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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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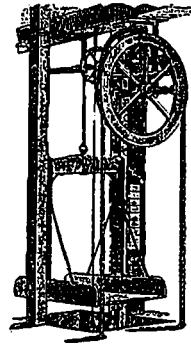
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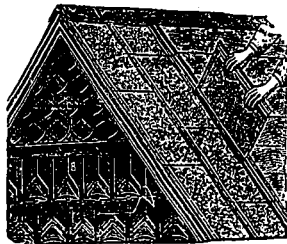
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ROOFING SHINGLES

Fire and Waterproof.



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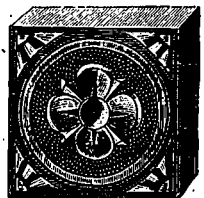
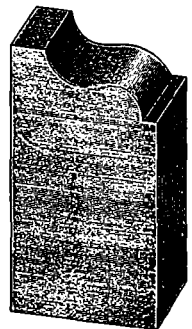
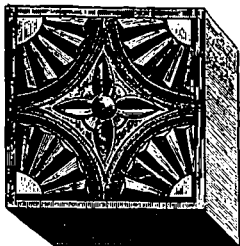
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TORONTO.

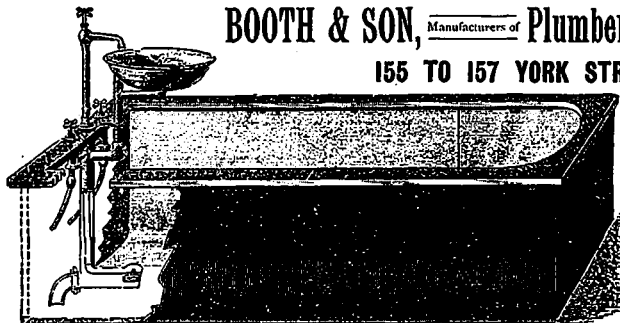
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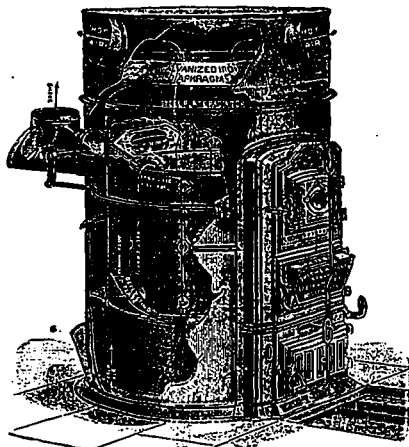
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THREE QUALITIES, VIZ. :-

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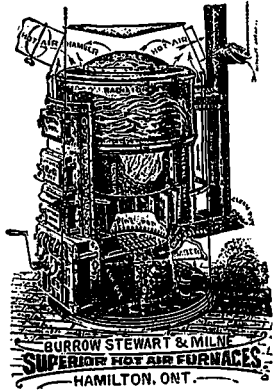
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Not a single failure;

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Manufacturers, HAMILTON.

Prices of Building Materials.

LUMBER.

CAR or CARGO LOTS.

Table listing prices for various building materials including lumber, shingles, and steel products. Columns include item descriptions and prices per unit.

YARD QUOTATIONS.

Table listing yard quotations for materials like mill cull boards, shipping cull boards, hemlock casting, and various types of flooring.

B. M.

Table listing prices for various types of flooring, sawn lath, red oak, white ash, black ash, and pickets.

BASIC—N M

Table listing prices for common walling, good facing, and pressed bricks.

Pressed Brick:

Table listing prices for plain brick, quality per M, and ornamental brick.

Stone.

Table listing prices for common rubble, large flat foundation blocks, and cubic foot.

Slate: Roofing (per square).

Table listing prices for different types of slate roofing, including red, purple, unmined, and black slate.

Terra Cotta Tile, per sq.

Table listing prices for terra cotta tile and ornamental black slate roofing.

Sand:

Table listing prices for per load of 1 1/2 cubic yards.

PAINTS. (In oil, per lb.)

Table listing prices for various types of paint including white lead, red lead, vermilion, yellow ochre, green, black, and blue.

Oil, linseed, raw (& Imp. gallon).....	68	70
" " boiled.....	73	75
" " refined.....	78	80
Putty.....	2 1/2	2 1/2
Whiting, dry.....	75	1 00
Paris white Eng. dry.....	80	1 25
Litharge, Am.....	6 1/2	8
Sienna, burnt.....	15	20
Umber.....	8 1/2	2

CEMENT, LIME, etc.

Lime, Per Barrel of bushels, Grey.....	40	55
" " " White.....	45	60
Plaster, Calcined, New Brunswick.....	2 00	2 00
" " " Nova Scotia.....	2 00	2 00
Hair, Plasterers', per bag.....	1 00	1 00
Cement, Portland, per bid.....	3 25	3 50
" " " Theroid.....	1 50	1 50
" " " Queenston.....	1 50	1 50
" " " Napanee.....	1 50	1 50
" " " Hull.....	1 50	1 50

HARDWARE.

Cut Nails:		
American Pattern, 1 1/2 inch, per keg.....	4 40	
" " " 1 3/4 to 1 3/8 inch, per keg.....	3 65	
Canadian Pattern, 1 1/2 inch, per keg.....	3 30	
" " " 1 3/4 to 1 3/8 inch, per keg.....	3 30	
" " " 2 to 2 1/2 inch, " " ".....	3 40	
" " " 2 1/2 to 2 3/4 inch, " " ".....	3 15	
" " " 3 inch and larger.....	2 50	
Steel nails, 100, per keg extra.....		5 00
Finishing nails, 1 inch, per keg.....		5 20
" " " 1 1/2 " " ".....		4 95
" " " 1 3/4 " " ".....		4 60
" " " 1 1/2 " " and larger.....		4 20

MONTREAL PRICES.

Lumber, Etc.		
Ash, 1 to 4 in, M.....	\$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.....	25 00	40 00
Cedar, first.....	60 00	80 00
Cherry, per M.....	60 00	80 00
Elm, Soft, 1st.....	15 00	17 00
Elm, Rock.....	20 00	30 00
Maple, hard, M.....	20 00	25 00
Maple, Soft.....	16 00	18 00
Oak, M.....	40 00	95 00
Pine, select, M.....	35 00	40 00
Pine, 2nd quality, M.....	20 00	25 00
Shipping Culls.....	13 00	16 00
Mill Culls.....	8 00	10 00
Loam, M.....	1 50	1 00
Spruce, 1 to 2 inch, M.....	10 00	12 00
Spruce Culls.....	4 50	6 00
Shingles, 1st quality.....	2 00	3 00
" " " 2nd " " ".....	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 3/4 inch hot-cut.....	3 50	5 60
" " " 1 1/2 inch.....	4 25	5 20
Can. Pattern, cold-cut, 1 1/2 and 1 3/4 inch.....	3 25	4 45
" " " 1 1/2 inch.....	3 75	4 95
Finishing Nails, per 100 lb. keg, 1 1/2 inch.....		75 cents
Finishing Nails, per 100 lb. keg, 1 3/4 inch.....		advance on
Finishing Nails, per 100 lb. keg, 2 inch and up.....		Hot Cut Nails.

Patina, 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
" " No. 3.....	4 00	4 50
" " dry.....	3 75	4 25
Venetian Red, English.....	1 30	1 75
Yellow Ochre, French.....	1 25	1 30
Whiting, London, washed.....	0 50	0 60
" " Paris.....	1 15	1 25

Oils:		
Linseed, raw.....	0 3	0 55
" " boiled.....	0 60	0 88
Olive, pure.....	1 10	1 10
" " machinery.....	95	1 05
" " extra, qt., per case.....	3 00	3 25
" " " " " " ".....	5 50	6 50
" " " " " " ".....	2 75	3 10
Spirits turpentine.....	0 67	0 70

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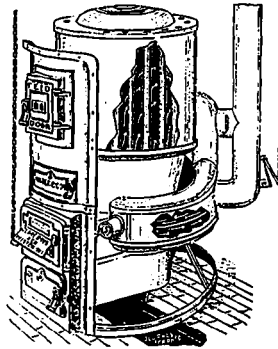
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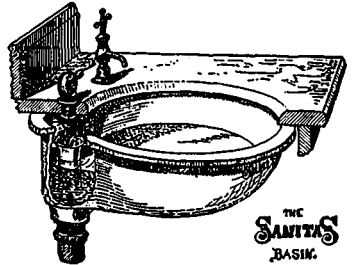


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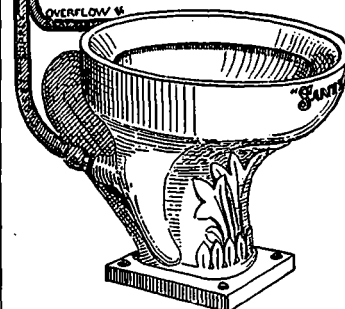
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Offers the following advantages:



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 for an overflow without requiring a special pipe or valve for this purpose; it has no brass-work in the bottom of the bowl in the way of hands when washing, and no chain and plug.

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Colors, etc.

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- Napanee, Tamworth & Quebec Station, Newburgh.
- Barrington's Trunk Factory, Montreal.
- Hon. G. A. Drummond's Dwelling, Montreal.
- Bank of Commerce Building, Toronto.

- New Post Office, Napanee.
- Royal Insurance Co.'s Building, Montreal.
- Imperial Fire Insurance Co.'s Building, Montreal
- Canada Life Building, Toronto.
- Board of Trade Building, Toronto.

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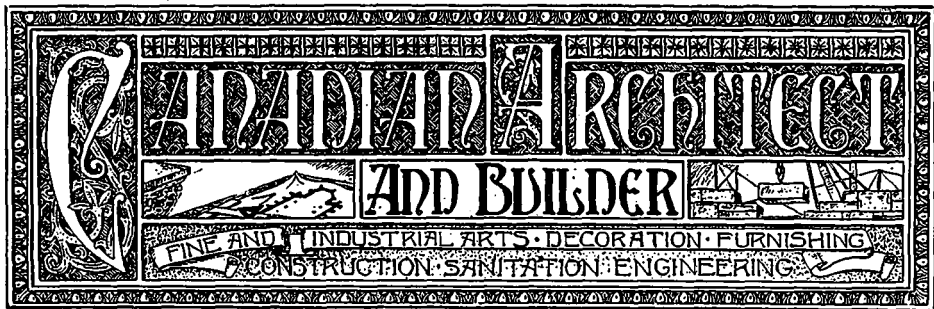
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Guaranteed equal to any native Cement.

ROACH LIME, BUILDING STONE, Etc.



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TORONTO, CANADA, APRIL, 1890.

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—THE—
CANADIAN ARCHITECT AND BUILDER,
A Monthly Journal of Modern Constructive Methods,

(With an Weekly Intermediary 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
MATERIALS AND APPLIANCES.

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ADVERTISEMENTS.

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EDITOR'S 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.

A HAMILTON paper recently published an article from a correspondent which depicted in a truly alarming manner the dangers resulting from defective plumbing and insanitary surroundings generally. If our memory is not at fault, the writer estimated that 20 per cent. of the deaths were the result of this cause. Whether as a mere coincidence, or as a result of the article referred to, we noticed a few days later the appointment of Mr. J. M. Byren as Building and Plumbing Inspector. We hope that this commendable step will be followed in due time by the abolition of the dual position and the appointment of an inspector of buildings and an inspector of plumbing.

WE are pleased to observe from the proceedings of the annual meeting, that the Engineering Society in connection with the School of Practical Science, Toronto, is prospering. There were seventeen additions to the list of life members during last year, and twenty-nine additions to the list of ordinary members. The papers read and discussions held cover a wide range of subjects, and will be published in pamphlet form. A new and valuable feature is the establishing of a circulating library. The officers elect for the current year are: President—J. K. Robinson; Vice-president—T. R. Dencon; Recording secretary—C. C. Fairchild; Corresponding secretary—G. E. Sylvester; Treasurer—W. A. Lea; Librarian—A. Lane; Third year representative—J. E. A. Moore; Second year representative—E. E. Langley.

