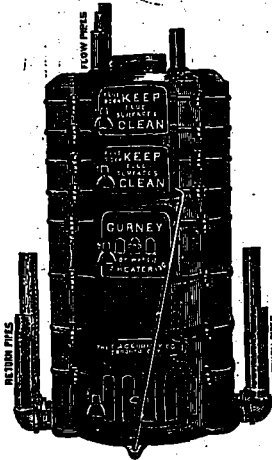


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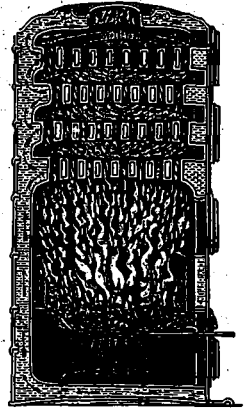
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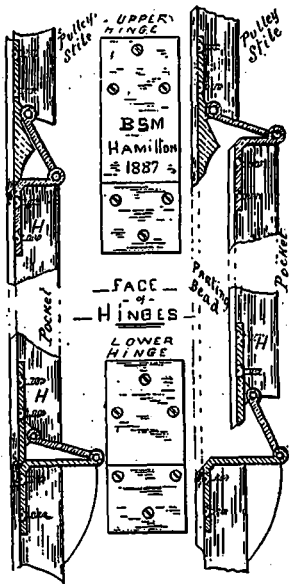
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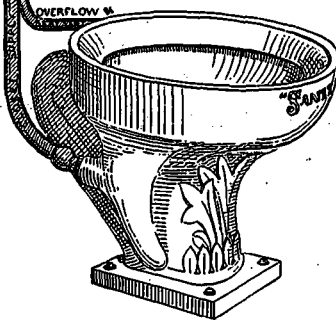
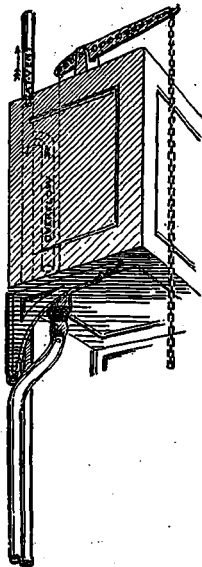
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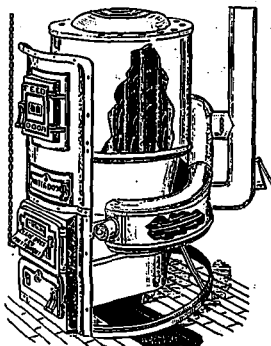
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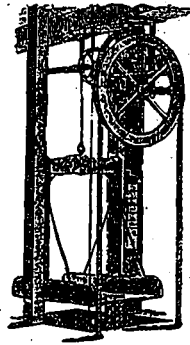
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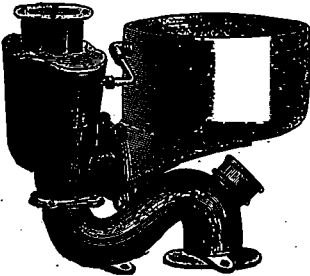
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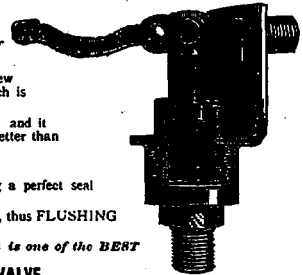
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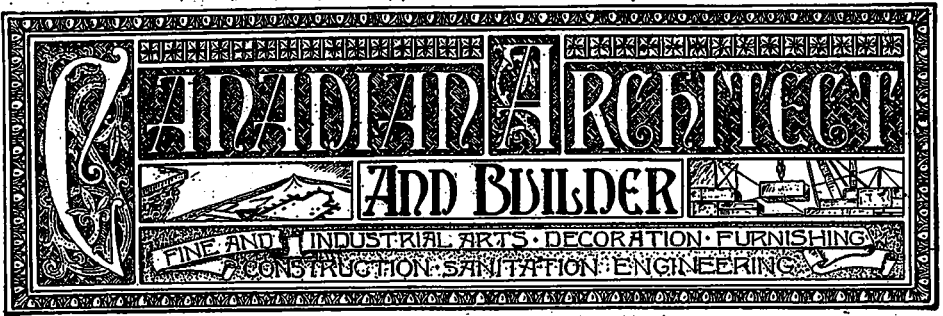
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**EDITOR'S ANNOUNCEMENTS.**

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.

**R**EPORTS received by the CANADIAN ARCHITECT AND BUILDER from various cities and towns throughout the Dominion, and published elsewhere under the heading, "The Building Outlook for 1889," tend to show that a fair amount of building will probably be done during the coming season. There is nothing in the reports to indicate that building operations will be more extensive than last year.

**T**HE "Canadian Contractor's Hand-Book," published as a premium to new subscribers to the CANADIAN ARCHITECT AND BUILDER, is meeting with general appreciation. We have received a number of congratulatory letters upon the results of our efforts in the compilation of this Hand-Book, one or two of which will suffice to show the favorable reception the book has met with: Messrs. S. Bowen's Sons, Philadelphia, Pa., write: "Through the courtesy of Messrs. M. & J. L. Vokes, our Toronto agents, we have received a copy of the "Canadian Contractor's Hand-Book." We must express our pleasure and thanks for this valued little volume, which is full of practical hints and information. If we have not already subscribed to your paper, please put us on your list and oblige." Robert Falbord, Montreal, writes: "I thank you very much. It is a very useful book." We may add that upwards of 150 new subscribers have been added to our list since the publication of our last number. This journal will be made as valuable as possible to the master builder as well as to the architect, and the price at which it is published, not to speak of the handsome inducement which we are at present offering in the Canadian Contractor's Hand-Book, should secure for us as subscribers every master builder who has at heart the promotion of the interests of his business, and desires to be thoroughly equipped to help in its advancement.

**T**HERE are in almost every city ricketty old buildings left standing, which are a menace to human life, and should be pulled down. In Montreal the other day a building of this character which, singularly enough, was expected to stand the jarring motion of saw and planing mill machinery, suddenly collapsed. The walls refused any longer to support the roof, which came crashing down upon the workmen, twenty-five in number, employed in the mill. In some miraculous way, all but two escaped uninjured. The less fortunate ones were almost buried under a pile of bricks and timbers, and both were seriously injured. It is the policy of some owners of old buildings to keep them standing as long as they will hold together, and persons can be found willing to risk their lives by living in them. The taxes on such buildings are a mere trifle, while the land on which they stand is in course of time rendered valuable by the improvements of more enterprising owners in the neighborhood. We presume the duties of Building Inspectors are intended to include the oversight of such old structures, as well as of new ones in process of erection. If so, regard for human safety, as well as the appearance and progress of our cities, demands that these duties should be more thoroughly performed.

**H**ERE is a sample of the sage advice which a Toronto daily paper offers to the public on the subject of the proposed new Court House and City Hall for the city of Toronto: "What the citizens should do is to defeat the by-law which will shortly be submitted, and put the work of construction in the hands of a competent commission. Then the commission should set aside a sum of money, say \$500,000, and call upon builders to say what kind of a building they could put up for the money, awarding the contract to the one who will furnish the best design. The city has already spent a great deal in architects' fees, which would be lost if a new arrangement were entered into, but it would be better to let them go than to have the citizens committed to the building of a structure the cost of which might mount up into millions before it could be completed." In spite of the self-assurance of the writer who would thus settle off-hand a matter which has engaged the serious thought of the Mayor and a committee of the Council of this city for many months, we must express our lack of confidence in the wisdom of his proposal. The absurdity of asking builders to furnish competitive designs for a building of such cost and importance needs not to be pointed out. The conceit of the most conceited builder would scarcely prompt him to such an undertaking. But even supposing that it should, how unenviable would be the lot of the judges who should be appointed to select from the designs submitted, one suited to the requirements of such a building. The worst punishment that could befall the writer of the article in question, would be to be appointed an arbitrator in the case. It is the business of a builder to build, not to design, and in an undertaking of so much importance any attempt to economize in the direction of dispensing with the services and advice of a competent architect, would result in a series of blunders which would eventually cost the citizens many times the amount of the architects' fees, not to speak of the lasting disappointment, consequent upon the erection of an inartistic, and badly-planned structure.

HERE appears to be little or no supervision of plumbing in the city of London, Ont., notwithstanding the fact that the *Free Press* of that city is one of the few daily journals in the Dominion which devotes considerable attention to subjects affecting the preservation of the public health. The sanitary condition of some of the houses, is thus depicted by a gentleman who, after losing one of his children by a severe attack of diphtheria, set to work to investigate for himself the causes which had induced the disease: "I had the floor of my cellar up, and I found the box drain, immediately under the floor of the cellar, with no trap, nor yet covered with earth, and there was a half-inch space around the waste pipe from the sink. On holding my hand over it I could feel a draft like in a chimney coming up from the sewer into my house; so the cause of sickness is easily explained, although hid by a cellar floor. On closer inspection of the lead trap under the sink, I find it is only about the thickness of writing paper—so that it soon wears or is rotted out. When the houses were being built, the builder was spoken to about the drain not being put lower, but he (the builder) said he did not care, he was going to sell. Although there never has been any sickness in the house before since it was built (about nine years), still the germs of disease were growing. I think there should be a law passed, that no box drains should be carried into a house, for tiles are cheap enough now, and, above all, it should be compulsory for one, if not two, traps to be put in, in its construction. There are four more houses on the same street, the drains built the same as mine." Such a revelation should suffice to bring about the passing of an ordinance stipulating the manner in which plumbing work shall be done, and the character of the material to be used, as well as the appointment of one or more inspectors, to see that the regulations are complied with. The law should provide not only that "no box drains should be carried into a house," but that tile even shall not be used inside a house. Tile is suitable enough for private drains extending from the outer walls to the street sewer. Inside the walls, nothing but iron pipe should be allowed to be used.

WE print elsewhere, draft constitution of the proposed Architectural Association for the Province of Ontario. During the last month, delegates from the Toronto Architectural Guild have interviewed architects of cities and towns east and west of Toronto, on the subject of the formation of a Provincial Association. The result is most satisfactory. The need of such an organization appears to be universally recognized, and the delegates have received assurances on every hand of the willingness of architects to assist in carrying out the object. In view of the encouragement received, a meeting of architects has been called for Thursday, the 21st inst., in the Rossin House, Toronto, for the purpose of organizing under the name of "The Ontario Association of Architects." Every *bona fide* architect in Ontario is given a cordial invitation to be present at this meeting, and assist as far as possible in establishing on a broad, firm and satisfactory basis the proposed Association. By "*bona fide* architect," is meant men who have received the training and practice necessary to qualify them to perform satisfactorily the duties of an architect. This definition should not be understood to include builders, who may now and again draw the plan for a building. It is of the utmost importance to the success of the undertaking, that the meeting on the 21st should be representative of the whole Province. We therefore strongly urge architects in every locality, to make a little self-sacrifice if necessary, in order to attend. The Toronto Architectural Guild will leave nothing undone to render the visit of the architects not only profitable, but pleasant as well. The programme of the meeting will include a dinner at the Rossin House, where, over the good things of this life, the members of the profession will be afforded opportunity of becoming acquainted, and of discussing what objects the Association should seek to attain, and the wisest basis upon which it may work to accomplish its purposes. One of the most important matters to be decided at the meeting, will be the selection of executive officers to direct the affairs of the new Association. It is not too much to say that the success of the Association will depend upon securing men of the highest intelligence, judgment

and energy, to fill official positions. It is most important, also, that the occupants of these positions should represent various sections of the Province, thus making the Association truly Provincial in its interests and character. Not only would we again request every Ontario architect to attend this meeting, but in the interval, would have him consider carefully everything which might tend to promote or hinder the success of the proposed organization, and come prepared to offer wise counsel, which will help to insure the complete success of the undertaking.

THE architects of Ontario, in deciding to form themselves into an association for the promotion of the interests of the profession, are wisely recognizing the principle that in union there is strength. It is beyond question that the time has come when the master builders and contractors of Ontario should also take action in this direction. Architects and master builders would then be in a position to work harmoniously together for the welfare of all engaged in the building trades, as has lately been the case in the United States. At the convention of the National Association of Builders of the United States just closed, some of the leading architects of the country were present, and by carefully prepared papers, assisted the builders to a solution of some of the difficult questions affecting their interests. Among such questions which received careful consideration at the convention, were: "Uniform Contracts," "Lien Laws," "Rules and Conditions for Estimating Work," "Permanent Arbitration," "Apprenticeship," the establishment of National Mechanical Trade Schools, etc., "Bureau for Furnishing Sureties on Builders' Estimates and Contracts," "Uniformity of Measurements and Uniform Size of Brick," "Insurance against Accidents to the Public."

