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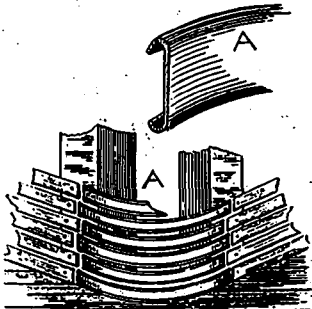
THE G. B. TISDALE CO.,

BRANTFORD, CANADA.

SITUATION WANTED.

DRAUGHTSMAN, 25 years School of Practical Science, 1 year Architect's Office, desires engagement as finisher with architect. Address, J. H. F., care of CANADIAN ARCHITECT AND BUILDER, Toronto.

Radigan's Patent Metallic Lath.



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

JOHN RADIGAN,

68 Marv Street, HAMILTON, ONT.

THE VICTORIA ROOFING PAINT COMPANY OF MONTREAL.



Have appointed Mr. J. H. SHALES, 153 MUTUAL ST., TORONTO, as agent for the sale with application of their

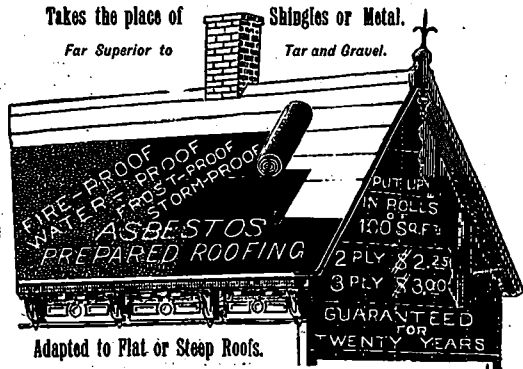
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AND THEIR Patent 3-Ply Felt

for new roofs, which they guarantee for ten years. EST. The people of Toronto are warned against unscrupulous parties who are selling inferior Roofing as made by us. A sample of our roofs may be seen on Mr. Lumisden's Bakery, cor. Queen and Ontario Streets. ESTIMATES GIVEN ON APPLICATION. 153 MUTUAL ST., TORONTO.

Takes the place of Shingles or Metal. Far Superior to Tar and Gravel.

Can be Applied by Any One.



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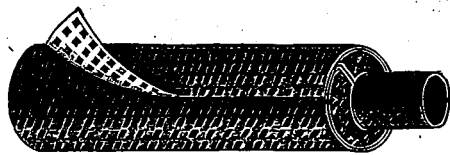
Adapted to Flat or Steep Roofs.

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Architects and Builders! Protect Your Buildings and Make Them Perfect.

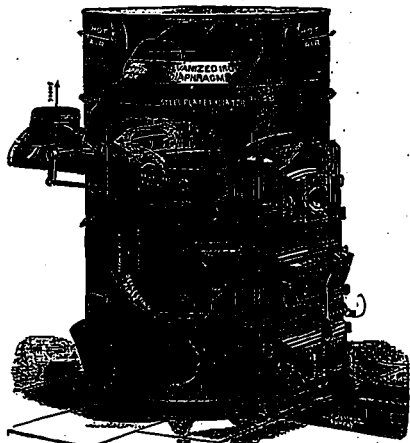


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(Lamkin's Patent)

Water pipes covered with our Frost Proof Covering will not freeze no matter where exposed or how low the temperature. Mineral Wool for sale by the sack, ton, or car lots for despatching purposes.

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WITH ONLY ONE JOINT.

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A strictly Sanitary Heater, which will produce in the house all the purity of the external atmosphere, at the proper temperature for respiration.

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1 1/2 and thicker clear picks, Am. ins.	\$30 00 @ 32 00
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1 x 10 and 12 dressing and better.	20 00 22 00
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1 x 10 and 12 dressing.	15 00 16 00
1 x 10 and 12 common.	15 00 13 00
1 x 10 and 12 spruce culls.	10 00 11 00
1 x 10 and 12 maple culls.	9 00
1 inch clear and picks.	23 00 25 00
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1 inch siding, mill run.	12 00 15 00
1 inch siding, common.	12 00 13 00
1 inch siding, ship culls.	10 00 11 00
1 inch siding, mill culls.	8 00 9 00
Cull scantling.	18 00 9 00
1/2 and thicker cutting up plank.	22 00 25 00
1 inch strips, 4 in. to 8 in. mill run.	14 00 16 00
1 inch strips, common.	11 00 12 00
1/2 inch flooring.	15 00
1/2 inch flooring.	16 00
XXX shingles, sawn.	\$2 40 @ 2 50
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Eastlake galvanized steel shingles, 24 W. G., per square.	5 25
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Eastlake painted steel shingles, per sq.	4 00
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Manitoba painted steel siding, per sq.	4 50
Special galvanized steel siding, per sq.	4 50
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Imitation brick siding, per square.	1 50

YARD QUOTATIONS.

Mill cull boards and scantling.	10 00
Shipping cull boards, promiscuous widths.	13 00
Shipping cull boards, stocks.	14 00
Hemlock canting and joist up to 16 ft.	11 00
" " " 18 "	12 00 13 00
" " " 20 "	13 00 14 00
Scantling and joist, up to 16 ft.	11 00
" " " 18 ft.	15 00
" " " 20 ft.	16 00
" " " 22 ft.	17 00
" " " 24 ft.	18 00
" " " 26 ft.	20 00
" " " 28 ft.	22 00
" " " 30 ft.	24 00
" " " 32 ft.	25 00
" " " 34 ft.	26 00
" " " 36 ft.	28 00
" " " 38 ft.	30 00
" " " 40 to 44 ft.	35 00
Cutting up planks, 1 1/2 and thicker, dry boards.	25 00 20 00
Dressing stocks.	16 00 22 00
Picks, American inspection.	48 00
Three uppers, American inspection.	50 00
Cedar for block paving, per cord.	5 00
Cedar for Kerbing, 4 x 14, per M.	14 00

B. M.

1 1/2 inch flooring, dressed, F. M.	28 00 32 00
1 1/2 inch flooring rough, D. M.	18 00 22 00
1/2 " dressed, F. M.	25 00 28 00
" " undressed, B. M.	18 00 19 00
" " dressed	18 00 22 00
" " undressed	12 00 15 00
Beaded sheathing, dressed	22 00 25 00
Clapboarding, dressed	12 00
XXX sawn shingles, per M, 16 in.	4 75
Sawn lath.	8 00 8 25
Red oak.	30 00 40 00

BRICK—B. M.