ABOUT a year ago reference was made in these columns to a resolution passed by the Committee on Works and approved by the City Council of Toronto, providing that all sewers of fifteen inches diameter and upwards should be constructed of brick. We pointed out at the time that for small sewers, vitrified pipe was to be preferred to brick, its smooth interior facilitating the flow of sewage matter, its durability when properly laid being beyond dispute, and the cost of construction being substantially less than in the case of brick. In the absence of any satisfactory explanation of their action, people were unkind enough to say that the aldermen were simply throwing a bait to catch the votes of the brickmakers and bricklayers. However this may have been, we are credibly informed that \$1,100 above the cost of pipe sewers was expended on the construction of small brick sewers last year. The City Engineer now recommends that the resolution be rescinded on sanitary, economical and other grounds.

THE Board of Works of the city of Toronto has been trying the experiment of constructing public works by day labor under the supervision of city officials instead of by contract. It is not surprising to learn that the results in the case of works of any importance, have not been satisfactory. As an instance, a bridge for the construction of which a tender of \$6,000 was received, cost by day labor, \$8,349, a loss to the city on a single contract of \$2,349. The City Engineer expresses the opinion that were the city to purchase the necessary appliances and enter upon the construction of public works on an extensive scale, the work could be done as cheaply if not cheaper by day labor than by contract. This might prove to be the case for a time, but such a system would be well-nigh certain to open the door for abuses which would eventually make the undertaking a costly one to the citizens. It is proverbially true that economy does not enter into the practice of the city's employees to the extent to which it appears in the contractor's methods of conducting his business. While no doubt there are in the city's employ foremen and inspectors of undoubted faithfulness to the interests placed under their charge, it would be found difficult to secure a sufficient number of such persons to manage successfully and with the greatest economy the expenditure of the large sums annually placed at the disposal of the Committee on Works.

THE appointment of an inspector or inspectors of scaffolds is still engaging the attention of a committee of the Toronto city council. The City Solicitor has been asked for his opinion on the following points: "Will the city be held liable in the event of a workman being injured by reason of a scaffold giving way after the said scaffold has been approved of by the city inspector? Will a claim against a contractor for injuries received by a workman in consequence of an accident occurring by the giving way of the scaffold which has been constructed according to the specification be in any way prejudiced?" The city authorities do well to satisfy themselves as to where the responsibility for accidents would rest under a system of municipal inspection, before they decide to put such a system in

operation. The very fact of their anxiety to learn the legal bearings of the case, is, however, a proof that they do not hope to put a stop to scaffolds falling or injury to workmen in consequence by means of the proposed system of inspection. The question then arises, if the inspection is not to be thorough and effective in protecting workmen from injury, of what use will it be? Evidently, little or none whatever. Without being informed as to the legal aspect of the case, we hold to what seems to us the common-sense opinion that if the city appoints inspectors to see that all scaffolds erected are of proper material and securely put up, the contractor is entitled to be freed from all responsibility, and the claims for damages for any accidents which might possibly occur, should be presented to, and if well-founded, paid by the city.

A FEW days ago a structure erected for the protection of pedestrians in front of a building in course of construction on Yonge street, Toronto, collapsed. Fortunately, the attention of a policeman had a few moments before been drawn to its unsafe condition, and placing himself at the entrance he prevented persons from passing under it. But for this, serious injury if not loss of life must have been the result. The unsafe character of this and similar structures in different parts of the city has long been observable, and should accidents result, the responsibility will rest with the City Commissioner's Department. We presume that from this department emanated the by-law compelling the erection by contractors of these structures, and the City Commissioner has a right to see that a device intended for the protection of the public shall not be so carelessly put up as to be itself a cause of danger.

WE have frequently called attention to the manner in which the by-laws supposed to govern the erection of buildings in the cities of this country are disregarded. Nothing like a determined attempt is made to enforce compliance with the law, and unsatisfactory results follow as a natural consequence. A Montreal alderman expressed the opinion the other day that the duties of building inspector and boiler inspector might be performed by one man. He thought the building inspector was of very little use, for buildings were going up all over the city in contravention of the by-laws. It is not improbable that in cities like Montreal and Toronto the work is more than a single inspector can properly perform. If this be the case, he should be given the necessary assistance to enable him to perform his duties efficiently. Perhaps duties are saddled upon him which do not properly belong to his position, and which take up time which ought to be given to enforcing the building regulations. If so, all such obstacles should be removed from his path. It ought to be sufficiently evident that in the cities mentioned the duties of the position, if honestly fulfilled, are sufficient to task the energies of a single inspector. Therefore the proposal to add to these duties those of an inspector of steam boilers is simply absurd, more especially in view of the fact that the necessary qualifications for a good building inspector will not apply to an inspector of steam boilers. A very great improvement on the present state of things in all our cities would be the honest carrying out of a system under which a correct record should be kept of every building erected within the city limits, and it would be impossible for the work of construction to begin without a permit from the inspector of buildings.

WE print in the present issue the Act passed by the Legislature of Ontario incorporating the Ontario Association of Architects. The preamble states the objects to be "the better protection of the public interests in the erection of public and private buildings in the province of Ontario," and "to ensure a standard of efficiency in the persons practising the profession of architecture in the province." These objects would have been attained had the Bill not suffered emasculation in its passage through the House. In the form in which we present it to our readers, and in which it will be placed on the statute books, it can scarcely be said to afford much protection to the public or

to ensure a standard of architectural efficiency. The Bill as originally presented, constituted it a punishable offence for any person to call himself an "architect" who was not registered as such under the Act. By substituting for the title "architect" the words "registered architect" the Legislature defeated one of the main purposes of the Bill, viz., to make the word "architect" a guarantee of the capability of the person using it. Notwithstanding that the Act in its present shape is in a great measure disappointing to the Association, it should be considered as one step forward in the direction of securing for the architectural profession the recognition and respect which is its due, inasmuch as it enables the public to distinguish between the qualified and unqualified practitioners. It is well that this view should be taken, and that every member of the Association should register as a "Registered Architect" under the Act. The Association will then be in a position to put forth united effort at future sessions of the Legislature to have such amendments made in the Act, as will make it effective in accomplishing the objects of its promoters.

FAME and fortune are awaiting the individual who shall perfect a method of heating buildings, especially residences, at less cost than is entailed by the present expensive systems. The amount of money annually expended by the people of this continent for fuel, would we doubt not, prove truly startling were the figures at hand. Let us endeavor to arrive at a rough estimate of the coal consumed every year in Toronto residences. Placing the population at 180,000, and supposing the average family to consist of five persons, we have, say, 36,000 families. These might be divided into three classes, viz., poorest class, 15,000; middle class, 12,000; highest class, 8,000. A fair approximate estimate of the annual cost of fuel to these three classes would, we think, be about as follows: highest class, \$150; middle class, \$75; poorest class, \$40. Basing our estimate on these figures, we have a total expenditure of \$2,700,000 for fuel in the residences alone of the city of Toronto. These figures represents, perhaps, less than one half the total expenditure in this direction were public buildings, factories, etc., to be taken into the account.

We are pleased to observe that successful experiments are said to have recently been made, and a patent based thereupon applied for, in the United States, for the purpose of utilizing electricity for heating purposes. The plan is said to provide for a central plant but the manner in which it is proposed to convey the heat to the buildings is as yet unrevealed. In the building to be heated it will be distributed by a system of pipes similar to the furnace pipes now in general use, except that no hot air will be allowed to escape until it is distributed by radiation into the desired rooms. About 75 per cent. of the heat from furnaces is lost before it can be distributed where it is wanted. By the proposed system, if successful, none of the heat will escape until it is distributed through registers into the room, and this saving of heat will be so directly in the path of economy that the inventor claims that electricity can be used for heating houses wherever coal is used, and that it will cost no more than coal, and he thinks considerably less. The purchaser of electricity by this plan would pay only for what he uses. When the desired temperature is attained in a room the current can be completely closed or reduced, as may be desired, and a meter will record the amount of electricity used. A spring on the house registers will close the electric current, and up-stairs registers can be closed by a device on the ground floor. The results of this and other experiments designed to give us a more economical method of heating will be watched with much interest.

THE subject of street paving is at present engaging much attention throughout the American continent. Investigations are taking place in many cities to determine the wearing qualities of various kinds of paving materials, and the methods of construction which are calculated to ensure the best results. So great, indeed, is the interest aroused in this subject, that a street paving exhibition is to be held shortly at Indianapolis

Ind., to which four hundred cities have been invited to send representatives. Papers will be read by experts, and the merits of various types of practice discussed. Cedar blocks were extensively used a few years ago, and in the case of streets carrying only light traffic, they have proved, when properly laid, to be very satisfactory. On the other hand, their unfitness for streets bearing heavy traffic has been clearly demonstrated. Less than ten years ago the three principal streets of the City of Toronto, viz., King, Queen and Yonge streets, were paved with cedar blocks. This pavement is now worn out, and must at an early day be taken up. It is due to the status of the city and the health of the citizens, as well as necessary from the standpoint of economy, that these streets should be paved in the most durable and satisfactory manner possible. The City Engineer has been asked to investigate and report upon the material which should be used, and the method of construction.

This choice of materials for a first-class pavement appears to have recently become narrowed down to Medina stone, brick and asphalt. First-class Medina stone costs in Buffalo \$4 per square yard; in Cleveland, \$3.50; and in Columbus, with a ten inch broken stone foundation, \$3.25. It is said to make a very durable and comparatively smooth pavement; not being so hard as granite, is less slippery. Brick pavement has been laid to a considerable extent in the cities of Ohio during the last six or seven years, and appears to be rapidly growing in favor. In the city of Columbus, Ohio, 21 mile of streets have been paved with this material. The brick here used is made of mica shale mined about fifty miles from the city, ground to a fine flour, sifted, mixed with water, pressed, dried and thoroughly vitrified by burning. The cost, including a foundation of ten inches of broken stone, ranged from \$2.25 to \$2.50 per square yard. Asphalt is already in use on several of the streets of Toronto and Montreal, and appears likely to give satisfactory results. It is, however, open to the objection of being very slippery. The City Council of Detroit recently appointed a Committee to report on the subject of pavements, and as a result of a very full and careful investigation, the Committee made the following recommendations for street paving in Detroit: "1. That no pavements in future be laid in Detroit without a 6-in. concrete foundation and 4-in. tile drain under the curb. 2. That all pavements except asphalt have not less than a 2-in. cushion coat of sand on the concrete. 3. That curb stones, whether of Medina or Berea stone, be not less than 4 ft. in length, not less than 18 ins. in depth and 4 or 5 ins. in thickness. 4. That first-class Medina stone with filled joints be used on all very heavy traffic streets. 5. That asphalt be used by the main thoroughfares where the traffic is not too heavy, and on fine residence streets, and that brick be used on other residence and suburban streets. 6. That where wood pavements be used, the joints shall be filled with fine gravel and cement, making the surface water-tight. 7. That Medina stone, brick or asphalt be used for all re-paving. 8. That no pavement of any kind be laid hereafter without a five years' guarantee. 9. That no paving be done on any street until all water, gas and sewer connections have been made, and that a proper ordinance to enforce this recommendation be adopted and strictly enforced."

We observe that the town of Chatham, Ont., has decided to test the brick pavement, provided a suitable quality of brick can be obtained. We would suggest that, in the time which will elapse before the taking up of the cedar block pavements, the Board of Works of the city of Toronto should also make a test of the wearing qualities of brick under heavy traffic. Should it prove satisfactory, the material could no doubt be manufactured within the Province. We have been told on what appears to be good authority, that the city could effect a considerable saving in the cost of asphalt paving by having the necessary concrete foundation laid under the supervision of its own engineers, and only letting by contract the work of laying thereon the 2½ inches of asphalt surface. We observe that the City Engineer has been asked to report upon the advisability of adopting this course.