The majority of these subjects might profitably engage the attention of an Association of Ontario master builders. The question of self-interest alone, if no higher motive will prompt the step, should be sufficient to induce the builders to organize. It may fairly be supposed that if the architects and the master builders of Ontario had each an organization, they might, by combining their efforts, remove the possibility of a recurrence of the extensive and disastrous strikes on the part of workmen which in the past have caused such loss to the community as well as to every person directly concerned. Organization can only be met by organization. The labor union is not dependent for financial support upon the locality in which it exists, but is part of an international organization, with an international fund at its back. On the other hand, the master builders in each city or town, having no national or provincial organization, are compelled to rely upon their local resources for means to carry on the fight. If a Provincial Association were formed, with ample financial support at its command, the unions would be more reasonable in their demands, and less eager to precipitate a strike if these demands should not be promptly and entirely complied with. By means of an association the relations of the master builder to the architect might be made more satisfactory than at present; an influence could be exerted to prevent manufacturers and dealers in builders' supplies from giving credit to contractors of no experience or capital, who, having nothing to lose, frequently take contracts at figures below the actual cost of the work, to the detriment of the honest contractor. In these and many other directions which might be mentioned, substantial benefits would accrue to the members of such an organization. We direct attention to the opinions of contractors in favor of organization, which we print elsewhere. There are indications that the movement is taking root. We shall be pleased to publish the views of others on the subject, as we are convinced that the more thoroughly the proposal is discussed the greater will appear the desirability of putting it into practice.

The statements submitted at the annual meeting of the Byam Manufacturing Co., manufacturers of specialties in builders' hardware, Hamilton and Toronto, held in this city on the 6th inst., showed the business done during the past year of the Company's existence to have been of a most satisfactory character. The old board of directors was re-appointed, which in turn re-elected the old officers: William Bee, president; J. M. Smith vice-president; Sturgeon Stewart, managing director and secretary-treasurer.

OUR ILLUSTRATIONS.

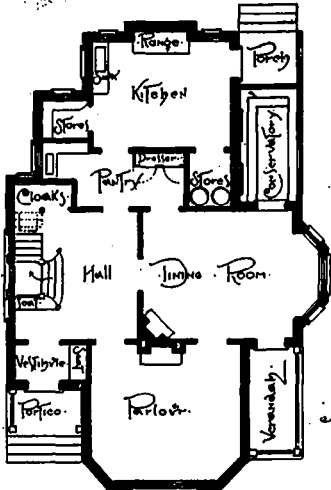
DESIGN FOR NEW UPPER CANADA COLLEGE, TORONTO.—  
MR. GEO. F. DURAND, ARCHITECT, LONDON, ONT.

THE sum of \$130,000 has been appropriated by the Legislature for the erection of this building, which is designed to accommodate from 250 to 300 boarding students, and in addition, the requisite teaching staff and servants. The fronts are to be constructed of Credit Valley sandstone, in random course rock-face work, to the height of the basement—six feet—and red pressed brick above the plinth course, with terra cotta panels and string courses, the openings to be trimmed with rock-face red sandstone. The main entrance arcade is to be built of sandstone to the height of the first floor (25 feet), and is sparingly carved and ornamented, the columns of the arches being of polished red New Brunswick granite. The roofs are to be covered with slate throughout (there being no deck or flat portions), are of steep pitch, sub-divided by the dormer windows, lighting the attic, the sky line being varied by the use of gables and the grouping of the chimneys. The four main staircases are each

eight feet wide in the clear, are easy of access from any portion of the building, and are enclosed between brick walls as a preventive to the rapid spreading of fire. The heating is to be by low pressure gravity steam, supplied by two boilers of wrought steel. The class rooms are heated by indirect radiators, with fresh air supply; these are placed under the windows, the vitiated air being removed through registers on the opposite side of the rooms leading into ducts connected with two large exhaust shafts, which are continually heated, and are over 80 feet high. The fresh, heated air is to be supplied at the rate of 200 cubic feet per minute to each occupant, at a velocity not exceeding five feet per second. Mr. Geo. F. Durand, London, Ont., is the architect.

A COTTAGE NEAR MONTREAL.—J. W. & E. C. HOPKINS, ARCHITECTS, MONTREAL.

This cottage is to be built of red brick, terra cotta tiles, slate roof, and stone foundation. The interior will be finished in hard woods; hall in oak; dining room and parlor, cherry; chambers and bath room, chestnut. The cost, which depends considerably on the location, is approximately \$3,800.



Ground Plan.

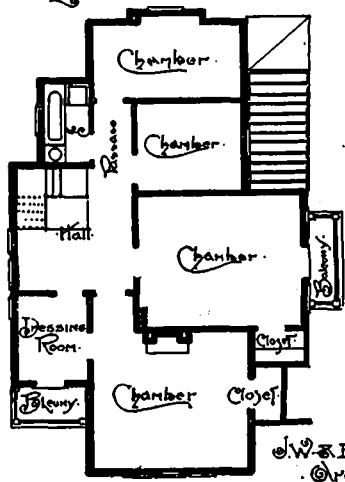


Side Elevation

A. Cottage Near Montreal.



Front Elevation



Chamber Plan.

J. W. & E. C. Hopkins Architects. 145 St James St. Montreal.

## TORONTO BOARD OF TRADE COMPETITION.

THE following is Prof. Ware's report on the plans submitted in competition for the new Toronto Board of Trade building:—

DEAR SIR,—After a careful examination and comparison of the twenty designs which were sent in to me on the first of October for the proposed building for the Toronto Board of Trade, I have selected three which seem to me to be for any reason or another clearly the best.

These I herewith enclose to you for consideration by the Building Committee.

The task of selection has been an unusually difficult one, since all the sets of drawings which exhibited a marked superiority in any one respect, uniformly proved to be signally deficient in some other particular, equally important.

Nine of the designs present substantially the same arrangement of plan. They all show an area, or courtyard, in the north-eastern corner of the lot, enclosed by a building in the shape of the letter L. A corridor of similar shape runs through the middle of the building with offices on the outer side, lighted from the streets; on the inner side of this corridor are two or three small offices lighted from the court-yard, and the lavatories, closets, staircase and elevators. The rooms for the Board of Trade are in the upper stories. In some of the designs the Restaurant is next to the roof, in some it is placed in the lower stories.

Two of the designs I send you exemplify these arrangements. Five of the designs show an interior well-lighted shaft, set against one of the party walls, some of them adding a smaller well, or ventilating shaft, set against the other party wall.

Neither scheme seems to have worked out very well.

Three of the designs show an area or external court, opening upon Yonge Street. Neither of these is sent to the Committee, for the lot seems to be too small for this device to be used to advantage. At any rate, all three of these plans afford less available floor-space than do any of the others. The irregularity of the shape of the lot, also, is in all of them, in spite of some very ingenious attempts to disguise it, exceptionally conspicuous.

Two of the schemes show an interior area, or light-well, with rooms all around it, and one which I enclose, shows no open space at all, the building covering the whole lot, and the centre part being lighted by a skylight.

In respect of external architectural details, six show more or less of Romanesque influence, and six are composed in a manner to which no name has as yet been given.

The elevations as well as the plans vary greatly in character and expression, as well as in style. As I have already intimated, it happens unfortunately that the best plans do not have very attractive elevations, and that the most attractive elevations do not belong to very good plans.

In this state of things I am not able to recommend any of the designs, as they stand, for adoption by the Committee. The only service I can render them is to bring before them, as I have done, those which seem to me to possess substantial merit of one sort or another, hoping that they may find some among them so well suited to their ends that they will be disposed to recommit the drawings in question to their author for further consideration and amendment.

So far as concerns the general arrangement of the plan, I am disposed to agree with the chief part of the competitors in believing that the most obvious way of covering the ground is the best, namely, by building an L-shaped building on the two outer sides of an interior court.

The design marked with "TWO CIRCLES," shows better than any other of those which follow this scheme how large a number of well lighted offices can be secured by adopting it. This design shows thirty-six offices, all of good size and shape, and covering together nearly fifteen thousand square feet.

Even if not adopted for the present, I am hoping that the design down to six stories, the office space would amount to over twice thousand feet, which is as much as any of the good plans afford. The open area is sufficiently large, the stair-way and lavatories well lighted, and the halls and passages wide and open. This scheme is, moreover, the only one among them all in which the plan itself is noticeable for neatness and elegance of arrangement.

In this design the Restaurant is in the basement, the Board Rooms, which comprise a large circular hall, are in the upper story, and the safes are arranged in a stack which occupies the middle of the hall-way.

The design marked "TEN PER CENT." has most of the practical advantages already mentioned, but lacks elegance and style. The main difference, so far as concerns the distribution of the rooms, is, that in this design the large hall of the Board of Trade is rectangular, the Restaurant is small and is placed at the top of the building, and the safes are scattered about in the offices. The amount of office space, both being regarded as six-story buildings, is about the same. The offices are in this building more numerous, but smaller and less desirable.

Unfortunate is the external treatment of these two designs, though not without merit, do not seem to me to be, in either case, suitable or satisfactory. This is more to be regretted, inasmuch as neither of the plans is of such a character as greatly to influence the elevation, and in either case a different treatment might just as well have been adopted.

The rest of the plans are distinctly inferior, for the Committee's purpose, to the two just mentioned, and, with a single exception, none of the elevations present any special features or combinations of features that it would profit the Committee to consider.

By the design bearing the title "UTILITY" (one of two thus designated), shows an external treatment so effective and original that it deserves to be urged upon the Committee's attention. It is seldom, in my opinion, that it comes across a design so noticeable out of the common course which is at the same time so simple, rational and dignified. It was, moreover, to my mind, just the character suited to a business building which is at the same time the seat of a public institution.

The plans which accompany these elevations show about the same amount of office space as the other two. But the accommodation they offer is inferior, and the tortuous and eccentric arrangement of the rooms and passages forbid its serious consideration.

These then—the "TWO CIRCLES," "TEN PER CENT." and "UTILITY,"—being the three designs which, from one point of view or another, I find to be the best among those submitted to my judgment, I in turn submit them to the judgment of the Committee. To the foregoing comments I venture to add the following recommendations.

1. If the Committee find the general arrangement of the plans marked with "TWO CIRCLES" is such as to serve their purposes, and agree with me that its technical merits in respect of simplicity and elegance in the dis-

tribution of parts are of a high order, I recommend them to adopt this plan as the basis of their future operations.

If they further agree with me in that the external treatment of the design is unsuitable and unsatisfactory, but that the skill and professional resources manifested in this set of drawings are such as to promise, on a second trial, a happier result, I recommend that the drawings be returned to their author with a request to present a new design for the exterior under such further instructions as the Committee may give.

Such an adoption of the general scheme would not, of course, preclude the Committee from changing the plans in matters of detail, such as omitting the tower, using the basement for offices instead of for a restaurant, putting safes into the rooms, or substituting an oblong hall situated upon one of the side streets, for the circular room shown in the plans. This last is a feature common to most of the designs sent in, as well as to two of those here presented, and does not constitute, in my judgment, a special feature of those designs, original as to this competition, in any way to interfere with the Committee, or the author of this design, incorporating it into his composition, if it is desirable to do so.

2. The design marked "TEN PER CENT." has, to my mind, no advantages of plan over that just spoken of, and if the Committee agree with me in thinking that the elevation is not specially suitable or attractive, I think they may dismiss this design from further consideration. Should they, however, differ from me on this point, and find the elevation to be just what they would be best pleased to erect, then I should say that these plans, though not so good as the others, were good enough, and that the Committee had better adopt this design, substantially as it stands. This they would be warranted in doing, in spite of obvious faults in the details of the arrangement, since these defects could easily be removed by further study.

3. If, however, the Committee do not incline to this course, and if they agree with me in regard to the great merits of the design marked "UTILITY," in its external treatment, then I recommend that they take such measures as may prove practicable to combine this elevation with the other plans. Fortunately there is nothing in this elevation to prevent its fitting the plans of the design marked "TEN PER CENT.," if they were slightly modified, or even fitting the plans marked with the "TWO CIRCLES," if the large circular room were given up, and a rectangular room adopted instead, as has been suggested. I am, very respectfully,

Your obedient servant,

WILLIAM R. WARE.

Columbia College, New York, November 3, 1888.  
P.S.—The envelopes containing the names of the authors of these plans are herewith enclosed, with the seals still unbroken. I have no knowledge or belief as to their identity

W. R. W.

DEAR SIR,—In the report which I had the honor of sending to you two days ago, I recommended your Building Committee, in case they found the plans belonging to the design marked with "TWO CIRCLES" suitable and convenient to adopt them as a basis of procedure, and to ask their author to present different elevations, in accordance with such instructions as the Committee might frame. This I urged on the ground that the ability and resources displayed in this set of drawings were such that the Committee might safely place themselves in the hands of their author, at least provisionally, in spite of the unsatisfactory treatment in them of the exterior of the building.

I ought to have added—I ought to have remembered to add, for the point is a familiar one—that further evidence as to the professional resources at the command of the author of this design might and should be obtained by opening the envelope containing his name. This the Committee are perfectly free to do whenever they have reached a point where they cannot proceed intelligently without knowing who is who. They have never undertaken to come to a final choice in ignorance of whom they were dealing with. The incognito provided for in the instructions has fully answered its purpose already, and I ought to have suggested to the Committee to break the seals as soon as the question of the standing or resources of either competitor was brought before them, as it was by my first recommendation.

