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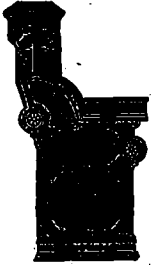
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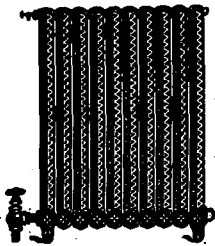
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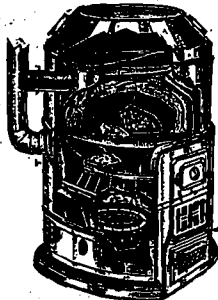


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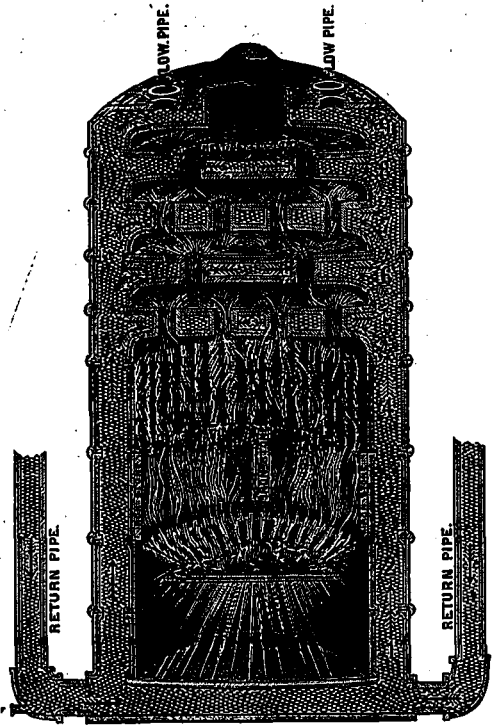
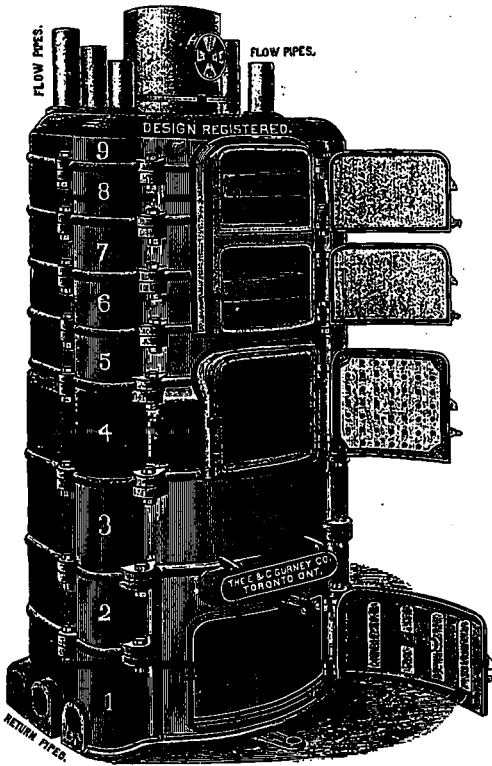
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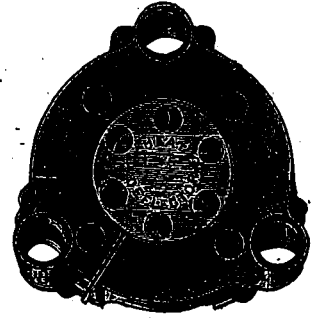
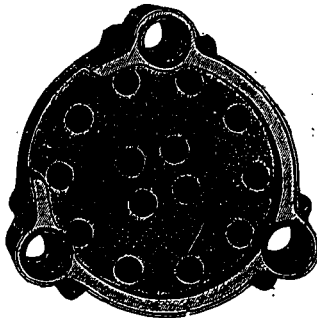
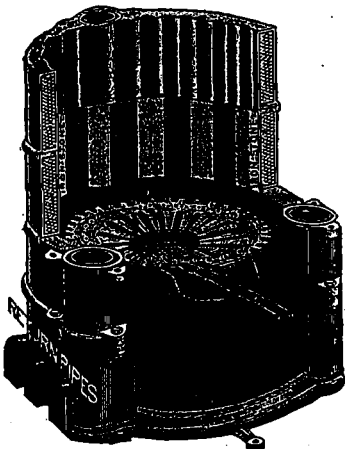
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VOL. I.—No. X.

TORONTO, CANADA, OCTOBER, 1888.

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THE  
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A JOURNAL OF MODERN CONSTRUCTION METHODS,  
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THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States for \$2.00 per year. The price to subscribers in foreign countries, is \$3.50. Subscriptions are payable in advance. The paper will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, it will be continued until instructions to discontinue are received and all arrears are paid.

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**EDITORS' ANNOUNCEMENTS.**

Contributions of technical value to the persons in whose interests this Journal is published, are cordially invited, and if found to be of sufficient merit, will be paid for. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

**R**EFERRING to the remarkable attitude assumed by the Toronto Trades and Labor Council in opposition to the proposal to introduce manual training into public schools, the *Philadelphia Record* says—"Canadian workmen must be far below their American brethren in intelligence to form such a narrow-minded and erroneous idea of a system which seeks to extend the producing power of a country, to widen the opportunities for skill and handicraft."

**O**UR Hamilton correspondent has repeatedly called attention in these columns to the very unbusiness-like and unsatisfactory manner in which the building record of that city is kept. So far as its usefulness is concerned, the city would probably be as well off without a record of any kind. We notice that in New Orleans, where a somewhat similar state of things has existed, the builders themselves will hereafter insist upon having the records properly kept. We hope the architects and builders of Hamilton will also adopt this course, in order that an intelligent estimate may be formed of the amount, character and cost of the buildings erected.

**B**RANTFORD, Berlin, and other cities and towns in Ontario, have lately adopted improved systems of water supply, and as a consequence, are now brought face to face with the problem of the best method by which to dispose of their sewage. The citizens of these places are aware that the proper course to pursue is not to dump the sewage into the nearest creek or river. In this respect Toronto has probably served as a "horrible example," which her neighbors are wisely determined to profit by. We regret that the city of first importance in Ontario has not yet solved the sewage problem for itself, and is accordingly not in a position to help those who are grappling with the question for the first time. One paper suggests that municipal corporations should not be required to bear the expense of experimenting and finding out which is the best method of sewage disposal, but that the Provincial Government should undertake to deal with the subject in the interests of the whole province. We are in accord with this opinion. The Provincial Government is in a better position than the

corporation of any town or city can be to make the necessary experiments, and collect all possible data bearing on the subject. Furthermore, the required information might in this way be obtained at a fraction of the amount which it would cost the municipalities to conduct their investigations individually. We trust the time is not far distant when a Department of Hygiene, with all the appliances necessary to solve questions of this kind, will be established by the Government of this Province. The cost of establishing and maintaining such a Department would be a mere bagatelle as compared with the amount spent by this and other cities for expert opinion. At present we have no recognized governmental authority whose opinions should serve to decide the thousand and one matters affecting the health and lives of our people.

**T**HE tearing up of an old corduroy roadway on St. Patrick street, in this city, to be replaced by cedar block pavement, served to remind citizens the other day of Toronto's youth, and of the wonderful progress made in the last quarter of a century. Speaking of pavements, calls to recollection the fact that within a very brief period the city will be called upon to substitute something more durable for the cedar block roadways on the three principal thoroughfares of the city—King, Queen and Yonge streets. A costly mistake was committed when streets carrying such a large amount of traffic and traversed by the street railway, were cedar block paved. Let us hope that when the work comes to be done over again, the best kind of materials, and the proper method of putting them down, will receive full consideration.

**I**T is surprising how little space is given by the daily press to the important subject of the preservation of the public health. It is probably because there is so much apathy on the part of the public itself. Because a considerable number of people are intensely interested in baseball and prize-fighting, our leading daily papers devote a page every day to imparting news of that character. It seems to be a question of supply and demand. Just at present, the people of Toronto and other Canadian cities and towns are aroused from their wonted indifference to health measures by the fear of a small-pox epidemic. As a result of this awakening, the daily press has suddenly taken to discussing sanitary methods. What we would like to see, would be the manifestation of greater interest in health preservation in times of supposed safety as well as at a time like the present.

**W**E present our readers this month with a perspective sketch of the proposed new Court House and City Hall for the city of Toronto. The estimated cost of erecting the building in accordance with this design, is about \$1,400,000. After the citizens have been given full information concerning the character of the buildings which it is proposed to erect, and have had an opportunity to examine the plans, and judge for themselves as to their adaptability for the purpose intended, they will be asked to vote \$600,000 in addition to the amount already voted for the construction of the buildings. We trust the money will be forthcoming. The opinion expressed by a Toronto paper, that the present City Hall and Court House will be good enough for fifteen years to come, is not deserving of a moment's consideration. The same journal which opposes the erection of the proposed new public buildings on the ground of economy, urges the "wealthy city of Toronto"

to invest large sums of money in new land and buildings for Exhibition purposes. The inconsistency of such arguments robs them of any value. Our present Court House and City Hall have been a standing disgrace to Toronto during the last five years, and will have to be replaced by something more in keeping with the city's importance and progress. This being the case, no good purpose can be served by delaying the commencement of the enterprise for a year or two longer. While the cost of the proposed buildings is considerably greater than was at first anticipated, we know of no cities in the United States of equal size and importance, where from one to three million dollars has not been spent for similar purposes. A future generation will be called upon to pay a large proportion of the cost of the structure, and it is safe to assume that they will prefer to pay for a building that will in their day be standing intact and an ornament to the city, rather than for one already crumbling to decay, and suggestive only of the short-sightedness of their forefathers.

We had the pleasure of examining the plans of the proposed new Court House and Municipal Buildings a few days ago and was very much pleased with them indeed. There has been an immense amount of labor expended on these drawings, none can know how much except those who have gone through a similar experience. The plan is so simple in its arrangement that no person need be puzzled to find any room in the building. This is a very great advantage, and must have required much thought to evolve a plan so perfect and yet so simple. The entire plan of the building is good throughout, especially the arrangement of the court rooms and their attendant rooms. The elevations call for high praise, and we have no doubt but that the citizens will be proud of the building when it is erected, and also of the fact that the designer is a Canadian. We could not help comparing the design of this building with the one according to which the Parliament Buildings are being erected. It certainly does not suffer by the comparison, but rather it shows how very poor a design the imported one really is. The two buildings are about equal in size, and yet one seems to be a mass of disorganized parts, and the other a compact whole. Certainly the foreign design for the Parliament Buildings will not compare with the home production for the Court House. If the Canadian design for the Parliament Buildings were being carried out, and the Court House being built according to the present design, Toronto would have had two very large buildings of which it need not have been ashamed.

**S**INCE our last issue the plumbers' strike in Toronto came to an end. It lasted nearly three months, to the great loss of the strikers and likewise the employers. We are of the opinion that the strike could have been avoided if the question in dispute had been approached in a moderate and reasonable spirit. They were eventually settled after many weeks of idleness on the part of the men, loss of business on the part of the masters, and with loss and trouble to many persons who were only indirectly concerned. The loss which falls on outside parties, calls for some means of settling these strikes outside of the parties directly interested. If they were the only sufferers, we could stand and look on with greater indifference. But such is not the case, and as many who suffer have no voice in the matter, some means should be worked out whereby quiet settlements between workmen and their employers could be brought about. There

should be a board of arbitrators, or some court of the kind, where all questions in dispute could be argued, and a reasonable and just settlement obtained.

