the maximum amount of sunshine in the various rooms. The direct rays of the sun are seldom disagreeable in the winter, and it is only the level beams of the declining western sun which, in summer more particularly, penetrate the house far enough to be disagreeable. The summer sun, during the mid-day hours, is so nearly vertical as to be easily kept out, while the mornings are rarely too warm for the easterly rays to prove uncomfortable.

The Entrance should have some special feature giving it such a measure of prominence as to leave no reasonable doubt in the mind regarding its purpose. It should not be a mere hole in the wall, and if at the back of a

The drawing room should not be square in plan, but if necessarily so, it can be greatly improved by the judicious location of a bay or angle, or even in the grouping of windows and placing of doors. It should also if possible have more than one doorway—two doorways, even should they open into the same hall, are of great help in the entertainment of a considerable number of guests.

Irregularity of plan is also of great assistance to a hostess, breaking up a



verandah, should be so treated as to be easily distinguished from a jib-head window. If a choice be possible, a south or east aspect is preferable, thus avoiding the coldest winds which are from the north and west. A loggia or recess is a great protection from side winds. A western entrance may be made comfortable by having a porch with the opening facing south (Fig. 2).

The entrance should not be placed, in our climate, where it will receive the full effect of a snow slide from the roof. If a hood or porch is impracticable, a broad dormer may be located directly above the door, or a gable worked in to obviate or divert that which is always a dangerous nuisance. When a carriage porch is provided, it should never be so placed that foot-passengers will be compelled to wade while the carriage is being lifted.

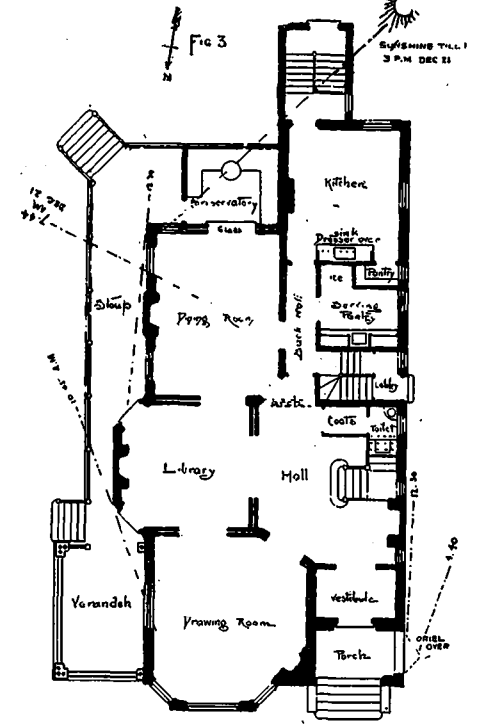
The hall should never, in our climate, have direct connection with the entrance door—a vestibule should be interposed. If the vestibule door can be placed at a right angle to the entrance it will tend to prevent the sweeping of a sudden gust of wind through and chilling the house, should both doors happen to be open at the same time, (fig. 2). The nearer a square form, the more convenient, as a rule, will the hall be, requiring less travel to reach any particular room, also making easier the heating of the house.

The stairs should be so placed as not to expose the upper hall to view from the entrance, and where practicable, a semi-concealment of most of the staircase is both preferable and more picturesque in effect.

Where a hall fireplace is introduced it should be in a cosy nook away from drafts. If this cannot be secured, it would be as well to omit the feature.

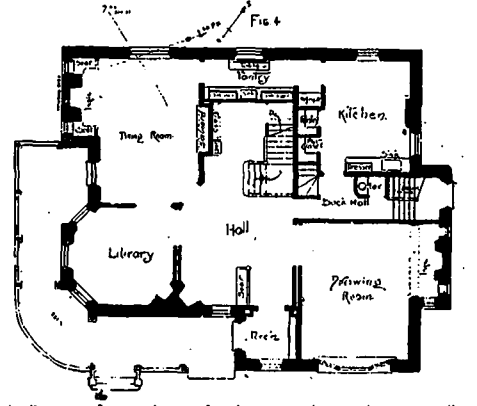
If a lavatory cannot be so placed as to be inconspicuous and out of hearing, the alcove is to be desired.

Where the ground floor accommodation is limited to three rooms, the reception or drawing room should be the readiest of access from the entrance. It would often be most inconvenient to be compelled to lead a chance caller to the reception room past the door of a family apartment such as a sitting or dining room.



company into separate groups. Irregularity of plan, however, should not be carried to the extent of leaving insufficient wall space for furniture, two large spaces at least should be provided for the larger and more cumbersome articles.