Please consider these suggestions as forming a part of the recommendations of my report, and believe me to be very respectfully,

Your obedient servant,

WILLIAM R. WARE.

New York, Nov. 5, 1888.

## A CRITICISM, ETC.

HAMILTON, March 6th, 1889.

EDITOR CANADIAN ARCHITECT AND BUILDER.

I HAVE much pleasure in congratulating you on the improved size and general appearance of your publication, and have no doubt that the profession, students and other subscribers will appreciate your efforts.

Excuse me if I criticise the illustrations of your last number. Your remarks on the arrangements of the Town House, page 16, are just and terse. There being no chamber plan, I would suggest to future contributors that they furnish basement and chamber plans, also elevations to a scale, or otherwise one is induced to think that the perspective has been "cooked" to make a picture, and so deceive, which is at all times condemnable.

The design for the new Board of Trade building is very creditable, and the plans well considered. I have no doubt the members of the Board of Trade will feel proud of the building when it is completed. I notice, however, that the point of view has been taken too far away; the view can never be seen as such, unless I am mistaken as to the locality. I recollect the old Board of Trade building as being situated at the junction of two narrow streets. If the perspective has been made for a picture, it is not honest to do so. Architects, I am sorry to say, are too much given to this kind of deceit, which mitigates



against them and the profession. Nevertheless there are some good points in the design, which if carried out, will be an advance in the right direction. I am pleased with the lecture and remarks therein, by Mr. Gambier-Bousfield, on the "Responsibilities of Students." I trust he will continue these lectures. They should be an incentive to students to carefully study the valuable works in the library now so close to their hands in Toronto. Let me assure the youthful students that their youth is the most precious period of their existence. They will find their enthusiasm will wane and dull when they come in contact with the mean and sordid spirit in this life, unless they lay a deep, solid foundation of love for their profession which will carry them forward and uphold them through all the troubles they will have to meet incident to contact with this venal business age.

I am gratified by your remarks anent so-called competitions, and the treatment meted out to the profession by individuals and corporations who in an ordinary business transaction would doubtless scorn to be dishonest, but who, in the matter of these so-called architectural competitions, are trying to obtain by dishonest means the knowledge and labor of members of the architectural profession. But, sir, the profession is to a great extent to blame, for are there not self-styled architects always on hand to propagate these evils? Until the architects unite as a common brotherhood there is no way that I can see to successfully fight this and other kindred injustices.

We have had three meetings of the most prominent architects in this city, and appointed a committee to draft constitution and by-laws to govern an association. We are determined with the aid of our brother architects in Ottawa, Toronto, and elsewhere, to raise the status of the profession to its proper level.

F. J. RASTRICK.

**THE WOODSTOCK COMPETITION.**

TORONTO, March 7th, 1889.

Editor CANADIAN ARCHITECT AND BUILDER.

I send you my protest against the manner in which the architectural competition for Woodstock Court House is being conducted.

Yours truly,

ROBT. OGILVIE.

**HAMILTON ARCHITECTS ORGANIZING.**

A CORRESPONDENT writes as follows: The architects of Hamilton have had two meetings and formed an Association similar to the Ottawa Association, with F. J. Rastrick, President; Jas. Halfour, Vice President; W. A. Edwards, Secretary-Treasurer, and Messrs. Mulligan, Hills, and Brass as council. Mr. Townsend, of Toronto, was at the last meeting, and explained the objects of forming a Provincial Association. Architects here are all in sympathy with the movement, and a number will attend the meeting in Toronto on the 21st March, when I trust we will see our way clear to form a strong body.

**QUERIES AND ANSWERS.**

(Reply to Query No. 1.)—The factor of safety for wood beams should not be less than  $\frac{1}{4}$  the breaking weight. To find the breaking weight of a wood beam, multiply the square of the depth in inches by the breadth in inches, and by the constant for the kind of timber, and divide by the square root of the length in inches; the result will be the breaking load of the beam-in pounds.

The constant for oak, 1,700; clear pine, 1,300; rough pine, 1,100.

To find the required depth for a beam, when supported at both ends to sustain a given load with safety, multiply the square of the length in feet by the weight in pounds and by C, and divide by the breadth in inches; the cube root of the result will be the required depth of the beam in inches.

Let C represent .013 for oak, .01 for clear pine, and .009 for rough pine or hemlock.—WILM. KNOX.

(Reply to Query No. 2.)—Let "Lux" take one pound of iron filings and 5-16 of an oz. of sal-ammoniac, and make them into a thick paste with water.—SUBSCRIBER.

(Reply to Query No. 3.)—Use muriatic acid, painted on with a brush and let it stand for an hour or two; the old putty will become quite soft and easily run over.—PAINT BRUSH.

(No. 4.)—Will you kindly inform me through the column of your paper, whether fusil oil will remove varnish from wood-work, so as to allow of the woodwork being stained another color, or can you recommend anything that will remove varnish, and very much oblige,

HENRY LUCAS.

**DRAFT CONSTITUTION OF PROPOSED ONTARIO ASSOCIATION OF ARCHITECTS.**

THE Toronto Architectural Guild has submitted for the approval of architects throughout the Province of Ontario, copies of the following draft constitution for the proposed Architectural Association:—

SECTION I.—*Name*.—The name of this organization shall be "The Ontario Association of Architects."

SECTION II.—*Objects*.—The objects of the Association are: To unite in fellowship the architects of the Province of Ontario, to combine their efforts so as to promote the artistic, scientific and practical efficiency of the profession, and to cultivate and encourage the study of kindred arts.

SECTION III.—*Membership*.—The Association shall consist of Fellows and Honorary Members.

SECTION IV.—*Qualifications*.—Any architect engaged in the honorable practice of the profession in the Province of Ontario may become a Fellow of this Association. Honorary Members of this Association may be elected upon the recommendation of the Board of Directors, but all Fellows of the Association shall become Honorary Members when, after three years honorable standing as Fellows they resign the practice of architecture. Honorary Members shall not be entitled to vote, nor be eligible to office, nor shall they be assessed for dues or initiation.

SECTION V.—*Officers*.—The officers of this Association shall be a President, three Vice-Presidents, a Secretary, a Treasurer and five Directors. All the officers shall form a Board of Directors for the care of the property and management of the general welfare of the Association, and shall report at each regular meeting.

SECTION VI.—*President and Vice-President*.—It shall be the duty of the President to preside at all meetings of the Association. In his absence the chair shall be taken by the first Vice-President; in the absence of the first Vice-President by the second Vice-President; and, in the absence of the second Vice-President, by the third Vice-President.

SECTION VII.—*Secretary*.—It shall be the duty of the Secretary to take the minutes of the meeting and conduct the correspondence of the Association, subject to the Board of Directors.

SECTION VIII.—*Treasurer*.—It shall be the duty of the Treasurer to collect all funds, and disburse the same on the order of the Secretary when countersigned by the chairman of the Board of Directors.

SECTION IX.—*Amendments*.—The Constitution may be amended by a two-thirds vote of the Fellows present at any regular meeting.

SECTION X.—*Status of Architect*.—The status of an architect is hereby defined as follows: An architect is a professional person whose sole ostensible occupation consists in supplying data preliminary to the material construction and completion of buildings, in exercising administrative control over the operations of contractors supplying material and labor incident to the construction and completion of buildings, and in officiating as arbitrator of contracts, stipulating terms of obligations and fulfilment between proprietor and contractor.

SECTION XI.—*Failure to Pay Dues*.—Should any member fail for one year to pay his dues, the Board of Directors may at its discretion, drop his name from the roll. Should charges of misconduct be preferred against any member, they must be made in writing, and be signed by the person making such

charges; whereupon the Board of Directors, at its next meeting, must take the matter up, and the said Board may, at its discretion, drop the name from the roll, and the decision of the Board shall be final and absolute. The member against whom the charges are made shall, however, have the right to be heard in his own defence.

#### OTTAWA INSTITUTE OF ARCHITECTS.

ON February 19th was held the first regular annual meeting of the Ottawa Institute of Architects, originally set on foot for the purpose of improving and raising the status and efficiency of the profession of architects. This society, before completing its organization, drew up a comprehensive constitution and by-laws, suitable to the requirements of the locality, and from the commencement has looked forward to legal recognition in the Province, a by-law to that end being amongst its earliest regulations, requiring the executive to keep the object constantly in view.

Owing to the illness of Mr. Thomas Fuller, President, Mr. K. Arnoldi delivered an address from which the following extracts have more than local interest:

"Our members may not altogether realize the important position that such an Institute must attain; how by proper management it must become a real and substantial advantage to every individual member; and a position achieved for it that will bring appreciative approbation from the general public, placing at a positive disadvantage any architect attempting to practise in our midst who may not be one of us. Without association we might indeed be acquainted more or less, but we all know, in such a state of affairs, the antagonism and jealousy that seem fated to exist between members of the same calling—how often through misunderstanding, wrong motives are imputed, and any way, a miserable competition carried on, certainly not to the advantage of any one. Meeting together, acquaintanceship will remove such asperities, and we shall look to one another for counsel and aid in solving such difficult problems as may present themselves.

"This is how I interpret 'maintaining a proper standard of professional ethics'.

\* \* \* \* \*

"I will now present to you the views I entertain as to what our future programme should be: Till now, our energies have been principally devoted to the perfection of our organization. In this we may congratulate ourselves, having almost every practising architect in the city on our roll, and I would like to make our Institute of such importance that no architect will be able to afford to remain outside. Of the numerous guerillas, they will continue to exist. Their status has been fully considered by your council, and the inadvisability of admitting them to membership has, after mature deliberation, been decided upon.

"Now, having associated ourselves for the decent practice of the profession, and having adopted the lowest scale of charges known amongst qualified architects, it would be a pity for it to go abroad that we have formed a "combine," which I have no doubt will be the title some may be inclined to apply to us.

\* \* \* \* \*

"In any action affecting us, we should be the first movers. For instance, the city of Ottawa requires a building by-law, therefore the corporation should be communicated with, and the co-operation of the Institute offered towards its perfection, our influence being used to see that the Inspector under it is a person in whom we have confidence. This is a matter that if not attended to, may be the source of much annoyance to our profession.

\* \* \* \* \*

"Our by-laws as to affiliation must not stop at a simple exchange of courtesies; the object to be kept in view must be the recognition of ours as a close profession, similar to lawyers, doctors, land-surveyors and civil engineers. This will require a great deal of labor, and the co-operation of all now practising in the entire Province. Our Toronto confreres are moving in the matter, and we must lend them active assistance. Much time and some expense will be involved in this, but to carry out the

objects of our association we should be prepared to spend both time and money, since in all the matters I have pointed out, we can depend on receiving a return that will amply repay us.

"Our worthy first president, in relinquishing his office, does so from conviction that for him to hold this position would be to defeat the objects we have in view. He considers that every officer should give time and active work to the interests of the Institute, and these he does not find himself able to give. I would therefore express the hope that the officers for the ensuing year, to be elected at this meeting, will be prepared, in exercising their functions, to attend closely to the interests of our society—will be prepared to sacrifice some of their valuable time in the common interest—so that with the co-operation of our own members and the architects of the Province generally, we may attain by the next session of the Provincial Parliament a position or status for our profession which it has not previously attained in any other part of the British or American world."

Mr. King Arnoldi was afterwards elected president for the year 1889-90.

#### NATIONAL ASSOCIATION OF MASTER BUILDERS.

THE third annual convention of the National Association of Master Builders of the United States, was held in the Franklin Institute, Philadelphia, Pa., on Feb. 12th, 13th and 14th. The gathering embraced about three hundred builders and contractors from all parts of the United States. A synopsis of the proceedings at this convention should prove interesting and instructive to Canadian master builders, especially in view of the expressed desire for a somewhat similar association for the Province of Ontario. The Secretary's report showed that there are in the United States and Canada 445 exchanges directly connected with the building interests.

It was resolved to endeavor to secure amendments to the lien laws in each state, so that they might only protect actual personal labor performed upon the property liable to attachment in amount not to exceed the value of twenty-four days work for each individual entitled to protection.

The report of the Committee on apprenticeship, recommended the following definition of the training and qualifications of a regular journeyman in the building trades:

1. The serving of a regular course of instruction in a mechanical trade school, and graduating therefrom with a certificate of proficiency granted by the same, under rules and regulations approved by a committee of master mechanics who may unite in the management of the said school.

2. The preliminary training in the trade school to be followed by a term of practice with an employer on actual work, this term to be at least one year less than the usual term of apprenticeship by virtue of the holding of a certificate of proficiency granted by a mechanical trade school. During this term of service the young man to be known as a "Junior."

3. Finally, completion of the education of the mechanic to be acknowledged after a proper examination has been passed before a board of examiners appointed for the purpose by the association of builders to which the employer may belong, or to whom the junior may apply for examination by the issuance of a certificate by the said association, which shall state that the holder has passed through the prescribed course at the trade school, and the term of practice with an employer (name and location given) with satisfaction and credit, and is entitled to be received by all builders as a journeyman. Any young man who has received the "certificate of proficiency" from the trade school may apply for the second examination before the board of examiners, and, if adjudged by them to be old enough, strong enough, and competent, may receive a special certificate, which shall state the facts in the case.