WE notice in *Building* an illustration of a house proposed to be erected in this city by one of its residents. The design was prepared by a New York architect, and is certainly a very good one. We would like to welcome the erection in this city of many houses of equal artistic merit. But notwithstanding that it is a good design, we certainly could name several Canadian architects who could and would prepare designs of equal, if not greater excellence. That Canadian architects do not design houses equal to many of the expensive houses in the States, is because their clients have not the wherewithal to pay for their construction. Architects in the States are not better able than our own to make bricks without straw. In Canada they are even asked to make them with a short allowance of clay, and if the article is not equal to that made with the full complement of materials, the unfortunate architect is made the subject of blame. Good work must be paid for, whether it be material or the product of the intellect, and those who cannot pay must be content with what they are able to afford. It is time that persons building should understand that architects must as nearly as possible fulfill the conditions under which their clients place them, and that where they are able to afford what they profess to admire and want, they will have no difficulty in getting their wants supplied without going beyond the bounds of the country where they found it possible to make money, and where, if they were patriotic and capable of recognizing native artistic ability, they would take pleasure in spending it.

WE should like to see the building interest, which stands second to but few others in this country, occupy a more prominent place in connection with the annual Industrial Exhibition held in this city. While there were quite a number of exhibitors of building materials at the recent Exhibition, many lines of goods were not represented at all. We have been led to think that perhaps this was due to the very unsatisfactory accommodation provided for exhibitors. No attempt seems to have been made to classify goods, but exhibits were crowded in wherever there was a bit of space to spare, regardless of their surroundings. At the Exhibition this year, could be seen side by side, pressed brick and pianos, organs and jewelry, brick machines and agricultural implements; improved water closets and specimens of cookery. Perhaps with the present number of buildings it may be impossible to make a better classification of exhibits. If that be the case, then we hope to see some new buildings erected during the coming year. We would suggest to the Exhibition Association that a building should be set apart exclusively for the accommodation of exhibitors of materials entering into the construction and decoration of buildings, in the same manner that Machinery Hall is reserved for machinery manufacturers. If such a step were taken, we have no doubt that the building would not only be fully occupied, but would present one of the most valuable, interesting and attractive features of the Exhibition. In such a building the wonderful improvement which is taking place in materials of construction, as well as in sanitary and decorative appliances, could be shown in properly classified departments, and visitors interested in such goods would know where to find them, and be able to examine them without going through almost every building on the grounds. They would also be given the opportunity of comparing side by side different appliances designed to accomplish the same object, and of judging of their respective merits. We should be pleased to have the opinions of manufacturers and dealers in building materials and appliances on this subject.

A contemporary remarks that among the rules suggested or adopted in various localities for the regulation of electric light circuits, the proposition of Mr. S. S. Wheeler that "an arc lamp within the reach of any man's umbrella is hung too low," is such an obvious common sense suggestion as to commend itself everywhere.

A rich inhabitant of Berlin is erecting a building where patients suffering from tuberculosis may be subjected to a special treatment. The ground floor of the building which is of circular form will consist of stables containing hundreds of cattle. The patients will occupy the upper stories, which will be connected with the ground floor, so that they may inhale constantly the odor of the stables, which will be conveyed to them by special air tubes.—*Le Progress Medical.*



### "CANADIAN ARCHITECT AND BUILDER" PRIZE COMPETITION.

THE publisher of the CANADIAN ARCHITECT AND BUILDER has decided to make a number of improvements in the journal, beginning with the second volume, in January. One of these will be a new heading, artistic in design and expressing the character of the publication. Architects and designers are invited to send us designs for this purpose, drawn with pen and black ink on white bristol board. Size of drawing to be 7½ inches wide by 2½ inches in depth. Lettering to be the following:

"CANADIAN ARCHITECT AND BUILDER"  
FINE AND INDUSTRIAL ARTS, DECORATION, FURNISHING,  
CONSTRUCTION, SANITATION, ENGINEERING.

If any design sent in should be considered suitable for use, the sum of \$15.00 will be paid to the author. All designs must reach us not later than the first day of December next. Each design must be marked with the *nom de plume* of the author, and the author's name, *nom de plume* and full address, must accompany each drawing. In order to obtain a purely Canadian design, this competition is restricted to Canadian designers, who will, we trust, manifest their interest in Canadian enterprise by sending us samples of their best efforts.

### INTERESTING AND PROFITABLE.

TORONTO, Oct. 2nd, 1888.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—From the fact that the last two numbers of the CANADIAN ARCHITECT AND BUILDER contained no mention of the recent competition for a \$2,000 house, it seems to me that you must have forgotten your promise in the May number to publish criticisms on all the eight designs submitted, but up to the present only three have been made. It would be interesting as well as very profitable to students to see the rest of them criticised.

Yours truly,

STUDENT.

### OUR ILLUSTRATIONS.

"CANADIAN ARCHITECT AND BUILDER" COMPETITION FOR A \$2,500 TOWN HOUSE.—DESIGN BY TAMAR.

THIS author has evidently planned a house for a northeast corner, and with the intention of placing the house in the extreme east side of the lot. We do not understand why anyone when asked to prepare a design for a northwest corner should design one which can only with advantage be placed on a northeast one. If we were to place this house on the lot we specified, we would either have to place the windowless side of the house to the street and east, or else the south front to the east, which would bring the plan about right, except that the bathroom would have a north exposure. We notice that the author, in designating the points of the compass, has made the west the east and the east the west, which is somewhat confusing when one wishes to determine how he intended to place his house. We will again state that the indiscriminate arrangement of rooms without thought of the purposes for which they are intended, and their climatic exposure, is not planning, but an ignorant way of providing a certain amount of required space for strictly utilitarian purposes, without one thought for health or comfort. In this plan we have not one good point, so far as we are able to judge. The dining room is small and inadequate, while the drawing room is unnecessarily large. The entrance to the dining room is bad, and we should rather do without a closet than have one placed like this one. The pantry to the kitchen is useless—in fact the closet and pantry arrangements are bad. The kitchen is too much cut up by doors and windows to be convenient, or even large enough. The outside door to kitchen is very narrow, and the window is correspondingly very wide, and the door should have a porch or some kind of protection from the north winds. The front entrance door opens directly into the hall with the stairs starting much too close to the door. Many of the doors opening into the room are hung on the wrong side—for instance, the bath room door is hung to expose all the fixtures when slightly open. The stairs are much too steep; the cellar stairs being easier than the principal stairs. The spindle of the main stairs is divided into but two panels, which would never do, and shows lack of ex-

perience. The elevations are very poor in design, and badly drawn.

PROPOSED NEW COURT HOUSE AND CITY HALL FOR THE CITY OF TORONTO—E. J. LENNOX, ARCHITECT.

### TORONTO ARCHITECTURAL GUILD.

THE monthly dinner of the Toronto Architectural Guild took place at the "Hub" restaurant on Thursday evening, the 11th of Oct. There was a very large attendance of members. Many questions of interest were brought up and discussed in an animated and encouraging manner. Several committees were appointed to report on important matters. A resolution was also passed expressing the interest of the Guild in the success of the CANADIAN ARCHITECT AND BUILDER, and the intention of the members to give it such support and assistance as may be in their power.

### MONOTONY IN HOUSE BUILDING.

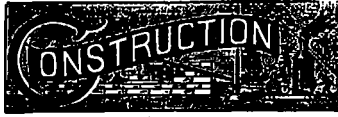
MR. JOHN J. DEERY, writing in *Home*, deplors the monotony which characterizes the houses in some American cities. As an illustration, he says.— "In Philadelphia, during the past fifteen years, many thousands of houses have been built from a common stereotyped plan, and model, which according to the location and size of lots, have produced houses which, large or small, are all alike on general principles." This lack of architectural variety has left its offensive work upon the City of Toronto, and must prove to be a standing cause of regret to this and future generations of educated Canadians. Within the last five years, we are glad to say, a change for the better has been noticeable, and in those sections of the city which are now being built up, there is much in the outward as well as the interior appearance of the houses to please the eye and accord with correct ideas of the "eternal fitness of things."

### ARCHITECTURE IN THE REIGN OF QUEEN VICTORIA.

IN two subjects not precisely architectural, in the common meaning of the word, but of the highest practical importance, there has been an extraordinary progress during the last fifty years. One of these is the science of sanitation, which may be said to belong to this reign. Fifty years ago the current ideas upon the subject of drainage and ventilation were comparatively of the crudest kind and it was hardly recognized that the subject was one specially demanding an architect's attention, except so far as some general perfunctory attention to fall and brick traps was concerned. A good many of the artistic architects are much in default in this respect now, but the knowledge that they are so, and that sanitation is a subject which some one, at all events, must attend to, is forced upon them; and in general there is now a degree of study given to the sanitary requirements of buildings which was not dreamed of fifty years ago; a study which, if may be added, has resulted in condemnation or absolute reversal of some of the sanitary beliefs and expedients of that period. The other subject we refer to is the progress in regard to the improvement in the habitations of the poorer classes, and the recognition, to some extent at least, of the responsibility resting with landlords and with the Government in regard to this subject, the part taken many years ago by this journal in urging attention to this subject is known to all who are acquainted with the history of the amelioration of artisans' dwellings; and though much remains to be done in this respect, what has been already accomplished may count among the architectural achievements of the present reign; and while we have witnessed the foundation of a new cathedral (unfortunately only a good medieval copy and with no Victoria *cachet* about it), we may, perhaps, be justified in thinking that the many blocks of healthy dwellings which have been built during late years, not indeed beautiful architecturally, but representing the possibility of decent, comfortable, and healthy housing for the poor, are as important architectural works in their way as cathedrals and churches. In regard to sanitary progress, by the way, it is worth remarking that one of the most recent pieces of work for which public money was voted was the rectification and putting on a proper and efficient footing the drainage of that same great House of Legislation, the commencement of the present reign; architecture was done fifty years ago, and adequate drainage supplied now—a significant indication of the progress in practical matters, which has been made during the period we are considering.

Though there has been a good deal said of late as to the desirability of drawing architecture and engineering closer together, as a matter of fact the two professions are farther dissociated in the manner and aspect of their

works than ever; and the greatest piece of constructional work at present going on, the greatest in some ways that has been attempted, is the gigantic structure at the Firth of Forth, from which everything that we generally call architectural design has been entirely eliminated, nothing being left, so to speak, but the bare poles of construction. Such a work as this is an appropriate culmination to a half-century in which the most numerous and remarkable constructional works have certainly been those of the engineers. Engineering has known what it wanted, it and the public have known what they wanted from it; that is the secret. In architecture there has been doubt and experimenting on one side, and a good deal of public indifference on the other side. As to the latter drawback, we see little immediate prospect of improvement; architecture is still a kind of sealed book, and a subject of indifference to the public, but the



Architects, Engineers, Builders, Contractors, and others are invited to contribute to this department of their experience regarding methods of construction. Also particulars—such as location, character, cost and means of success, etc.—of any works of construction in progress.

**PRACTICAL HINTS TO CARPENTERS.**

By OWEN D. MAGINNIS.

When setting door jambs on underflooring, or where the finishing floor is not yet laid, always take the following precautions:—First. Place a straight edge across the floor to each stud at each opening to ascertain if the weight of partition has not sunk it out of level. Second—Ask the foreman if there are base

blocks only to fit a few doors to find this out. Also keep them square to the edges and be sure they are not nailed in wind.

The object of nailing on the strip is, that by tacking it on equally distant from the head and leveling it, the head is likewise leveled without the trouble of climbing upon a horse. The 1/4 inch being added to the length brings the head up 1/4 inch higher, so that the base will come level with the top of the base block on the trim.