Where means and space permit, a reception room, in addition to the drawing room is desirable, and may open into that apartment with portieres, or for greater privacy with sliding doors, the drawing room may then become the more retired apartment and be used, to a greater extent, as a



family room. In most houses of moderate cost, the second room usually becomes the sitting room and library combined. Of course when the head of the house or some member of the family is of decidedly literary tastes, it becomes necessary for the proper prosecution of his reading, writing or study to have a special apartment, be it ever so small. When absolute seclusion is desired it may be necessary to locate the library on the first or even on the second floor. The family sitting room is convenient to be rather square in form, permitting a group to form around the table, and it may be made a more interesting room by the addition of an angle-nook, or

by a bay where a good view is to be obtained. It should be the easiest room in the house, facing south, when practicable, and when attainable have a view of the sunset.

The dining room is one of the most important divisions of the house, and should always receive special attention in planning. Where a breakfast room is provided, the question of the aspect of the dining room is not of so much importance, except that it should never be dependent on the east for its sole or chief light. The level rays of the declining sun would make a room thus lighted very uncomfortable for its occupants at the evening meal, while in summer the room would be made disagreeably warm. The south-east corner, as before mentioned, is the most pleasant position for the dining room, it being, in the majority of homes, used also as a breakfast room.

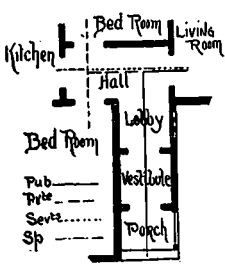


Fig 5

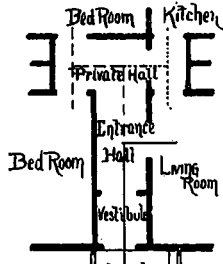


Fig 6

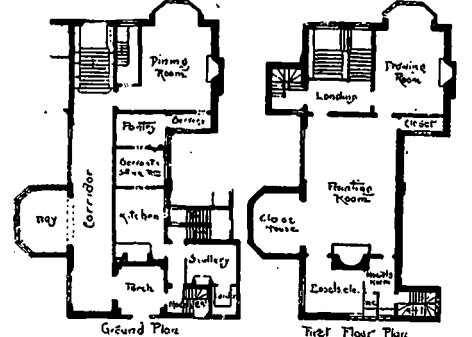
Where the room is, of necessity, placed on the south side, a bay window with a ledge for advantage in catching the rays of the sun. When placed on a north-east corner, the period of sunshine may be lengthened by a similar device. The entrance to the dining room should be removed somewhat from the main thoroughfare (fig. 5), and out of the range of a chance caller or unbidden guest—in fact it should be a truly family room, to which only the specially invited guest may have access. The inevitable odor of cooked food will also be less likely to make its presence noticeable. Unless the house is limited to two rooms, it is better that the dining room should not open into a reception room. It is often convenient and pleasant to have it in connection with the family sitting room, but doors should always be provided in order that the room may be effectually disconnected at will. The connection with the kitchen should never be direct, but at the same time the distance should be as short as possible, consistent with the proper isolation of the culinary department. The break should consist of a short hall or a service pantry, or better still, a combination of the two, and the doors should not be opposite each other, in order to prevent a direct view by a guest of the interior economy of the cook's domain. If the kitchen abuts directly on the dining or other rooms, the wall should be defaced to prevent the inevitable kitchen sounds being heard. Sometimes closets can be interposed.

The minimum size of room sufficient for six persons is about 12 x 14, and this would only be possible with any degree of comfort where the fire-place and window are placed at the ends or corners of the room. A good width is 14 to 15 feet, and 16 or 17 is quite sufficient for any establishment less than a palace. 2' 4" is considered the minimum allowance required for each

window between the two pantries, thus forming an additional barrier to the passage of kitchen odors.

If the kitchen be placed in the basement, the dumb waiter should never be carried directly from it to the dining room—it should be located in a separate room or pantry on both floors. The service pantry should be large enough for a commodious dresser for china, etc., and for a sink with drain. A refrigerator in or near the service pantry is also a great convenience, saving many a journey to the cellar and enabling the mistress of the house to retain control of many a dainty which would otherwise become the property of some "follower" or chum of Bridget. A mistress's pantry, even though small, is for a like reason very desirable.

The kitchen, as before mentioned, should be convenient of access to the dining room, should be placed, if possible, on the cool side of the house, lighted on two sides—preferably opposite—to permit of cross draught and good ventilation. The windows should not overlook the verandah, entrance or lawn, unless set up too high for vision. The kitchen table, when meals are eaten from it, ought to be placed as far from the range as possible, and



in such position that a cross draught may cut off the heat, thus making life in this apartment more bearable. A small room for use as a servants' dining and sitting room is a great boon, and conducive to long and contented service. Like the kitchen, it should not overlook the lawn, etc., and it should be placed near the kitchen.