A special Committee was appointed to take this matter in charge and persistently agitate the proposed reform.

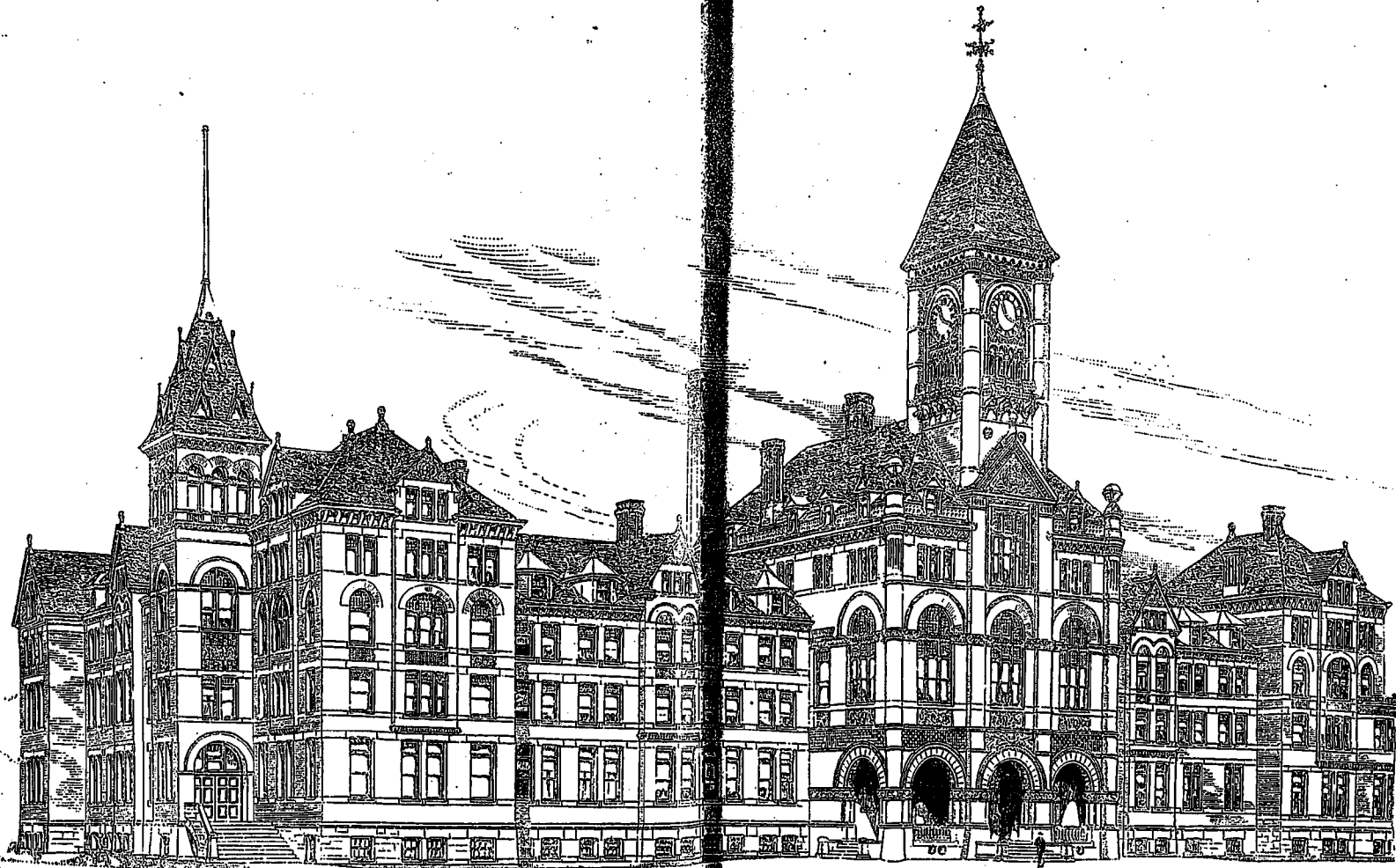
It was resolved that the convention shall use its influence to secure the passage of a law for the punishment of any person or association hindering an American youth from learning any trade.

Papers were read by James John, of Chicago, on "Plastering and Stucco Work;" by Samuel J. Crosswell, of Philadelphia, on "Iron Work, Past and Present;" by John T. Tucker, of New York, on "Masonry;" and by W. H. Saward, of Boston, on "Builders' Exchanges, Their Opportunities and Advantages." Addresses were delivered also on "The Metric System," by George Eastburn, M. A., and "The Relation of the Architect to the Builder," by U. P. Hatfield, of New York.

The following officers were elected: President, Edward E. Scriber, of St. Paul, Minn.; First Vice-President, John J. Tucker, New York; Second Vice-President, A. McAllister, Cleveland, Ohio; Secretary, William H. Saward, Boston; Treasurer, George Tapper, Chicago.

The next meeting of the Association will take place at St. Paul, Jan. 20, 1890.

Mr. John Miller, of Toronto, won the prize of \$50 for the best essay on heating recently offered by the editor of the *Metal Worker*.



UPPER CANADA COLLEGE  
TORONTO - ONTARIO  
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### A PROVINCIAL ASSOCIATION OF BUILDERS AND CONTRACTORS.

THE following letters have been received on the subject of the formation of a Builders and Contractors' Association for the Province of Ontario:—

BELLEVILLE, March 7th, 1889.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—Your suggestion regarding the formation of a Provincial Association of Builders and Contractors is one of the utmost importance to every builder and contractor, and should be dealt with at the earliest possible moment. In a short letter it would be impossible to enter into a discussion of the subject, and I would therefore suggest that a convention be called at some central point (Toronto, perhaps, would be as convenient as any) to deal with the whole matter. I am glad you have taken this matter in hand.

Yours truly,

THOMAS HANLEY.

BOWMANVILLE, March 11th, 1889.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—I am in full sympathy with your views in regard to the formation of a Provincial Association of Builders and Contractors, and have often wondered why no effort has been made before to form an association of the kind. I have talked the matter over with other builders and contractors, and find that they all are favorably impressed. I would be willing to assist all I could to form an association. Hoping that your efforts in this direction will have a successful issue, I remain,

Yours truly,

WM. BUNNEY,

of the firm of Munson & Bunney, contractors and builders.

HAMILTON, March 11, 1889.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—With regard to your suggestion as to the benefit likely to be derived from a Provincial Association of Contractors, it is a matter which in my opinion is of grave importance, and likely to open up a great many questions. The principle one is the attitude of employees at the present time. If continued in, it must inevitably result in some kind of a combination of contractors, and the questionable benefit or good resulting from such combinations. As one evil begets another, so will the aggressive action of the trades unions be likely to bring into existence combination on the part of employers, with perhaps a mission of usefulness in curbing to some extent the selfish legislation of the trades unions in regard to such matters as the apprentice system for instance, which at present limits almost to exclusion the opportunity of young Canadians to learn trades. The result is, that the ranks of skilled workmen in the building line are largely filled by old country mechanics, who are allowed in their own country to learn such trades as they may have capacity for. They come out here and fill the places our own young men are heirs to, but are practically prohibited from fitting themselves for.

The better remedy for this appears to me to be the establishing of government trade schools, where such a knowledge of trades may be gained as will fit our young men with very little after training to take their place as mechanics. If such schools cannot be brought into existence by the government, here is one purpose which might be served by a Provincial Association of Contractors, whose united action would no doubt be influential in starting such schools and gaining the support of municipalities or government to continue them.

An Association could be of great benefit in many other ways, provided the proper material could be got into it. Here is where the principle difficulty is to be met with; and I do not well see how it is to be overcome. To engage in building the smaller class of buildings, requires but little capital, and less plant. The step from a journeyman to a contractor is the simple matter of getting a small job which a man may figure up after supper in the evening. He will probably be a contractor next morning, oftener through guessing than by any real knowledge of the value of the work he has taken. True, he may turn out to be a good man, but good or bad, he would have to be counted

in, in forming an Association. There is no standard at present by which fitness for this business can be regulated, and unless men can come up to a certain standard that their quality may be known, they could not be considered safe members of an association. Instead of giving strength to it, they would be a source of weakness, and would prey upon it. Still, as I said before, they would have to be included, as the association of a portion of the contractors who might live up their agreements, would be handicapped by the fact that others not included in the association could do as they considered most expedient.

I have not more time at present, but would like to see the views of abler men than myself on the matter.

Yours truly,

M. A. PIGOTT,  
Contractor.

### EXTEMPORIZED SCAFFOLDING.

By OWEN B. MACINNIS.

BUILDERS throughout the country in their daily practice, find it necessary to erect temporary scaffolding, and in doing so usually employ scrap-stuff or some of the material they intend using in the building. These scaffolds require to be handy, take little time in constructing, and must at the same time be strong and suitable for safely sustaining men and material. With a view to assist builders to a rapidly formed system of scaffolding the following is submitted:

The handiest, though not always the most applicable form, is the bracket scaffold, which consists of a number of permanently framed timber brackets, placed on a line, at a convenient distance apart, on which to rest the planks. Each bracket measures about 4 x 4 feet, and is framed together of 1½ inch, or 2 x 3 inch sound spruce, for lightness and strength. It is held in its place on the frame wall by a ½ inch round iron bolt, which is forged long enough to pass through the boarding and studding, and a 2 inch block, which spans two studs inside. The end of the bolt is tapped and the bracket can be screwed tight against the boarding by a screw, key and washer. The bolt is fastened to the bracket under the horizontal arm, after passing through a hole in the vertical arm, by being forged flat and bored and bolted to it with ½ inch bolts which are countersunk on the upper side of the arm, to permit the plank to rest level on it.

All that is required to affix these brackets to the building is to bore a hole for the bolt, and they hang quite safe and will sustain the weight of any ordinary quantity of boards or siding. They can also be put up for boarding, and taken down as each strip of covering is finished.

In the absence of the above, a good safe scaffold can be quickly made of joists and ¾ inch covering or roofing boards. Cleats gained out the thickness of the bracket board are first got out, and to the gain a bracket piece is well nailed; the outer end of the bracket piece is next nailed square to the side of a sound joist at the required height, and the three together are then nailed by the cleat through the wall boarding into a stud. If much weight is to put on the scaffold, blocks should be nailed under the bracket piece on the vertical joist to take the strain off the nails, especially when hemlock joists are used for uprights.

A very simple way of gaining a strong scaffold is to lay joists on their edges across brackets no more than ten feet apart, with ledgers placed across their upper edges, on which the planks rest. It is also very convenient when the scaffolding planks are not forthcoming, and boards are substituted, and it saves a double thickness of boards. This scaffold is braced diagonally, and in order to increase its height, another joist can be placed on the top end of the bottom one, and the joist secured by nailing a ¾ cleat across it.

A useful and easily removed scaffold for putting on roof boarding consists of simple brackets nailed through the roof boarding into the rafters beneath, with a plank laid across them to stand on.

When the boarding is all on, and the window frames and cornice set, one of the next accessories is a handy shingling stage. After the first courses have been laid, it is usual to form a scaffold out of joist laid against the roof on their edge, and fastened by shingles. The best way, however, is to shingle the joist in, by nailing the shingles to it, and fastening them in a course of shingles, keeping those nailed on the joist down, so that the joist will come below the butts of those in the course. These can be cut off when the scaffold is no longer needed, and the roof will not have been in any way injured.

The handiest scaffold which a carpenter and builder can adopt for setting cornices over store fronts, consists of a piece of 8 or 9 inches x 1 inch spruce board nailed square across near the ends of two joists at the desired height, far enough apart to permit each joist to stand respectively, allowing for the difference in their levels on the store floor and sidewalk. When the number of these frames needed is nailed together, they are placed in position, braced diagonally, and the plank laid across them. This method makes a very convenient, firm scaffold, and costs very little time.

Messrs. Harding & Seathorne, of London, Ont., contractors for the construction of the Goderich water works system, have successfully completed the work.

## HAMILTON.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

SINCE my last report, owing to the cold weather having set in rather severely, all building operations have been suspended, but as there are quite a number of buildings yet unfinished, on resuming work there will be plenty of employment for all until the new spring business comes on. As yet it is impossible to form any idea as to the extent of the spring operations, for as a general rule, parties intending to build either in spring or fall, do not place their orders in the hands of the architects until the season is well advanced, and then all is hurry and rush to get the plans prepared and the contracts let, so that the building will be completed on a certain date, and in most all cases, the time allowed is unreasonably limited.

This is certainly not a prudent way of doing business, and is disadvantageous to all parties concerned. The architect has not the proper time to mature his plans. The proprietor in his limited decision, requires alterations and extras; and the contractor being so bound up to time, cannot execute the work in as good a manner, as if a reasonable contract time was allowed. This has always been a general cause of complaint among architects and contractors, and one which it would benefit the parties most concerned to seek to have remedied. I have nothing to report from the Building Inspector's book, as there have been no new entries made. But I am glad to be informed that owing to very frequent complaints having been made, there will be proper attention paid in future to having all new buildings properly recorded.