FOR the past few weeks all interested in building work in Toronto have been anxiously watching the movements of the Labor Unions on one side, and the Master Builders' Association on the other, and all have been wishing to see some sign of an agreement which would save the city building interests from being so demoralized that the season now upon us will be practically lost. Up to the hour of going to press the breach seems to widen, and we desire to cry halt! We do not wish to undertake in this connection a lengthy discussion or comment covering all the complicated questions arising out of the conflict between capital and labor. The position of this journal in regard to strikes and their consequences may be very briefly stated. We consider that strikes, as brought about and managed during recent years, are in almost every instance an unmitigated evil. As a consequence of having stated this opinion, we do not wish to be misunderstood by any member of the Labor Unions as opposing the advancement of his welfare in the least. We believe there is a good and legitimate field for the work of Unions in which the members may properly and successfully seek their own advancement, and would welcome any measure calculated on a right basis for the betterment of all wage workers, but the only basis we are prepared to admit as right for such efforts to rest upon is the old and solid one of supply and demand, coupled with the individual qualifications of one man compared with others in the same branch of industry.

Strikes are to the social or industrial life what war is to the life of a nation—simply the substitution of barbarous methods, and in many cases even brute force, for calm reason in the settlement of differences always arising. And it must indeed be an extreme case and one seldom seen which will justify even an ordinary strike. Any real mechanic should feel himself qualified to compete with the world in selling his labor in open market, and when he places himself under obligations to lay down his tools and go out on strike at the dictation of any number of men and against his own wishes and judgment, he simply places the best interests of himself and family in other hands than his own, and gives away what should be the dearest right of every true man. We are aware that human selfishness is very great, and if labor could make every strike win and secure every increase demanded in wages, it would only be satisfied when there was nothing left to demand, and the industries would be literally struck to death. On the other hand, capital in its own selfish interests would only stop the downward pressure on wages when it had reduced all labor to the level of slavery and wages were barely sufficient to sustain life. That is the tendency of capital if it were all controlled by one selfish individual, or under the too common system of combination. But happily the division of capital into many hands sets all this selfishness to pulling in different directions, and if left to work in its natural course of competition, acts as a check upon itself and a remedy for the dangers which would otherwise exist. And so the conflict goes on.

Labor unions as a whole and as individuals, seem to lose sight of many of these simple truths, and act on the assumption that force is their only resort. Not that we would say that labor union men are without reason or intelligence; but we do say that labor unions are not always controlled by the intelligence they possess, and strikes are rarely brought about except by some matter trifling in itself perhaps, and acted on more from bad temper than from the desire to further the general welfare of the community. There are good mechanics now out on strike in Toronto against their own judgment, because a majority union vote says "strike," and these men will and do tell us that they prefer to remain out and let their families and themselves take the consequences, rather than to face the treatment they would otherwise receive at the hands of the unions. Shame on such ideas of manhood! Count up the cost. Grant for the sake of argument that wages have been forced up in some cases by strikers, and that the unions carry the point in the present struggle. Still, if considered in the light of a long enough period of time and as affecting all the industries it reaches indirectly, there is always an irreparable loss to the business prosperity of

any city or country, and this must eventually react to the detriment of the strikers, be they engaged in whatever pursuit. It is perfectly safe to say that the increase of wages gained at the loss of weeks and months of solid working time is no more a profit to the workmen in the long run, than that the reduction of taxes through license fees from the liquor traffic is a profit to the community after paying the costs and losses entailed by its existence.

A solution of the problems in connection with the adjustment of wages must be recognized as being as difficult as those pertaining to the science of political economy, and a solution which every one will accept as correct and satisfactory may be considered to be well nigh impossible. But some plan for the avoidance of these periodical convulsions in our industrial life we believe must and will be found, however slow its development may be. What we would propose and appeal most earnestly to every man to strive for, is some arrangement of the present difficulties that will set and keep the wheels and machinery moving until the happy condition shall have been brought about when these disputes will be a thing of the past. To that end, and as meeting the immediate necessities of the case, we would suggest for the consideration of labor union men, master builders and every business man in Toronto, that a committee be appointed, to sit as a Board of Arbitration between the building trades and the employers for the city of Toronto, this committee to settle the present difficulty and decide what shall be the standard of wages for the years 1890 and 1891, and the same committee to remain organized for two years and re-adjust the scale of wages for the years 1892 and 1893, reporting its decision of same to the Trades Unions and Master Builders' Association on or before Jan. 1st, 1892—the same course to be pursued biennially thereafter. The membership of this Board of Arbitration should be one delegate from each branch of the building trades and one from the Building Laborers' Union, one delegate from each branch of the Master Builders' Association, and an equal number of architects, to be delegated by the Ontario Association of Architects; making in all about 25 members. Let this Board establish its own rules of procedure, except that the vote of a majority of all its members should decide any question under consideration. After settlement of the questions now in dispute, they would be prepared to receive information or complaints tending to furnish light needed for the next biennial regulation of prices. After that, a new selection of delegates could be made every two years. We believe that the Trades Unions, Master Builders and public generally could and would have confidence in such a body, and that it could be made successful not only as a regulator of wage rates, but could also be made a sort of Court of Appeal for the settlement of any differences now usually ending in a strike. The trades and masters would be evenly balanced and no doubt prepared to protect their respective interests, and the position of mediators would devolve upon the architects. We feel sure that the Master Builders would be satisfied to place themselves in the hands of such a Board and we can see no reason why the Trades Unions should not have all necessary confidence in its fairness and intelligence. Contractors are constantly placing themselves in the hands of architects in a way that involves large interests, and they know that every true architect will endeavor to see that they as well as the proprietor, get fair play. Surely the workmen ought to be ready to have as much confidence as their employers in the reasonableness of the architects. This is one of several apparently feasible plans, which might be suggested for the adjustment of such disputes. For instance, three Superior Court judges might constitute a Board of Arbitration to whom each party to the dispute would state their case and in accordance with whose ruling on all the points submitted, the difficulty would be settled.

After all it is not so important that the Trades Unions and Master Builders shall agree between themselves, as it is for them to agree in such a way and on such terms as the public will approve. Strikers may stop works already under way, but when they want new works started they must wait for the public to

give the orders according as they are satisfied with needs, prices, etc. Who will be the first to move in the right direction? Do the Trades Unions and Master Builders' Association really want peace and plenty, or do they want to continue a most deplorable contest just to see which organization is the strongest?

THE ONTARIO ARCHITECTS' ACT.

WHEREAS it is deemed expedient for the better protection of the public interests in the erection of public and private buildings in the Province of Ontario, and in order to enable persons requiring professional aid in architecture to distinguish between qualified and unqualified architects, and to ensure a standard of efficiency in the persons practising the profession of architecture in the Province, and for the furtherance and advancement of the art of architecture:

Therefore Her Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This act may be cited as "The Ontario Architects' Act."
2. All persons who shall cause their names to be registered under the provisions of this Act, shall be, and are hereby incorporated under the name and style of "The Ontario Association of Architects," hereinafter referred to as "The Association."
3. The Ontario Association of Architects shall be a body corporate by the name aforesaid, having a perpetual succession and a common seal, with power to acquire, hold and dispose of personal and real estate, for the purpose of this Act, and to sue and be sued, in the manner usual with such corporations.
4. Every person registered under the provisions of this Act, shall be a member of the said association.
5. There shall be a council of management of the said association, to be appointed in the manner provided for in this Act, and hereinafter referred to as "The Council."
- 6.—(1) The council shall be composed of nine persons, who shall in the first instance be appointed by the Lieutenant-Governor in Council within one month after the passing of this Act, and shall be British subjects, both residing and practising the profession of architecture within the said Province for at least ten years before the passing of this Act. The members of said council so appointed shall meet in the city of Toronto, in the county of York, for the purpose of organization within one month after appointment, at such time and place as may be directed by proclamation in the *Ontario Gazette*.
- (2) Any five members of the council shall form a quorum.
7. The members of the council so appointed by the Lieutenant-Governor in Council, shall hold office for the following terms respectively: the first three names mentioned for the term of three years; the second three names mentioned for the term of two years; the third and last three names mentioned for the term of one year.
8. All subsequent members of the council shall be elected by ballot, in such manner as may be provided for by the by-laws of the association, at the annual meeting of said association, or at a special meeting called for that purpose; and the member, or members, obtaining the greatest number of votes shall be declared elected.
9. No person shall be eligible for election to the council, or qualified to fill any vacancy thereon, or to vote for any member thereof unless duly qualified under the provisions of this Act and the by-laws of the association.
10. All elected members of the council shall hold office for the term of three years, except as hereinafter provided, and five shall form a quorum.
- 11.—(1) In case of the resignation or death of any member or members of the council not exceeding four, the other members of the council shall have power to fill all vacancies so caused, until the time of the holding of the next annual meeting, provided said annual meeting is not to be held within a period of three months of the occurring of such vacancy or vacancies.
- (2) In case of the resignation or death of five or more members of the council, the president or vice-president of the association, or in case of their, or either of their default for a period of ten days, any five members in good standing, shall have power to call a special meeting of the association upon a notice of not less than ten days, for the purpose of filling the vacancies so caused.
- (3) In case of an election to fill the vacancies referred to in sub sections 1 and 2, the member receiving the greater number of votes shall be considered the member elected to fill the vacancy which will require the longer term to expire, and so on until the vacancies are filled.
12. In case of any doubt or dispute as to who has or have been elected a member or members of the council, or as to the legality of the election of any member or members of the council, it shall be lawful for the other duly elected members to be, and they are hereby constituted a committee to hold an enquiry and decide who, if any, is, or are, the legally elected member or members of the council, and the person, or persons, if any, whom they decide to have elected shall be and be deemed to be the member, or members legally elected, and if the election is found to have been illegal, the said committee shall have power to order a new election.
13. Meetings of the association and the council shall be at such times

CONFEDERATION LIFE BUILDINGS BY "PAID UP POLICY"



MESSRS. EDWARDS & WENSER, ARCHITECTS, TORONTO.

and places as may be fixed by the by-laws of the association or council respectively; and in the absence of any rule or regulation as to the summoning of meetings of the association, or of the council, it shall be lawful for the president, or in the event of his absence or death, for the registrar to summon the same at such time and place as to such officer seems fit, by circular letter to be mailed to each member.

14. In the event of the absence of the president from any meeting, either of the vice-presidents, or in their absence, some other member to be chosen from among the members present, shall act as president.

15. All questions submitted to the association, or the council, shall be decided by a majority of the members present, not being less than five in number in case of the council, and twenty in case of the association.

16. At all meetings the president for the time being shall have only a casting vote.

17. There shall be paid to the members of the council such fees for attendance, and such reasonable travelling expenses as may be fixed by by-law passed by the association at the annual meeting.

18. The council shall annually elect from among its members a president and two vice-presidents, and shall appoint a registrar, treasurer, solicitor and such other officers as may be necessary for the working of this Act, who shall hold office during the pleasure of the council, and who shall, as well as being officers of the council, hold the like position as officers of the association.

19. The council shall have power to fix by by-law the salaries or fees to be paid to such officers, and to the board of examiners hereinafter appointed.

20. The council shall have power and authority:

(1) To appoint an examiner, or examiners, for the purpose of ascertaining and reporting upon the qualification,

(a) Of all persons who shall present themselves for admission and enrolment as students at any of the matriculation, preliminary, intermediate or final examinations.

(2) To make all necessary rules, regulations and by-laws respecting the admission and registration of students, the periods and conditions of study, and the enrolments of architects as members of the association and all matters relating to the discipline and honor of the profession.

(3) To regulate and fix the annual admission fees payable by architects and students, and to make all rules, regulations, and by-laws, necessary for the proper working or carrying out of the provisions of this Act.

(4) To enact by-laws as to the terms upon which it will receive the matriculation or other certificates of colleges and other institutions not in the Province of Ontario.

21. Any student who has matriculated in arts in any university in Her Majesty's dominions, or in the Ontario School of Practical Science, shall not be required to pass the preliminary examination.