The 9-6 jambs are set in the same way, except that a 1 inch is allowed 9-6 instead of 1/4 inch. The extra inch on the length as 8-7, 9-7 is to allow for the finishing floor 1 inch thick. This method should always be followed for first class trim when there is a supervising architect who uses his eyes. In trimming doors, the trim now comes to the building put together, or with the sills and head casing glued and doweled perfectly square, fitted and varnished or polished. All ready to nail up, so it is absolutely necessary that the jambs be properly set and their edges leveled to ensure the joints being close.

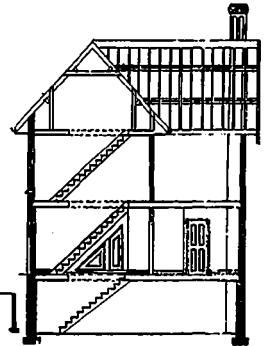
Jambs should never be set too wide for the thickness of the



— South Elevation. —

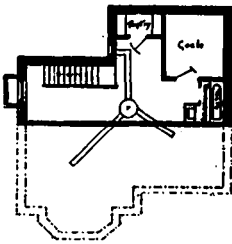


— East Elevation. —

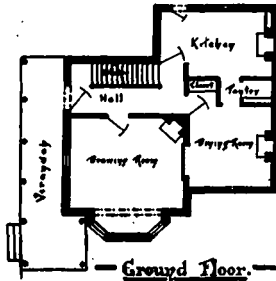


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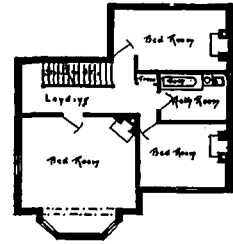
— DESIGN FOR A —  
— \$ 2500 HOUSE. —



— Basement. —



— Ground Floor. —



— First Floor. —

DESIGN FOR A \$2,500 TOWN HOUSE.—BY "TAMAR."

art itself appears to be in a healthier and more promising condition that it was at the beginning of the present reign, it has more of life and originality, is less fettered by precedent, and has a sounder basis of sanitary and constructional knowledge; and these are conditions which may make us hopeful for the future achievements of English architecture during the remainder of a reign which we all trust may still be prolonged for many years.—Abstract from an article in the *Builder*.

Plans are invited from the architects of all nations for a municipal theatre in Cracow, Austria. Prizes of 2,500, 1,500 and 1,000 florins will be awarded for the best plans by a jury of experts, whose names are soon to be announced. The sum of 1,500 florins has also been reserved for the purchase of such other plans as may be recommended by the jury. Plans must be submitted not later than March 1, 1889, to Dr. Sziachtowski, President of the city of Cracow, from whom all the necessary data can be obtained.

blocks on the trim. Now, if there are, base blocks and the base must be kept level. Supposing one opening has the floor sunk a 1/2 inch below the level, and another 1 inch below, the difficulty will be to set the jambs so that each base block will be level with the other, and the door leads their proper height and level. In such a case proceed as follows:

The height of the doors being determined by one 8-6 clear of head and floor and one 9-6, nail the heads and jambs together and tack a piece across the edges of the jambs about 12 inches from the bottom, equally distant from the head, about 7-6 down, and keep the jambs parallel by marking the piece with the pencil equal to the inside distance at the head. This being done, obtain a 10 foot rod and lay off 8-7 1/2 for the 8-6 jambs, and mark this length on one edge of each jamb. This mark will be the *scribe line* for the jambs, or their exact length. Set them in the opening between the studs, and place a true level on the sllp and wedge up the lowest side until the bolt is exactly in the centre. Now set your compasses to the line on the stile resting on the floor, and keep the jambs about plumb, scribe them to the floor, saw these lines, always leaving the line on, and replace the jambs far out from the studs, and nail them perfectly plumb and straight on the foot. Be sure they are perfectly straight and wedge out all short crooks and lumps. There is too much careless jamb setting just now, and one

wall, as in a great many cases no wall molding is employed, and the back joint must fit to the plaster. They must also be out of wind.

In nailing on trim, care should be taken to have the margin on the edge, showing equally all round, for it often occurs that the trim may be put together and 1-16 of an inch more or less than the dimensions shown on the details; therefore, if only an 1-8 is shown on the sills, the same must be left on the head. One thing is particular must be well done, namely, to fit well under the back edges of all casings and corner blocks, and to fit the wall mold close, as the recesses left by carelessness in this respect are too often the abodes of bugs, roaches, etc.

"What are you doing?" demanded a citizen of a countryman who was critically examining the former's electric bell-knob. "Saw, mister," replied the countryman, straightening up, "there's suthin' the matter with your door-bell."

A swiss inventor has perfected a method of making artificial boards, and is advocating their use in building. They are made of a mixture of plaster of paris and rods, pressed into shape by hydraulic process. The material has the advantage of incombustibility and lightness, and will resist the warping action of atmospheric changes.

## ST. JOHN, N. B.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

YOU are probably aware that this city has risen, Phenix like, from the ashes of the 1877 fire, and shares with Chicago the earned emblematic sobriquet of "Phœnix City," instead of "the Liverpool of America" that so aptly personified the facilities and business of the should-be eastern terminus of the Canadian Pacific railway.

The recent fire of a month ago has partly laid bare a site for the long contemplated "Grand Opera House," for which preliminary plans have been prepared and a subscription list for stock opened. All indications point to a practical realization of the most sanguine hopes of the company. Theatres have had a somewhat transient and hard line existence here, the old Lyceum to the contrary notwithstanding. The play house of St. John's father of dramatics, Longgan's Lyceum of the south side King's Square, the Academy of Music, of German street, and Small's Hall, (more familiarly known as Bishop's & Lee's Opera House and Professor Nelson's "Figaro") were all destroyed in the holocaust of the 24th of June, 1877, leaving only the Mechanics' Institute, now in its fiftieth year, and Dockerell Hall, of Union street, as available for entertainments. As flame has been historical the world over for the destruction of the play house, it is well that the company in this case intend to look well to having their building fire proof, with three separate exits, and two iron fire escapes.

The only buildings of a public character now in course of erection in St. John are the electric light works building, and Seord's Hospital, both in brick with principally stone trimmings.

## QUEBEC.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE large stones being erected for Mr. O. E. Murphy on Dalhousie street, are nearing completion. The front on the street named is 140 feet, with two extensions in rear 50 feet, the whole being 2 feet in width and three stories in height. The design is perfectly plain, walls faced with pressed red brick. Mr. O'Leary contracted for the mason work, and Mr. S. Peters for the woodwork; Mr. Hume, C.E., prepared the plans.

A handsome stone residence from the design of Mr. E. Charest, architect, is being erected by Messrs. Laroux, mason, and Mr. DeVarennes, carpenter, for Mr. Dussault, of the firm of B. Houde & Co., tobacco manufacturers. The walls are of rock faced Cheslaubauk stone in regular courses, with trimmings of same stone, chiselled. Stone steps leading to a portico, and terminating in a tower placed in the centre of the front, give a bold and handsome appearance to the building. It stands immediately opposite St. John's church on the street bearing the same name, with stables, etc., in rear of house. The cost will be in the neighborhood of \$20,000.

A cottage residence is being put up for Mr. J. J. Boyce on D'Arquill street, at a cost of about \$4,000. Rock faced stone foundation, walls of white brick, and trimmings of cut stone. Mr. H. Staveley, architect; J. Kelly, carpenter, and J. Juneau, mason.

## ENGINEERING SOCIETY.

WE are pleased to notice that the Engineering Society in connection with the School of Practical Science in this city enters upon its work for the coming winter under most favorable auspices. The membership of the Society numbers upwards of 140.

- The objects of the organization are stated to be:
1. The encouragement of original research in the science of engineering.
  2. The preservation of the results of such research.
  3. The dissemination of these results among its members.
  4. The cultivation of a spirit of mutual assistance among the members in the practice of the profession of engineering.

At the semi weekly meetings of the Society, papers on engineering and scientific subjects are read and discussed by students and ex-professors. The president for the present year is Mr. H. E. T. Hautain.

## JOINTS IN SEWER PIPE.

THE joints in stone-ware sewer pipe are a generally acknowledged point of weakness, says a writer in the *Building Budget*, and in sewers within the house walls architects have to a certain extent tried to overcome this by embedding the sewer in concrete. Under the test of filling the sewer with water this is not found to make an impervious drain, and we would suggest as a surer method of making a tight joint, the following clause for the specifications: "Each joint shall be made by filling the joint perfectly with portland cement mortar made of one part cement and one part sand, caulking the same thoroughly all around the pipe with a proper hand caulking tool, making the joint flush with the end of the socket, and striking it off smooth all around the pipe with a trowel." Throwing on more mortar and striking off to make an outside collar may be as each architect considers necessary, but the joints made as above will be tighter and stronger than if the sewer were imbedded in concrete as ordinarily made. It is not safe, however, to specify this and leave it to be done or omitted as the drain-layer sees fit. House drains should be laid in open trenches, and during pipe-laying the superintendent should see every pipe laid.

## HOW VANCOUVER WAS BUILT.

A GENTLEMAN who arrived in Boston yesterday fresh from Vancouver, the Pacific terminus of the transcontinental railway, gives the genesis of that city in terms which are as startling as they are significant. Two years ago there was but one house in the locality. A year ago there were a dozen straggling log huts. To-day there is a population of 5,000 persons; the Victoria Hotel is one of the finest houses in the country, charging \$4 a day and worth it; the main street, built through the virgin forest, as it stood a year ago, is flanked by granite blocks that rest where stumps fifteen feet or more in diameter have been blown out by dynamite; the town is lighted by electricity; there is semi-weekly communication

with China and Japan by steamship, and the Canadian Pacific keeps that northernmost city on the Pacific coast in daily communication with the eastern world. All this is substantially a year's work. Other places of this size, or even greater, have sprung up in a nightlike Jonah's gourd, but it is believed that there is no record on the American continent of the building of a similar town, with all the improvements of modern civilization, within so short a space of time.—*Boston Herald*.

Mortar and paint may be removed from window glass with hot, sharp vinegar.

Wide lath do not make a good job of plastering on a ceiling. Use inch lath and give them good distance apart.

Mr. Sewery has commenced the erection of his new stove works at Barris, Ont.

Tenders are being asked for the construction of an iron trestle bridge over the Ottawa river to connect Ottawa city with the city of Hull.

Good stable floors may be made by first paving with broken stones and then covering with concrete, and finally laying the whole with plank.

It is reported that Messrs. Davis, of Ottawa, and E. E. Gilbert, of Montreal, have been given the contract for improvements on the Cornwall canal.

To prevent screws from becoming fixed and rusted, make a mixture of graphite and oil, which will facilitate the tightening of them up, reducing the friction in the sockets, and protecting them for years from rust.

Asbestos powder, made into a thick paste, with liquid silicate of soda, is used with great advantage in making joints, fitting pots, connecting pipes, filling cracks, etc. It hardens very quickly, stands any heat, and is steam-tight.

The *Builder* and *Workman* points out that thoughtless acts on the part of workmen sometimes lead to disastrous results. A well-known instance of a falling mill has been ascribed to fastening a block and tackle to a column and pulling it out of position while moving some heavy machinery. A few years ago, one of the roof trusses fell into the hall in Marblehead, Mass., because a pipe had cut one of the members nearly in twain, rather than make an offset in his pipe.

We learn from the *Engineering and Building Record* that the engineers of the Minneapolis Sewer Department are meeting with trouble from water in the sewer tunnel that they are now building, and of which about 1,000 feet remain unfinished. Engineer Van Duzee has suggested two plans for overcoming the difficulty, one by freeing and the other by the use of compressed air, at an estimated cost of \$40,000 and \$15,000 respectively. Mr. Van Duzee favors the internal shield plan, but its use has been opposed on account of the expense.