The fixtures in the kitchen should be placed as much as possible to one side of the room, away from the line of traffic, and should consist of the range, sink, drain, table and dresser; a small second table and a gas stove are additional conveniences for which space should be planned. If no laundry is provided, fixed tubs should also be placed in the kitchen. The most convenient position for the laundry or wash room is on the same floor as the kitchen; it can then, also, be used as a scullery, relieving the kitchen of the dirtier portion of the work. When the laundry must be placed in the basement, it should be approached by outside steps, protected by a porch, only a few steps being then necessary to reach the yard; passing through the kitchen will thus be avoided. The same porch may be made large enough to contain also the steps from the kitchen door to the yard.

If possible to be avoided, the back or servants' stairs should not lead directly out of the kitchen, as in that case they become a sort of flue to draw all the odors to the bed room floor. A back hall should be arranged to contain these stairs; when this hall connects with a side entrance it should have a vestibule. It is well to place this entrance at that part where it will not require to pass through the yard, the gate to which may be kept locked for the exclusion of tramps and clothes thieves.

Some of the points referred to may seem trivial when taken up in detail, but none are beneath the study of a careful and painstaking architect, and

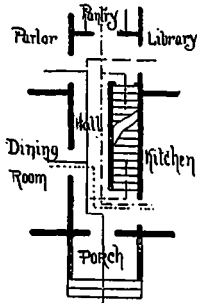


Fig 7

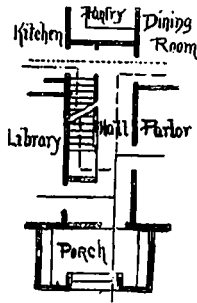


Fig 8

guest at table, and a dozen may be comfortably seated in a room 20 feet in length. The fireplace should be so placed as not to be a source of discomfort to the occupants of the table—for this reason it is better to place it at the end or corner of the room. If means will permit, an angle may be introduced, removing all cause of discomfort, and making a cosy nook for an after-dinner chat (fig. 4).

The position of the windows is of decided importance, and the injudicious disposition of them may prove a source of discomfort. Light from the end of the room is the most pleasant, but one person being in shadow. The windows should not be grouped, and should have a central blank space of considerable size. Where the room is long, it will be advisable, if practicable, to introduce a side window, which should be placed towards the opposite end.

The plans shown indicate the simpler method of disconnecting the kitchen, (figs. 3, 4.) Where the size of the establishment permits, it may be made more complex. For instance, the cook's pantry may be interposed between the kitchen and the butler's pantry, and the only connection a hatch or pass

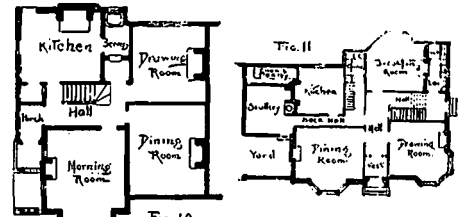


Fig 10

when confined, go to make up a convenient abode where labor is reduced to a minimum, and where everything has a place and a place is provided for everything.

Time has not permitted of reference to the upper floors. There are many points demanding careful study in the planning of the bed rooms, the location of the bath and dressing rooms, wardrobes, closets, etc., which will well repay careful study. The four sketches (figs. 5 to 8), taken from Prof. Osborne's book, show graphically the anatomy, as it were, of the thoroughfare, and its relation to the various functions of the house. It may be laid down as a safe rule, that if the analysis of a given thoroughfare plan results in confusion, a mixing up of guests, family and servants, it is a proof that it is imperfectly developed and demands further study. The dotted and solid lines on these plans indicate the routes of the three classes.

The plans of an artist's house, by Norman Shaw (fig. 9), are admirable in the disposition of the thoroughfare, the isolation of servants' apartments and suitability for the purposes of entertainment and the display of statuary, pictures and bric-a-brac. The position of the kitchen in relation to the dining room is a mixing up of guests, family and servants, it is a proof that it is imperfectly developed and demands further study.

Two plans (figs. 10 and 11) of English houses are given as examples to be avoided, and as showing a complete lack of study of the scientific disposition of the thoroughfare plan—very slight and obvious changes would result in less work for the servants and far greater comfort for the members of the family.

MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE most exciting event of the past month has been the total demolition by fire of the Longue Point Lunatic Insane Asylum. The particulars of the fire and the building have already appeared in almost every paper of the Dominion, and therefore require no further description. It seems almost incredible that a building containing so many human lives, practically helpless and caged behind iron bars, should in this 19th century be so wholly devoid of fire protection. It strikes me that if any buildings should be fire-proof or provided with appliances for fire protection, surely an insane asylum or hospital ought to be placed in such a position as to be impossible to be damaged by fire. In the case of Longue Point Asylum somebody is certainly at fault, for this institution being practically endowed by the Government, they should have taken such steps as were necessary to be certain that the building in which they placed the weak minded people of the province was thoroughly protected against accidents by fire. It is to be hoped that this calamity will be a lesson to all connected with our public institutions to see that their buildings are properly protected; in fact the Government ought to spare no expense in having all public buildings, such as asylums, hospitals, schools, convents and hotels examined, and their owners compelled to have them properly protected.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

The Canadian Society of Civil Engineers held an ordinary meeting on Thursday last at McGill College, where a paper was read on the generation of power and light by electricity by Mr. Lawson. There was a good attendance and an animated and interesting discussion will likely take place on the paper at the next meeting.

It was announced at the meeting that owing to the burning of the Toronto University and the absence of Colonel Gzowski, the Branch Society recommended that the summer convention be not held in Toronto this year. The probability is that there will be no summer convention take place this year.

FLOOD PROTECTION.

The commissioners appointed by the Government to examine and report upon the plans for flood protection and harbor improvements have so far done nothing. The explanation given is that Mr. Keefer is absent and Mr. Page is too busy with departmental work. The citizens are quite indignant at this treatment, and think that the members of the commission should either not have accepted the position or have immediately proceeded with their work. A deputation, including the Mayor and members of the Board of Trade have just interviewed the Government urging the appointment of a new commission; the Government have taken it into their consideration and a favorable answer is daily expected.

CONTRACTS.

Contracts for the new Victoria Hospital are not yet let. Rumor has it that the tenders are far in excess of the estimates, and that the plans will require remodeling and new tenders taken before the work proceeds.

MOUNT ROYAL PARK INCLINE RAILWAY.

The Directors of this railway have at last secured permission from the City Council to erect their station on Fletchers' field near the Golf Club House, and are pushing on the construction with all possible despatch. They hope to have cars running by the 24th inst. It is a great pity while they are at it that they did not ask permission from the City Council to run their cars to the corner of Craig and Bleury St. It would be a great convenience to the public, and without additional charge would pay the company handsomely for their outlay.

THE CARPENTERS' DEMANDS.

I hear that the carpenters propose to hold a meeting to-night to demand the eight hours movement from their employers. It is stated that if not acceded to they will go on strike on Monday. This I hardly think probable, as there are more men than work at present and it would be a very bad time for the men to act thus. Personally I believe in the eight hour system, if not abused. It is rather hard for the laboring man to have no time for recreation or self improvement. Take for example a man living in St. Jean Baptiste Ward, he requires to get up about half past five in time to get breakfast and be to work by seven o'clock. As a rule men live a long distance from their work. They leave off at six o'clock, thus making it nearly eight o'clock p.m. before they get home and have their supper; thus no time is left them to take advantage of night schools or any amusement. I would prefer to see all compelled to stop work at five o'clock and to have every Saturday off, but what I fear is, that even if the men's demands are granted, the object will be defeated by "the boss's" not compelling the men to stop work at the proper hour, but holding out inducements to them to work overtime.

REAL ESTATE AGENTS.

The real estate agents of this city are greatly excited by the fact that a firm of estate agents here have petitioned the City Council to impose a special tax upon all real estate agents. They claim the object is to wipe out all the smaller men, and to allow the wealthier members to control the business. Petitions opposing the tax are being presented to the City Council by those interested.

Mr. Dennis O'Brien, contractor, has taken out an action for damages against the synods of the parish of St. Antoine de Pardou for \$10,000. He alleges that they illegally took away from him his contract for building a church without any plausible reason.

STEREOTOMY.

STONE-CUTTING.

By JOHN A. PEARSON.

PART II.

THE RECESSED PLAT ARCH OR PLATE BAND.

AN arch is an assemblage of blocks, mutually supporting, by means of radiating joints between them, and side supports to withstand the lateral thrust. When the arch surface usually curved, is plane, the structure is called a plate band. Fig. 5 is the elevation and Fig. 6 the plan of a rectangular opening through a wall. The joints A, D, U, W, divide J, T, into equal parts and radiate from the centre O, which is arrived

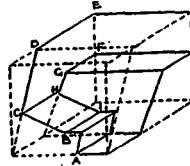


FIG. 5.

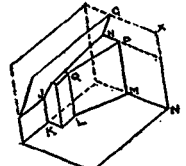


FIG. 6.

at by making the O, J, T, an equilateral triangle. The lapping over of the first arch stone at G, F, on the jamb springer is designed to give greater security.

Having set out the plan and elevation, it is required to work the jamb springer, K, L, M, N, X, G, H, I, J, and the first arch stone, A, B, C, D, E, P, G, H, I, J. Fig. 3 is an oblique projection of the first arch stone, looking at it obliquely upward, so as to see its front right hand and under surfaces.