The hot air furnace is rapidly taking the place of the heating stoves in the dwelling houses now erected. This is probably a step in the right direction, providing careful attention is paid to ventilation. Here lies the great danger, for where the house is heated with hot air, the stove pipe holes, when such exist, may be closed, and the fire place covered up, leaving no exit for the vitiated air. Of course proper expert attention to ventilating and heating will obviate all danger, but it can be plainly seen in many instances where furnaces have been introduced, that expert care in this direction has not been used.

## OTTAWA.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE CANADIAN ARCHITECT AND BUILDER in its new robes must have been a pleasure to its numerous subscribers and readers. It is to be hoped that with the commencement of the third volume still greater improvements will be made. This can only be accomplished by the architects and builders throughout the Dominion taking a lively interest in its welfare, and endeavouring to advance its interests in every way possible.

On the evening of January 15th, the architects of Ottawa held a meeting for the consideration and adoption of the constitution and by-laws of the proposed Ottawa Institute of Architects. After having been carefully read over, and some alterations made, they were finally adopted. Eighteen architects signed the members' roll binding themselves to faithfully adhere to the constitution and by-laws of the Institute. The election of officers was then proceeded with, and resulted as follows:—President, Thos. Fuller; Vice-President, K. Arnoldi; Secretary, A. M. Calderon; Treasurer, J. R. Bowes; Executive Council, H. H. Horsey, D. Ewart, K. Arnoldi, R. Surtees, J. R. Bowes, A. F. Alexander and A. M. Calderon. The Association meets monthly, when questions relating to the interests and advancement of the profession will be discussed. The architects consider they have accomplished a great deal in thus being organized, and each individual member expects to derive a great deal of benefit from the institution. It is also proposed to submit differences between architects and contractors to the Institute for adjudication, if such arrangement can be made with the contractors, as a great deal of unnecessary legal expense may thus be saved. It is to be hoped the architects of other cities in the Province will form similar organizations and all become affiliated. If this is done, there is no reason why an Act of Incorporation should not be granted at the next session of the Ontario Legislature, as the Hon. Mr. Ross, Minister of Education, is favorable to the idea. It is to be hoped that through the columns of the CANADIAN ARCHITECT AND BUILDER, you will make every effort to have the Association formed and a charter granted as soon as possible. I have no doubt but that the Secretary of the Ottawa Institute would be happy to furnish a printed copy of the constitution and by-laws to any architect applying to him.

It is gratifying to learn that the difficulty between the architects and builders of London, in regard to the form of contract, has been amicably settled. There is no reason why a uniform contract should not be adopted by the architects and contractors throughout the Province. This is one of the points that could be arranged if an Architectural Association was in existence. A contract, drawn up by a joint Committee of Builders of the National Association of Builders of the United States and Committees of the American Institute of Architects and the Western Association of Architects is now being almost exclusively used by the American architects and builders, and seems to give general satisfaction.

About fifty members of the Contractors' Union, of Montreal paid Ottawa a visit recently. They were met at the station by the Mayor and principal contractors and driven to the Grand Union Hotel, where they were presented with an address by the Mayor, and granting them the freedom of the city. They were afterwards tendered a banquet by the city contractors,

the Mayor presiding. The Ottawa contractors are discussing the advisability of forming a similar Union.

Very little work has been let out as yet for 1889. F. Alexander, architect, has let contracts for a brick residence for Alderman Stroud, to cost \$7,000; Arnoldi & Calderon, architects, have let contracts for a Bank of Ottawa building at Carleton Place, to cost \$73,000; J. R. Bowes, architect, has let contracts for a free stone residence for N. Charlebois, to cost \$12,200; the congregation of the Dominion Methodist Church are receiving tenders for a lecture hall to cost about \$12,000.

The architects appear to have plenty of work on the tables, and anticipate a brisk season, but clients are slow in getting the work let out.

## MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THERE is very little to report in the way of building transactions. Things architectural may possibly boom in the spring, but at present there is little sign of activity. Architects, contractors, and the public at large, suffer from the annual "corner" in bricks, and no one is inclined to build until the quotations for summer brick are out.

There is a tremendous rush to finish the numerous gigantic piles of offices which have been in course of erection during the past year in time for the fated 1st of May.

Mr. W. T. Thomas is engaged on plans for a mansion for Mr. Duncan McInyre, which will be commenced this summer.

A new Methodist Church is to be erected in St. Gabriel village on Wellington St., from designs by Mr. W. McLea Walbank. It is intended to commence operations at once.

A temporary architectural *furor* was caused by the designs sent in for Messrs. Morgan & Co.'s colossal establishment up-town on St. Catharines St. Ten designs were sent in, and it is a pity the public will not be allowed to judge of their merits by their being publicly exhibited. As it was, the unsuccessful competitors had their plans promptly returned without note or comment, the design of Mr. J. P. Hill being selected. The buildings will cost approximately \$150,000, and be completed by May 1st, 1891.

Apocops of the above I enclose you my opinion of competitions generally, having through dearth of prose matter (like Mr. Silas Wegg) "dropped into poetry," as follows:

An architect sat in his old arm chair—  
T square and drawing board both were there—  
With "Whatman's Imperial" mounted with care  
He was equally ready to do or dare,  
But he rubbed his knee  
As he sighed "ah me!  
What sort of a job will my next one be?"

(Reads advertisement.)

"Be it known to all whom it may concern  
That the worshipful Borough of "Butter-on-the-Burn"  
Thron prizes will give for designs for a churn."  
"What the deuce do they want with a churn?" quoth he,  
"Now I'm all up a tree,  
(For between you and me),  
A churn in full action I never did see!"  
An "ancient example" he anxiously sought,  
And by his office boy neatly was caught  
In making a copy of something he thought  
Was genuine classic. "Hello! I may be

This will suit to a T,  
(I 'ho' between you and me)  
It's meant for a well with a windlass," quoth he.  
Elevations he hasteneth now to prepare,  
A perspective he etcheth, as much as he dare  
A specification he copeth fair;  
And he slappeth his knee,  
And he crieth with glee,  
"Now I'm certainly sure to be one of the three!"  
For weeks he walleth—no news can he gain—  
"No news is good news," he quotheth in vain,  
Till the following drives him completely insane:

(Reads letter.)

"Dear Sir: We herewith return your drawing,  
For we found if we kept on much longer see-sawing,  
We somehow might possibly get into lawing—  
After getting as pretty well mixed up as mortar,  
We withhold the prizes—  
Though all shapes and sizes,  
Not one of your churns will make butter out of water!"

P. B. W.

It is computed that if one horse can draw a certain load over a level road on iron rails, it will take 1½ horses to draw the same load on asphalt, 3½ horses to draw it on the best Belgian block, 5 on the ordinary Belgian pavement, 7 on good cobblestones, 13 on bad cobblestones, 20 on an ordinary earth road, and 40 on a sandy road.

### THE BUILDING OUTLOOK FOR 1889.

**GALT, ONT.**—Building operations here do not look very bright at present.

**OWEN SOUND, ONT.**—Building outlook, fair. Not many very large buildings under contemplation so far.

**BERLIN, ONT.**—Building operations during the coming season are expected to exceed those of last year, which were very large.

**ST. CATHARINES, ONT.**—The outlook for building is fair; no great push is looked for; quite a number of alterations and improvements are proposed.

**DESERONTO, ONT.**—Building operations have already commenced, and the probabilities are that many new houses will be put up the coming season.

**KINGSTON, ONT.**—The outlook for the approaching building season here promises very fair; as good or better than last year. There is more work out now than last year at the same time, and more in the different offices under way.

**ST. THOMAS, ONT.**—There will be a fair amount of building done in the city during the coming season. There will be a very large amount done among the farmers in the vicinity, fully as much as during the past two or three years put together.

**COLLINGWOOD, ONT.**—The building outlook is not of the best; tenders are being asked for a general and marine hospital to cost about \$30,000; a by-law has been passed to raise \$20,000 for a new town hall; one or two stores are spoken of, also some dwellings.

**HAMILTON, ONT.**—The building outlook here is considered good. A great number of cheap buildings have been contracted for; in fact, if all is true that I hear, the city will be boomed this summer. I don't think the architects as a rule are busy, as most of the buildings are in speculative builders' hands.

**GUELPH, ONT.**—Ten contracts have already been let for new houses to be built this spring. From the number of contracts already awarded there is promise of considerable activity in building operations in the spring. Amongst the prospective erections will be the new passenger station of the G. T. R., and a new skating rink.

**LONDON, ONT.**—Building prospects for the coming season are not very bright. A few small contracts have been let. A block of stores on Richmond St. and a large hotel on York St. are contemplated, and the Canadian Savings & Loan Society are about erecting new offices on Richmond St. The architects appear to think there will be plenty of work, and our principal builders are hopeful.

**BROCKVILLE, ONT.**—Building operations do not tend to be very brisk; no work has been yet let, although plans have been prepared for a number of residences and several summer hotels, including a 150 room hotel on Rideau Lake, probable cost \$32,000, and addition to a summer hotel at St. Lawrence Central Park, containing 80 rooms, probable cost \$3,600. The Leeds and Grenville County Court House will also be remodelled and a new fire hall built.

**REGINA, N. W. T.**—The prospects of a busy summer are very good. A new Methodist Church and a large school building to cost about \$12,000, are contemplated. Operations will begin as early as possible on the police riding school, and also on the Indian Industrial school. Contractors are expecting the plans for the proposed gubernatorial residence, will be ready soon. A number of handsome substantial blocks are to be erected, and also several residences.

**STRATFORD, ONT.**—There is every appearance of a good trade this season. Already a large number of contracts are let, among others, Worth's block—4 stores and public hall, to cost \$14,000; alterations to Dr. Kilroy's residence "Glebe House," to cost \$5,000; houses for Jas. Corcoran, cost \$3,000, H. M. Johnson \$3,000, and John Hogarth \$2,000; also one for J. R. Kilbura, architect, to cost \$3,700. A large number of smaller contracts ranging from \$1,000 to \$1,500 are also let, and from present appearances the builders will have a busy season.

### FAILURE OF THE SUSPENSION BRIDGE AT NIAGARA FALLS.\*

THE members of this Society will be glad I am sure to be informed of the circumstances connected with the recent failure of the Suspension Bridge at Niagara Falls, which I constructed for the Bridge Companies, and which was opened for traffic on the fourth January, 1869, just twenty years ago. All the particulars relative to the first construction of this bridge were published in a report made by me to the Directors, dated 1st March, 1869, and this report with illustrations was the same year given in "Engineer," in England.

The span of this bridge is 1268 feet between the points of suspension at the towers. The roadway was 10 feet wide, providing a single track for carriages, and a path for foot passengers. The roadway was supported by two cables, each cable composed of seven wire ropes, each rope of seven strands, each strand of miniature wires 0.155 inch in diameter, No. 9. B.W. 0. Each rope had a guaranteed tensile strength of 100 gross tons=112 tons net. They bore the test of 108 tons net without rupture of the rope, when the fastenings gave way.

\* Extract from the annual address of the President of the Canadian Society of Civil Engineers, held at Montreal, Jan. 17th, 1889.

The single track bridge was designed to carry with perfect safety a load of 100 tons without producing a strain of more than 25 per cent. of the ultimate strength. Besides the cables there are over-flow stays which are a real support to the roadway; and in order to keep the roadway from swaying about in the wind, there were 54 guys, 28 of which were on the up stream, and 26 on the down stream side. Some months after the bridge was opened there was added both on the up stream and down stream side a horizontal arched cable, with horizontal stays between them and the roadway, which had a good effect in steadying the bridge.

The original bridge rested on wooden towers, but for fear of accidents by fire the Directors submitted steel towers for wood.

About two years ago the Directors decided to make the bridge a double track bridge without consulting me in the matter. They proceeded to take down my single track roadway, and to substitute a double track. This enlargement was completed in September last. I have not seen any of their work, and from lack of information I am unable to state what means were adopted by them to secure the double track against the additional strains that must come upon it. The additional strain on the cables and stays, and the additional surface offered to the force of the wind, for which more guys would have to be provided.

My bridge, before it was opened to the public, was officially inspected by officers of the Dominion, and of the state of New York; the Directors also employed the Hon. W. McAlpine, their consulting engineer, to report more fully in regard to its sufficiency.

My bridge weathered the storms for twenty years. My cables and anchorages are still in place, and, I understand, are to be used in the reconstruction of the bridge. My roadway was not blown from the cables, it was taken down by the Bridge Company. It was the double track roadway substituted for the single track that was blown away only three months after it was put up; and I am not aware that there was any Government inspection of it.

It is a fortunate circumstance that no lives were lost in this accident. From all accounts it was a terrible storm. The anemometer at Buffalo registered the velocity of the wind 88 miles an hour.

The great problem to be solved in the construction of a bridge over this chasm is to keep it from being injuriously affected by wind storms which not only causes vibrations like that of a pendulum, but wave like undulation through the length of the roadway and the suspended portion of the cables. To guard against these a cradle form is given to the cable and the over-floor stays from the towers to the roadway, as well as the cradle stays from the cables to the base of the towers seem to check these undulations, while the under-floor guys reaching down at various angles from the roadway to the rocks along the river bank, meet and check the lateral force of the wind upon the whole suspended system.