Common Walling.	\$ 7 50
Good Facing	10 00
Sewer	9 50

Stone:

Lommon Rubble, Rer Toise, delivered	14 00
Farge flat	16 00
Foundation Blocks, 1 Cubic Foot.	35

Slate: Roofing (3/4 square).

" green.	5 00 6 00
" " unsliding	5 00 6 00
" " green	5 50 6 00
" " red.	10 00
" " black, Lehigh.	3 50 4 00
" " " Chesapeake.	5 00
" " unsliding, Monson	5 50 8 00
" " black slate.	7 50

Sand:

Per Load of 1 1/2 Cubic Yards.	1 25
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PAINTS. (In oil, 3/4 lb.)

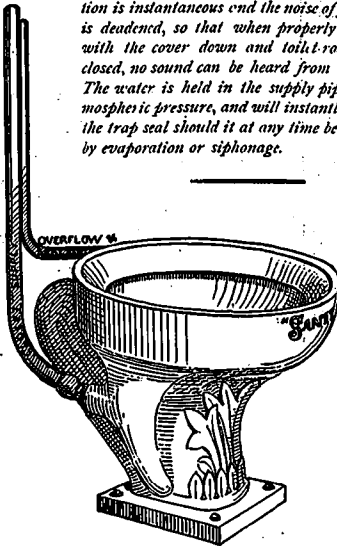
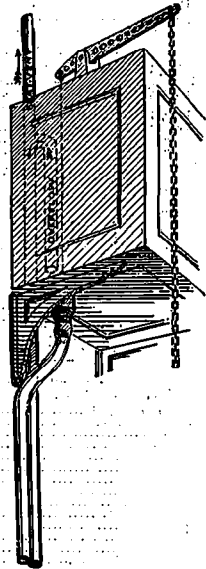
White lead, Can.	6 7 50
" " zinc, Can.	6 1/2 8 50
Red lead, Eng.	5 1/2 6 50
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" " vermilion.	30 1 00
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Yellow chrome.	15 25
Green, chrome.	7 12
" " Paris.	25 40
Black, lamp.	15 25
Blue, ultramarine.	15 25
Oil, linseed, raw (& Imp. gallon).	56 70
" " " boiled	59 75
" " " refined.	59 75
Putty.	3 1/2 3
Whiting, dry.	75 1 00
Paris white, Eng., dry.	90 1 25

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THE SANITAS PATENT WATER CLOSET

Has the simplicity of the Short Hopper, all the sanitary advantages and conveniences of the best improved modern closets, and others peculiar to itself, in being anti-siphonic, quick-acting, self-sealing, free from splattering or waste of water, and, when properly set, almost noiseless in operation.

The supply pipe between the cistern and the closet stands permanently full of water, and, discharging below the level of the standing water in the bowl, the action is instantaneous and the noise of flushing is deadened, so that when properly set and with the cover down and toilet-room door closed, no sound can be heard from without. The water is held in the supply pipe by atmospheric pressure, and will instantly restore the trap seal should it at any time be lowered by evaporation or siphonage.



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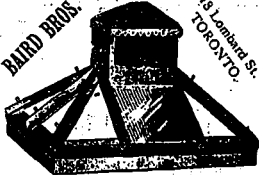
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SEALED TENDERS address to the undersigned and endorsed Tender for Additions and Clock Tower to Custom House, London, Ont. will be received at this office until Wednesday, 10th June, 1889, for the several works required in the erection of Additions and Clock Tower to Custom House, London, Ont. Specifications can be seen at the Department of Public Works, Ottawa, and at the office of G. F. Durand, Esq., Architect, London, Ont., on and after Tuesday, 4th June, 1889, and tenders will not be considered unless made on forms supplied and signed with actual signatures of tenderers.

An accepted bank cheque payable to the order of the Minister of Public Works, equal to five per cent. of amount of tender, must accompany each tender. This cheque will be forfeited if the party declines the contract or fails to complete the work contracted for, and will be returned in case of non-acceptance of tender. The Department does not bind itself to accept the lowest of any tender.

By order, A. GORRIL, Secretary.

Department of Public Works, Ottawa, 5th June, 1889.



Notice to Contractors.

TENDERS

Will be received by registered post, addressed to the Chairman of the Committee on Works, up to two o'clock p. m. of the

18th DAY OF JUNE, 1889,

For the construction of the following works:

CEDAR BLOCK ROADWAY.

- Simpson Avenue—Broadway Avenue to east terminus.
- Bulwer Street—Spadina Avenue to Soho Street.
- Sauker Street—Queen East to Eastern Avenue.
- Alice Street—Yonge Street to Terauley Street.
- Marlborough Avenue—Yonge Street to west terminus.
- Bloor Street—Yonge Street to Avenue Road.
- Walmer Road—Lowther Avenue to Castle Ave.
- Manning Avenue—Bloor Street to Hammond Street.
- Wilson Street—Broadview Avenue to east terminus.

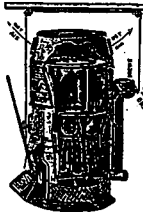
Plans can be seen, and forms of tender obtained, on and after the 11th inst. A deposit in the form of a marked cheque payable to the order of the City Treasurer for the sum of 5 per cent. on the value of the work tendered for under 1,000, and 1/2 per cent. for over that amount, must accompany each and every tender, otherwise it will not be entertained. All tenders must bear the bona fide signatures of the contractor and his sureties (see specification), or they will be ruled out as informal.

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

WM. CARLYLE, Chairman Committee on Works.

Committee Room, June 4, 1889.

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COAL:

BOYNTON, all cast, 7 styles. TORRID, Steel Dome and Radiator, high-class, 3 sizes. CHALLENGE, Strong, Durable and Cheap, - 3 sizes. COPP'S PATENT WOOD FURNACE, Best and most perfect line made, 6 styles.