22.—(1) Any person professing the profession of architecture within this province, on the coming into force of this Act, may become a member of the association, by causing his name to be registered with the registrar of the association within three months from the appointment of such registrar, and by paying to the registrar such fees as may by by-law or otherwise be made payable in that behalf.

(2) In case any such person as aforesaid omits to be registered within said period of three months, through absence, illness, or inadvertence, such person may, at the discretion of the council be admitted to enrolment as an architect.

23. Any other person who applies for admission to registration as an architect after the coming into force of this Act, shall not be less than twenty-one years of age, and shall have served as a student not less than five years with a principal or principals entitled to register under this Act, or with any other principal or principals approved by the council and have passed such qualifying examinations as may be required by this Act.

24.—(1) All students desirous of entering the profession of architecture shall be presented by a member of the council, and shall cause their full names to be entered with the registrar, and shall pay such fees, and submit to such examinations as shall be necessary in that behalf; provided that any person who, before the passing of this Act, was entered as a student for a shorter term than five years, but not less than three years, with a principal or principals qualified to be registered under this Act, or with any other principal or principals, approved by the council shall, on serving the full term of his indenture and passing the examinations prescribed by the council, be entitled to register under this Act.

(2) Notice and evidence of existing studentship shall be given to the registrar within six months after the passing of this Act, and shall be accompanied with such fee as the council shall from time to time direct, and with properly executed articles of indenture for the said term.

(3) Any person who has graduated from the Ontario School of Practical Science shall be required to serve only three years as a student, one of which three years may be served during the vacations of such school.

(4) Upon and after the passing of this Act, students shall serve such term as is required to be served by the provisions of this Act, under indenture, to a registered architect, which indenture and any assignment thereof with affidavit of execution thereto attached shall be filed with the registrar upon payment of such fee as the council may by regulation direct.

25. From and after the first day of July, 1890, no person shall be entitled to take or use the name or title of "Registered Architect," either alone or

in combination with any other word or words, or any name, title, or description, implying that he is registered under this Act, unless he be so registered. Any person, who, after the above date, not being registered under this Act, takes or uses any such name, title, or description, as aforesaid, shall be liable, on summary conviction, to a fine not exceeding \$25 for the first offence, and not exceeding \$100 for each subsequent offence.

26. The registrar of the council shall, in every year, cause to be printed, published, and kept for inspection at his office, free of charge, under the direction of the council, a correct register of the names, in alphabetical order according to the surnames, with the respective residences, in the form set forth in schedule A to this Act, or to the like effect, of all persons appearing on the general register on the first day of January in every year, and such register shall be called "The Architects' Register," and a copy of such register for the time being purporting to be so printed and published as aforesaid, shall be evidence in all courts, and before all justices of the peace and others, that the persons therein specified are registered according to the provisions of this Act; provided always, that in case of any person whose name does not appear in such copy, a certified copy under the hand of the registrar of the council, of the entry of the name of such person in the register, shall be evidence that such person is registered under the provisions of this Act.

27. If the registrar shall wilfully make, or cause to be made, any falsification in any matters relating to the register, he shall be deemed to be guilty of a misdemeanor, and shall, on conviction thereof, be imprisoned for any term not exceeding twelve months.

28. Any person who wilfully procures, or attempts to procure registration under this Act by making, or producing, or causing to be produced, or made any false or fraudulent representation, or declaration, either verbally or in writing, that he is entitled to such registration, shall be deemed guilty of a misdemeanor, and shall, on conviction thereof, be sentenced to imprisonment for any term not exceeding twelve months.

29. There shall be paid to every registered architect summoned to attend any court, civil or criminal, for the purpose of giving evidence in his professional capacity, or in consequence of professional services rendered by him as an architect, for each day he so attends, in addition to his travelling expenses (if any), and to be taxed and paid in the manner by law provided with regard to the payment of witnesses attending such court the same fee or allowance as is payable to provincial land surveyors.

30.—(1) All fees payable under this Act may be recovered as ordinary debts due to the association, and all penalties under this Act may be recovered and enforced before one or more justices of the peace, in manner directed by the Revised Statutes of Canada, chapter 178, entitled the *Summary Convictions Act*, and any Act amending the same.

(2) Any sum or sums of money arising from conviction and recovery of penalties as aforesaid, shall be paid immediately upon the recovery thereof by the convicting magistrate to the registrar of the council.

(3) Any person may be prosecutor or complainant under this Act, and the council may allot such portion of the penalties as may be expellent towards the payment of such prosecutor.

31. Subject to the other provisions of this Act, all notices and documents required by or for the purposes of this Act to be sent, may be sent by post, and shall be deemed to have been received at the time when the letter containing the same would be delivered in the ordinary course of the mail, and in proving such sending it shall be sufficient to prove that the letter containing the notice or document was prepaid and properly addressed and put in the post. Such notices and documents may be in writing, or in print, or partly in writing and partly in print, and when sent to the council or other authorities shall be deemed to be properly addressed if addressed to the said bodies or authorities, or to some officer of the council or authority at the principal place of business of the council or authority, and when sent to a person registered under this Act, shall be deemed to be properly addressed if addressed to him according to his address registered in the register of the association.

32. All moneys arising from fees payable on registration or the annual renewal fees, or from the sale of copies of the register, or otherwise, shall be paid to the registrar of the council, and by him paid over to the treasurer, to be applied in accordance with such regulations as may be made by the council for defraying the expenses of registration and the other expenses of the execution of this Act, and subject thereto towards the support of museums, libraries, or lectureships, or for other public purposes connected with the profession of architecture, or towards the promotion of learning and education in connection with architecture.

(2) The council shall have power to invest any sum not expended as above, in such securities as shall be approved by the Government of the Dominion of Canada, or of the Province of Ontario, in the name of any three of their number appointed as trustees, and any income derived from such invested sums shall be added to and considered as part of the ordinary income of the association.

(3) The association may also use surplus funds or invested capital for the rental or purchase of land or premises, or for the building of premises to serve as offices, examination halls, libraries, museums, or for any other public purpose connected with architecture.

33. The registrar and treasurer of the council shall enter in books to be kept for that purpose, a true account of all sums of money by them, or either of them, received and paid under this Act, and such account shall be

audited and submitted to the council at such time, or times, as the council may require.

34. It shall be the duty of the registrar to keep the register in accordance with the provisions of this Act, and the by-laws, orders and regulations of the council.

SCHEDULE A. (Section 26.)

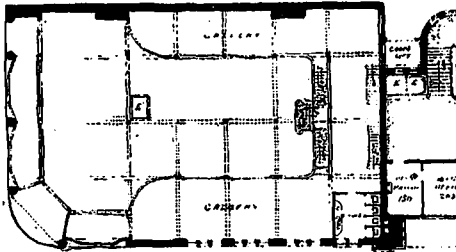
A. D. 1889.

Date of Registration.	Name.	Title or Distinction (if any).	Residence.
1890. July 1st.	A. B.	Toronto University.....	Toronto.
1891. Aug. 1st.	C. D.	London.
	E. F.	Ottawa.
	G. H.	Toronto.
	I. J.	Hamilton.

NOTES ON THE CONNECTION BETWEEN THE DIFFERENT STYLES OF "GOTHIC."

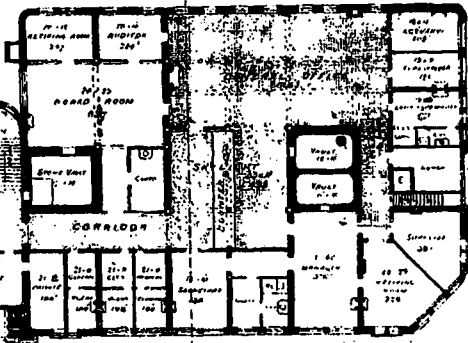
By R. W. GAMBIER-BOUSFIELD.

Our Secretary told me that he thought this would be a very useful subject for to-night's discussion because there is always a difficulty in ascertaining from books a reason for the "change of style," as it is called. The fact is, that the books usually at the command of students do not give any concise reasons. They give full particulars of the details and characteristics of each date, but they leave it to the ingenuity of the reader to connect the styles. The reasons are there, if sufficient care is taken to decipher



GALLERY PLAN

PLAN OF OFFICES ACCOMPANYING MESSRS. EDWARDS & WEISBERG'S DESIGN FOR CONFEDERATION LIFE ASSOCIATION BUILDING.



GROUND PLAN

them, but in order to do this accurately, the study of a great many books is necessary, otherwise the reader is apt to get hold of some one author's ingenious theory, and to believe that theory to be fact, not having the means of ascertaining the truth.

I hope you have all been looking up the subject during the past fortnight, and are come prepared to lecture me as well as I can lecture you. I am not going to give you a formal lecture, but rather I shall string together a few notes to form a basis for a discussion.

The question before us then is, "What was the reason of the change from one style to another in architecture?" Why has not the architecture that was so fully developed eight centuries ago remained the same,—heavy, magnificent and glorious style that we call "Norman"—to this day? Or why, when the Early English was so characteristic of English art and feeling, was any change found necessary? But in order to answer this question, we must first find out in what architecture consists. What is architecture? And strange to say, you may ask a great many men this question, and not receive the same answer from two of them. But it is a very simple answer when once any one has found it out. The most comprehensive definition that I know is, "Architecture is ornamented or ornamental construction." "So far, so good, but what is "ornament?" That word requires some further explanation. Everybody now-a-days answers this question for himself according to his own ideas, which ideas are formed upon or based upon, his knowledge of the art. What one man thinks ornamental, another thinks vile or at least barbarous; and when one architect believes he has ornamented his building in a very satisfactory manner, and feels very "cocky" about it, another architect thinks that the man who designed such a piece of work ought to be taken into a ten acre field and shot.

Medieval architects, however, answered this question for themselves and for us, and have left their answer for those who choose to read it, graven in

imperishable stone. Our Medieval cathedrals are their answer. From them we learn what is true ornament. This is solved the problem; and they show us what relation ornament bears to construction.

There is one other question to answer before we proceed with our subject. It is, "What is 'Gothic?'" For apparently there are two distinct forms of architecture called by the same name. The round arched and the pointed are both called "Gothic." However, "Gothic" simply means that style of architecture that was developed by the French or "Goths"—not the semi-barbarian Visigoths and Ostrogoths—but their civilized descendants, whom we now call French. Classic architecture was developed by the Classic nations, the Greeks and the Romans. The French developed the Gothic, and the terms French Gothic, German Gothic and English Gothic, are used to designate the peculiar characteristics of the style, as it is found in either of these countries.

The first introduction of the round arch into Europe was by the Romans some 250 years B. C., but it was not until a thousand years later that the pointed arch was used. The French were the first to make use of it about A. D. 850. Some three hundred years later, however, the pointed arch fell into disuse because its characteristics were not fully appreciated. During that time it had been used in conjunction with the round arch, but it was the round arch that best suited the requirements of that period, and is the principal feature of the "Latin" or "Norman" style.