To balance these forces one against the other, and leave a fair margin for safety, will tax the best skill of the engineer, because the storms through this gorge seem to drive with greatest fury in consequence of its funnel shape.

An opinion was expressed by the late J. A. Roebling, who built the railway suspension below this, that no bridge could be made to stand here at the falls; and on account of the storms, but from the spray coming from the American Fall, which would cover the bridge with ice and break it down. But the experience of twenty years has proved there is no danger to be apprehended from this cause. In deference however to his opinion the bridge was made a tentative structure, and if successful might afterwards be enlarged and made a permanent structure.

### HOW TO USE DYNAMITE IN WINTER.

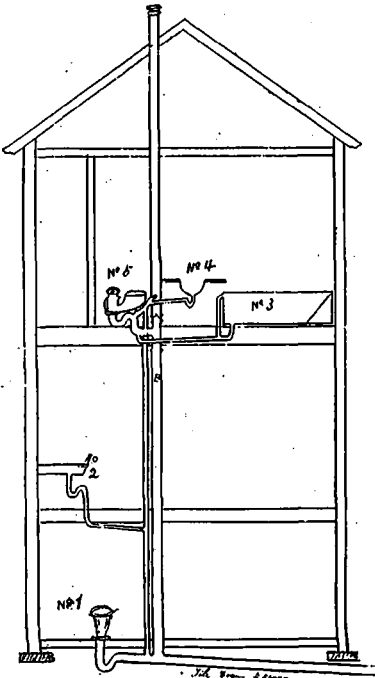
IN view of several fatal accidents which have occurred recently from dynamite explosions, Mr. John A. Macdonald, writes from Sault Ste. Marie to the Toronto *Empire* as follows:

"In order to prevent such accidents in future I offer a few suggestions for the benefit of those who may be engaged in the use of dynamite in cold or frosty weather. Your correspondent has used all kinds of explosives on the C. P. R. on the north shore of Lake Superior, from the 30 per cent. up to 60, and the glycerine in its pure state. In winter make a good strong fire, and around this fire put three or four bushels of common plasterers' sand; as it dries push it into the fire and make it hot enough to run. Now pull the sand out of the fire and apply cold water to the sand, so that it will be all damp. This can be accomplished with a hoe. Mix well, the heat will be very great, and no fire. Put this in a shallow box, say two feet wide by three feet long and about eight inches deep; spread four inches on the bottom, then place the dynamite on this, then cover up with this warm sand, throw a blanket over the box and everything is safe. This can be done at night, and with protection from the wind and a larger quantity of sand all the powder for the following day can be thus prepared without fear. I have used dynamite by the tons in every form, and for all kinds of work, but of all the plans for thawing dynamite the above is the safest. Dynamite is as harmless up to 50 per cent. as candles if handled properly. Dynamite is more dangerous in winter than in summer. Dynamite that is not properly thawed is dangerous, because in a low temperature it will sometimes burn and not explode; but frozen dynamite may burn down to dynamite that is properly thawed and cause this to explode.

## SANITARY PLUMBING

### SPECIMEN NO. 2 OF "SANITARY PLUMBING."

IN our issue of last month we gave a brief description of a case of scamp plumbing that was aired in the Toronto courts. In the present issue we give another and a similar piece of work, executed by the same individual, and over which there has been another law suit. The circumstances of the case are briefly as follows: A was building a pair of houses and invited B to tender on the work. B sent in his tender and a specification of what he proposed to do. The builder considered the price ridiculously low compared with what he had been accustomed to pay for similar work, and sent word to B to this effect, at the same time stating that he wanted a good sanitary piece of work, and asked B to reconsider his tender, and put in a price to cover the requirements of the city ordinance. B sent in another tender, this time asking fifty dollars in excess of his first offer and was awarded the contract. All went on merrily until about



NOTE.—B, 4 in. cast iron pipe; A, 4 in. lead pipe, with slip joint made with putty; No. 1, hopper closet; 2, kitchen sink; 3, bath tub; 4, wash basin; 5, Demarest water closet. About one-half of the joints in lead and iron waste pipes were made with putty, and one joint on the 2 in. lead vent pipe was made with pitch.

half the work had been done, when one day the plumbing inspector happened along and insisted that material of proper weight should be put in to conform with the plumbing by-law, which B consented to do. Nothing further was heard of the matter until A received his bill, when to his surprise B had, in addition to his contract price, charged him \$42 for extra material in having to comply with the city by-law. A naturally refused to pay this extra charge, as he claims he instructed B to do this in his second tender. B then entered suit to recover his claim when A sent the plumbing inspector up to examine the job, and discovered the work exactly as shown in our engraving, which will at a glance explain itself. The judge on hearing the evidence decided the plumber was at fault, appointed another master plumber to examine the job and report

to him the probable cost of putting the work in good sanitary condition, gave judgment that the plumber should pay this bill, and disallowed his claim for extras with costs. This is not the first time this very enterprising person who poses as a plumber has received his reward for scamp work.

### TRAPS AND THEIR VENTILATION.

BY E. KIRK.

THE main trap on house drains has been the subject of much attack from various quarters. It has been charged with having generated nearly all the foul gases which emanate from the sewers, and acting on the assumption that the charge has been proven, some are prepared to abolish it. This would be equivalent to a jump out of the frying pan into the fire. A drain trap is like any other trap used in plumbing practice; it should be so constructed as to be self-cleaning, and if it is not so constructed, it will be a nuisance. A drain, together with its trap should be of such a size as is calculated to meet all that will be required of it and not more than that. A six-inch drain is too large for an ordinary house, for the reason that sufficient water cannot be collected into it at one time from such a house to flush it. Therefore if the drain cannot be flushed, its trap cannot be flushed. I have seen a small house drained through a nine-inch trap which could never be anything but a cesspool of reeking filth.

Much ignorance is frequently displayed in the setting of drain traps. Nearly all the drain layers I have met with, level the trap from the cleaning hand-hole—placing a straight-edge over it—and if on placing a level on it, the drop shows in the centre, it is pronounced to be correct. Now, a look at some of the traps will demonstrate the absurdity of this. The hand-hole is seldom at right angles with the trap, so that when a trap is so set, the outgo will be found to be higher than the inlet (in some cases as much as three inches), and as a result, the water will remain in the drain on the inlet side for two or three lengths, varying with the amount of fall which is given to it. A trap set in such a way could not be otherwise than foul. It is folly to reason that because such bad results emanate from improperly constructed traps, they should therefore be abolished. It might as well be reasoned that because improperly constructed water closets give poor satisfaction, therefore water closets should be abolished. Let us have traps properly constructed and then we will have good results.

I prefer the  $\frac{1}{2}$ S trap or P trap to the running trap, where sufficient fall can be obtained; the water having a fall of from six to twelve inches into the trap will more thoroughly flush it. In setting a running trap, the water seal should be about half an inch lower than the inlet. This will favor its chances of being flushed.

Another fruitful source of filth accumulation, is the manner in which the piping is often put together. A bedding of cement is placed in the bottom of the last pipe laid; then the next pipe is placed into it and forced up to the shoulder at the hub, carrying with it some of the cement, which is squeezed up into the pipe.

S. S. Hellyer, in his book "The Plumber and Sanitary Houses," speaking of untrapped drains, says: "It is, to say the least, a little communicative." It is bad enough to contend with the foul air contained in one's own drain, without contending with the accumulations of a whole community.

These are some of the risks attending the omission of the main trap. Some handy man who professes to understand all about drains, is engaged to make a connection with the drain for an additional rain water pipe, or for the purpose of draining a wet cellar. If a trap is furnished he will probably put it in, but it is a chance. A wall, under which the drain passes, settles down upon it, crushing or breaking the tiles; one of a block of houses remains idle—the traps being unused, dry out, the house being closed up and communication with the houses on either sides not being entirely cut off, sewer gas will find its way into each of them; the extension of soil pipes in close proximity to the windows of an adjoining house; the liability of such extensions to become closed up by hoar frost during the winter months, in which case a pressure in the sewer would be liable to force the traps.

There are some instances in which it would be safe to omit the drain trap, but they are special. In some of our high buildings where the entire drainage system from the outside of cellar walls to the roof is constructed of heavy cast iron, said trap might be safely omitted, but only where such conditions exist should this be done.

In the case of an empty house, as above mentioned, the trap is the only safe-guard. Its seal would be maintained by every rainfall, the fresh air from the inlet pipe would keep the drain sweet, and evil resulting from dried-out traps would thus be minimized.

As I said before, all traps should be self-cleansing, and to my mind it is clear that the drawn lead trap fulfills all the requirements of a self-cleaning trap, and while it is necessary to have sufficient depth of seal, (one and a quarter inches is little enough), it should not be more than two inches in depth for more than that will constitute a filthy cesspool.

Every trap should be ventilated mainly to prevent siphonage, but also to prevent air pressure, and the formation of gases which have a tendency to form in unventilated waste pipes, and which may be absorbed by the water in the traps and given off again into the house. These trap-vent pipes should rise separately from their connection with the traps and connect into the soil pipe above the highest fixture, or they may be combined by connecting into one main pipe, but such junction should be at least six inches above the highest of the adjoining fixtures, otherwise, in the event of a stoppage in the waste pipe, the waste water would rise until it reached the vent pipe through which it would continue to flow until it in turn became stopped up, thus rendering it useless.

Close to the connection with the trap, a cleaning screw should be placed on the vent pipe for convenience of inspection or the cleaning of the trap or vent pipe at its connection with the same. Local ventilation might also be furnished to each trap. This should be connected to the inlet side of trap as remote as possible from the water seal (to prevent evaporation) and carried to a heated flue. Each trap thus becomes an outlet for vitiated air as well as for waste water.

I have recently made some experiments on the durability of the seal of a one and a quarter inch trap ventilated on each side of the water seal as above described. The depth of seal was one inch and nine-sixteenths. It took just six days to destroy the seal, and after the seal had been broken, the blaze of a match was still attracted down into the trap when placed near the mouth of it. I then cut off the local vent, leaving only the back-vent or break-siphon; and although the trap has been placed in a warm kitchen it has taken just twenty-four days to reduce the seal one inch and a sixteenth; after the seal has been entirely destroyed, I intend testing the durability of it without any vent attachments.

It would thus appear, that the objections raised against vented traps on the score of evaporation are not tangible.

#### INSUFFICIENT ACCOMMODATION FOR STEAM PLANTS.

THE *American Engineer* says:—"The past few years has seen a change in the building question as in many other problems of the time, and as a result it is a rare exception to find, in any of our larger cities, any large building erected, that is to be used either for mercantile, hotel or office purposes that is not heated by steam, hence have steam plants as a part of the building. In fact it may be said that steam power forms a feature of all of our large buildings.

However apparent the fact is, that a steam plant is to be located in the great buildings of this age, the architects in Chicago at least, seem to design the building with a view to every other connection, and then after that is done, the steam plant is suddenly thought of, and as they have made no provisions for it, they stick it away down in some corner, often times under the pavement, with hardly room enough to get it in, let alone room to work around it.

To any one concerned in the matter it can not but prove an interesting trip to go about among the gigantic office buildings of Chicago, and note the cramped up arrangements of the machinery department, and to see in what a circumscribed space the engineer must perform the duties assigned to him."



#### PLASTERING AND STUCCO WORK.\*

BY JAMES JOHN.

IT has not been the fate of this simple, durable and inexpensive material to escape the assaults which every good thing in this world must encounter at one time or another. It has been called unclean; but it is not so of itself. Like many another wholesome and useful medium, it can be so illy made and be so indifferently applied, as to offer to dirt and insects abiding places due to the perverted ingenuity of man, not to the inherent defects of itself. In spite of all that has been said against it, it remains the universal lining for dwellings throughout the civilized world. Wealth may incase walls and ceilings in decorative woods and metals, but for the mass of mankind, plaster must continue to be the simplest, cleanest, least costly and most enduring finish for homes. The health of the vast majority of mankind is, therefore, largely dependent upon the materials used in its mixture, and the principles which shall actuate its employment.

It is undeniable that the custom that obtained some years ago of applying plaster in highly ornate designs, was for domestic purposes unsanitary. The isolated, convoluted and otherwise multiform designs which used to be spread out upon ceilings, in cornices or special pieces, are gradually passing out of use. Their innumerable crevices served only as receptacles of dirt, in which the deposits were continuous.

The ornamental uses of plaster having been reduced by good sense and good taste, it remains still the most vigorous, as it is the oldest vehicle for carrying down to generation after generation the masterpieces of art with which the golden age of sculpture enriched the human race. Humble as its components are, common and cheap as it seems beside marble, and paltry when compared with the metals that have, to a considerable degree, taken its place for reproductive uses, it still preserves the plastic art, and enables youth to contemplate antiquity in its noblest achievements. To-day plaster is revolutionizing industrial art; for us, and, in all probability, for those who are to come after us, plaster, lowly and cheap, but docile and durable, is the connecting agent with this greatest of men's indorsements in the past.