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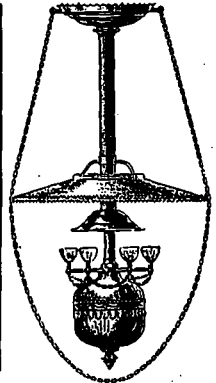
NOTHING

A system of increasing the illuminating power of gas by the use of a cheap, solid hydro-carbon, whereby a dull, flickering flame is rendered intensely white and steady. It affords the means of saving one-half the consumption of gas, besides giving a better light than the common burner.

The lamp is a cheap and ornamental gas-fixture, is simple in operation, and cannot get out of order.

RESULT OF TESTS.

With a consumption of but three feet of gas per hour the photometer registered twenty-seven candles, or nine candles per foot (Ordinary gas burning gives from two to two and a half candles per foot.) The above shows an increase of from 350 to 450 per cent. over the common burner.



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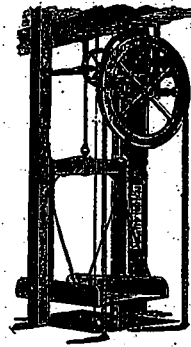
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Closets,

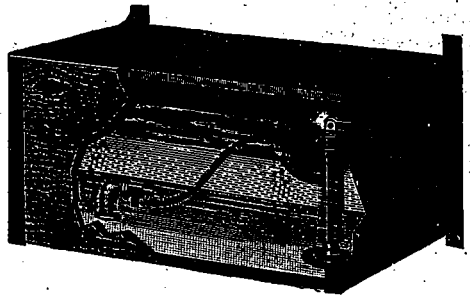
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Tanks,

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Porous Terra Cotta

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Bank of Commerce Building, Toronto.
New Post Office, Napanee.
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LUMBER, LATH, SHINGLES AND TIMBER, DOORS, SASH, BLINDS, STAIRS, COUNTERS,
And all descriptions of Wooden House Building Materials.

THE NAPANEE CEMENT WORKS, (Limited.)

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MANUFACTURERS OF

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CONSTRUCTION · SANITATION · ENGINEERING

VOL. II.—No VI.

TORONTO, CANADA, JUNE, 1889.

PRICE 20 CENTS
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Canadian Architect and Builder,

A JOURNAL OF MODERN CONSTRUCTIVE METHODS,

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In ordering change of address give the old as well as the new address. Failure to receive the paper promptly should be reported to this office.

ADVERTISEMENTS.

Prices for advertising sent promptly on application. Orders for advertising should reach the office of publication not later than the 15th day of the month, and changes of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

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

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

THE unusual amount of rain during the last month had the effect of retarding considerably the progress of building operations, and served to offset to a very large extent the advantages of an early spring.

THE consolidation of the American Institute of Architects and the Western Association of Architects was effected by a majority ballot vote of the members on the 20th of May. A convention of the members of the new organization will shortly be arranged for.

WE are pleased to notice the promises of improvement which our American contemporaries, the *National Builder and Builder's Gazette*, are making to their readers. We trust they will include the giving of proper credit for original articles copied from other journals, the CANADIAN ARCHITECT AND BUILDER not excepted.

ARTHUR Wellesley Peel, Speaker of the House of Commons, in welcoming the visiting American engineers at Leamington the other day, said the English people admired the great feats performed by American engineers. Anyone travelling in America was bound to admire the enormous energy, prowess and force that dominated the powers of nature.

NOVA Scotia freestone is said to be in active demand in New York city, and a fleet of vessels is engaged in carrying stone to that city. The Nova Scotia quarries are unusually busy. The short C. P. R. route to Halifax opened for traffic during the past month, should result in the use of larger quantities of this stone in our western Canadian cities.

THE Confederation Life Association is to be commended for its determination to have its new buildings in Toronto designed and erected by a Canadian architect. We trust the Association will further manifest its patriotism and confidence in Canadian ability by appointing a Canadian as expert to judge the plans in the forthcoming competition.

THE labor agitators in our Eastern cities, whose motto is the greatest amount of remuneration for the least amount of labor, are in danger of being outdone by their more progressive brethren of the Pacific coast. Vancouver, B. C., advises state that the Plasterers' Union has passed a resolution declaring that eight hours shall constitute a day's work, and \$5 the standard of wages per day.

DURING the last few years, the towns throughout Canada have been adopting the electric light and improved methods of water supply. It is a noticeable fact that very many contracts for the construction of water works systems in country towns have been secured by American companies. It looks like lack of enterprise on the part of Canadian contractors to allow this work to be done by foreigners, who certainly should not be able to work to the same advantage as resident contractors.

THE St. Louis *Globe-Democrat* makes the alarming statement that lepers have invaded British Columbia, and had such free access to the Indians that the whole race of red men is infected, and adds that the antagonism to Chinese immigration will be more widespread than ever, and will be based on something beside race prejudice. It would be far better to stop quarantining against yellow fever and small-pox, for while the latter kill more quickly, leprosy devours its victims with a living death. If our contemporary is correctly informed, it is high time that the Dominion quarantine authorities should seek to rid the country of such a terrible plague.

REFERRING to the article published in our May number urging some Canadian manufacturing firm to begin the production of the finer class of bronze hardware, the E. & C. Gurney Co., of Hamilton, inform us, in a letter published elsewhere, that they are experimenting with that object, and hope shortly to be in a position to supply the desired class of goods. We are pleased indeed to hear that the opening pointed out in our article bids fair to be so soon taken advantage of. The enterprising company who have the undertaking in hand have our best wishes for success. Should they be able to produce a class of fine hardware approaching nearly in quality that hitherto imported, they will be entitled to the fullest support of Canadian architects and builders.

THE best remedy for the smoke nuisance which the Local Board of Health of Toronto is calling upon the manufacturers of the city to abate, would probably be the employment by the owners of steam plants of properly qualified men to manage them. One of the manufacturers who was present at the

consultation with the Health Board stated, that in addition to a smoke consuming apparatus his firm employed a skilled engineer. As a result, there were no complaints about the smoke from people residing in proximity to their establishment. A writer on this subject, in an American contemporary, says: "It is a fact that a steam generator with properly proportioned grate and heating surfaces and combustion chamber, with all these parts large enough to perform the work without forcing, may be fired continuously and regularly, allowing the fuel to heat gradually and give off its gases slowly, and admitting air in sufficient quantity, and as the fuel heats, forcing it regularly forward on the fire without producing smoke. This process is also the most economical of fuel. The same result in a less degree may be obtained by firing with small charges evenly spread over the fire. On the contrary, a hot fire with a heavy charge of coal thrown directly upon it, evolves so large a quantity of gas that its volume prevents the proper admixture of air and the hot gas thrown against the cooler boiler precipitates its carbon, or in other words, makes smoke; on the other hand, a low fire suddenly forced and charged with fresh fuel, gives off gases at too low a temperature for full combustion and smoke is again produced. The production of smoke by either process means waste of fuel."