It is customary to speak of the "Norman" "Early English" "Decorated" and "Perpendicular" periods as of separate styles, and this has given rise to the difficulty—whereas in reality they are by no means so, but are rather progressive steps in the working out of a great problem. That problem was not one of design, but it was the question of construction, and there you have a reason for the so-called "change of style,"—the working out of a

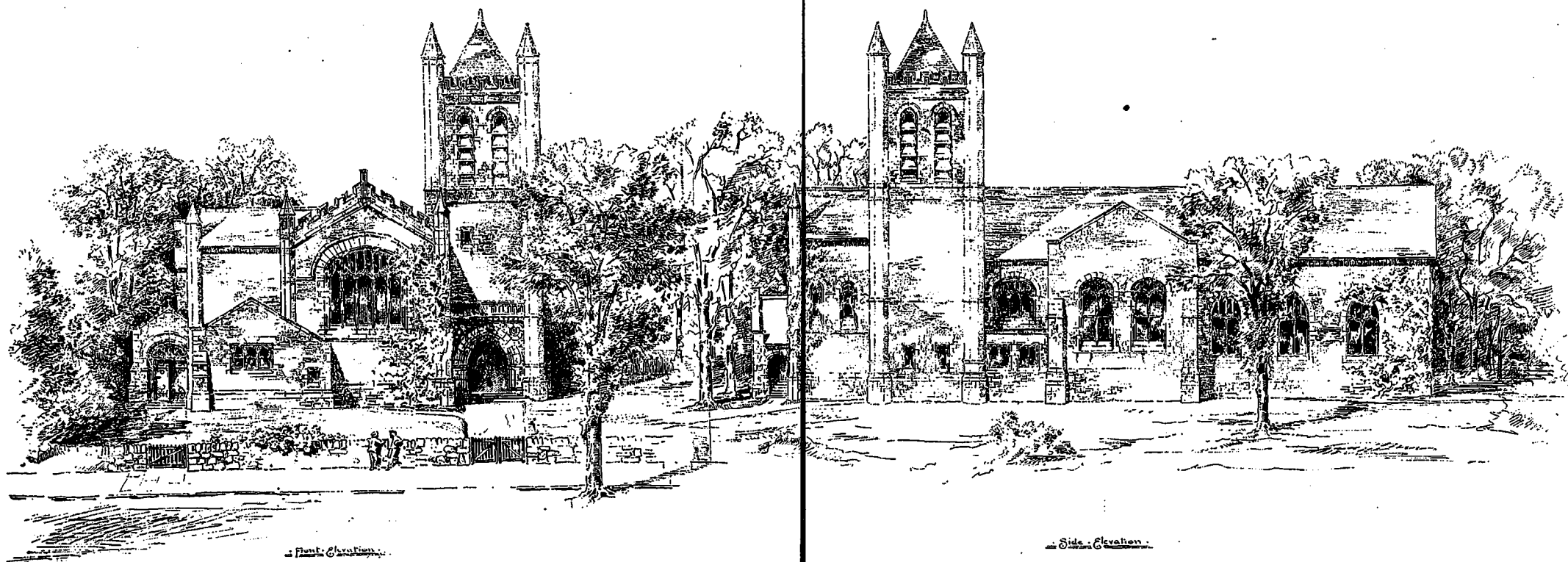
problem of construction. The problem was, how to roof in their buildings with their heavy stone vaults, and yet admit the greatest amount of light. It was easy enough to build walls solid enough and strong enough to support the great roofing, but the question was, how they could support the vault when it was necessary to convert the solid walls into windows. This problem resolved itself into another, which was, how to arrange their building materials so as to obtain the greatest result with the smallest amount of material, or in other words, to discover a perfect method of construction, giving to every particle of material its work to do, and having no more in use than was necessary.

You remember how, in the earliest days of architecture, when the pyramids were built, they were constructed of solid masonry several hundred feet thick, with only some narrow passages and small chambers in the interior quite out of all proportion to the amount of the material used in their construction. They had of course their reasons for building in this way, but anyone building a tomb now, containing a room say 12 feet square, the walls of which were 200 feet thick would be considered a fool. But it took more than four thousand years to find out how to construct properly, and between the time of the pyramids and the period we are considering, the science of building with walls and roof was developed; and we need not go back further than the Romanesque—that intermediate style between Classic and Gothic—for our purposes to-night.

The Romanesque was admirably suited to the brilliant climate of the sunny south. Its small windows admitted just enough light, and not too much hot air; and their small proportions did not endanger the stability of the walls supporting the heavy roofing. The Roman method of roofing was to make one covering answer for ceiling and roof—a method satisfactory neither inside nor out—for a dome high enough for the external appearance was too high for the interior, and vice versa. So in the south of France and north of Italy this was not attempted, but instead, they formed their ceiling of stone vaults and covered these externally with wooden roofs.

The earliest roofs consist of a series of domes along the naves—a simple

* Paper read before the Toronto Architectural Sketch Club, illustrated by diagrams.



SKETCH FOR A CHURCH AT SMITH'S FALLS, ONT.
MESSRS. DARLING & CHURCH ARCHITECTS, TORONTO.

extension of the manner of roofing the earlier circular churches. They built square and a circle at the top, and so on and so on, until the required length of nave was attained. But with the Gothic the tunnel or barrel vault was the simple means employed of roofing the nave. Where side aisles existed, a semi-vault was thrown over them to help in resisting the thrust of the main vault. This relieved the walls of considerable weight, and having found that it was possible in this way to support the vaults and piers, they made their roofs of two stories, putting windows in the outer vault to give light to the upper part of the nave. But still there was no light in the vault or roof.

Now in Normandy, a more northern province, and still more so in England, more light was essential, and simpler it seems, this was the actual cause of the development of the pointed Gothic. You have only to go to the north of France to see this for yourself. Church after church was erected, and the steps in the problem are to be seen almost all, and we must allow these steps to show how the problem was solved at the turn of the Medieval architects. But to make myself clear is by no means an easy matter. There is nothing more intricate in all our science than vaulting, and I doubt if it is possible in five or ten minutes to enable those among you who know very little at present on this subject to comprehend it through what I say. I can only give you an outline now—details must be filled in later.

First, the first thing that we find them doing in order to obtain more light, is to alter the form of the vault. Hitherto it has only been the barrel or the pointed arch in section, and the first idea that appears to have occurred to them, was the absolute necessity of raising the side walls above the springers of the vault. This was accomplished by the introduction of bold diagonal ribs or groins stretching across the nave from south-west to north-east and north-west to south-east, and making the walls vary thick at the corners of the square vaulting, and building piers in the form of a cross to resist the thrust of the groins. Thus the vaulting divided the nave into squares, and as the aisles were narrower than the nave, the square of the aisle roofs was smaller than the square of the nave; so that an intermediate pier in the nave that had really nothing to do with the vaulting of the nave, but formed a corner of the aisle vaulting, had to be put in; and in order to give it a semblance of use in the nave, they carried it up and threw a small arch across the nave which gave some support to the top of the groining which did not require it at all.

This was so evident a makeshift, and so contrary to the spirit of art which does not admit of shams, that they found it was of no use attempting anything further with the round arch, and notwithstanding all the ingenuity expended upon the subject in France, Germany and England, their attempts to make the round arch serve the purpose proved futile. The consequence of this proved momentous, and they decided they must adopt the pointed arch. They made the attempt, they found their way out of the difficulty. By using the pointed arch for the finish of the nave walls, they could not only attain any height they required, but it was no longer necessary to make the plan of each section of vaulting a square; but instead, the intermediate pier became a main one, giving its support not only to the vaults of the aisles, but also to the nave vaults. Then, if they made the section of the nave a pointed arch, and building piers in the form of a cross to resist the thrust of the groins, these lofty vaults gave, however, a tremendous thrust to be resisted, and enormous buttresses were built to counteract it. There was only one other step to be taken; if they made the pointed arch of the side walls spring from pier to pier, as a discharging arch, they could do what they liked with the wall itself. With no weight to support, they could pierce its whole width from pier to pier with windows or other openings, for it had become simply a screen to protect the interior of the edifice. It had become what Ruskin called "a veil," serving no further purpose than a veil or curtain.

The pointed arch once introduced, was fully substituted for the rounded heads of windows and doors, and airiness and lightness henceforth characterized every detail.

One other great constructional or structural feature we must notice before proceeding with the problem of vaulting. The immense buttresses, so proceeding and had hence occupied a great deal of space, and it was required to reduce them to a minimum. Have you ever thought what could be the relation of the pinnacle to the buttress? Probably you have thought it was more an ornament than a want. If you open your pocket-knives and stick the point of one blade in the table and then press against the upper end of the handle horizontally, it will very soon tumble over; but if you put a weight on top of the handle, it will not be so easy to knock down the knife. So it was with the buttresses. The pinnacle acts as a heavy weight pressing down upon the top of the buttress, and in proportion to its weight the size of the buttress could be reduced. This was a very neat problem, to determine the weight and size of the pinnacle as compared with the size of the buttress necessary to resist the thrusts of the vaults. This is Early English art, the most perfect of the English periods.

Upon all this followed a gradual transformation also we can speak about the new group of three lancets enclosed beneath a label moulded, left solid spandril that were only reduced, not done away with, when five lancets were placed side by side. It was a simple matter to pierce this spandril with a trifol or something of the sort, but why have it there at all when there was a relieving arch above it which carried all the super-imposed weight? These piers became shafts with capitals and bases instead of piers. They turned the trifol into a trifolium, which in time became the trifolium of the perpendicular, and by these features alone one can tell the date of any church in Christendom. As the Decorated took away the piers from between the lancets of the Early English, the Perpendicular changed the pillars of the Decorated into vertical mouldings.

Having reached perfection of utility in vaulting, the restless spirits tried to improve upon perfection, and in doing so, naturally went from bad to worse, until after expending the most consummate ingenuity, they had to confess they had gone back to the original starting point, when to introduce the pointed arch again was their only salvation. They desired to

lighten the heavy inverted pyramids of the simple form of Early English vaulting, (as shown on the diagram.) They cut off the corners and made semi-octagons of them. Each side of this figure was again sub-divided, until it was so nearly a circle that it was impossible to resist the temptation of making it one. These circles, as you can see, left large flat spaces at the crown of the vault that required support, and were not satisfactory to decorate, but by a continuation of one of the rays of the circle, a diagonal rib was obtained, which gave this flat surface a camber. But where the height of this rib, owing to the pitch or rise of the diagonal rib, would have been very great, they adopted—or attempted either, for it did not become a fixed principle—that ingenious feature, the pendant, literally hanging from the ribs, the backs of which pressed together gave it support. It was a structural makeshift, and therefore a failure architecturally.

Hitherto their lines had all been true parts of circles, every line a single curve from springer to crown, but here in order to make this fan vaulting possible, they introduced the present day and the four-centred arch. So long had they sunk in their struggles with construction, that they had lost all feeling of art. Every feature was now dealt with from a purely constructional point of view, and art was almost dead. It came about in this way. They had got back to the former principle of vaulting the naves in squares. From each pier springing a fan vault, the main or transverse rib became broken-lacked, and the section thus produced was the four-centred arch. Very many imitations of the present day find this wretched makeshift a very convenient feature in their construction—convenient, but not artistic. There is an excuse now-a-days for its use in the economy of house planning, but let me urge upon you to do without it whenever it is possible. Never introduce it as a feature in any of your designs, or you are trying to make of an acknowledged abortion, a thing to be admired. But no one ever succeeded yet in the attempt. You may as well try to make a silk purse out of a sow's ear. You can make a useful article out of it, but not a silk purse.

Now I must bring this rapid sketch to a conclusion, and no doubt your President will open the discussion.



CONTRACTS OPEN.