Plaster thus employed in duplicating works of marble, iron and bronze, is to-day extending the finest industries, modern and ancient. The erection of the new museums in England, near the great manufacturing centers, would be next to useless were not plaster available for distributing fac-similes of the works, whose grandeur has made the name of Greece imperishable, and whose usefulness in development and the study of form, for all arts, is acknowledged to be unequalled. So potent is this simple medium, therefore, that it serves to-day as effectually as marble itself for the perpetuation of fine art; and by its endless variations of models, copied from every other material known in history, it is the supreme teacher of design. The reproduction of classic works at Kensington, and their dissemination throughout the provinces of the United Kingdom, has had the effect of making France fear for her supremacy in fine industrial productions. The important part that plaster thus plays in the Old World, it will continue to play in the new. Wherever art places its altar, plaster will be there as its handmaid; and though it may be abused by carelessness and calumniated by more pretentious rivals, it must remain the most faithful friend of progress in taste, in science and in decoration.

Noble and varied as may be the uses to which plaster has and may be applied, I regret to say that the art of applying same, as a vocation, for the lining of dwellings is to-day so unremunerative to the artisan, that it almost ceases to enlist the skill and intelligence that the art should command. This is due mainly to the want of appreciation by the architect and owner, whose only thoughts are for a semblance, for the time being, and are tempted by the questionable economy of saving a few dollars,

\*Paper read before the third annual convention of the National Association of Builders, at Philadelphia, February 13th, 1889.



into letting contracts to men of no mechanical standing. It is hoped and expected that through the influence of the National Association of Builders, and the intercourse its executive officers may have with the reputable architects of the country, that the day is not far distant when it will be required of the artisan in the various branches pertaining to buildings, to arm himself with a proper and authoritative testimonial, giving proof that he is skilled in his art, and thus divest the wheat from the chaff, and the former be recognized and the latter find its level.

It is a well-known fact that plaster on a ceiling surface, in the event of fire, will detain it for a long time, providing any means have been taken when applied to secure it under such circumstances, and were these means more generally employed, millions of dollars would be saved to this country annually.

As the fire-proof construction is the exception, and as wood construction must predominate for years to come, therefore, more attention should be given to make the latter structure more fire-resisting.

During the last twenty years I have devoted much thought to this subject, and some of the devices I have had in that direction, I have sought to secure by letters patent, and, strange to say, came in conflict with an English patent in the archives at Washington, bearing date 1797. The device then discovered has been slumbering there nearly one hundred years, and to-day, I know of nothing more economical or effectual to secure plaster in position in the event of fire than this same device. It is simply a wire netting, as used to-day for a foundation, but as these described placed over the bottom surface of the plaster, and then securely stapled to the furring or joints, and afterward the finishing coat of plaster applied over the surface. And as most every mechanic has at some time or other taken out a patent, or applied for one, it may be interesting to you to hear the language that Edmund Cartwright (as that was the name of the applicant) used in paying due deference to his sovereign lord.

After describing his invention in substantially the same language that obtains in patents of the present day, he closes thus:

"In witness whereof, I, the said Edmund Cartwright, have hereunto set my hand and seal this eighth day of November, in the thirty-eighth year of the reign of our Sovereign Lord, George the Third, by the grace of God, of Great Britain, France and Ireland King, Defender of the Faith, and so forth, and in the year of our Lord one thousand seven hundred and ninety-seven.

EDMUND CARTWRIGHT."

Some of the designs in art tiles are formed by pressing on the surface actual stalks, leaves and flowers, reliefs being taken from the impressions, either the intaglio or embossed design supplying a pattern for dies. Intaglio tiles, may have the incised lines filled with enameled colors corresponding in hue, if desired, to the objects impressed.

It is suggested that a profitable opening exists for the manufacture of plaster of Paris from plaster of gypsum, which is produced and exported in large quantities from Nova Scotia.

Messrs Geo. Moore & Co., of Waterloo, Ont., have bought the well-known brick-yards of Mr. Oetzel at Berlin and Waterloo, and fitted them up with the latest and most approved machinery.

The *Winnipeg Sun* says that Mr. J. R. Tracey of that city, who is the inventor of a heating apparatus as an attachment to cook stoves, will come east shortly and endeavor to commence the manufacture of his invention at some point in Ontario.

At the annual meeting of the Owen Sound Stone Quarrying and Construction Co., held recently, the following officers were elected: President, S. G. Parker; Vice-President, George Ingils; Secretary-Treasurer, W. P. Stephens; Manager, David Chalmers.

A deputation of soil pipe makers from Montreal, Toronto and Hamilton, interviewed the Ministers of Finance and Customs recently, and asked for an increase of duties on pipes of less than 4 inches diameter. They want a specific instead of an *ad valorem* duty.

Electricity is being more and more used for the purification of kaolin and other porcelain clays. The clay is sifted on to a rapidly revolving horizontal plate, which is surrounded with powerful electro-magnets, which retain the particles of iron. From this the clay passes to a second plate which removes the last traces. The process is said to be comparatively cheap and very rapid, and since its introduction, many clays hitherto rejected as containing too much iron have become of value for the manufacture of pottery.



### CONTRACTS AWARDED.

The contract for the new Congregational Church at Waterford, Ont., has been awarded to H. J. Fowler. Cost, \$2,000.

The contract for erecting a new high school at Parkhill, Ont., has been awarded to Mr. A. K. Vanwyck, of that town.

Mr. Geo. Newlands has been awarded the contract for the new tower for St. Mary's Cathedral, Kingston, Ont., at the price of \$63,302.

Messrs. Kennedy & Co., Guelph, Ont., have received the contract to supply the stone for the new Government building at Goderich.

### CONTRACTS OPEN.

ST. THOMAS, ONT.—A hospital will be erected here this spring.

PRESTON, ONT.—A new school building is to be erected here.

BEETON, ONT.—W. J. Bell will build a large public hall in Beeton.

ELMVALE, ONT.—A hotel to cost \$5,000 will be built here this spring.

STAYNER, ONT.—The Roman Catholics will put up a new parsonage.

SIMCOS, ONT.—Money has been voted for the erection of a new fire hall.

PERTH, ONT.—A site has been selected for the new St. Andrew's church.

BRANDON, MAN.—A new post office will be erected this coming summer.

DUTTON, ONT.—Two large brick hotels will probably be built here next summer.

ELMVALE, ONT.—The trustees have resolved to enlarge the public school building.

DESERONTO, ONT.—The council has voted \$12,000 for the erection of a high school.

CLINTON, ONT.—\$3,000 has been subscribed towards the erection of a new Methodist Church.

VICTORIA, B. C.—Mr. Macauley contemplates the erection of a \$25,000 residence here next summer.

HARRISTON, ONT.—Tenders are called for a new town hall, to replace the one lately destroyed by fire.

AMHERSTBURG, ONT.—A new Roman Catholic parsonage to cost about \$5,000 is to be erected this spring.

BROCKVILLE, ONT.—An hotel to cost \$75,000 will be built at Grennell park, Thousand Islands, next summer.

GUELPH, ONT.—Steps are being taken to erect a new curling rink, the probable cost of which will be \$10,000.

MONTREAL, QUE.—It is the intention of the Bank of Montreal to erect a building for a branch establishment in this city.

CHATHAM, ONT.—Preparations are under way for the erection of a hospital for this town. Dr. CARTON can give particulars.

INGERSOLL, ONT.—A piano manufacturing company intend erecting a four-storey brick factory, at a probable cost of \$5,000.

KINGSTON, ONT.—A company of capitalists has purchased Grovedale Park Tabernacle and grounds and will erect a \$50,000 building.

KINGSTON, ONT.—Mr. H. Calvin has offered a donation of \$1,000 towards a new wing for the hospital on condition that \$9,000 additional is raised.

KINGSTON, ONT.—Tenders are asked until the 28th inst., for the construction of a dry dock. For particulars see advertisement "Notice to Contractors" in this paper.

ST. JOHN, N. B.—The commissioners of the general public hospital are to ask the New Brunswick legislature for permission to borrow \$10,000 to erect an additional wing to the institution.

MIDLAND, ONT.—A by-law has been passed granting \$5,000 towards the completion of the harbor improvements in conjunction with the Dominion Government and Grand Trunk Railway.

DARTMOUTH, N. S.—Tenders are asked until 3rd April for sewer pipe, sluice valves, cast iron pipe and special castings required for use in the construction of a proposed system of sewerage and water supply for this town. Particulars may be obtained on application to A. Elliott, town clerk.

WINNIPEG, MAN.—The President of the Northern Pacific Railroad says it is the intention of his company to expend about \$2,000,000 in new buildings in this city the coming summer.—The Provincial Treasurer's estimates include \$20,000 for the erection of buildings for land titles offices, \$20,000 for the erection of a deaf and dumb institution, \$50,000 for the erection of a reformatory and home for incurables.

HAMILTON, ONT.—Mr. R. McKechnie, of Dundas, has purchased a site in this city on which he will erect large machine shops in the spring.—A handsome new building for the Y. M. C. A. will be commenced shortly, Mr. James Balfour, architect, has prepared the plans. The building will

have a frontage on James street of 70 feet, and on Jackson street of 150 feet. It will be of red brick, trimmed with Credit Valley stone, and will cost \$25,000.

**LISTWOL, ONT.**—The Foresters are considering the advisability of erecting a block of stores, with offices in the first flat, and a hall in the second flat. Also an opera house in the rear of the stores, to be reached by an arcade.

**OTTAWA, ONT.**—The following sums are to be voted for public buildings in Ontario: Almoite post-office, custom house, etc., \$7,000; Brampton public building, \$7,000; Cayuga post-office to complete, \$4,500; Cobourg post-office, custom house, etc., to complete, \$6,000; Gananoque post-office, custom house, etc., to complete, \$2,500; Goderich post-office, custom house, etc., \$7,000; Government printing bureau, to complete, \$33,000; Kingston penitentiary, \$20,000; Lindsay post office, custom house, etc., \$9,000; London custom house (re-vote of lapsed amount,) \$4,000; Napanee post-office, custom house, etc., to complete, \$11,000; Pembroke post-office, custom house, etc., \$8,000; Port Arthur post-office, custom house, etc., on proper site being given, \$7,000; Prescott post-office and custom house, \$10,000; Strathroy post-office, custom house, etc., \$7,000; Toronto Dominion buildings, improvements, \$1,500; Trenton public building, \$7,000; Toronto drill hall, for the construction of, on condition that the city of Toronto provide a plot of land, as agreed upon, \$30,000; Departmental buildings, Ottawa; reconstruction of elevator in Western block, \$3,000; Toronto examining warehouse, outbuilding, \$750.—The following appropriations will be made for Ontario harbors and rivers: Cobourg harbor, \$6,000; Kincardine, repairs, \$5,000; Kingston harbor, \$6,000; Little Nation River, removal of obstructions, \$4,000; McGregor's creek, to complete, \$2,250; Owen Sound, \$15,000; Port Elgin, \$3,000; Port Hope, repairs, \$2,500; Portsmouth, repairs to pier, to complete, \$1,000; River Ottawa, improvement of steam-boat channel through narrows of Petawawa, above Pembroke, \$3,000; Meaford, the town having furnished \$3,000, to complete \$3,000; Belleville, to complete harbor works, the local authorities protecting the island with crib work to the extent of \$6,000; Rideau river, dredging branch, \$3,500; Collingwood harbor, works of improvement, \$5,000; Toronto harbor, works at eastern entrance, the city of Toronto having to contribute \$100,000, \$20,000; Penetanguishene harbor works, locality having furnished \$10,000, \$5,000; General repairs and improvements, harbors and rivers Ontario, \$10,000.