A new brick machine of simple construction is reported upon favorably from Nashville, Tenn. It is the invention of Mr. John E. Lesueur, an extensive manufacturer of brick of that city. The machine is set in a pit, and it is described as having a class of moulds linked together to form an endless chain, pressed beneath the pug mill whence they pass to the presser. The machine can be made of varying capacity, the one working at Nashville, being equal to 60,000 bricks per day. Mr. Lesueur has associated himself with Mr. John D. Anderson, and they are organizing to introduce the invention throughout the United States.

World says: Few steam fitters or engineers understand the valuable properties of graphite in making up joints; this valuable mineral cannot be over-estimated. In this connection, indigestible under all changes of temperature, a perfect lubricant, and an anti-oxidant, a joint can be made up perfectly tight with it and it can be taken apart years after as easily as put together. Rubber or metal gaskets, when previously smeared with it, will last almost any length of time, and leave the surface perfectly clean and bright. Few engineers put it to sea without a good supply of this valuable mineral, while it seems to be almost overlooked on shore.

A construction detail that is gaining much popularity in some Western cities is the bricking in of frame houses. The building is sided up with matched stuff, as if complete, then a brick face wall, four inches thick, is laid in contact with the exterior, tied on by spikes about every sixth course. A boy distributes them all around on top of the wall. They are laid in the mortar-bed ready and driven through into the siding till the heads are flush with the face of the wall, when the next courses are laid, and so on. The walls present the appearance of solid masonry, are durable, and, as they add to the warmth of the buildings, seem to present substantial recommendations, especially for severe climates.

At the instance of the Belgian Minister of Public Works, Messrs. Boudin and Donny have investigated the subject of rendering wood fire-proof. They report that the resistance of wood to heat may be considerably increased, though absolute non-combustion cannot be secured. The resisting material must take the form of an injection into the fibres of the wood or of a coating; and it must be not too expensive, non-corrosive, speedy in becoming fixed, easily applied, neat and unalterable. An injection of a concentrated solution of phosphate of ammonia is recommended as the best treatment for small pieces of wood; but a more generally available plan is coating with cyanide of potassium or asbestos paint.

Sir Frederick Bramwell concludes an address before the British Association on "The Glories of Modern Science," by saying,—"To what and to whom are these meritorious prime movers due?" I answer: "To the application of science, and to the labors of the civil engineer, using that term in its full and proper sense as embracing all engineering other than military. I am, as you know, a civil engineer, and I desire to laud my profession and to magnify mine office; and I know of no better means of doing this than by quoting to you the definition of "civil engineering," given in the charter of the Institution of Civil Engineers, namely, that it is "the art of directing the great sources of power in nature for the use and convenience of man."



## A CRITICISM OF THE PROVINCIAL ART SCHOOLS.

Editor CANADIAN ARCHITECT AND BUILDER.

THROUGH reading the daily papers I became aware that the prizes and certificates won by the students of the Toronto Art Schools were presented by His Worship the Mayor to the successful candidates in the theatre of the Normal School, on Friday afternoon, Sept. 27th.

There was not a large attendance of spectators or students, especially of the former. Neither were many of the prize or certificate winners present—I understand not more than one in ten. This is deplorable, and shows that there is something radically wrong with the school. That there should not be many present outside of those directly interested in the school, is not surprising, and does not call for comment. The public is usually apathetic and indifferent towards any movement unless it promises some possibility of materially enriching them. Dollars and cents is the great force of the present day, and it is therefore surprising that but few of our citizens thought it worth while to be present at this meeting to give some encouragement to Art. But that there should have been so few—those who had won honors calls for some explanation. I can think of only three reasons for so poor an attendance of those directly interested: First, that the meeting was held at an inconvenient season, and that it was impossible for them to be present. Second, that they were so overcome by bashfulness that they would rather stay away than be formally presented before strangers with the prizes they had won—they might have come, for strangers were few. Third, that the students take so little interest in their work, have so little enthusiasm, that they did not consider it worth the trouble to be present on such an occasion.

That this school is not the success that it should be, and might easily be, is evident in more ways than one. Those at its head lamented that there were so few students in attendance; that instead of two hundred there should be at least one thousand; that there is much better attendance in the smaller cities. To my mind instead of lamenting, the directors should be thankful that there are so many in attendance, considering the condition of the school. The poor attendance is undoubtedly caused by the indifferent work the school is doing, which is the result of the incapacity of the directors, and of the ignorance of Art on the part of the teachers.

This Art School was first established by the Ontario Society of Artists, in their old quarters at 14 King st. west. By ceaseless efforts the society, with the assistance of the teachers, made the school a great benefit to the city. It had a large number of students, and what was of more importance, it had instilled in them an enthusiastic love of Art. The school grew so rapidly that the King street quarters became too small, and it was obliged to remove to the Normal School building, where it has by degrees come under the influence of the Education Department. That it has not thriven under the Department's administration, is not require proof. The drawings which have been exhibited with so much laudation of the work of the school, so much noise about the influence of Art, and so much unnecessary information about the lack of Art in Canada, and the necessity of Art institutions and training, prove most conclusively that the school is not accomplishing the work for which it was established, and which it should do. Notwithstanding that the school does not teach Art, and that its directorate and teaching staff are entirely ignorant of Art, a person would be led to believe by the upholders of the school, that outside of the Art Schools there is no Art in Canada. We are persistently informed that we are without artists, and that to the United States we must apply if we want artistic work. The truth is that we have more love of Art and better artists in our own land than have the States, when due allowance is made for the difference in population and wealth. Wealthy men buy works of art more often because pride and jealousy urge them, than because they have any love or appreciation of the beautiful. We may therefore say that it is wealth that encourages Art, and that alone. Because the States have accumulated a large amount of wealth, rather than because the people are artistic, they have become possessed of artists of which they may well be proud, and whom we should imitate. But when it comes to belittling ourselves and worshipping loush and fifth rate men, because they are residents of the States, it is too much for us to quietly submit to. It certainly tends to show little knowledge of Art on our part as a people. But after all, is it the people? Is it not those among us who, having little or no knowledge of Art, and having become possessed of some wealth, are now attempting to impress us with their assumed and fictitious love of Art? Then again, there are those amongst us who, recognizing that it is the fashionable thing to be artistic, and being possessed of little knowledge of Art, and aware of the fact, are trying to hide their ignorance by loud statements of our lack of Art and the necessity of Art training. I imagine that some of these people have obtained control of the Art School of this city.

How does it come, that in a school established and supported by the Ontario Society of Artists until it had become firmly established and was doing good work, there is not now a single member of that Society connected with the school in any way whatever. The Society has received the cold shoulder, and no mistake, simply because it could not look at Art through the spectacles of the Minister of Education and his satellites. The teachers who were members of the Society were all compelled to resign one by one, disheartened and disgusted with the treatment to which they were subjected by the "book artists" of an hour, whose ideas of Art never rise above the plates in a medical work, who have been placed in control. These teachers had been teaching not for the

pliancy which they received, but out of love for their art. They were not dependent on what they received; they were conferring the favor, and when they were treated as so many pupils who must obey the governing body or leave, they resigned with sad hearts, and left the school to the tender mercies of those whose Art knowledge is not sufficient to distinguish good Art from the wretched stuff which is put forward as artistic by those who are masquerading as artists. I do not know who the present teachers are; they may be thorough artists for all I know of them personally, but I do know that the work of their pupils is bad, wretchedly bad, and that is sufficient in my judgment to condemn them as incompetent. Copies or drawings of very inartistic work are supplied to the students. A copy of a good piece of wrought iron work, for instance, will cost no more than a copy of the worst piece of work that ever left the hands of a blacksmith. The fault must, therefore, be with those who select the copies, and they must be devoid of all artistic faculties, or they would be able to distinguish between copies of good and bad work.

That an attempt has been made to run the school under machine regulations is evident, and however well it may answer for the common schools of the country, it will not do in our Art Schools. The teachers must be allowed sufficient latitude to develop such courses of training as will interest their students in their work. There must be enthusiasm, for without it everything becomes dull, lifeless and discouraging.

I am of those who believe that more depends on the individual qualities of the teacher and the influence that he can bring to bear on the pupil to interest him in his work, than in any quantity of dull routine work done under set regulations, which kill all individuality and do not make allowance for the very different temperaments of the pupils. It is any wonder that the Art Schools have suffered tremendously under such a system, and it is not possible that our common schools will likewise suffer? Teachers cannot be made to teach as if they were machines, without injuring them as men, and the system of which they are without doubt the most essential part, if not the whole. An attempt to teach with the object of giving practical training only, must always result in failure, where no instruction in general principles is given. Students should be taught in a manner that will broaden their views, make them reason, and thoroughly study the requirements of any work on which they may be engaged, that what they do may be nearly as possibly fulfill the conditions. Nothing good can result when a student is hurried along on superficial instruction in special designing, even though it may be very practical. He will almost to a certainty do any designing which he may attempt along mechanical lines, not having had his reasoning faculties expanded by instruction in the principles he should follow, while leaving him free to exert his individuality. All instructions and training should be with the object of developing the individual without sacrificing his individuality. There is sufficient machinery in the world at present, and if not, more can be manufactured. It is not necessary, therefore, to train members of the human race down to the grade of machinery—for too many are now, of their own free will, machines to all intents and purposes. It may be necessary to give some mechanical training to certain classes, but certainly not to students who are to be the designers of the future, more especially if their work is to be artistic, and consequently refining and ennobling.

I am not opposed to Industrial Schools; in fact I am a strong supporter of them, but I desire to support schools which are truly industrial, and not something else. The sort of industrial training which should be encouraged is the teaching of drawing to such an extent that the pupils of the school will be both able to understand drawings of work which they may be called upon to execute, and make drawings of any work—where drawings are not supplied—and they will facilitate the execution of the work. I do not believe that it is the duty of the Government to make the pupil a trained artisan in any particular calling. If the Government will give a good foundational course of training that will start the student in the right course to perfect himself in his chosen calling, it is doing all that any Government should do. If the means are supplied whereby the student can gain the information necessary to him, he should be called upon to make some effort for the attainment of himself in the knowledge of his trade or art. That a school such as we possess, or, for that matter, any school, can be made to turn out competent designers, is impossible. The time necessary for such perfecting would be badly spent indeed, if spent in a school, no matter how good. A man will learn ten times more in one year at his trade or art in the workshop, than he will in the same time spent at any school, provided he has first the knowledge which it is the place of an industrial school to impart. The designing taught at schools where they strive to be very "practical," is such that the student must unlearn it before he will be of any service in the manufactory. It is mechanical to a degree that is simply ruinous to anything like good work. It is a thousand times better to teach the principles of design and the different methods of artistic expression, than to attempt the impossible and strive to turn out what are called "practical designers." If turned out at all, they will be like so many machines—their designs will be lifeless, mechanical and uninteresting, but very possibly not harmful, as some may be lead to look upon them as the production of artistic training, and consequently to be admired.

There is nothing gained by attempting much and failing; more benefit will result from attempting little and doing that little well and along correct lines. One good teacher is better for a school than ten or any number of inferior ones; but above all things, the principal teacher should be capable and enthusiastic. An incapable at the head of an institution will be its ruin, and that, I believe is the position of the Toronto School of Art.