WE are pleased to observe the patriotic spirit which prompted certain of the Toronto aldermen to object most strenuously to the giving of the contract for the supply of steel plate pipe required for the extension of the water-works to an American firm. The quantity of pipe required was 6,000 feet of 60 inch, and 4,600 feet of 48 inch. For the former, a Canadian firm sent in figures \$900 below those of the American. For the smaller size and quantity the figures of the American firm were the lowest, and the Water works Committee figured out that by giving the whole contract to the American firm they could effect a saving of \$572. A majority of the Committee accordingly decided to recommend the Council to adopt this course. Ald. Dodds very properly protested against the injustice which such action would entail upon the Canadian tenderers, and pointed out that by giving the contract for 60 inch pipe to the Canadian firm and the contract for the 48 inch pipe to the American company, the saving would amount to \$1472 instead of \$572, and in addition justice would be done home interests. As the result of these representations and the vigorous defence of the rights of Canadian manufacturers and workmen, the former recommendation of the Committee was referred back for further consideration. We trust that the good example set by the aldermen who thus championed Canadian rights and interests as against those of foreigners, will not be lost upon the community, but will extend to other public bodies as well as private individuals. It should be the duty as well as the privilege of every one calling himself a Canadian to assist in every way possible in the upbuilding of Canadian interests. The country which affords men wealth is entitled to receive the benefit of the expenditure of that wealth.

SINCE the publication of the May number of this journal, the ratepayers of Toronto have voted the additional \$600,000 required to complete the new municipal buildings. In this we believe they have acted wisely. It is a matter for regret, however, that the Court House Committee is seeking to violate one of the most important pledges made to the public when the money by-law was submitted to them, viz., that a commission composed of men in whose ability and integrity the citizens would have confidence would be appointed to supervise the erection of the buildings. It was this distinct pledge, given over the signatures of the Mayor and the chairman of the Court House Committee, which induced many persons to vote for the granting of the money. The action of the Committee in thus breaking faith with the citizens, is dishonorable in the extreme, and especially so in view of the absence of the Mayor, who is at present in Europe. It is due to the chairman of the Committee to say that he is doing everything in his power to secure the carrying out of the promise made to the citizens. The construction of a building of such a costly and important character,

requiring a number of years for its erection, cannot safely be left in the hands of a committee of aldermen, the membership of which is apt to change with every yearly election. The salaries of three competent commissioners for a period of five years should not exceed the sum of thirty or thirty-five thousand dollars. We have no hesitation in saying that many times this amount would be saved to the citizens by a wisely selected commission. Should a committee of the Council be allowed to superintend the work, we may look forward to a period of delays and expensive bungling such as has marked the history of undertakings of this kind in some American cities. The citizens will be justified in taking legal steps if necessary to forbid the commencement of the work until such time as a commission shall have been appointed to superintend the same.

THE question of the relative merits of various methods and materials for paving our city streets, which is at present occupying considerable attention, is one of very great importance. In the city of Toronto an effort has been made to prove that asphalt paving does not give satisfactory results. The weight of evidence appears, however, to be in opposition to this view. Asphalt is in use to a very large extent in London and other English cities, and is giving good satisfaction, as shown by the following extract from a paper read recently by Mr. Geo. R. Strachan, Assoc. M. I. C. E., Eng., before the Society of Engineers at Westminster: "The true principle of road construction was to make the foundation the real road, and the material thereon a wearing surface only. Its use secured economy in construction and maintenance. Roads should be made to suit the vehicle using them, and not the vehicles to suit the road. A concrete foundation six inches thick would carry 500 tons per day without deterioration. It should be constructed carefully, accurately and scientifically, for it is the actual road. Asphalt as a wearing surface was the best in use to-day, as it possessed the advantages of durability, cleanliness, economy and healthiness, which outweighed its slipperiness. When laid 2½ inches thick it gives a life of fifteen years in Cheapside, at a cost of 13s. per square yard. The first cost of such a road 36 feet wide equaled £12,788 per mile, and the average annual cost for repairs equaled £528 per mile. The asphalt could be renewed at half the original cost, and a life of fifteen years was again before it." Jarvis street, Toronto, is to be paved with asphalt at a cost of \$2.80 per square yard, the company doing the work guaranteeing to keep the same in repair for five years. Taking into account this guarantee, the length of time which asphalt will wear, the possibility of renewing it at half the original cost when the surface has become worn, together with its noiselessness and the saving in wear and tear resulting from its use, it cannot be regarded as very expensive compared with other kinds of roadways whose sole advantage lies in their first cost.

COMPETITION, if not carried too far, is certainly the life of trade. It tends to stimulate production and consumption. The public interest is apt to suffer when any one firm or company succeeds in obtaining control of the supply of a particular class of goods or materials in general use throughout the country. A number of roofing firms in the city of Toronto are complaining of the disadvantage at which they are placed by the Rockland Slate Company of Quebec. This company, it is said, have agreed to limit the sale of their slate in Toronto to four or five firms, with the object we presume of keeping prices up to a point that will insure continuance of the handsome profits which the company are understood to be making. Those dealers who are so unfortunate as not to be members of the "ring," are compelled to purchase their supplies from United States quarries, and pay thereon the import duty of 80 cents per square. This, as we have said, places them at a serious disadvantage as compared with their competitors who are supplied by the Canadian quarry.