Fig. 4 is an isometrical drawing of the jamb springer, showing the front and left hand surfaces. The different faces will be clearly traced by the corresponding letters on the elevation.

There is no exact order of operation, but the top bed being the largest surface, we should naturally bring that to a plane face by the method explained in our last number. Having accomplished this, we should then work the joint, A, B, C, D, with a shiftstock set to the angle caused by the

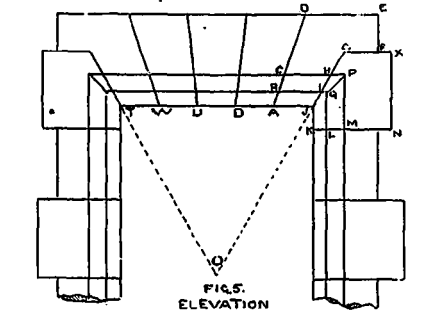


FIG. 5. ELEVATION



FIG. 6. PLAN

radiating joint A D, and applied on the top bed D E. Then the face D, C, G, F, E, should next be worked perpendicular or square to the top bed. Having finished this, we can now inscribe our face lines E F, F G, G J, H C, I, B, J, A. We cannot apply the mould used on the bed of the jamb stones to the radiating joints of the arch stones, so by square, trammel and gaging we can obtain the points on the joints of the convergent face, and the square cheek.

TO WORK THE JAMB STONE SPRINGER.

We commence first on the bottom bed of the jamb, and next work the face M, P, H, G, X, N, perpendicular to it. On this surface apply the face mould, marking the mitre and return of convergent face. Now work the joint J, G, at right angles to the face, carefully noting that the square on being applied is set at right angles to thearris J, G. A draft M, P, can now be raised, holding the chisel at the proper angle so as not to undercut the face; then with a shift-stock set to the angle M, L, at P, sink a draft, P, Q, and work the face through; then with the distance, M, L, marked at P, Q, run the draft J, Q, and the draft K, J, squaring these faces with each other by a set square.

The top joint, G, X, and side joint X, N, may now be worked, completing the whole. It is the better plan where a mitre occurs, as in this case, to leave about 1/4 of an inch rough to be pared when the stone is set.



"CANADIAN ARCHITECT AND BUILDER" COMPETITION ESSAY ON HEATING AND VENTILATION.

By "Zen."

THE subjects of heating and ventilation should always be inseparably considered in the construction of any edifice designed to be inhabited; and the reason for this is obvious, since one system is so dependent upon the other for its action.

ESSENTIALS OF HEATING AND VENTILATION.

We do not find the essentials which insure a good working of both systems to exist always together. The reason of this may be found, sometimes, in the misplaced idea of economy of a proprietor, but most often, it results from the difficulty experienced with some, of applying a properly selected system to suit each particular case.

We may conclude that, the object of the two systems being not only to provide comfort for the home, but above all to make it healthy, the selection of a proper mode is most important, and that the qualities necessary to secure the above ends are: that the apparatus should be docile of management, permitting to obtain at will any degree of heat required; also, that notwithstanding the variations of temperature which may result therefrom, the air in the room should maintain an even standard of purity with the absence of any discomfort from draughts of air.

APPARATUS FOR HEATING.

Every system has its friends as well as its enemies; only, some would have fewer opponents if a bad application of them was not so often made.

No particular system will give scientifically perfect results, but some get nearer to it than others.

The Chimney.—Owing to the climate in this country, little difficulty has ever been experienced in constructing a chimney which will act well. The section of a chimney should be square or perfectly round, as such forms insure a more even warming of their inner walls, and prevent, thereby, counter currents of cold air descending the flue, as happens sometimes when the section has the form of a parallelogram and is too large. We need not insist that a tall chimney will draw better than a short one. The diameter of a flue for an ordinary room need not exceed 6 or 8 inches, and the velocity of the draught should not be more than six feet per second; Galton recommends that one square inch be allowed for every 50 or 60 cubic feet of space.

With inlets for fresh air, chimneys will always draw well.

Fire-places will always be popular, but the main drawback with them is the difficulty of renewing the fresh air in the room to replace that carried up by the chimney in sufficient quantity without causing some draughts of air. To obviate this inconvenience many forms of chimneys have been invented, the best known of which is that of "Galton's" constructed with a false back, forming an air chamber, communicating with the outer air which permits it of delivering in the room about the same amount of fresh warmed air as escapes by the chimney. This form is more economical also than the common one, as giving with the same amount of fuel about 30 per cent. more heat.