**TORONTO, ONT.**—The Provincial Legislature has voted the sum of \$471,656.67 to be expended on public buildings as follows:—Asylum for the insane, Toronto, \$11,370; Mimico Cottages, \$211,004; Asylum for the insane, London, 22,535; Asylum for the insane, Hamilton, \$24,854; Asylum for the insane, Kingston, \$4,019; Branch Asylum, Kingston, \$200; Asylum for Idiots, Orillia, \$63,150; Provincial Reformatory, Penetanguishene, \$5,530; Reformatory for Females, Toronto, \$4,319.67; Central Prison, Toronto, \$8,100; Deaf and Dumb Institute, Belleville, \$6,725; Blind Institute, Brantford, \$2,500; Agricultural College and Experimental Farm, Guelph, \$26,

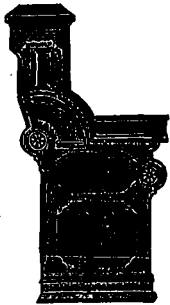
780; Educational Department and Normal and Model School, Toronto, \$7,000; Normal School, Ottawa, \$1,800; School of Practical Science, Toronto, \$2,000; Osgoode Hall, Toronto, \$2,500; Government House, Toronto, \$3,000; Algoma District, \$11,000; Thunder Bay District, \$500; Muskoka District, \$500; Parry Sound District, \$1,500; Nipissing District, \$2,500; Rainy River District, \$1,500; Miscellaneous, \$200.—It is reported that the Equitable Life Insurance Co., of New York, will erect a fine office building in Toronto shortly.—The congregation of Bloor street Presbyterian Church, will erect a new building.—See advertisement in this paper asking tenders for pipe, etc., required by Water Works Department.—The following building permits have been issued from the office of the City Commissioner since the date of our last number: John Frisken, alterations to offices, 23 Scott st., cost \$3,000; A. C. Thompson, 9 att. 2 storey stores, with public hall on 3rd storey, Yonge st. north of Bloor, cost \$15,000; Mrs. Bengough, 4 att. 2 storey and attic brick dwellings, Roxborough ave., cost \$10,000; Wm. Charters, two 2-storey and attic brick dwellings, Seaton st., cost \$2,000; Mr. White, 3 pr. s. d. 2-storey and attic brick dwellings, east side Huron st., near Bloor, cost \$30,000; Jas. Hudson, pr. s. d. 2-storey and attic brick dwellings, Bathurst st., near Bloor, cost \$6,000; P. Bedford, 2-storey and attic brick dwelling, Rosedale, cost \$6,000; C. H. Stainton, 4 brick 2-storey dwellings, Scollard st., cost \$2,800; Dr. J. E. Graham, alterations to 16a King st. west, cost \$1,500; Mr. Harris, two 3-storey brick stores and assembly hall, corner Queen st. and McDougall Lane, cost \$15,000; W. D. Gillean, 2-storey and attic brick dwelling, Dale ave., Rosedale, cost \$9,000; Wickett Bros., pr. s. d. 2-storey brick dwellings, and r. c. add. Rose ave., cost \$3,000; John Boyca, pr. att. 2-storey and attic brick dwellings, Spadina ave., cost \$4,000; Jos. Tate, 2-storey brick add. to 622 Yonge st. cost \$1,500; J. Ritchie, pr. 2-storey r. c. dwellings, McPherson ave., cost \$3,000; Jas. Crang, 5 pr. s. d. 2-storey brick dwellings, and one detached, Trambly ave., cost \$18,000.

**PUBLICATIONS.**

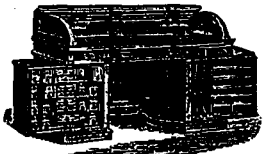
We extend the right hand of fellowship to a new class journal, *Hardware*, published weekly at Toronto, by Mr. J. B. McLean, and designed to be the organ of the wrought, cast, stamped, sheet and spun metal trades.

Last year 100,000,000 feet of gas was burnt in Kingston, an increase of 2,500,000 over the previous year.

The Edison patent on incandescent electric lights has been declared null and void as regards Canada. The ground of the decision is failure to comply with the patent regulations, which provide that the articles thus patented must be manufactured within Canada one year from the issue of the patent, and the importation of the same patent from the United States must cease within two years.



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PRESTON, ONTARIO,  
MANUFACTURERS OF  
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CHURCH AND LODGE  
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Church and Opera Seating and Other Furnishings.

**24 Front St. West,**

**TORONTO.**

## MANUFACTURES AND MATERIALS

### WHICH ARE THE HARD WOODS?

THE relative hardness of woods is calculated by the hickory, which is the toughest. Estimating that at 100, we get for pignut hickory 96, white oak 84, white ash 77, dogwood 74, scrub oak 73, white hazel 72, apple tree 70, red oak 69, white beech 65, black walnut 65, black birch 62, yellow and black oak 60, hard maple 56, white elm 56, red cedar 56, cherry 55, yellow pine 53, chestnut 52, yellow poplar 51, butternut and white birch 43 and white pine 35. According to this formula woods possessing a degree of hardness equal to only about 40 per cent., or less than that of hickory, should not be classed as hard woods. Such woods are, however, limited in quantity, and are not of sufficient importance to justify a classification, and the trade will continue to construe hard wood to mean everything except white pine.

### STEEL GIRDEES.

THE substitute of steel for iron in girder manufacture appears to be making steady progress. *The Montreal des Inerts Materials* states that for the large new warehouses in course of erection at Buenos Ayres steel girders are specified, and that, as could not be advantageously obtained in Belgium, the contractors, Halot & Co., Louvain, have had to place the order with Rothe Erde Works, in Germany, a concern which makes a specialty of this kind of work. As the order is for 5,000 tons, the Belgian iron-girder rollers are asking themselves to what extent steel girders are likely to replace iron in the future, and how far their present practical mon-

opoly of the export business in large-rolled girders is threatened by this preference for steel. *The Montreal* draws comfort from the reflection, that while for the nine months ending Sept. 30 the export of steel from Belgium was only 80,000 tons, the shipments of manufactured iron reached 21,000 tons.

### PAPER FOR BUILDING.

THE use of paper fabric for building purposes—by the term paper being meant, broadly, a flexible sheet made of vegetable or other fibre, which has been reduced to a pulp, and then pressed out and spread and dried—is now advocated by some builders on the following grounds: First, continuity of surface; that is, it can be made in rolls of almost any width and length, is flexible, or, by gluing several layers together, may be made stiff, and will stop the passage of air, because there are no joints. Second, it has no grain like wood, and will not split. Third, it is not affected by change of temperature, and therefore has an advantage over sheet metal as roofing material. Fourth, whereas, in its natural condition it is affected by moisture, it may be rendered waterproof by saturating with asphalt, or by a variety of other methods. Fifth, it is a non-resonant, and well fitted to prevent the passage of sound. Sixth, it is a non-conductor of heat, and can be made also of incombustible material like asbestos, or rendered fire-resisting by chemical treatment. The combination of paper with other substances, and solidifying the mass by pressure, renders practicable the production of a material capable of replacing wood for many purposes; and not the least among its characteristics of adaptability is the ease with which it may be made into sheets of any width and thickness, that will not warp or shrink from heat, cold or dampness.

E. W. Hawes, of Toledo, Ont., is about to establish a glass factory at Kingsville, Ont.

### TO ARCHITECTS AND BUILDERS.

## TAIT & CO.,

MANUFACTURERS OF AND DEALERS IN

## Wood Mantels

— AND —

## Overmantels

GRATES, TILES, Etc.

Are now prepared to fill all orders for these lines of Goods promptly and in a satisfactory manner.

Estimates given for Office and Store Fittings.

SHOW ROOMS:

231 Queen Street West,  
TORONTO.

SEND FOR PRICES.



KINGSTON DRY DOCK.

## Notice to Contractors.

SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Dry Dock," will be received at this office until Thursday, the 28th day of March next, inclusive, for the construction of a Dry Dock at Kingston, Ontario, in accordance with plans and specification to be seen on and after Wednesday, the 6th day of March next, at the Engineer's Office, 30 Union Street, Kingston, and at the Department of Public Works, Ottawa.

Intending contractors are requested to bear in mind that tenders will not be considered unless made on the printed forms supplied, and accompanied by a letter stating that the person or persons tendering have carefully examined the locality, have satisfied themselves as to the nature of the materials to be excavated, and the foundations for the cofferdam and its probable cost. Tenders must be signed with the actual signature of the tenderers.

An accepted Bank cheque, not limited as to time of payment, for the sum of \$20,000, payable to the order of the Minister of Public Works, must accompany each tender. This cheque will be forfeited if the party de-

clines to enter into a contract when called on to do so, or fail to complete the work contracted for, and will be returned in case of non-acceptance of tender.

The Department does not bind itself to accept the lowest or any tender.

By order

A. GOBELL,  
Secretary.

Department of Public Works,  
Ottawa, 19th Feb., 1889.



A New and Beautiful Interior Decoration for Ceilings and Walls. (Patented.)

Must be seen to be appreciated. Costs less than the higher priced decorations. The Press speaks of it in the very highest terms of approval.

SOLE AGENTS FOR ONTARIO:

THOMSON & SONS,  
364 YONGE ST.,

Painters and Decorators, Importers and Dealers in Artists' Materials, etc. References given to work done in this city.



## Toronto Water Works.

### TENDERS FOR SUPPLIES.

SEALED TENDERS, addressed to the undersigned, and marked "Tender for Iron Pipe," or "Tender for Special Castings," etc., as the case may be, will be received by registered post at this office up to twelve o'clock, noon, of

Monday, March 25th, 1889,

For the supply of the following materials, etc.: Cast Iron Pipe, Special Castings, 3 in., 4 in., 6 in., and 12 in. Valves; Hydrants, Pig Lead, Bar Iron and Steel, Iron Stop-cock Boxes, Rubber Packing, Stone Tops for Valve Chambers, Pipe Laying, General Stores, Drinking Fountains, Horse Troughs, Brass Work, Lead Pipe, Cylinder and other Oils, Brick Valve Chambers, Oak Valve Chamber Traps.

Specifications and forms of tender may be obtained at the office of the Superintendent. A deposit (cash or marked cheque) equal to 25 per

cent. of the amount of the contract, must accompany each tender. The lowest or any tender not necessarily accepted.

JAMES B. BOUSTEAD,  
Chairman Water Works Committee.

Toronto, March 6th, 1889.

## THE "EASTLAKE" SHEET STEEL SHINGLES

— ARE —

Fire and Storm-Proof,

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Our MANITOBA AND SPECIAL STEEL SHINGLING is specially adapted for Elevators, Warehouses, etc.

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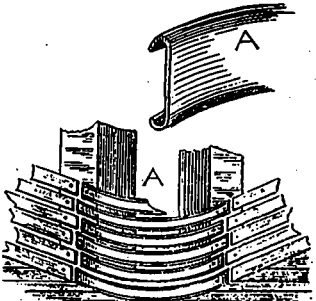
Our Goods are the heaviest and cheapest of the kind in Canada.

SEND FOR CIRCULAR.

MEFALIC ROOFING CO. (Ltd.)

82 1/2 YONGE ST., TORONTO.

## Radigan's Patent Metallic Lath.



THE object of this invention is to form circular corners on stud partitions, both outside and inside, when required, or only on the outside. This has hitherto been done by making the grounds with coppers' laths, which, owing to shrinkage, caused the plaster to crack—but curves of any required radius may be made with these Metallic Laths, and which will form a strong and firm ground in line with the wooden lathing for plastering on, and as shown in Cut A, the laths are keyed top and bottom, thus forming a double key. The attention of Architects and Plasterers is called to this invention. Give them a trial and be convinced. Send for circulars and price list.

JOHN RADIGAN,  
68 Mary Street, HAMILTON, ONT.

**BUILDING MATERIALS.**

**LUMBER.**

CAR OR CANOE LOTS.

1 1/2 and thicker clear picks, Am. ins.	\$30 00@32 00
1 1/2 and thicker, three upper, Am. ins.	37 00
1 1/2 and thicker, pickings, Am. ins.	27 00
1 x 10 and 12 dressing and better	30 00 27 00
1 x 10 and 12 mill run	15 00 16 00
1 x 10 and 12 dressing	15 00 16 00
1 x 10 and 12 common	12 00 13 00
1 x 10 and 12 spruce culls	10 00 11 00
1 x 10 and 12 maple culls	9 00
1 inch clear and picks	23 00 25 00
1 inch dressing and better	18 00 20 00
1 inch siding, mill run	13 00 15 00
1 inch siding, common	12 00 13 00
1 inch siding, ship culls	10 00 11 00
1 inch siding, mill culls	8 00
Cull scantling	8 00 9 00
1 1/2 and thicker cutting up plank	22 00 25 00
1 inch strips, 4 in. to 8 in. mill run	14 00 16 00
1 inch strips, common	11 00 12 00
1 1/2 inch flooring	15 00
1 1/2 inch flooring	15 00
X.X.K shingles, sawn	\$3 40@3 50
X.X shingles, sawn	1 30 1 50
Eastlake galvanized steel shingles, 24 W. G., per square	5 25
Eastlake galvanized steel shingles, 26 W. G., per square	5 00
Eastlake painted steel shingles, per sq.	4 50
Eastlake painted steel siding, per sq.	3 50
Manitoba galvanized, steel siding, per square	4 50
Manitoba painted steel siding, per sq.	4 50
Special galvanized steel siding, per sq.	4 50
Special painted steel siding, per sq.	3 50
Imitation brick siding, per square	3 50
<b>WAND QUARTERS.</b>	
Mill cull boards and scantling	10 00
Shipping cull boards, promiscuous widths	13 00
Shipping cull boards, stock	13 00
Scantling and joist, up 18 ft.	15 00
" " " " " " " " " "	16 00
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Machines for ripping, cross-cutting, scroll-sawing, mortising and tenoning, forming edges, grooving, galing, rabbeting, cutting dados, and turning. Builders use our Hand Circular Rip Saw for the greater portion of their ripping in preference to carrying their lumber to a mill five miles' drive from their shops. The same is true in regard to scroll-sawing, mortising, tenoning, cutting stuff for drawers boxes, etc. Builders using these machines can bid lower and save more money from their contracts than by any other means.

Read the Following Letters from Builders:  
CLARENCE F. LEE, carpenter and builder, Morristown, N. J., says: "I have had one of your Hand Circular Rip-Saws for about three months, and am much pleased with it. I have done the ripping for 15 houses in that time, which is over forty miles through inch boards. Have ripped as high as 8-inch plank. Table is also good for rabbeting; having rabbeted all joints and saved all drips for 200 windows."

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