- PEMBROKE, ONT.**—An addition is to be built to the public school.
- CRANBROOK, ONT.**—The Foresters' Court contemplate building a new hall.
- SPRINGHILL, N. S.**—A new school house to cost \$5,500 will probably be erected here.
- ESSEX, ONT.**—Messrs. Williams Bros. will rebuild the Gardner Block, which was recently burned.
- SMITH'S FALLS, ONT.**—Mr. Alexander Wood contemplates the erection of a four storey oatmeal mill.
- COMBERNERE, ONT.**—\$900 has been granted by the Ontario Government to complete the repairs to the bridge here.
- OTTAWA, ONT.**—The present season's expenditure in building operations will amount to about half a million dollars.
- BARRIE, ONT.**—It is said that the Methodists and English Church people of Trout Creek, are preparing to build new churches.
- WOODSTOCK, ONT.**—The Mayor has called a public meeting for the 22nd, to discuss plans for the maintenance of a public hospital.
- ORILLIA, ONT.**—Mr. J. M. Moore, of London, Ont., has been engaged to report on the enlargement of the water works system.
- WATERLOO, ONT.**—The Methodists will erect a church at an estimated cost of \$7,800.—A Roman Catholic church to cost about \$3,000 will also be built.
- MOOSOMIN, N. W. T.**—Mr. C. H. Wheeler, of Winnipeg, is preparing plans for a large brick and stone hotel to be built here for Mr. Whymising. The building will cost about \$8,000.
- NELSON, N. S.**—\$50,000 has been appropriated for increasing the capacity of the water system, constructing a system of sewerage, and improving the streets.
- LONDON, ONT.**—Rev. Mr. McLaurin will erect a handsome residence at the corner of Cromwell and Vidal streets.—By-laws authorizing the block paving of several streets have passed.
- WINNIPEG, MAN.**—It is said to be the intention of the Great Northwest Railway to extend its lines at least 100 miles during this summer. The work will be commenced some time in June.
- KINGSTON, ONT.**—The plans prepared by Mr. Newland, architect, for a central fire station, have been accepted.—The School Board will ask the Council to grant \$20,000 for the erection of a new school building.—Mr. Dickinson has purchased a site for three dwellings on Sydenham street.
- MONTREAL, QUE.**—The location of the proposed new buildings on the McGill University grounds have been decided upon. It is said that work will be entered upon immediately, and the whole completed before the end of the year.—Tenders will be shortly asked for plumbing and heating the new Victoria hospital.
- HAMILTON, ONT.**—A site for a north end branch of the Bank of Hamilton has been purchased at the corner of James and Barton streets.—Plans have been prepared and tenders will be immediately asked for remodeling the Central School building.—The Finance Committee of the Council recommend the issuing of debentures to the amount of \$50,000 for school building purposes.
- TORONTO, ONT.**—Plans are being prepared for a new factory to be erected for Millicanp & Co., on King st. west.—Extensive alterations are to be made to the Millicanp buildings, Adelaide St. E.—The Public Library Board has instructed its architect to prepare plans for a branch library building immediately west of College St. fire station.—A sum has been added to the estimates of the Public School Board to cover the erection of a new school building in St. Matthew's Ward.—Mr. W. H. C. Kerr will erect a business block adjoining the new Canada Life Buildings on King St. west.—The following building permits have been issued: Mrs. Gates, pr. 2 storey and attic block, stores, 227 and 229 King St. east, cost \$3,500.

OUR ILLUSTRATIONS.

COMPETITION DESIGN FOR CONFEDERATION LIFE ASSOCIATION BUILDING.—MESSRS. EDWARDS & WEBSTER, ARCHITECTS, TORONTO.

SKETCH FOR A CHURCH AT SMITH'S FALLS, ONT.—MESSRS. DARLING & CURRY, ARCHITECTS, TORONTO.

QUERIES AND ANSWERS.

APRIL 7th, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—Would you kindly inform me through your valuable journal whether a contractor, under a contract similar to the revised contract used by the architects and builders of Toronto, would be justified under "clause 8," in refusing the owners or their janitor access to a building prior to its completion, for the purpose of putting on fires, unless relieved by the owners from all liability under the above clause? and if the contractor did the firing, would he be entitled to be paid by the owner for his services. The contractor having allowed the owners to use the building some two months before his contract expired, and before other portions of the building were finished, and access to the furnaces being impossible except through the unfinished portion where shavings, chips, etc., were scattered in abundance, would the owners be justified in enforcing "clause 9," and in charging the contractor with the insurance while they were themselves using the building? An answer will oblige.

Yours truly,

SUBSCRIBER.

[This is clearly a question of law, and one which we imagine a lawyer even would decline to express an opinion upon without being in possession of all the circumstances of the case. It may be that "Subscriber" is behind with his contract. This and a score of other circumstances might have to be taken into consideration in deciding a case of this kind. We would advise "Subscriber" to lay all the circumstances before a lawyer and be governed by whatever he may advise.—ED. A. & B.]

PUBLICATIONS.

The *Cosmopolitan* magazine, of New York, offers a prize of \$200 for competitive plans for each of the following subjects: Public Baths; Public Laundries; Public House Co-operative Kitchens. Drawings are to be sent in on or before May 10th.

We have received a copy of a new illustrated catalogue just issued by the Toronto Pressed Brick and Terra Cotta Co. It comprises 50 pages of text and illustrations representing various styles of brick and terra cotta adapted to a variety of purposes. Testimonials regarding the satisfactory quality of the company's products are given by leading architects. We are pleased to notice the success which is being achieved in this new field of Canadian manufacture.

"CANADIAN ARCHITECT AND BUILDER" SERIES OF PRIZE COMPETITIONS.

THE following is a list of competitions in Architectural subjects which we have decided to hold during the winter.

1st.—Three designs with details, for front fence. Designs to be sent in on or before 1st May, 1890. First prize, \$5; second, one year's subscription C. A. & B.

2nd.—Essay on Heating and Ventilation. Essays to be sent in on or before 1st May, 1890. First prize \$10; second one year's subscription to C. A. & B.

The Architectural Guild of Toronto have very kindly appointed a committee from their number to judge the above competitions. We shall publish each report as sent to us by the committee. Draughtsmanship, neatness and clearness of arrangement of drawings will be taken into consideration in awarding positions.

Drawings must be made on sheets of heavy white paper or bristol board 14 x 21 inches in size, and must be drawn to allow of their being reduced to one-half the above size. Drawings must be made in *firm, strong lines*, with pen and *black ink*. No color or brush work will be allowed.

Each drawing must be marked with the *nom de plume* of its author, and the author's name, *nom de plume* and full address, enclosed in sealed envelope, must accompany each drawing sent in.

We reserve the right to publish any design sent in.

Drawings will be returned to their authors within a reasonable time after the committee has given its decision.

AN EASY METHOD OF CALCULATION.

CITY HALL, QUEBEC, March 8th, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

The following is an easy method of calculating the area of cross section of waney timber or of any regular or symmetrical octagon:

RULE.—If a , b , c , d the area equal a b - c f or the square of the diam. or thickness of the log, less the square of the wane e f ; as it is immediately seen that the square e g on e f is equal to the four wanes of the log.

If a , b and c , d be unequal, which they often are to the extent of an inch or two, then the area is equal a b x c d less e f , and if the wane is irregular or different at the four corners, add the four and assume e f = $\frac{1}{2}$ thereof, which will give a result extremely near the exact area.

C. BALLAUGE, Architect and Engineer.

24 Chomodey St.,

MONTREAL, April 5th, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—In glancing over my essay on plumbing which you were good enough to print in your last issue, I would call your attention to one or two slight errors, viz.:

"Brick piers" should be read in place of "thick piers." I am made to say "waste pipes, etc., should never be trapped," etc., whereas the "never" should be omitted. "Draw off trap" should read "draw off tap."

Yours truly,

T SQUARE.

CREDIT WHERE CREDIT IS DUE.

MONTREAL, March 20th, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—In inserting illustrations of some of the sculpture from Mr. Drummond's house here in last month's issue, you omit any mention of the carver. We will feel obliged by your stating in your next issue that Mr. H. Beaumont, of this city, executed all the sculpture and carving for us on this building from our designs and full size drawings, and we have pleasure in bearing testimony to the fidelity and spirit with which he interpreted our ideas.

The capitals of the porch columns which you illustrated, are emblematic of Architecture, Music, Painting and Sculpture.

Faithfully yours,

TAYLOR & GORDON, Architects.

WANTED—A CODE OF PRACTICE.

HAMILTON, March 20, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

As the advent of the incorporation of the architects of the Province of Ontario is close at hand, when the profession can rank with the other learned professions, it behooves its members to be firmly united in spirit and practice, and to have a code of rules and conditions strictly to be observed under all circumstances, and from which any departure could only be made at the risk of the party so deviating. This code of rules and practice should be prepared with wisdom, forethought and discretion, so that when the proclamation is made it will be favorably received by all the parties concerned.

Yours truly,

ARCHITECT.

THE PROPER POSITION FOR INLET PIPES.

TORONTO, March 15, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—What are our master plumbers thinking about, when, as reported in this month's issue of your paper, they want to have the *inlet* pipe for fresh air carried up to the roof of the houses when it is considered unsightly on the ground? If this is done, it is no longer an *inlet*; the very principle is affected by this absurd proposition. It would then be the same height as the soil pipe carried up through the roof, and there would be

no current of air through the soil pipe at all. The inlet should be as low, and the outlet as high as possible in every case. If the inlet is to be carried up to the roof, and *inside* a house, there will at once be an *up* draft, except that as it is in connection with the soil pipe in which also an *up* draft would be created, but for the height of the so called "inlet," but as they are connected there will simply be a stagnation of air in the pipes.

Yours truly,
ARCHITECT.

TORONTO ARCHITECTURAL SKETCH CLUB.

IN accordance with the suggestion of Mr. S. G. Curry, no special subject was announced for the meeting to be held Tuesday, March 25th, over which he was to preside. Many subjects were brought up for debate and some lively discussions were the result, among those taking part being Messrs. Simpson, Dawson, Brown, Barrett, Rae and Wilby.

The third club competition was decided at this meeting, a good showing of drawings for a baptismal font having been submitted. The following were the successful competitors in order of merit: Senior Section, Messrs. G. T. Goldstone, J. A. Radford, C. J. Gibson; Junior Section, Messrs. A. C. Barrett, T. B. Johnston and J. Y. S. Russell.

A thoughtful and well rendered design was received from Mr. J. McC. Radford, a Montreal member of the club, but it was too late to be judged with the other members. Mr. Frank Darling gave a thorough criticism of each of the designs in an impartial and acceptable manner.

The first exhibition of the club was opened to the members at this meeting and to the public for the remaining days of the week. It was a loan exhibition by Mr. Wm. R. Gregg of photographs of representative buildings in the United States, and proved a very interesting one to the members and to the large numbers who visited it during the week.

On Tuesday, April 8th, the club forsook its headquarters to accept the invitation of Mr. James Bain to spend the evening at the Public Library in studying the many works on architecture it contains. Few were aware of the value of the collection, and the meeting will probably result in a more liberal patronage of the institution by the architects and draughtsmen who were present.

NOTES.

The Club is rapidly gaining in numbers. At the last meeting the following names were put through: Messrs. J. P. Murray, M. B. Aylesworth, J. P. Hynes, W. A. Sherwood and John A. Pearson.

Some forty members have taken advantage of the special artist's rate granted the club and secured season tickets to the Toronto Art Gallery.

It has been suggested that a Photographic Section be formed for the summer season, the object being the organization of photographic trips, and holding of exhibitions of amateur work.

QUEBEC.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

LARGELY attended meeting a few days since passed resolutions favorable to the erection of a monument to the memory of Major Short and Sergt. Wallick of B Battery, Canadian regiment of artillery, who were accidentally killed while looking at the great fire of the 16th May last, when a large portion of St. Sauveur was destroyed. Collectors have been appointed to canvass for subscriptions, and a committee named to open negotiations with Canadian sculptors with a view of arriving at a decision as to a design and cost. It is anticipated that a sufficient sum will be available to guarantee the erection of a handsome memorial.

Plans for the new hotel proposed to be built on the site of the old Parliament buildings are now being prepared. When completed they will be submitted for final approval by the directors, when tenders for its construction will be invited, it will approximate \$200,000 in cost. Work will probably begin about the end of May. Standing at an elevation of about 150 feet above the St. Lawrence, its position will command a view of the magnificent scenery seen from the famed Dufferin Terrace, including the village of Beauport and St. Joseph, the town of Lévis, and the Island of Orleans, also the whole harbour of Quebec, and Montmorency Falls in the distance. It is intended to connect the Lower Town with the hotel by means of an elevator.

The Academy of Music has lately undergone a thorough overhauling, including a very considerable enlargement of the stage, new scenery, new dressing rooms and green room in basement, a graded floor in the auditori-

um, and new opera chairs of the best make, the whole tending to a vast improvement upon the original building. Mr. W. E. Russell, the present proprietor, intends having the Academy open all the year round, and so remove the staid reputation of Quebec, that it has no place of amusement. A hearty endorsement of this enterprising spirit, on the part of the public, is now in order.