Stoves and Furnaces.—These two modes have prevailed at one time to a greater extent than they ever will again. One of the greatest objections to their use is that they provide air at an excessive temperature on its entering the room. An even and constant temperature is also difficult to obtain with the hot air system, for the least change in the intensity of the fire is instantly felt at the register, either by a diminution in temperature or an excess of it, as the case may be. True, in the latter case, the heat can be checked by closing the register, but the supply of air is affected and ventilation ceases. General Morin suggests as a cure to this objection that the regulation of the temperature of air before entering the room may be obtained by having a mixing chamber where cold air is admitted when necessary, thus giving more comfort without affecting ventilation. But the main drawback with this system is the difficulty

of accomplishing an even distribution of heat throughout the house. It has been observed (Michel Levy, *Traite Hygiene Publique, 1879*) that, "in places where furnaces are used, the inmates show unmistakable signs of anemia, and that such a fact has also been observed among all classes in those countries where porcelain and iron stoves are in use." How far this may be true in regard to this country we are not prepared to say. It is conjectured, however, that the nature of the air is changed by coming in contact with an intensely heated metal surface, but the precise nature of such a change has not been yet explained, but it is known that the uncomfortable feeling resulting from the aspiration of such air is due in a measure to the fact that its power of absorbing moisture is then greatly increased (which is equivalent to its being made dryer). Hot air is disagreeable when it contains less moisture than 50 per cent. of its point of saturation (Peclet), though this standard may vary according to circumstances.

STEAM HEATING.

This system is no doubt superior to stoves and furnaces in many ways, but it is not without possessing some disadvantages, too. One of them is, that no heat is obtained in the radiator until the water in the boiler has reached the boiling point (212°). This in itself is no serious objection, but the fact that the temperature of the radiators must always be that of steam is a decided objection in some particular cases. Then a vigorous fire must always be kept up so long as any heat is needed, otherwise, the temperature lowering, the supply of steam ceases, and the radiators cool instantly. The noise in the pipes resulting from the condensation of steam can be pretty well overcome by the use of automatic valves.

It has been observed by an author (Dr. Billings, Boston), that "more constant and skilled supervision is necessary with this apparatus than with the hot water system." The rapidity with which heat can be radiated and the great power of the system certainly favors its adoption in many cases in preference to the other systems.

It can also be applied to ventilation, but as such application is costly and extensive its adoption will scarcely ever be made outside of large establishments. We have read of such an application to a theatre in Hamburg, if we mistake not. It consists in having all the radiators placed in a large chamber situated below the pit of the house; the hot air from this room is supplied to different parts of the theatre above by ducts and orifices in the floor. The temperature is regulated below by partly controlling the inlet of cold air, and also by having a greater or less number of radiators in operation at a time, as circumstances may require. A system analogous to this is in operation in the John Hopkins hospital in Baltimore.

HOT WATER SYSTEM.

This is the system *par excellence*, and which is growing in favor every day; though it is not recent, for the first apparatus used for this kind of heating was invented in France by Bonnemain towards the end of the eighteenth century.

The circulatory movement of water through which heating is secured by this system, depends upon the difference in density between hot and cold water; thus it is, that water after being treated in the boiler ascends the pipes, and as it cools in its course through the radiators, returns to the boiler and enters it at the base. The chief advantage of this system lies in furnishing a more constant and milder temperature, with less fire and care than is possible with any other mode. Its facility for regulating the temperature by simply controlling the flow of water in the radiators is no less in its favor. The system is less fickle than any other in its action on account of the great mass of water contained in the pipes being once heated, does not cool very rapidly if the fire should get low, for, once hot, it will require a comparatively small fire to keep up a good temperature. It is calculated by some that after the fire is out the temperature of the room will be maintained five or six times longer than is possible with steam under similar circumstances.

We may summarize as follows: That every system possesses some bad points as well as advantages. The improved form of chimney such as already mentioned is a great adjunct to ventilation, besides its heating qualities, but it would be best in some cases to have some other means of heating at command besides it.

Of the hot-air system, we cannot say much beyond the fact that its promptness and vigorous power may recommend it in some cases, but the difficulty of distributing heat evenly, already mentioned, may sometimes prove a great objection.

The steam system possesses the advantages of the hot-air system without some of its faults. Its application commends itself to those large edifices which require to be well heated at short notice and for short intervals.

Hot-water should in general be preferred to any other system, especially for the home, it being considered less costly and more easy of management than any other.

Pure air is an absolute necessity for the maintenance of good health. We will not cite any example in support of this beyond

the fact that "a deprival of fresh air produces phthisis." Parke says, that "the practical limit of purity will depend on the cost which men are willing or able to pay for it," and that "it may be fairly assumed that the quantity of fresh air supplied to every inhabited room should be great enough to remove all sensible impurity, so that a person coming from the external air should perceive no trace of odor or difference between the room and the outside air in point of freshness."