Where are all the capable teachers that were once in this school gone? And why? Because they were lovers of Art and not mechanical pupils willing and ready to jump at the command of "practical" ignorance, incapacity and conceit. There is such a thing as being so practical, as well as so artistic, that nothing good or beneficial results. Is it not better to err on the artistic, poetical and pleasurable side of life, than on the practical, the mechanical and gloomy side? Will not the human race be better with a little more joy and happiness, than with more energy and

drive? Does not the great wealth of the few, and the abject poverty of the many, prove that there is too much hard-headedness and energy, and too little kindly consideration one for the other, and desire to give and obtain happiness? Would it not be better to seek knowledge to gain contentment and refinement, than to gain wealth and the pride of wealth.

After all, would it not be better to teach Art in an Art School for its refining influence, rather than attempt to train pupils who are indifferent to their future some specialty that they may gain a livelihood? Would it not be better to have industrial classes to teach the hard and dry knowledge required by mechanics in a way that will be useful to them, without any pretence of teaching them something else?

We want both Art Schools and Industrial Classes conducted by those who have a knowledge of the work entrusted to them. What we do not want are Art Schools degraded until they do not teach art, and too important in their own conceit to give industrial training that will be of service to the mechanical classes.

The Toronto Art School must be taken from under the wing of the Education Department and allowed to breathe the air of independence. The freer the Art Schools of the Province are, the better the work they do. The one at Ottawa, from all accounts, leads the Art Schools of the Province; and we understand that there the Minister of Education was not allowed to interfere with its management. If he had been, the Toronto school might not now be the most inefficient in the Province. The Toronto school should be placed under the management of men having some artistic training, and who will have sufficient firmness to resist all efforts which may be made to effect its ruin under any and all disguises. Teachers should be selected who have a knowledge of Art, and are capable of teaching it. If without certificates from Art Schools, so much the better. There have been too many teachers in the past with certificates from schools of somewhat similar standing to the Toronto school, for its good. Teachers without certificates, but with artistic ability, would be a change, and should work wonders. Let us try this innovation.

I am glad to see that some members of this year's Board of Directors have come to the conclusion that they are not the men to manage an Art School without the assistance of the artistic talent of the city. There are many good men on the Board of Management, but they have not the information nor experience necessary to successfully control an Art School. The direct management of the school should rest with a committee of artists, but there should be a general board, with many interests represented, to control the committee and provide funds for the proper working of the school. I am not confident that this will come to pass—I hope it will—but such a radical change will not meet with the approval of the Minister of Education, as he insists on being the controlling power in all things, both great and small. Let us hope that the men now on the Managing Board who recognize that the school is not what it should be, will not cease their efforts of reform until they have relieved the school of the load of official incapacity which has weighed it down into the mire of utter uselessness.

Yours truly,

ANTI-PATHY.

### STONE-CARVING.

A great deal of the ornamental stone-work, which has been done in some of our best building in recent years, has been cut after the stone was in position. This is common, indeed, in the larger cities. Within a short time this process was rare. We can remember in 1873 that in Boston the practice was only then coming into general use. It was introduced by a number of architects who had studied abroad. At that time in a number of cases it was more of a fad than a necessity as considerable stone cutting was done in the building which might better have been done elsewhere. But as the general character of the design changed, work of this kind became more rational. Though in some cases, as at the present time, it was carried to an unwarrantable extent. The practice of stone-carving was probably developed most fully in France, where an extended use is made of the soft Caens stone. There the moldings, as well as the more ornamental carved and decorative portions are worked out on the building. It is quite absurd to do this to its fullest extent in the case of granite, hard limestone and even brown sandstone, as was done to a certain extent in the East several years ago. Certain carved and highly decorative portions can best be done after the building has been finished otherwise. But a mere mania for imitating foreign methods, without the exercise of reason, is absurd indeed. Some of the foreign methods of building are better than ours. Some of them are not so good. If we can only use sense enough to discriminate we will be fortunate indeed. The extremes of patriotism or mania for foreign imitation are alike unsatisfactory. We remember a visit to Trinity College at Hartford, a few years ago. They had very beautiful buildings after the designs of Mr. Burges, the English architect. They have his work in all its beauty, but they had not imported the English climate; they had the same old New England climate with English winds, sashes and English gates. We were in a number of student's rooms and found them cold and miserable. There is nothing better than the American windows for the Northern American climate, particularly that of the colder portion. The English windows are suited to the English people and their climate. This illustration is used for the purpose of its general application in all details of building

work. In the matter of stone-carving there is no need of doing it in the building merely because some one else does it. It may be done because there is a good reason for it. Under certain conditions the reason may not exist. Mere imitation is a sign of decadence.—*Stone.*

Wood may be inlaid with other woods, with bone, ivory, tortoise-shell, mother-of-pearl, and other shells, with metals, with marbles, with precious stones, with glass, pottery, china, or enamel, either plain or in pattern, says Prof. G. Atchison, A. R. A., in a lecture on decoration before the society of arts, London. Living as most of us do in hired houses, we hardly think of anything but painted deal, the painting being renewed every few years, according to the caprices of fashion. Modern inlaid woodwork most of us have never seen; what we take for it is marquetry—two veneers of different colors cut into the pattern wanted, and one fitted into the other, and the whole glued on to a backing. Inlaying is sinking out the solid wood and letting in pieces of other colored materials, and requires much greater care and skill than marquetry. There are said to be only five men in England who are first-rate at marquetry, and most of them are foreigners. The main merit of real inlay is this, that at the worst the inlay can but come out, while veneer, if it gets damp, or if the glue gets too dry, comes off bodily. Very few people appreciate the value of hard wood, which has the incidental merit of not bruising so easily as soft; but its main merit is preserving the decorative color originally designed, and that it can be inlaid, or if carved, is not spoiled by successive painting. Oak is mostly our highest ambition. The medievalists and the people of the last century were quite right to plaster and paint, or to gild it, for new oak is one of the vilest colors—a sort of cross between coal veal and a top-boot. If not French polished, it may get a decent color in the days of your great-grand-children, though when new it does not make a bad background for inlays of ebony, other colored woods, and ivory. Spanish mahogany also looks well when it is about a century old, and is then a blackish purple. For dignity nothing is so serviceable as ebony, or wood stained black. Ebony varying from black, through brown to yellow, or through grey to black, has the inestimable advantage of variety, which dyed wood mostly wants. In this respect it is like real black marble, that is rarely without variations to gray or brown, and more often than not has white flecks or veins in it, so that you do not mistake it for enameled iron or slate. [Specimens of marquetry shown.] The parquetry of floors may be equally well inlaid in patterns, only it wants to be done on a larger scale.

### HINTS ON VENTILATION.

IN ventilating—say a bed room—by means of the window, what you may principally want is an up-draw blowing current. Well, there are several methods of securing this without danger of a draught:

1. Holes may be bored in the lower part of the upper sash of the window, admitting the outside air.
2. Right across one foot of the lower sash, but attached to the immovable frame of the window, may be hung or tacked a piece of strong Willenden paper—prettily painted with flowers and birds if you please. The window may then be raised to the extent of the breadth of this paper, and the air rushes upward between the two sashes.
3. The same effect is got from simply having a board about six inches wide and the exact size of the sash's breadth. Use this to hold the window up.
4. This same board may have two bent or elbow tubes in it, opening upwards and into the room, so that the air coming through does not blow directly in. The inside openings may be protected by valves, and thus the amount of incoming current can be regulated. We thus get a circulating movement of the air, as the window being raised, there is an opening between the sashes.
5. In summer a frame half as big as the lower sash may be made of perforated zinc or wire gauze and placed in so as to keep the window up. There is no draught; and if kept in position all night, then, as a rule, the inmate will enjoy refreshing sleep.
6. In addition to these plans, the door of every bed room should possess at the top thereof a ventilating panel, the simplest of all being that formed of wire gauze.

In conclusion let me again beg of you to value fresh air as you value life and health itself; while taking care not to sleep directly in an appreciable draught, to abjure curtains all round the bed. A curtained bed is only a stable for nightmares and a hotel for a hundred wonder-ills and ailments.—*Cassell's Magazine.*



**SOME POINTS ON SEWERAGE, WATER SUPPLY, AND THE CONSTRUCTION OF A HEALTHY HOUSE IN A COUNTRY TOWN.**

By DAVID B. DICK, ARCHITECT.

(CONTINUED.)

THE danger of gasses from the sewer entering the house drain was recognized after a fashion, and was sought to be avoided by building a large cesspool between the house drain and the street sewer. Experience, however, showed that the filthy reservoir, which is what it really was, did not serve its purpose, but gave off its own dangerous emanations into the house drain. It was then sought to bottle these up in the soil pipes by putting a trap under each fixture. It was then supposed that all that human ingenuity could do to render plumbing safe had been done, and that if people still died of zymotic diseases, it was a dispensation of Providence which had to be submitted to, but for which there was no remedy. The clergyman was called in, when the man who was really wanted was the sanitarian, whether doctor, or engineer, or plumber—no, not plumber, he had already done all he knew; for the sanitary plumber has been an evolution of recent times. There were two reasons why these traps failed to do what was expected of them: First, the pipes were made of poor and light materials, and if air-tight when first put up, soon became corroded and full of holes, especially if of iron, but lead was little better. I have seen a piece of lead soil pipe with a large piece eaten out of it by rats. When pipes were put in, no test was applied to discover whether they were air-tight. That was taken for granted. The second reason was that the traps became unsealed. Every one knows that a trap is useless unless the bend is kept full of water. Now, although traps had been in use for generations before anybody discovered the fact, it is not only very easy to unseal an ordinary invented trap, but it is very difficult to prevent its becoming unsealed. When a quantity of water is poured quickly down a soil pipe, it drives the air in the pipe before it, and causes a vacuum behind it in the same way as the plunger of a pump does. According to the popular saying, "nature abhors a vacuum," therefore the air rushes in to fill it and take the place of that which has been driven down the pipe. But the only way by which it could get in was through the fixtures and the trap below them. Now that our eyes are open to the fact, we know what happened. The air in its passage carried the water with it out of the trap, leaving the trap, if not empty, at least unsealed, which amounted to the same thing. This is called syphoning the trap. There are several other ways in which a trap may become unsealed, but it is not necessary to enter into a discussion of these now. Enough has been said to show how untrustworthy the old traps were.

All this has been changed in modern practice. Pipes are now made of the materials and heavy enough not only to resist corrosion, which in calking joints in iron pipes is very considerable, and quite sufficient to split a thin pipe. But the most radical change has been in the entire abandonment of the old plan of trying to bottle up the sewer gas in the pipes. The objects aimed at now are: first, to make drains and soil pipes both self-cleaning, so that when properly flushed with water, no foul matter will lodge in them; second, to prevent the passage into the house drain of any sewer gas that may form in the street sewer, by interposing an efficient intercepting trap; and third, to have a current of fresh air passing at all times through the whole of the pipes in the house. This is attained by putting on the house drain, just above the main trap, a pipe which admits fresh air to the house drain and soil pipes, and by carrying the main soil up through the roof, having the end of it open. The air in the soil pipe inside the house being generally warmer than that outside, naturally ascends the passes out at the top, as cold air enters by the fresh air inlet at the bottom. If, when water is passing down the pipe, the air is driven before it, no harm is done, as the current of air is simply reversed for the moment and a puff of air will come out at the inlet, after which the normal upward circulation of the air is immediately re-established.

To guard against the danger of the traps being syphoned, a duplicate set of pipes is provided for supplying air to them. Each pipe has a trap taken from the top of it. These pipes are all connected together and either branched into the soil pipe above the highest

fixture, so as to draw air down through its open upper end above the roof, or they are connected into a similar pipe, which is led up through the roof independently. These pipes prevent the syphoning of the traps, because, when a vacuum is caused in the soil pipe by the sudden passage of a bolt of water, the air to fill the vacuum is drawn down through these pipes instead of being sucked through the traps under the fixtures. This apparent complication of pipes looks rather intricate to the uninitiated, but the main principle is really very simple and easily understood.