The demand for roofing slate has increased very rapidly within the last five years, with the result that the Rockland Company find it impossible to supply the market. In view of

this and of the large quantities of slate imported every year from the United States, there seems to be every reasonable prospect of success awaiting the individual or company who shall undertake to operate a second Canadian quarry. Indeed, we learn that such a quarry has been already opened, but owing to the death of the gentleman who intended to develop it, has remained inoperative for four or five years. This quarry is located at Melbourne, Que., on the same vein of slate and in close proximity to the quarry operated by the Rockland Company. It was opened some years ago by Mr. Benjamin Walton, of Toronto, who spent a large sum of money upon it, and had almost completed the formation of a company, with ample capital for its further development and operation, when he was suddenly stricken down by illness and died within a fortnight, leaving the enterprise in an uncompleted state, in which it has remained until the present. An expert engaged by Mr. Walton to examine and report upon this quarry, states that the supply of slate which it contains is practically inexhaustible, and that in addition, the thirteen hundred acres of land comprising the property is rich in asbestos and minerals. The quarrying machinery with which Mr. Walton intended to operate the quarry is still on the ground, together with a number of workmen's cottages. We are given to understand that the executors of the Walton estate, not being in a position to operate the quarry themselves, would dispose of it at a low figure, and that a company with twenty or twenty-five thousand dollars capital and the necessary knowledge of the business would find in it a profitable field for their money and energy. The shipping facilities are of the best, a branch of the Grand Trunk Railway running into the premises. In view of what has already been stated, we certainly think that such an opening for business enterprise is by no means frequent in this country, and should early be taken advantage of.

HOW TO ESTIMATE.

By "CATO."

THERE are few Canadian builders in the habit of submitting tenders for work and materials, who have not frequently been surprised at the difference in the sum total of all those sent in, and at a loss to account for it. Enquiry into this has developed that it can be attributed to various causes, which cannot be enumerated here, but are responsible for the difference in bids. They regulate to a certain extent the way in which the estimator figures on each detail, that is, if he go through the arithmetical operation correctly, which is not always done, for there are many no doubt who, on reading this article, will remember a loss or perhaps lucky gain through an error of this kind, or through pricing approximately.

However, should each competitor calculate each separate item correctly, then the discrepancy is likely due to the facilities which one or the other possesses or is lacking in, giving an advantage or incurring extra expense, as the case may be. For instance, supposing several builders are invited to tender for the labor and materials necessary to construct a given building, each should individually make a thorough examination of the plans and specifications, to become perfectly acquainted with their conditions and requirements before making out the bill of materials. When satisfied that the whole details are understood, the bill of material is made out, commencing at the staking out and excavation, including all necessary plant (if any should be required for same) and labor; and proceeding methodically with each detail in its order to the end of the specifications.

Inexperienced estimators do this in a general way, and often omit many small details which, though apparently trivial, add to and are a factor in the entire cost. Some allow a margin for contingencies to cover these, but it is better to calculate their true price and put it in the estimate so that their real cost may be at any time found after completion, and for future reference. Experienced builders have, of course, experience to guide them in matters of this kind, and will act up to it.

When the bill is made out, before affixing prices to each item, the builder ought to carefully examine his stock, resources, and facilities of working, in order that he may utilize all to the best advantage, to determine what in stock he can employ, and what must be obtained; to enquire into supernumeraries as digger, painter, plumber etc. prices, and to systematically make all provision that in case the contract be awarded him, the work can be pushed ahead rapidly and economically. He should also be of sufficient business capacity to buy all materials profitably.

To the difference in resources, etc., the difference in bids may be often attributed, for it is rarely two bidders possess the same. One may be the possessor of a fully equipped mill of machinery, while his competitor must go to another's mill for stuff and pay the millman's profit. Another can buy for cash, saving discount, or on better terms than his rival. The next can work his men to better advantage or on better terms than his rival, and

so on as the conditions vary, but one thing is necessary to all, that is, to know how to estimate on established rules. It is to enable all interested in this important factor in building that the following is submitted:

EXCAVATION.

As stated in the "Canadian Contractor's Hand-Book, builders find the cost of excavating or digging out cellars and for foundations at a given convenient quantity, namely, the cubic yard, one of which composed of common earth is termed a load. The common practice, when it is required to find the exact amount which must be removed to form any cellar, is to calculate by the cubic yard price per same. If the ground be level or nearly so, and the building a simple rectangle in plan, the easy process on page 91 of the "Hand-Book" need only be worked out.

The rule is: Multiply one side by itself for a square, or one side and end together for a rectangle, and the result by the intended depth. This will give the result in cubic feet, which must be divided by 27 to obtain cubic yards, thus—

$$30 \times 20 \times 9 = 5,400 \text{ cubic feet.}$$

$$5,400 \div 27 = 200 \text{ cubic yards.}$$

which in its turn must be multiplied by the current price, say 25 cts.— $200 \times 25 = \$50$ —the whole cost of digging out, placing adjacent to, yet clear of building. Prices vary for the different materials to be excavated; for instance, vegetable earth will cost less per yard, gravel more than clay, while rock, which will require a large expenditure of time, will cost four times as much.

OPEN ROADS.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

PLANS are now prepared for the proposed alterations and additions to the town hall here. There will be a gallery with a seating capacity of 325, and body of hall will seat 450. Pedicium arch will be 30 feet wide by 18 feet high. Stage will be 32 feet deep from curtain line, and will have four large dressing rooms. The building will have four exits—two for general use and two in case of fire—and will cost about \$7,000.

Plans are under way for a Sunday School addition to St. George's Church, size 75 x 35 feet, grey limestone, rock faced, slate roof, etc. Cost about \$4,000.

Ward school, 6 rooms, brick, with stone trimmings, cost about \$6,000; pair of semi-detached dwellings, 2 story, brick, 8 rooms and bath, R. E. Todd, owner; additions to residence of A. E. L. M'Keon, cost about \$1,000. Several small dwellings costing about \$1,200 to \$1,500 have been let within the month, but work has been kept back owing to the want of brick.

The Polson Co. are now laying the keel of the new steel barge for the Parry Sound Lumber Co., and will soon commence laying keel for the new ferry for Windsor. Work on the steamship Manitoba, lately launched by this Co., is being pushed rapidly forward.

OTTAWA.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE readers of your journal must have been pleased with the enlarged appearance and corresponding amount of interesting reading matter in the last issue. With proper encouragement there is no reason why the journal should not before long equal any of the architectural publications in the United States.

The contractors of this city held a meeting a few weeks ago, with the object of forming a Contractors' Association. A committee was appointed to draft by-laws and a constitution for the government of the same. Another general meeting is called for to-night, when it is expected the Association will be formed and the election of officers take place. The contractors have come to the conclusion that the time has arrived to form such an Association for their own protection, and we wish them every success in their undertaking.