OWEN SOUND.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

The building outlook is good this season. Plans have been prepared for the following: 3 storey building, store and offices, brick and limestone trimmings, corner of Baker and Poulett streets, 25 ft. by 100 ft., I. T. McCallum, owner; 3 storey building, 30 ft. frontage by 76 ft. deep, for J. S. J. Parker, two stores and office and lodge rooms above. Building will be red brick with Credit Valley stone trimmings; R. Chuskie, residence; J. C. Crane, residence; R. P. Butchart & Bro. are rebuilding on the site of their old stand, two storeys 57 ft. on Poulett St. by 100 on Baker, to be laid out in two stores with offices above. Mr. John Miller is about to build a terrace of three houses; total frontage of 71 ft.

Twelve feet of land on Poulett st. was bought on Thursday last at \$250 per foot frontage. This is the highest that has ever been paid for land in Owen Sound.

The C. P. R. are rapidly pushing ahead the sheet piling and slips, and the dredging will commence soon.

MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE prospects for a busy building trade in our city are brightening, and ere the present season closes we expect to have commenced several important buildings, amongst others the following: The Y. M. C. A. on Dominion Square, the Victoria hospital at the head of University street (the gift to the city of Sir Donald A. Smith and Sir George Stephen); the new Science School for McGill University, (the gift of the late James Workman), the Sun Life building on Notre Dame street and a large mansion on upper Peel street for Duncan McInyre, estimated to cost half a million, and only yesterday was added to this a magnificent gift to McGill University by Mr. W. C. McDonald, of about half a million dollars which includes two buildings which he has agreed to erect for the college, one to be the "McDonald Technical Building," and the other the "McDonald Physics Building." All Mr. McDonald asks the Governors of the University to do is to provide a site and approve of the plans—the rest he undertakes himself. It is estimated that the two buildings with their equipments will cost about three hundred thousand dollars. McGill college will be thus placed in a position equal to the best on the continent, and with the new means at its disposal will be able to adapt the faculty to the immediate demands of the hour by establishing chairs of electrical and mechanical engineering, etc. Besides these, Sir Donald A. Smith has bought the residence of the late Thomas Workman which occupies a position on the College grounds, and which he proposes altering and adapting for use by the Donaldin Department for lady students.

During the last month permits have been taken out for: some ten or twelve buildings, ranging from two to six thousand dollars a piece.

REAL ESTATE.

Real estate during the past month has been active, building lots in the west end being in specially good demand. It is almost impossible to buy choice lots in the city to-day, but there is plenty of land available in the vicinity of Montreal, the only drawback being the transit facilities. As soon as some system of rapid transportation is put into effect, which must of necessity soon be, farm properties in the neighborhood of Montreal will attract the attention of investors, speculators and home seekers. During the month of February the sale transfers in Montreal and Cote St. Antoine amounted to \$571,905.54, which is about \$22,000 more than the corresponding month of last year.

CANADIAN SOCIETY OF CIVIL ENGINEERS.

The Canadian Society of Civil Engineers have leased club rooms over the west end branch of the Bank of Montreal, on the corner of St. Catherine and Mansfield streets, and expect to move into them on the 1st of May.

FLOOD PROTECTION.

I learn that Mr. Keefer has arrived in the city to watch the action of the ice in breaking up, he having been appointed by the Government to report to them on the feasibility of plan No. 6.

NEW BRIDGE.

I learn a charter has been granted to a local company for the construction of a bridge from Montreal to Longueuil. The charter I understand has certain restrictions which will have to be overcome before any work is commenced, such as satisfying the City Council, the Harbor Commissioners, the Board of Trade, etc., etc. No doubt some better means of communication between the two shores of the St. Lawrence at this point is wanted, but whether it should be in the form of a bridge as proposed or some such scheme as the Shearer scheme, is a question upon which engineers, like doctors, differ. To my mind the Shearer scheme, with certain modifications, would be the most practical scheme yet presented for either connecting both shores of the river, for harbor improvements or flood protection.

It is to be hoped that some opportunity will be given to the Government Board to examine this scheme previous to adopting plan No. 6.

ARCHITECTS OF THE PROVINCE OF QUEBEC.

The principal architects residing in Montreal held a meeting this afternoon for the purpose of discussing the advisability of seeking incorporation, similar to that proposed for Ontario. There was a large attendance and many spoke strongly of endeavoring to form a Dominion association rather than a provincial one; but at all hazards to protect the interests of the province of Quebec with least incorporation if it is not possible to have Dominion incorporation. A committee was appointed to report as soon possible.

NO FLOODS THIS YEAR.

The harbor is clear of ice. No floods this year.

"CANADIAN ARCHITECT AND BUILDER" SERIES OF PRIZE COMPETITIONS.

INTERIOR DETAILS OF A MODERATE COST HOUSE.

IN this competition it is no easy matter to arrive at a satisfactory decision, as no one of the five drawings is free from objections. We place them in the order named "Echo," "Three Circles" "Novice," "B" and "Nota Bena." Granted that the details for a small house should be simple and quiet in character, "Echo" naturally comes in for first place, especially as his ideas are good while his details cannot be called bad. If executed in really good materials and in a workmanlike manner, the effect would be good enough for any small or moderately large house. The draughtsmanship is not up to the mark.

In giving "Three Circles" second place, it may be said his ideas are in good taste though too elaborate for a small house, one of his architraves having 4 members. It cannot be said that his details are better than those of "Echo." His beam, post and pilasters are rather out of date, and while the drawing is better, though marred by some carelessness, his printing would not look well in the pages of the ARCHITECT AND BUILDER.

"Novice" has the same faults. His ideas are not new, and his details, with some exceptions, are common, while his drawing shows no superiority.

"B" has a very painstaking drawing and deserves encouragement, but while his details are neither good nor new, they are too elaborate, his base being composed of four pieces with but one plain piece in the lot.

"Nota Bena" has not enough detail to cover the ground. Those he does show are, however, simple, and to that extent commendable. He eschews printing.

Your obedient servants,

R. G. EDWARDS.

JOHN GEMMELL.

W. A. LANGTON.

The author of the drawing marked "Echo," to which the committee has awarded first position, is Mr. James Walker, 5 Ann Street, Toronto. The names of the authors of the designs placed second, fourth and fifth have not reached us. We would be pleased to receive them.

COMPETITION FOR MANTELS.

We beg to report that drawings received in competition for mantels are a disappointment, yet it might have been expected that for the one feature in most houses used as the vehicle to display a little art or a violent striving after it, would have been an opportunity which should have evoked more hearty response.

We place first designs by "1890" as being quieter in taste, and showing more architectural knowledge of mouldings and their arrangement, although execution of drawings wants clearness and decision.

No. 2 by "Pen and Ink" is neat, painfully so, perhaps. The author would do well by ardent practice to attain more freedom of line.

"Andiron's" designs are modelled on old types, it being generally admitted now that shelf 3' 9" or 4 ft. is altogether too low, with no excuse except saving material when marble was in vogue.

Of designs by "Minerva," would say there are a good many ideas gathered together, exaggerations of style, which are drawn with considerable inexperience.

JOHN GEMMELL.

R. J. EDWARDS.

W. A. LANGTON.

The author of "1890" is Mr. James Walker, 5 Ann Street, Toronto, and of the design marked "Pen and Ink," Mr. Albert Ewart, 464 Bessner St., Ottawa.

A deputation consisting of Mr. Wm. Young, of Hamilton, and Col. Massey and Wm. Gray, of Montreal, waited on the Minister of Customs recently and asked that the duty on iron soil pipes and fittings be changed from 30 per cent. ad. valorem to a specific duty of one cent per pound.

STEREOTOMY.

STONE-CUTTING.

By JOHN A. PEARSON.

STONE-CUTTING is that branch of stereotomy which treats of the cutting of stone pieces of certain form from the rough block, so that when placed in proper order they shall form a given whole. Taking it as a science it embraces the following:—

The construction of projections of an arch, cornice, etc., of at least so much as will permit.

The derivation of directing instruments used by the workman to guide him in cutting the rough block to its required shape.

The rules for applying these instruments in their proper order and manner.

The number of directing instruments and the mode of their application will depend considerably on the ingenuity of the designer. The instruments used in directing the mason in stone-cutting are squares, templets, levels, moulds, straight-edge and bender.

Squares and bevels give the angle formed by the meeting of two arrises bounding one of the faces. These are called the angles of the faces, or plane angles. Bevels giving the surfaces of the stone showing the angles between the two faces are called dihedral bevels. Templets give the form or shape of a stone or other distinguishing lines of the surface, and are applied either on a face or bed. Moulds applied generally on the beds and joints, give the contour of the stone. Benders are for use on curved surfaces where a trammel cannot be applied. It is not the intention here to describe the different kinds of too's used by the workman in accomplishing his work, or the different styles of finish wrought on faces of stone, but to explain a few problems that are of common occurrence, and the simplest and quickest method of working same.

TO FORM PLANE SURFACES MAKING ANY GIVEN ANGLE WITH EACH OTHER.

This is the fundamental problem upon which all others are founded, and we shall take pains to explain this in order to avoid repetition. In working a rough block of stone, the mason begins by bringing to a plane surface one of the largest faces, which is generally a bed, and then a joint is worked to which a mould can be applied. Of course this depends upon the kind of work, and in some cases would not be the quickest method of attaining the desired end. The mode of procedure is as follows:

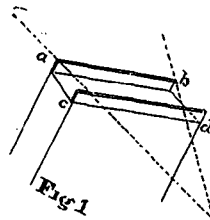


Figure 1 represents the first steps in forming a plane surface upon a rough block of stone, having two straight edges A B and C D of equal width, drafts are raised along the edges of the stone, and the draft on the opposite side is sunk till by sighting the top edges they are found to be in the same plane. If the straight edges are not of an equal width or parallel, the stone can be taken out of winding if they project sufficiently over the edge of the stone to sight the bottom edge. Cross drafts are now raised, and the rough stone punched or pointed down close to the surface and then chiselled off.

TO FORM A WINDING SURFACE.

Two edges are required for this purpose, one a parallel, and the other a divergent edge, the amount of divergence depending on the distance they are to be set apart.

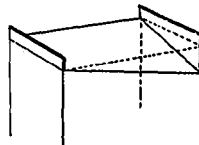


Fig 2

Sink the edges into drafts across the ends of the stone until the upper edge is out of winding. These drafts are connected by additional drafts, and the rough knocked off and the face worked to fit the straight edge, which should be applied parallel to the end drafts. The edge applied to the surface of stone on twisting faces should be round. The reason for this is self apparent. The diverging rule is called the winding strip, and the straight edge the twisting edge. In applying the twisting rules to a stone, they must be kept in parallel planes, and to keep these edges at the proper degree of divergence, it is convenient to connect the rules with light iron rods.

(To be continued.)

PERSONALS.

Mr. M. L. Buffy, architect, of Aylmer, Ont., has opened an office at London, Ont.

Mr. J. W. Hopkins, architect, Montreal, has recently returned from a visit to the Pacific Coast.

In the competition for plans for a new city hall for the city of St. Louis, Messrs. James & James, of New York, were awarded sixth position.

THE CANADIAN IMPORT DUTY ON ARCHITECTURAL DRAWINGS.

QUEBEC, April 11th, 1890.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—Competitors from the United States for plans of our proposed City Hall have written me as to whether such goods will be considered dutiable. You are no doubt in possession of the required information as competitive designs from the States I believe have been sent in for proposed buildings in Toronto. As this question interests the profession at large, I shall look for a few lines from you on the subject in the forthcoming number of your journal.

Your obedient servant,
CHAS. BAILLAIRGE,
City Engineer.

[The Custom authorities inform us that a duty of one-half of one per cent., assessed upon the value of the building, is charged upon American architectural drawings entering the Dominion. A further duty of one per cent. is charged upon the specifications.—ED. C. A. & B.]