To make assurance doubly sure, the whole system should be twice tested; first, by plugging the ends of the pipes before the fixtures are connected and filling them with water right up to the top, when any leaks will at once be detected by the water dribbling out. Secondly, after the fixtures are placed and connected and the traps filled with water, oil of peppermint is poured into the top of the soil pipe and volatilized by sending a puff of hot water after it. If there are any defective spots through which sewer gas could escape into the house, the pungent odor of the peppermint will find its way out at these places, and any ordinary nose will very readily detect and locate them.

Some of the old fixtures, notably the pan closets, were very objectionable, because their construction was such that it was impossible to keep them clean. There is now such a variety of good fixtures for every conceivable purpose, and competition has made them so moderate in price, that there is no excuse for using an old-fashioned or bad one of any kind. Many are still made and sold which cannot be recommended as coming up to the standard of modern requirements. But those who are familiar with the subject have no difficulty in selecting good ones. Indeed, there is quite an embarrassment of riches. As a glance at the catalogue of a good manufacturer will show, there are so many good fixtures of all kinds, differing only in slight particulars which only an expert can appreciate, that one is sometimes tempted to wish there was not quite so many.

A soil pipe or drain should never, if it can be avoided, be buried under the floor of a house or closed in behind plaster. They should, if possible, be run along the cellar walls or suspended from the ceiling and run up in a corner of a pantry or bathroom where their appearance need not be objected to. Every one knows they are there even when concealed, and a tastefully arranged and neatly executed piece of plumbing work is by no means an unsightly object. If it is absolutely necessary to bury a pipe under the floor, it should first be carefully tested and then covered with a good concrete floor, building small brick pits where necessary to give access to brass cleaning plugs, in suitable places to admit of any foreign bodies being removed from the pipes without tearing up the concrete. These foreign bodies will sometimes get into the pipes in spite of the utmost care on the part of the housekeeper. Children and domestic servants seem to have an unconquerable penchant for trying whether the plumbing system is able to assimilate sponges, wash rags and similar objects. I remember in one case of stoppage, being assured by the master of the house that his children and servants would never think of getting rid of any such thing in this way, but when the stoppage was reached, there were taken out, besides other things, several of his neckties and a piece of one of his wife's corsets. When shown the collection, he could only exclaim, "well, well; I never could have believed it." But there they were. Sometimes the much abused plumber is blamed when anything goes wrong, when some such gross ignorance and carelessness as this is the sole cause of the mischief.

The advice which any sanitarian would give to anyone intending to put plumbing in his house, may be summed up very briefly: First, have the work arranged and carried out by some one who knows his business. Never entrust it to a tinsmith who takes up plumbing, which he does not understand, in addition to the tinkering which he does understand; second, have no more plumbing put in than you are prepared to pay for having done in thoroughly good fashion; third, see that your plumbing appliances are properly used after they are in.

A concrete floor has just been incidentally mentioned. This is a most desirable thing to have under every house in order to keep down the damp ground air. For that reason it is desirable to have a cellar or basement under the whole of the house with a good concrete floor and the ground should first be underdrained if there is any appearance of dampness or any risk of surface water flowing towards the house. It is not an unusual thing to place a hot air furnace in a basement which has an earth floor that has been saturated with filth from leaky drains, and to draw the supply of air (to be warmed) from the cellar instead of from the open air by a proper closed

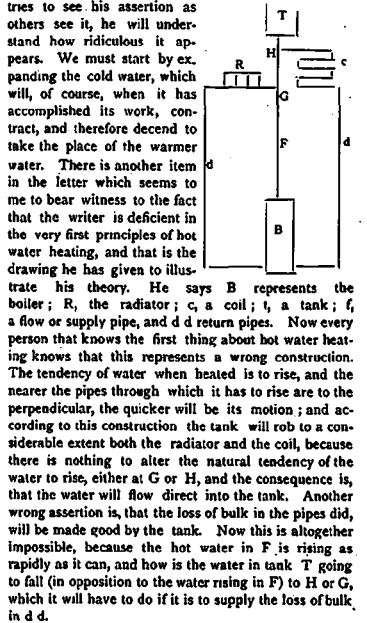
duct. This is sometimes the arrangement which forms the last straw that breaks the camel's back and renders a house entirely uninhabitable until it is altered. It effectually destroys any chance of escaping from the effects of the defective drains, because the air which has been befouled by them is thus carefully collected and warmed and sent up through the registers to be breathed by the occupants of the house. No surer way could be devised of intensifying the danger arising from defective soil pipes and drains. Even if there is no plumbing or drains in the house at all, the air of the house should never be thus taken to be warmed and breathed over and over again. Every hot air furnace should be provided with a duct bringing in fresh air directly from out of doors and it ought to be brought from some point where it will be as free as possible from dust or anything objectionable.

A few of the most important points to be attended to in order to have a healthy house "with modern conveniences" as the agents say, have been very briefly touched upon. There are many others besides which any one whose interest in the subject is once fairly aroused will soon discover for himself. And no one need remain in ignorance of anything that affects his well-being in this connection. The literature of sanitary science is now ample and easily accessible, and there are few who would not feel themselves well repaid for devoting a portion of their spare time to its perusal.

**HOT WATER HEATING.**

EDWIN CANAMIAN ARCHITECT AND BUILDER.

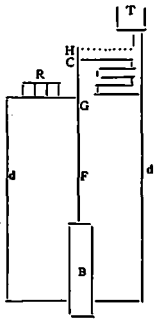
SIR,—I have had considerable experience both in the theory and practice of hot water heating, and have heard and read many opinions both good and indifferent in reference to this subject, but never anything that seemed to my mind so utterly ridiculous as the statements in the opening part of the article which you extracted from the *Northern Architect*, and which appeared in your August number. The writer claimed that it was the contraction of hot water, and not the expansion of cold water by heating that caused circulation. If the writer has found this to be the case, he might have informed us from what hot spring he obtained his water supply, so that we who are toiling up the rugged road to perfection might follow in his footsteps, and so gain such a grand result that our fuel bill for heating would be nil. But we ordinary mortals find that when we fill our system, the water is as cold as the season of the year will allow, and before we can obtain circulation, it is necessary to heat the water, which then immediately rises to the highest point in the system and is replaced by the colder, (and therefore heavier) water. The theory may be as very well from the writer's standpoint, but if he tries to see his assertion as others see it, he will understand how ridiculous it appears. We must start by expanding the cold water, which will, of course, when it has accomplished its work, contract, and therefore descend to take the place of the warmer water. There is another item in the letter which seems to me to bear witness to the fact that the writer is deficient in the very first principles of hot water heating, and that is the drawing he has given to illustrate his theory. He says B represents the boiler; R, the radiator; C, a coil; T, a tank; F, a flow or supply pipe, and d return pipes. Now every person that knows the first thing about hot water heating knows that this represents a wrong construction. The tendency of water when heated is to rise, and the nearer the pipes through which it has to rise are to the perpendicular, the quicker will be its motion; and according to this construction the tank will rob to a considerable extent both the radiator and the coil, because there is nothing to alter the natural tendency of the water to rise, either at G or H, and the consequence is, that the water will flow direct into the tank. Another wrong assertion is, that the loss of bulk in the pipes did, will be made good by the tank. Now this is altogether impossible, because the hot water in F is rising as rapidly as it can, and how is the water in tank T going to fall (in opposition to the water rising in F) to H or G, which it will have to do if it is to supply the losses of bulk in d.



The tank T should only be used for the purposes of expansion and feed, and in no way should it be expected to assist in the circulation of the system except when the boiler and radiators are on the same level; and where there is only one connection between the expansion tank-



and the system, it should be with the return pipe, and not the flow; but a small connection with the flow pipe may also be taken if the tank is in an exposed position to prevent freezing. The following sketch will illustrate the principle upon which I work: T is connected to return pipe d by a 1/2" pipe, and the same size connection to flow pipe F at H, when the tank is in an exposed or cold position. The flow pipe F decreases as the branches are taken from it as follows: Say, 1 1/2" inch as far as G, and from G to H 1 1/4" inches. This must, of course be determined by the size of the radiator and boiler.



I would not have entered so fully into these elementary details did I not think it necessary to do so in replying to the article in question, as the writer of it seems altogether ignorant of them. In reference to his assertions about the large mains and returning the water to the bottom of the boiler, I will reply later on.

TOM.

**HOT WATER HEATING.**

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—In a recent issue of your paper I notice an article under this head, taken from the *Northwestern Architect*.

The writer of the article in question starts out with the statement that "the motive power which causes circulation in a hot water heating plant is brought into action not by the expansion of the water, but by its contraction. To make this clear," he says, "consider that the normal condition of the plant when in operation is with the hottest water in the place, and that what takes place in the natural starting of the apparatus is a changing condition. Let us then imagine the apparatus to be filled with hot water, and just enough fire to keep the temperature at the top of the boiler constant to be maintained."

In order to explain his new and somewhat crude theory as to the circulation of hot water, he shows a system of pipes and connections, which would never be fixed by any good mechanic who understands hot water heating.

He assumes that the apparatus is filled with hot water, and then notes the changes that take place.

Circulation of hot water is not caused by its contraction, as stated, but it is caused by its expansion.

Take a hot water heating apparatus with its pipes and radiators filled with cold water. Water consists of an innumerable quantity of extremely minute particles, called molecules. These particles have the property of being able to glide over, under and to or from each other almost entirely without resistance or friction.

The action that takes place in a boiler is this: When the heat is applied, the particles nearest the heated surface become expanded or swollen, and are so rendered lighter (bulk for bulk) than their colder fellows, they are therefore compelled to rise to the highest point in the boiler; finding an opening there (the flow pipe), they travel up this also, until the highest point in the circulation is reached. It will be understood that immediately the expanded particles left the heating surface, other cold particles immediately took their places; these become heated in their turn and rise, following their predecessors, and so it continues.

The circulation can be described as a stream of heated particles flowing up one pipe from the boiler, and a stream of cooler particles flowing down the other into the boiler; or it might be defined as a means of automatically transporting heated water from the lower to the upper parts of a building, and providing a down flow of cold water to the boiler, to be heated in its turn.

This circulation goes on indefinitely as long as any fire remains, and even for several hours afterwards, until an equilibrium has been established between the two columns of water.

I entirely agree with the remaining portion of the writer's article wherein he speaks of the slipshod manner in which too much of the work is done nowadays. But while this is unquestionably true, it is equally true that there is such a thing as a taste educated or trained away from the right course by the pernicious influence of depraved familiarity. As Pope expresses it:

"Vice is a monster of each frightful mien  
That to be hated, needs but to be seen;  
But seen too oft, familiar with her face,  
We first endure, then pity, then embrace."

Yours truly,

W. B. FRANCIS.

**AMERICAN GAS LIGHT ASSOCIATION MEETING IN TORONTO.**

A CONVENTION of members of the American Gas Light Association will be held in this city commencing Wednesday, the 17th inst., at 10 o'clock, and closing on the evening of the 20th. The meetings will be held in Temperance Hall. The programme will include the reading of the following papers:

- "Experience in Distributing Gas Under Extremely Low Temperatures," by D. H. Geggie.
- "Observations During Many Years' Experience in the Gas Business," by Jas. R. Smedberg.
- "Construction of Gas Holders with Wrought Iron or Steel Tanks Above Ground" by Frederick Mayer.
- "The Steam Stoker and Improved Charger," by A. Q. Ross.
- "Daily Experiences and Observations of a Gas Manager," by Jas. Somerville.
- "Goals for Gas Making," by Jas. D. Perkins.
- "Enriching Gas with Naphthaline," by Arthur Kition.