The Architects' Association meet regularly and I understand have lately been engaged in drafting an uniform contract to be adopted by the Association in all building operations.

The City Council propose erecting a new fire station in Dalhousie ward. Architect Bowes has called for tenders for the same.

The building by-law which has been before the Council or several months has not been taken up lately, and the general belief is that it will fall through, although it has cost the city several thousand dollars to get it into its present shape. Until the by-law is adopted, it will be impossible to give a correct report of building operations, as no record is kept in the city hall.

The master plumbers have drawn up a by-law governing the plumbing in the city, and have submitted it to a committee of the City Council, but so far very little has been done with it. The Secretary of the Architects' Association has addressed a letter to the City Clerk, requesting that the Plumbers' By-Law, and all other matters in which the architects and builders are interested, should be submitted to the Association before being adopted. This is one of the advantages to be gained by the architects being united. In many ways their Association can exert an advantageous influence over the future growth of the city.

Building operations have been greatly retarded by the constant rain the past month. In outside work not more than ten days have been made the past three weeks.

The corporation have advertised in several papers for the building,

equipment and running of a new line of street railway, but up to the present time have been unable to receive any offers outside of the city, and as these have not been considered satisfactory, the matter remains in abeyance, to the great detriment of the city.

HAMILTON.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

The building prospects in this city for the season are fairly good, although it must be said that so far there has not been as much work contracted for as was expected. However, the season is not far advanced yet, and as there is now perfect harmony among the building fraternity, it is reasonable to expect that a fair record can be shown at the close of the season.

Mr. Landers from Toronto, is entering largely into speculative building here and has already completed a number of very fine detached brick residences in the east end of the city.

The City Hall is fast approaching completion.

The contract for the Young Men's Christian Association building on James Street south, is let to Isiah Fern, who will push on the work with his accustomed energy.

After all the excitement about the choice of a site for the new library building it is now to be built on James Street south, next the new Y. M. C. A. building.

There is to be a new Presbyterian Church erected on the corner of King and Emerald streets, for which competition plans will be invited.

In the matter of architects competition plans on committee invitation, much has to be considered. If the committee desire to avail themselves of a large field of design to select from, prepared by duly qualified architects, they certainly must give the assurance that there will be none of the prejudice or favor shown that has heretofore marred such competitions; and their premium for the 2nd and 3rd designs must be sufficient to induce competitors to devote the required time and attention to prepare their designs, otherwise only those having influence at court will deem it worth their time to enter the arena.

MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

MONTREAL SEWERS—CONTRACT VS. DAY WORK.

WHETHER our sewers should be constructed by public tender, or done under the Road Department by day's work, has been of late a vexed question both with the Road Committee and the Montreal contractors.

It has been decided by the Road Committee and Council, reconsidered by that body, and again carried in favor of "day's work," much to the disgust of the contractors.

To our mind, the question is one in which every property-owner is deeply interested, especially when we hear one of our "city fathers" say that "75 or 80 per cent. of the sewers constructed under contract are defective." Such a state of things should not exist (if it does) no matter whether the work was done by contract or by day's work. The responsible parties, whoever they may be, should be called upon to render an account of their stewardship.

The sewers are, should be constructed by or under the supervision of the Road Department. Our City Surveyor, who is considered a competent one, should be made responsible to the Council for all work done under his department. He has under him a Deputy City Surveyor and Assistant Engineer and some five or six subordinates, and in addition, an Inspector, paid by the city, is supposed to be daily on the works to see their orders carried out to the letter of the specification. If the specifications are honestly carried out we have no cause for complaint; if this is not done, then certainly some one is at fault, and it would be proper of the Council to sift the matter to the bottom and discover if any of our sewers are faulty in construction, and let us know who the guilty parties are, in order that a remedy may be applied. We will point out in your next issue where in our opinion the defect is, and how it can be remedied.

Looking at the question from a financial point of view, while we would not favor all departmental work being carried out by contract, yet we consider that under ordinary circumstances our sewers can be constructed cheaper and equally as good by contract as by day's work. If so, the people called upon to pay for sewers are justly entitled to this benefit.

It would be interesting to engineers, contractors and the public generally, to have a comparative statement of the cost of sewers actually constructed by day's work and those constructed by contract. No doubt such will be forthcoming ere the present season closes, when we shall endeavor to furnish our readers with a copy.

MONTREAL'S GAS.

Citizens generally are complaining that their gas bills, instead of decreasing with the red price of gas, the most improved appliances and other latest additions to their staff, are still rapidly increasing.

We all expected that when the new "Gas Engineer" arrived from England, something would be done to remedy the numerous complaints. There is, however, no noticeable improvement in the gas, and did we not see it in the press, we would not know that the Company had added to their staff a "Gas Engineer." Some consumers explain the increased gas bills as being

necessary to pay the extra expense incurred in employing this new official. At all events, our gas bills are no smaller now than they were when gas was half a dollar per thousand feet more:

The gas light flickers dim and low
And merrily is the flame,
But the meter with its measured click
Will get there just the same.

CITY HALL NOTES.

The city corporation have begun the paving of Craig street with wooden blocks, much to the satisfaction of those owning property and doing business on this important thoroughfare.

A regulation is expected shortly in favor of broad tires for heavy carts.

WATER SUPERINTENDENT.

Mr. B. D. McConnell, late Assistant Superintendent, has, after considerable wrangling in the Council, been elected to fill the position of Superintendent, rendered vacant by the death of Louis Lesage.

The new Superintendent has been Deputy Superintendent for the past twelve years, and it is considered that the Council have acted wisely and in the best interests of the city by promoting him to the position of Superintendent.

Some six applications for the position of Assistant Superintendent have been received, amongst them one from Mr. T. Lesage, son of the late Superintendent. We understand that all the candidates are not Civil Engineers, some being only Mechanical Engineers. It is to be hoped the Council will take this question into consideration, and appoint only a qualified Civil Engineer to assist the Superintendent, as a Mechanical Engineer would be of little or no use in preparing the plans and surveys required by this department for the amelioration of the water works, and as the Superintendent's own time will be fully taken up with more important matters connected with his department, he could not be expected to do the surveying and other field work himself; therefore he should by all means be given a qualified assistant.