We might here relate how air becomes contaminated by carbonic acid gas from human respiration, or the many other causes; and of experiments which have been made in endeavoring to establish some standard of purity which internal air should have, and the widely different results arrived at by different authors. We might also cite tables giving the cubic amount of fresh air per head which should be allotted under different circumstances; but all data on this point is within the reach of anyone in the numerous treatises on hygiene, and we consider it unnecessary to repeat it here. It will suffice to say that hospitals, theatres or any edifice where a large number of people assemble at a time, require per head a greater amount of fresh air per hour than is necessary in an ordinary dwelling; in which latter case it is fixed by DeChaumont at 1 cubic foot per second for each man as the minimum allowance, but we think this might be reduced.

A very large apartment is more difficult to heat and ventilate than a small one, but a moderate sized one will give the best results all round. We know that when air is changed more rapidly than three times in an hour, it occasions draughts in the room, though this is somewhat dependent upon the degree of temperature at the time.

It is evident after all the above considerations that in order to have a comfortable and healthy room, we must harmonize the workings of the heating apparatus with that of the ventilating system, and both of these to the size of the room in relation to the number of its inmates.

The introduction of fresh air should in preference be made at the ceiling than at the floor line (Morin), though the opposite mode has been known to give good satisfaction. All air entering a room should be filtered through a fine gauge to remove its coarse impurities before its introduction in the room. Ducts should be so designed that the air will have an equal distance to travel in them all.

MODES OF VENTILATION.

There is the artificial and natural mode. The latter is the natural operation of a change of air which is due to a difference in density between internal and external air; the mode is very good in winter, but it should not be altogether relied upon in the summer season, when the outside temperature is often that of

the house. Natural ventilation is obtained in many ways which are well known; but the most common is by depending on the opening and shutting of doors, cracks around windows, &c. It is mainly achieved, and better, by chimneys and shafts constructed for the purpose. One good way of many, of getting window ventilation is by lowering the top sash a little and lifting the lower one a few inches, the upper layers of air in the room being lighter in density escape at the top opening, while it is replaced by a fresh supply entering at the bottom, where the draught is checked by a board put in front of the opening to change the direction of the current.

We can say that hot-air heating is a mode of natural ventilation. Astonishing results in ventilation are obtained by burning a gas jet in a chimney shaft. Morin says, that with 7 ft. cubic of gas burnt per hour in a flue eleven inches square and 66 ft. high, 13,300 cubic feet of air will be drawn from the room.

ARTIFICIAL VENTILATION.

This mode is accomplished either by pulsion (forcing air in the room), or extraction (asping the air). In both cases the action can be secured in different ways, such as a jet of steam, etc., but most commonly by the use of a "fan" put in rapid motion by some motive power. These modes are used only where the space to be ventilated is very considerable, where natural ventilation would not be sufficient. When only one of these modes is used, preference is to be given to pulsion; but they are sometimes combined, as was the case in the "Palais du Trocadero" during the Paris Exposition of 1878, where ventilation was most perfect. The main point of excellence of natural ventilation, and which is not possessed by any other system is, that it can be depended on for a given result per hour, independently of outside temperature, or the direction of prevailing winds.

Competency in putting up a system, either of ventilation or heating, is not possessed by all those who lay claim to it; and this results sometimes in a good apparatus failing to give all the satisfaction which it otherwise might, whereas, if the work were properly executed, it would often effect not only an increase of comfort, but also a saving of expenses in working the system.

We have answered sufficiently, we think, the spirit of the competition for which this "essay" has been written, in restricting ourselves to treating simply of the principles on which the different systems are dependent for their action; and of the nature and value of the results as given by each under ordinary management, as compared to what should constitute good heating and ventilation, leaving out the question of the varied modes of application which can be made of each system according to circumstances. For example, as in hospitals, quarantine stations, schools, etc., etc.; it would require quite a series of articles to treat of these questions separately.

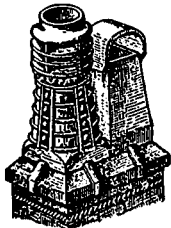
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HARALD M. HANSEN,

PATENTEE,

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CORRESPONDENCE SOLICITED.

PERSONALS.

Mr. G. W. F. Price has formed a partnership with Mr. J. W. Mallory, architect, the firm's name being Mallory & Price. Mr. Price has just returned from a visit of eighteen months to Europe.

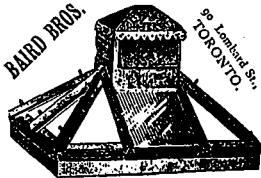
We chronicle with much pleasure the marriage of Mr. Geo. A. Allan, architect, of Brockville, and Miss Jennie Wright, of the same city. The event took place in the Episcopal church, Brockville, a large and fashionable assembly manifesting their presence their appreciation of and interest in the happy participants. Mr. Allan and his bride immediately after the ceremony left Brockville for New York en route for Europe, where they purpose spending several months before settling down to life's duties.