For the Question Box there are the following questions:

- "What is the exact cost on wear and tear of meters where iron purification is used?"
- "What is the best way to treat men who, while working in a trench, are overcome by gas?"

We bespeak for the members of the Association a hearty welcome to Toronto, and trust that their stay amongst us may prove both pleasant and profitable. The quickest way we know of to win the affections of the people of Toronto would be to tell them how to regulate the pace of their gas meters.

**SANITATION IN ENGLAND.**

UNDER the new English Registration Bill, the sanitary arrangements to be certified are to be in accordance with the following requirements:

- (1.) Each water-closet shall have a flushing service which shall be distinct and separate from every water service other than a water-closet service, and no cistern shall be connected with any pipe which is in direct connection with a soil drain.
- (2.) Each soil pipe shall be ventilated, and the open end of the ventilating pipe shall be at least two feet above the highest window or other opening on the side of the building where the pipe is situated.
- (3.) The drains shall be ventilated by means of a soil-pipe, or by a separate pipe above the highest window on the side of the building where the pipe is situated.
- (4.) Water closets shall be trapped, and they shall be the only arrangements inside the building having pipes directly connected with a soil drain.
- (5.) There shall be an air chamber, with disconnecting siphon trap, which shall be easy of access, on the soil drain between the buildings and the public sewer or cess pool.

In addition to these conditions, every certificate for a building used or to be used as a hospital shall specify the cubic contents of each ward, and set forth in detail the provision made for lighting, warming and ventilating each ward as well as the entire building, and the position of the water closets, sinks and discharge pipes with reference to the wards.

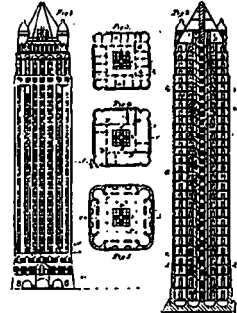
Buildings must not be used without being certified to, under a penalty of £10, and £1 for every day of such occupation, to be recovered of the owner, lessee or occupier. The certificates lapse in five years and must be renewed, as in case of any alterations made during that time.

Continued pumping at a well lowers the ground water level in the earth for a distance of from 100 to 1,000 feet, varying with geological formation and the water-supply. Hence, the greater amount of water taken from a well, the greater distance is the water drawn through the earth and the greater the chance for pollution. —*Wisconsin Water Report.*

In a recent lecture to the Sanitary institution of Great Britain, Dr B. W. Richardson considered the power the human body has been proven to possess of storing up labor to a prolonged period. He stated the conditions favoring such a storage in the following order: Hereditary qualifications, the virtue of continence, maintenance of bodily functions, perfect temperance and purity from implanted or acquired diseases. Temperament has its influence, the bilious and sanguine temperaments being best for long life and the best for long life and the nervous and lymphatic the worst. What he termed all-round temperance is the avoidance of everything that stimulates the heart beyond its natural activity, such stimulation being an unnatural tax that reduces the storage of life.

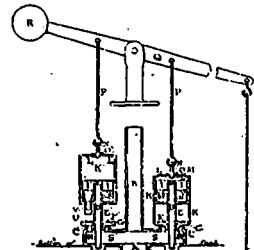


Iron Building Construction.  
No. 59,533. Leroy S. Buffington, Minneapolis, Minn., U. S. Pat. dated 23rd July, 1888.



Claim.—1st. A building having a continuous skeleton of metal, n covering or veneer, and a non-conducting packing between the skeleton and veneer, for the purpose set forth. 2nd. In a building frame, a continuous diminishing laminated post formed of layers of metal plates, secured together and arranged to break joints and decreasing in number towards the top. 3rd. In iron building construction, the combination, with a framing composed of continuous laminated posts suitably connected by braces and girts of tie-beams secured thereto and to one another, substantially as set forth. 4th. In iron building construction the combination, with a framing composed of continuous laminated framing posts, suitably connected by braces of an exterior covering of non-conducting material, for the purpose set forth. 5th. In iron building construction, the combination, with a framing composed of laminated posts suitably connected by braces and girts, of an exterior covering of non-conducting material, and a stone or other veneering exterior thereto, and supported on shelves secured to the framing, substantially as set forth. 6th. In a frame for a building of two or more stories, a series of tapering posts extending from base to top of the frame, and formed of metal plates in layers, secured with their flat slides together, and arranged to break joints and braces and girts, for connecting and securing the posts, substantially as set forth. 7th. In a building frame, a series of continuous framing posts, composed of metal plates secured with their flat slides together and breaking joints, in combination with girts and tie-beams secured thereto at each floor, substantially as set forth. 8th. The combination, with the laminated plates, of the continuous girts secured thereto, and the tie-beams also secured thereto, and to one another, substantially as set forth. 9th. The combination, with the framing posts and braces, of the wire-lath, or other suitable coverings, the non-conducting packing and the veneering the purpose set forth. 10th. The combination, with the building supported by the shelves, and anchor rods, substantially as set forth and frame composed of the laminated posts, girts, tie-beams and pillars arranged to form a central well, of the elevator shafts, and stairs arranged therein, substantially as set forth. 11th. The combination, with the building frame constructed with a central well, of elevator shafts arranged in the corners of such well, and flights of stairs rising from opposite sides of such well to a central landing, and other flights rising from said landing to the other sides of such well, substantially as set forth. 12th. The combination, with the posts and girts forming outer frame, of the beams having their outer ends resting on the girts and secured to the posts, and their inner ends secured to beams that are transverse to them, the pillars therefor, and the diagonal tie-rods, substantially as set forth. 13th. The combination, with the posts and girts, of the angle-plates connecting them, and forming supports for the veneer shelves. 14th. The combination, with the posts and their braces, of the plates forming the shelf supports, the shelves, the veneer and the anchor rods, substantially as set forth.

Fresh Patent for Water Closets.  
No. 58,790. Thomas Campbell, St. John. N. B., dated 3rd April, 1888.

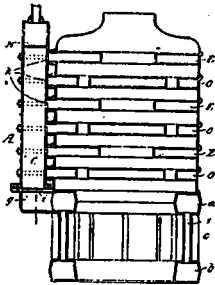


Claim.—1st. The combination of the cylinder K and the piston I, substantially as and for the purpose hereinbefore set forth. 2nd. The combination, with the two cylinders K, K', and the

pistons I, I', substantially as and for the purpose hereinbefore set forth. 3rd. The combinations of the cylinders K, K' and the pistons I, I', with the rods P, P', as connected with the lever Q and the chain T, substantially as and for the purpose hereinbefore set forth.

**Hot Water Radiator.**

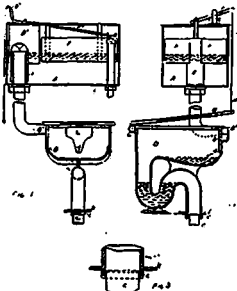
No. 28,923. Eugene S. Manny, Montreal, Que., dated 16th April, 1888.



**Claim.**—A hot water radiator, composed of a certain number of vertical hollow double independent sections A, mounted on a double hollow corresponding horizontal base B, by means of bolts C, and provided with a system of air tubes O, P and valve Q, the whole as above described and for the purpose set forth.

**Water Closet Apparatus.**

No. 29,526. David S. Keith and Alexander Keith, Toronto, Ont., dated 23rd July, 1888.



**Claim.**—1st. As an improvement in a water closet apparatus, the cistern A containing a siphon E which is operated by the depression of a miss D, or of a mass F F' in the water, as herein described, and for the purpose specified. and the improvement in a water closet apparatus which consists of bringing the seat M to lugs L, formed in the wire of the closets, and connecting the seat M to operate the action of the siphon cistern, as herein described and for the purpose specified. 3rd. In a water closet the fan B having an opening above the level of the water in the basin, and pointing towards the centre of the bottom of the basin, substantially as described herein and for the purpose specified. 4th. In a water closet apparatus, the connection of the closet to the soil pipe C, formed by the flange with the channelled recess C containing tar or other viscous matter, substantially as described and for the purpose specified.

**Composition for Roofing and Carpet Felt, Straw Lining, etc.**

No. 29,528. Thomas P. Bishop, Jr., St. Bazile, Que., dated 28th July, 1888.

**Claim.**—In the manufacture of carpet felt, roofing felt, and straw lining, the admixture with the ingredients of which these are now composed, of spent tan bark within the proportions of from fifteen to twenty per cent. as and for the purpose set forth.

**PROPOSED NEW SEWER PIPE MANUFACTORY IN CANADA.**

THE editor of the CANADIAN ARCHITECT AND BUILDER is in receipt of the following letter from a gentleman in the United States, whose name we withhold for the present, having no authority to make it public:

"I am thinking of establishing a manufactory for sewer tile, etc., in Canada, if I can find a city suitable for the purpose, and I think I know where I can get it."

I write to you for information regarding the market for sewer tile, and to find out if the demand is all good; or what there is any manufactory in Canada at present, and to what extent. I, of course, refer to a vitrified, salt glazed tile, and I understand the largest size at present manufactured in the country is six inch.

Any information you can send me on the subject will be thankfully received."

Upon receipt of the above letter, we instituted enquiries, with a view to obtaining the information sought for. We were informed by the principal dealers in sewer pipe in this city that a wide field lies open to the manufacturer of a first-class article in that line in Canada. There are at present two manufactories in Canada—one in Ontario, the other in Quebec. These, we were informed, supply but a very small percentage of the sewer pipe used in this country. The largest proportion is imported either from Scotland or the United States. We enquired

whether it was owing to the limited capacity of the Canadian manufacturers to produce the goods that such a large proportion had to be imported. The answer was that it was due rather to the inferiority of the pipe at present manufactured in Canada as compared with the imported article. The city of Toronto, it was said, would not allow the use of the native article, and that one dealer alone imported into Toronto last year 300 car loads of drain and sewer pipe. We give these statements to the public as they were given to us, with no desire to injure in any way any industry at present in operation in Canada, but rather to point out to the proprietors of such the apparent necessity of improving the quality of their output, if they desire to supplant the manufacturers of other countries at present used so largely in our public works. We also consider it a duty to encourage the establishment in Canada of manufactories whenever there appears to be a profitable opening for the same.