HARBOR IMPROVEMENTS.

The plan prepared by Messrs. Kennedy & St. George, Harbor and City Engineers respectively, better known as plan "number 6" has now been approved of, and the means for carrying it into effect will very shortly be decided upon.

BUILDING NOTES.

While the building business is not quite so brisk as it was this time last year, yet most of the offices are kept as busy as ever. There is every probability that before the close of the year there will be as many private houses erected this year as last, although the total expenditure can hardly be expected to reach as much as last year, when the New-York Life and Imperial Insurance Companies' buildings, and the Canadian Pacific and Grand Trunk Railway depots were under construction.

During the month of April, sixty-four permits have been issued from the Building Inspector's office for houses, varying from \$1,600 to \$13,000. The principal buildings now in course of construction are a block of houses for Sir Donald A. Smith, the new lighting station for the Royal Electric Company on Water street, a branch of the Bank of Montreal on St. Catherine street, a residence for R. G. Reed, contractor, Drummond street, a store and two dwellings, for H. F. Jackson, chemist, on St. Catherine street, a manse for St. Paul's Church, Dorchester street, a block of flats for R. Fisher on Sherbrooke street, something after the New York style, a manse for the Methodist Church on Sherbrooke street, Royal Insurance building on Notre Dame street, a racket court on Concord street, five houses on Manse street, and four houses on St. Matthew street.

Preparations for the widening of St. Lawrence Main Street have commenced, and already several of the buildings have been demolished, and the owners are making arrangements for the construction of substantial and handsome stores on their new lines. This will make St. Lawrence Main Street one of the finest business streets of the city.

FAULTY CONSTRUCTION.

The large new brick building on St. James Street West, recently erected for Messrs. Roland Bros, at a cost of some \$25,000, has just been condemned by the Building Inspector as being unsafe and dangerous, and is now being demolished. The building was just about completed and ready for occupation, when the defects were noticed. We understand an amicable arrangement has been arrived at between the contractors and owners by which the contractors are to rebuild same on the condition that the owners do not claim damages from contractors.

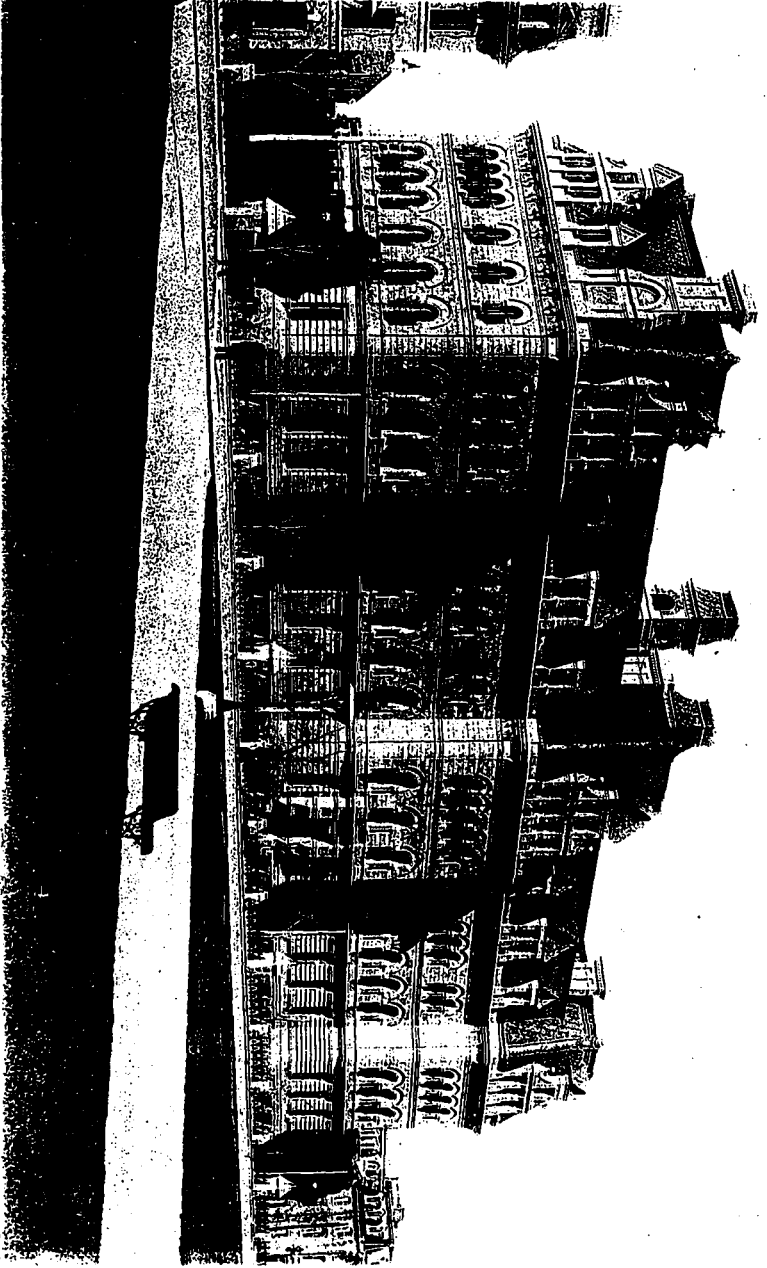
REAL ESTATE.

During the month of April there were some two hundred and fifteen real estate transfers in the city wards, and Cote St. Antoine, amounting to \$731,393.59 for which St. Antoine ward alone contributed \$246,527.70.

Real estate generally is in good demand and one finds great difficulty in getting a choice lot in a good locality at any price.

The old-established hardware firm of Rice, Lewis & Son, Toronto, has been incorporated.

A Belgian firm who propose to engage in the manufacture of iron water pipes at Three Rivers, Que., have been granted by the municipality a bonus of \$20,000, fifteen acres of land, and exemption from taxation. A large number of hands will be employed.



NEW DEPARTMENTAL BUILDINGS, OTTAWA, CANADA

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
VOL. 14, NO. 8.

THOS. FULLER, ARCHTCT.
PUBLIC WORKS DEPT., OTTAWA.

IMPORTANT JUDICIAL DECISION ON A MECHANICS' LIEN.