TO ARCHITECTS.

An architect of some experience in a small town desires a position in a good architect's office for the season as an assistant or draughtsman. For particulars and sample of work, apply before 1st June at the office of this paper.

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NOTICE.

Take notice that the firm of Knox, Elliot & Jarvis has this day been dissolved by mutual consent. All moneys due the said firm are payable to Messrs. Knox and Elliot, who continue the business, who also will pay all liabilities of the firm, Signed—Wm. Knox, John H. Elliot, E. Beaumont Jarvis. Witness—W. Macdonald. This 10th May, A. D., 1890.

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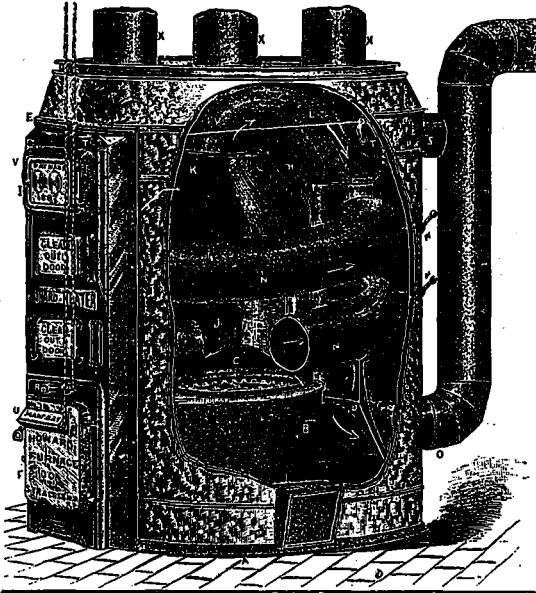
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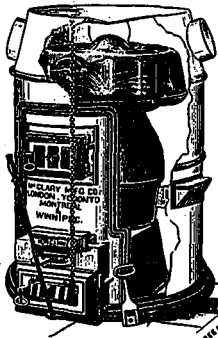
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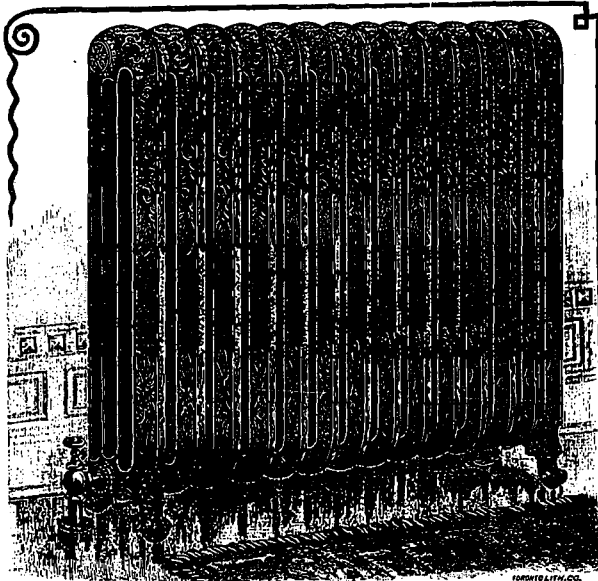
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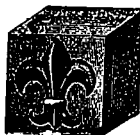
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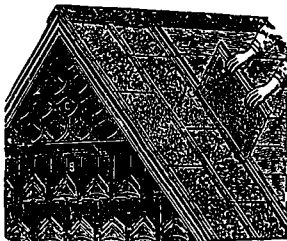
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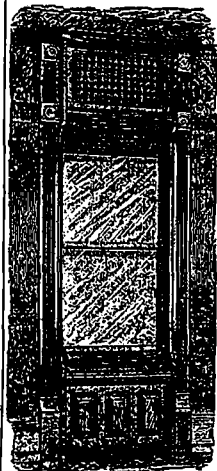
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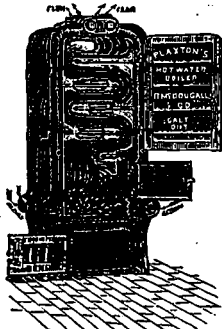
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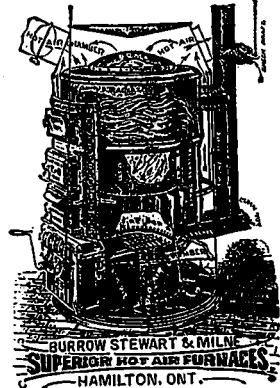
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