**ENGINEERING MATERIALS.**

I NOW desire, says Sir Frederick Emmwell, the eminent English engineer, addressing the British Association, to point out how, as the work of the engineer grows, his needs increase. New material, or better material of the old kind, has to be found to enable him to carry out these works of greater magnitude. At the beginning of this century stone, brick and timber were practically the only materials employed for that which I may call smelting engineering work—i. e., buildings, aqueducts and so on. The white, timber, cast iron and wrought iron were for many years the only available materials for the framing and principal parts of moving machines and engines, with the occasional use of lead for the pipes, and of copper for pipes and for boilers. As regards the cast iron, little was known of the science involved (for that ought to be involved), in its manufacture. It was judged of by results. It was judged of largely by the eye. It was "white," it was "mottled," it was "gray." It was known to be "fit for refining," fit for "strong castings," or fit for castings in which great fluidity in the molten metal was judged to be of more importance than strength in the finished casting. With respect to wrought iron, it was judged of by its results also. It was judged of by the place of its manufacture; but when the works of the district were unknown, the iron, on being tested, was classed as "good fibrous," although some of the very best was "steel-like," or "bad," "hot-short," or "cold-short." A particular district would produce one kind of iron, another district another kind of iron. The ore, the flux and the fuel were all known to have influence, but to what extent was little realized; and if there came in a new ore or a new flux it might well be that for months the turn-out of the works into which these novelties had been introduced would be prejudiced. Steel again—that luxury of the day of my youth—was judged by the eye. The wrought bars, made into "blister" steel by "cementation," were broken, examined and grouped accordingly. Steel was known, no doubt, to be a compound of iron and carbon, but the importance of exactness in the percentage was but little understood, nor was it understood how the presence of comparatively small quantities of foreign matter might necessitate the variation of the proportions of carbon. The consequence was that anomalous results every now and then arose to confound the person who had used the steel, and falsifying the proverb "true as steel," steel became an object of distrust. Is it too much to say that Bessemer's great invention of the steel by the "converter," and Siemens's invention of the open hearth process, reacted on pure science, and set scientific men to investigate the laws which regulate the union of metals and metalloids, and that the labors of these scientific men have improved the manufacture, so that steel is now thoroughly and entirely trusted? By its aid engineering works are accomplished which, without that aid, would have been simply impossible. The Fourth Bridge, the big gun, the compound armor of the Ironclad with its steel face, the projectile to pierce that steel face, all equally depend upon the "truth" of steel as much as does the barely visible hair-spring of the chronometer, which enables the longitude of the ship in which it is carried to be ascertained. Now, what makes the difference between trustworthy and untrustworthy steel for each particular purpose? Something which, until our better sense comes to our aid, we are inclined to look upon as ridiculously insignificant—a "next-to-nothing." Setting extraneous ingredients aside, and considering only the union of iron and carbon, the question whether there shall be added or deducted one-tenth of one per cent. (pardon my clumsy way of using the decimal system) of carbon is a matter of great importance in the resulting quality of the steel. This is a striking practical instance of how apparently insignificant things may be of the highest importance.

In an article descriptive of the Montreal Terra Cotta Lumber Company's business, which appeared in the June number of this journal, an error occurred which we very much regret, and now desire to correct. The President of the Company is Mr. J. Barsalou, and the manager, Mr. W. T. Gayoun, not W. C. Evans, as erroneously stated in the article referred to. The company's works are at Maisonneuve, not their business office at 86 St. Peter street, Montreal. Our readers are asked to note the company's correct address, as given above, and correspond with them for full particulars of their terra cotta fire-proof building material.

William Clarke, 39 Adelaide street east, Toronto, is the inventor and patentee of a new kind of sliding door hanger, which is superior in some important particulars to those heretofore used. Unless very carefully handled the ordinary sliding door will "stick," and prove itself to be a nuisance. This is owing to the fact that the door is hung entirely from the top. With Mr. Clarke's invention the door cannot hitch, being perfectly balanced and sliding on both top and bottom tracks. Another equally important advantage lies in the fact that it is put in separate form, instead of as a part of the building, and should any demagagement of the building throw it out of perfect adjustment, the difficulty can be overcome without disturbing either the wall, carpet or furniture. Mr. Clarke has commenced the manufacture of his device, and invites correspondence and investigation from persons interested in building.



Architects, Engineers, Builders, Owners and others are invited to send particulars of all kinds of construction work in continuation, for publication in this department. Please state location, character and cost, and name of person or persons controlling the work.

OSHAWA, ONT.—W. J. Hare will erect a foundry here at once.

KINGSTON, ONT.—Tenders will be asked shortly for the erection of the proposed dry dock.

OWEN SOUND, ONT.—The Methodist congregation propose to erect a handsome new church.

HALIFAX, N. S.—This city proposes to expend \$10,000 in sewer extension and improvement.

LEAMINGTON, ONT.—Capitalists have in view the erection of a \$50,000 hotel on the lake shore next summer.

PENDBROKE, ONT.—Pembroke will on the 26th December vote on a by-law to borrow \$50,000 for waterworks.

ST. JOHN, N. B.—The Intercolonial railway will be extended along the harbor front if right of way is given.

TESWATER, ONT.—A by-law to raise \$5,000 for a system of waterworks has been adopted by 45 of a majority.

WIARTON, ONT.—A by-law appropriating \$85,000 for the construction of waterworks was carried here on Oct. 10th.

AURORA, ONT.—The by-law to raise \$3,000 for the extension of the Aurora waterworks was carried by a majority of 65.

STRATFORD, ONT.—The necessity for the erection of a hospital for this city is being pointed out, and doubtless action in that direction will soon be taken.

OTTAWA, ONT.—The Y. M. C. A. of Ottawa, are about to erect a \$22,000 building.—The Chairman of the Waterworks Committee will receive tenders until the 31st inst. for the construction and erection of a set of pumping machinery. Specifications and drawings may be seen at the waterworks office, here.

QUEBEC.—An effort is being made to obtain a suitable site for a grand union passenger depot on the Cove field for all the railways entering the city.—A corps of engineers is making observations to ascertain the width and elevation of the St. Lawrence and record soundings of the river bed with a view to erecting a bridge across the river at this point.—A syndicate is said to have acquired ground near Dufferin terrace on which to erect a large hotel.

WINDSOR, ONT.—Health Officer Coventry, of Windsor, says Walkerville is bound to grow, and that sewage from that place will in time make the water lower down dangerously impure for use at Windsor. He favors a site above Walkerville for new waterworks buildings. A competent engineer will be employed to estimate the cost.—Foreign contributions to be applied to the building of the new hospital, Hoag Dieu, at Windsor, to the amount of \$20,000 have been received by Dean Wagner. A site has been secured, and work will soon be commenced on the main wing, which will cost \$30,000. The total cost of the building will be about \$75,000.

TORONTO, ONT.—A by-law will be submitted asking \$90,000 for new water mains.—Mr. A. E. Paull, architect, is preparing plans for a new fire hall to be built on Ossington Ave.—Plans have been prepared for a Wyafers' Home, to cost \$10,000.—The following permits for the erection of new buildings have been granted by the Toronto City Commissioner since our last issue: Mr. Byer, a blocks of six each a storey i. e. dwellings, 4 to 30 Davenport Road, cost, \$6,000; Mr. Clark, 3 attached r. c. dwellings, Eglon street, cost, \$4,000; Mr. T. Dowdell, attention to dwellings, corner Ontario and Wellesley sts., cost, \$1,150; Beady & Bell, a attached r. c. dwellings, Walton st., near Termyan, cost, \$2,500; Mr. H. H. Strathly, alterations to warehouse, 37 Front st., cost, \$3,000; J. T. Shipper, pair s. d. a storey and attic brick dwellings, Carlton st., cost, \$5,000; Mr. W. O'Neil, alterations to building, Adelaide st., cost, \$5,000; R. & T. Watson, 4 storey brick warehouse, Esplanada st., east of Church st., cost, \$6,500; Mr. W. S. Thompson, pair s. d. a storey and attic brick dwellings, cor. Wilcox and St. George st., cost, \$15,000; A. J. Mark, 2 pr s. d. a storey and attic brick dwellings, corner of Mainland and Church sts., cost, \$25,000; Mrs. C. Verrill, 4 attached 3 storey and attic brick dwellings, Bathurst st., near College st., cost \$16,000; Mr. Ben Heck, brick additional storey, cor. Duesch and Sherbourne st., cost, \$1,000; Mr. John C. Cochrane, a storey and attic brick dwelling, St. George st., south of Bloor, cost, \$11,000; J. G. Goddard, a storey brick addition, cor. Front and Sherbourne sts., cost, \$4,500; George Hastings, a storey brick addition and alterations to 200 Simcoe st., cost, \$2,000; Mr. A. Mitchell, pair attached a storey brick dwellings add alterations to store, Grange Ave., cost, \$3,000; St. Joseph's Convent, brick stable and coach house, cost, \$3,000; W. G. Boon, pair s. d. a storey and attic brick dwellings, Murray st., cost, \$3,000; G. C. Sheppard, one pair s. d. a storey and attic r. c. dwellings, Cumberland st., near Avenue Road, cost, \$1,600; O'Keefe & Co., alterations to store house, Dalhousie st., cost, \$2,000; B. Rosman, alterations to brewery, Duesch st., cost, \$5,000.—Those who have in hand the raising of funds for the erection of the new Victoria University building in this city hope to be in a position to let contracts for the work next spring.

**PERSONALS.**

M. B. Thomas, Superintendent of the Dundas gas works, has recently returned from a tour of inspection to various cities of the United States.

Hon. Mr. Smart, Minister of Public Works for Manitoba is reported to be dangerously ill of typhoid fever at Brockville, Ont.

Mr. Sandford Fleming, the well-known engineer, has returned to Ottawa after spending the summer at Halifax, N. S.

BUILDING MATERIALS.

LUMBER.

CAR OR CARGO LOTS:

Table listing various lumber types and their prices, including 1x4 and thicker clear picks, 1x4 and thicker, pickings, Am. list, etc.

WARD QUOTATIONS.

Table listing mill cut boards and scantling, shipping cut boards, scantling, etc.

Table listing 1 1/2 inch flooring, dressed, 1 1/2 inch flooring rough, etc.

BROCK - W M.

Table listing Common Walling, Good Facing, Sewer, etc.

Table listing Slate: Roofing (square), Green, up'ing, purple, red, black, etc.

Table listing CEMENT, LIME, etc. Lime, Per Barrel of a bushel, etc.

Table listing Hardware: American Pattern, 1/2 inch, per keg, etc.

Table listing Iron, etc. Reduced, 30, 100 lb. or ordinary sizes, etc.

Table listing MONTREAL PRICES. Ash, 1 to 4 ft, M., Birch, 1 to 4 ft, M., etc.

Table listing Shipping Calls, Mill Calls, Spruce, 1 to 2 inch, M., etc.

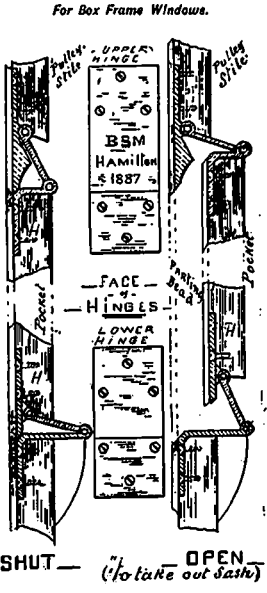
Table listing Cement, etc. Portland Cement, per barrel, etc.

Table listing Paints, etc. White Lead, pure, 25 to 100 lb. kegs, etc.

Table listing Lumber: Spruce, 24 ft, Bay Family Mills, etc.

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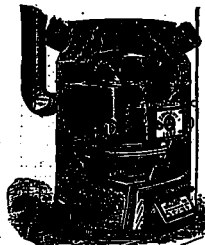
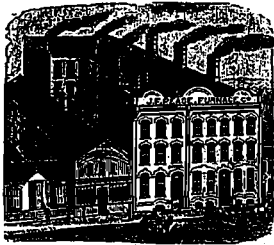
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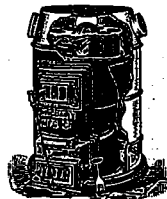
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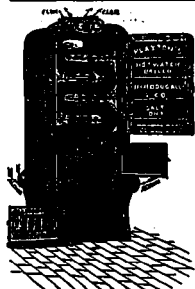
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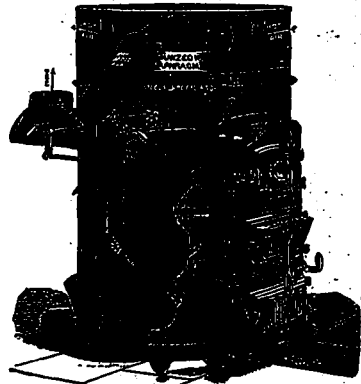


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