TENDERS

Are required for GRADING and SODDING the grounds of Mrs. Buchanan's residence, St. George Street, near Floor.

Full information to be obtained at the office of

S. H. TOWNSEND, Architect,
53 King Street East, Toronto.

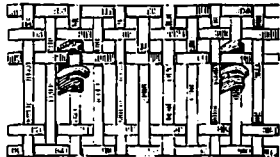
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ARCHITECTS AND CONTRACTORS:

GENTLEMEN:— I take this opportunity of bringing to your notice my Flat Wire Lathing, for which patents have been issued in the United States and Canada. The object of the patent is to provide a light, yet substantial Fire-proof Lathing, which offers a smooth, unbroken surface for the reception of plaster, and on which the plaster will key securely. Being made of flat wire, it offers the best plastering surface of any wire lathing. The key is an absolute certainty and is obtained by the plaster turning over the edge of the wire; this will be found invaluable in the plastering of ceilings. Its many advantages over Round Wire Lathing are apparent. An adjustable feet made of sheet metal, having two hooks, is attached to the lathing and takes the place of furring. By means of these feet the lathing can be fixed in position at one-half the cost of lathing requiring furring. After the cloth is woven the feet may be attached in any position required. The cloth may be used in either plain or with the adjustable foot as shown in cut.



NOTICE TO CONTRACTORS.

Tenders will be received by registered post, addressed to the City Engineer, up to 12 o'clock noon of the 22ND DAY OF APRIL, 1890, for the

DREDGING OF CORPORATION SLIPS, and also for the supply of a quantity of SAND STONE.

Quantities and forms of tender can be obtained on and after TUESDAY, THE 15TH DAY OF APRIL, 1890, at the City Engineer's office.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 5 per cent. on the value of the work tendered for under \$1,000, and 25 per cent. over that amount, must accompany each and every tender, otherwise it will not be entertained.

All tenders must bear the bona fide signatures of the contractor and his sureties (see specifications) or they will be ruled out as informal.

The Committee do not bind themselves to accept the lowest or any tender.

JOHN SHAW,

Chairman Committee on Works.
Committee Rooms, Toronto, March 11th, 1890.

Competition Plans

— FOR A —

CITY HALL.

The City of Quebec having decided on erecting a City Hall on Jesuit Barracks Square, opposite the Basilica, now invites competition designs for such a building. A prize of \$1500 will be paid for the best plan, \$500 for the second best, and \$500 for the third in value.

The City does not bind itself to the execution of any of the designs submitted, nor does it bind itself to comply with the direction of the work to the architect to whom the first prize may be awarded.

The plans to be for a building capable of accommodating all the municipal departments, not only as they now exist, but with the development hereafter required by the increase in the size of the City. The building must in addition contain the Recorder's Court and offices, the offices of the Police and Fire Departments, those of the Fire Alarm Telegraph, a Central Police Station and Central Fire Station, with lodgings for

guardians and others; the competitors to supply ground plans, sections and elevations or facades, and the details of the principal apartments, such as the Council Chamber and Recorder's Court. They shall moreover supply specifications, bills of quantities and estimates of cost of the several works and materials. The total cost of the building, inclusive of heating apparatus, water and gas service, shall not exceed \$200,000.

The plans and specifications endorsed "Plans for City Hall" shall be addressed to the undersigned before the FIRST DAY OF MAY NEXT. Each design shall bear a distinctive motto and contain nothing capable of designating the author, but shall be accompanied by a sealed letter bearing the same motto giving his name and address.

The judges of the plans shall be chosen by the Mayor, the Chairman of the Road Committee, and the City Engineer, and their decision shall be without appeal.

From the undersigned may be obtained all necessary information as to the configuration of the ground, the number and size of the principal apartments, and the area required by each department.

CHAS. BAILLAIRGE,
City Engineer, Quebec.
City Hall, Jan. 10, 1890.

PUBLIC NOTICE

Is hereby given that the time for receiving plans for the PROPOSED CITY HALL, QUEBEC, is, at the request of a number of the competitors, extended to the

1ST OF SEPTEMBER NEXT.

C. BAILLAIRGE,
City Engineer.



Notice to Contractors.

Tenders will be received by registered post, addressed to the City Engineer, up to 12 o'clock noon of the 6TH DAY OF MAY, 1890, for the supply of the following material:

Iron work for year ending June 30th, 1891.

Brick for year ending June 30th, 1891.

Concrete for year ending May 31st, 1891.

Sand for west of Yonge street for year ending December 31st, 1890.

Quantities and forms of tender can be obtained on and after Tuesday, the 29th day of April, 1890, at the City Engineer's office.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of five per cent. on the value of the work tendered for under \$1,000, and 25 per cent. over that amount, must accompany each and every tender, otherwise it will not be entertained.

All tenders must bear the bona fide signatures of the contractor and his sureties (see specifications), or they will be ruled out as informal.

The Committee do not bind themselves to accept the lowest or any tender.

JOHN SHAW,
Chairman Committee on Works.
Committee Rooms, Toronto, April 16th, 1890.

HOT AIR FURNACES.

"FAMOUS," for Coal, 5 sizes—Cast or Steel Radiators.

"HENDERSON DOME," for Coal, 4 sizes, very cheap.

"FAMOUS," for Wood, 3 and 5 feet long.

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Containing full information about this roofing: showing how to select, lay and paint; and how to specify for a tin roof in order to obtain best results.

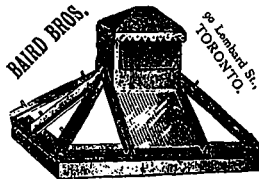
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FREDERICK TURNER,

—) Architectural (—

STONE CARVER AND MODELLER.

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YONGE ST. ARCADE, - TORONTO.

TENDERS FOR AN IRON BRIDGE ACROSS NATION RIVER AT CASSELMAN.

Sealed tenders will be received by the undersigned up to the 20th OF MAY at two o'clock p. m., for the building of an Iron Bridge across Nation River at Casselman; bridge to be 320 feet in length; roadway 16 feet wide; cut stone piers; stone and lumber convenient to the work. Tenders can tender on their own plan; two plans of the proposed bridge and specifications can be seen at my office at South Casselman; all tenders are subject to the approval of the County Council of Prescott & Russell at June session; work to be completed by the 1st of November next.

O. QUENNEVILLE,
Commissioner of the Proposed Bridge.

South Casselman, April 1, 1890.



NOTICE TO CONTRACTORS.

Tenders will be received by registered post, addressed to the City Engineer, up to 12 o'clock noon of the 22ND DAY OF APRIL, 1890, for the construction of the following works, viz.:

TRINIDAD ASPHALT PAVEMENT'S
On Sherbourne Street, from King Street to Queen Street; Ontario Street, from Carlton Street to Howard Street.

SCORIA BLOCK PAVEMENT.

The time for receiving tenders called for for scoria block pavement on Sherbourne street from King street to Queen street, to be received on the 8th April, is hereby extended to noon of the 22ND DAY OF APRIL, 1890.

Plans can be seen, quantities and forms of tender obtained on and after Tuesday, the 15th day of April, at the City Engineer's office. A deposit in the form of marked cheque, payable to the order of the City Treasurer, for the sum of 5 per cent. on the value of the work tendered for under \$1,000, and 2 1/2 per cent. over that amount, must accompany each and every tender, otherwise it will not be entertained.

All tenders must be accompanied by the signatures of the contractor and his sureties (see specifications) or they will be ruled out as informal.

The committee do not bind themselves to accept the lowest or any tender.

JOHN SHAW,
Chairman of Committee on Works,
Committee Rooms, Toronto, April 3rd, 1890.



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**MACHINISTS,
MILLWRIGHTS, &
ENGINEERS.**



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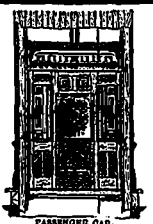
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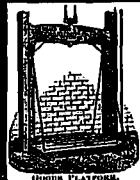
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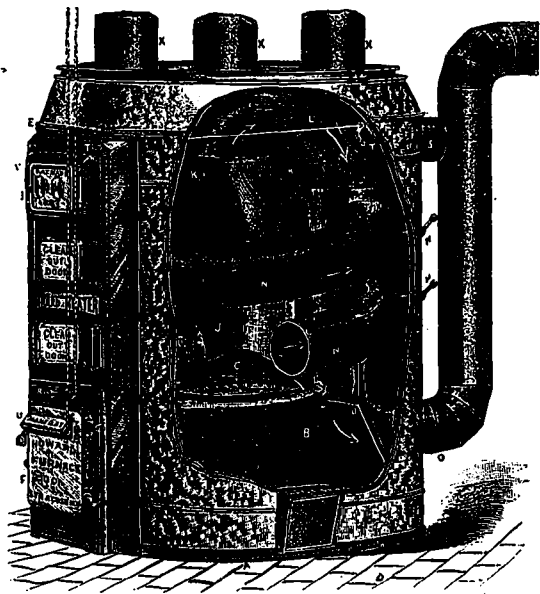
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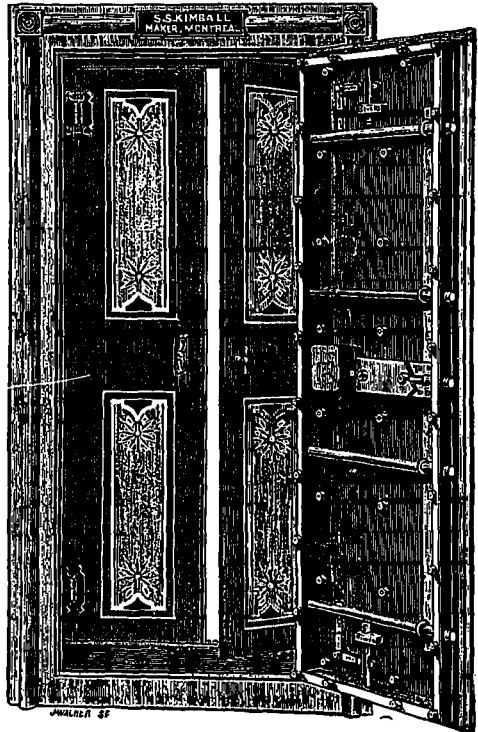
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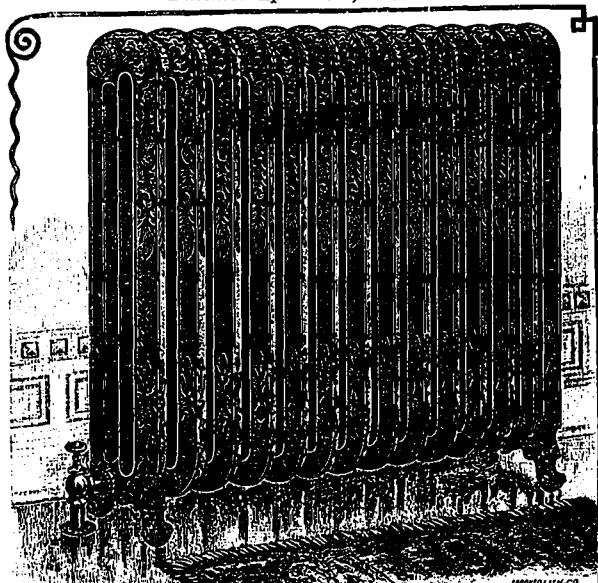
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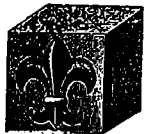
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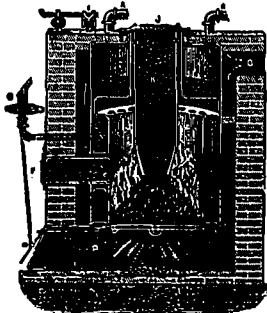
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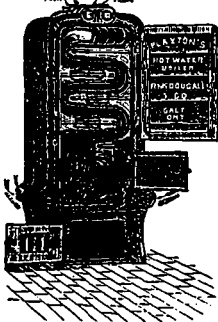


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