BELOW will be found a judgment by the Honorable Mr. Justice Rose delivered 27th April, 1889, while holding the Toronto Assizes. As will be seen this was an action by a sub-contractor who had delivered lumber for building some houses, to a contractor.

The whole amount of the contract was \$4,775 but when the contractor had done work to the extent of \$2,300 he gave up the job and the owner had to take the work off his hands, and when the house was completed the owner had expended the full amount of the first contract price, viz.: \$4,995 and \$90 in addition.

The plaintiffs claim that they were entitled to ten per cent. of the \$2,300, notwithstanding the fact that the owner had paid more than the original contract price to finish the houses. The Judge, after some considerable care which he had given to the case, decided, but not without some hesitancy, to dismiss the action with costs, and therefore the sub-contractor did not succeed in his action.

JUDGMENT.—“ This is an action by mechanic lien-holders who had supplied material to a contractor doing work on the lands of the defendant for the amount of their claim, or at any rate for 70 per cent. of the amount of the work done by the contractor. The original contract was for \$4,775. The contractor, after doing work to the extent of about \$2,300 refused to go on with the work. Thereupon the owner of the premises employed another to finish the work, and the work was completed at an expense of some \$90 in excess of the original contract price. The question for consideration and determination, is whether or not the owner of the land was bound to retain 10 per cent. of the value of the work done from time to time, thus making payments only up to 90 per cent. of the price to be paid for such work, or whether he was only bound to retain 20 per cent. of the price to be paid for the work as per the contract, on the supposition that the contract would be completed. In other words, does the Mechanics' Lien Act contemplate the retention of 10 per cent. of the price to be paid for the work as the work progresses, so that if the contract is not completed there will remain in hand from time to time 20 per cent. of the price of the work done, or does it contemplate solely the case of a contract being completed and the prices to be earned under that contract? There are three principles that seem to me to require consideration as exhibited by the Act. The first is, the payments up to 90 per cent. to be paid for the work are protected as long as they are made in good faith. Secondly, the lien is restricted to the amount payable by the owner of the property to the contractor or sub-contractor; and third, that the Statute does not contemplate that the owner of the property shall be required to pay a greater sum than the amount payable by him to the contractor. And if the words, ‘the prices to be paid for the work’ in section 9 of the Act mean prices to be paid for the work under the contract, then I think we have gone a long distance in support of the contention of the defendant. I am met with some difficulty by reason of what I think is possibly the direct conflict of authority in the cases of *Re Cornish* in 6 Ont. 259, a judgment of the Chancery Division, and *Godard v Coulson*, 10 App. Rept., s. 1. Each of these cases may be distinct from the case before us by microscopic examination, but I think the fair reading of the decision in these cases shows they are inconsistent and conflicting. In *Re Cornish* the court had not before it the argument that the 10 per cent. was only upon the price of the whole contract when the work was done. There were three propositions laid before the court, but they all looked towards the principle that the owner of the property was bound to retain 10 per cent. of the price of the work. The chief conflict there, was whether the 10 per cent. was to be on the whole contract prices, or whether it was to be on the prices of the work already done. The court held in that case that the contract was divisible, that part of the price earned by the man who had done the work up to a certain date was one contract price, and that the price earned by the man who was employed to complete the contract was another price, and it was the duty of the owner of the property to retain 10 per cent. upon each of these sums, such 10 per cent. to be available to those who can claim under the Mechanics' Lien Act. In *Godard v Coulson*, an appeal from the judgment of the County Court, the Judges who gave judgment held that the price to be paid was the price to be paid under the contract; that the Statute looked alone to the case of a contract completed and a price earned under that contract; and in the case of the price of the work already done having been paid at the time that the contractor abandoned his work, it was held that there was no further sum coming to him, that such payments made in good faith were protected by sec. 9, and that the person claiming under the Mechanics' Lien Act failed because he was unable to show that the contractor had completed his work and earned his money under the contract. If the principle of *Re Cornish* had been observed in *Godard v Coulson*, it would have been held that the 10 per cent. should have been retained with respect to the work already done, and that the plaintiff in that case was entitled to have his judgment for such an amount. I think I must follow the Appellate tribunal, although I am not sure exactly which authority is the binding authority, the one being an appeal from the judgment of the County Court, not to the Court of Appeal as such, but to members of the Court of Appeal constituting a Court of Appeal for the hearing of such a decision, and the other being a judgment of a court of as many members. It may be that I would be at liberty to express my own opinion, and follow whatever deci-

sion convinces me of its correctness, but I am glad that I am saved from expressing my own opinion in regard to the matter, and prefer to follow the decision of our appellate tribunal, even although it might successfully be argued that decision was no more binding than the decision of the Divisional Court. I think that in this case the contractor having been paid all that he has earned, and although there was a drawback, that drawback having been exceeded in completing the work, and the result having been thus \$90 more expended in completing the work than the contract price, there never was payable to him in respect to the work more than had been paid in good faith. And as he could not have recovered against the owner of the property for any sum in excess of that paid to him, and as if judgment were to go for the plaintiffs in this action the owner of the property would be required to pay a sum greater than that payable by him to the contractor, I shall follow the principle of the decision in *Godard v Coulson*, 10 Appeal reports, page 1, and dismiss the action.”

STRAIGHTENING WALLS OF BUILDINGS.

THE weight of the roof of the large gallery of the Conservatoire de Arts et Metiers pressed the sides outward so as to endanger the building; and it was requisite to find means by which the wall should be propped so as to sustain the roof. M. Molard contrived the following ingenious plan for the purpose. A series of strong iron bars were carried across the building from wall to wall, passing through holes in the walls, and were secured by nuts on the outside. In this state they would have been sufficient to have prevented the further separation of the walls by the weight of the roof, but it was desirable to restore the walls to their original state by drawing them together. This was effected in the following manner: Alternate bars were heated by lamps fixed beneath them. They expanded, and consequently the nuts, which were previously in contact with the walls, were no longer so. These nuts were then screwed up so as to be again in close contact with the walls. The lamps were withdrawn, and the bars allowed to cool. In cooling they gradually contracted, and resumed their former dimensions; consequently the nuts, pressing against the walls, drew them together through a space equal to that through which they had been screwed up. Meanwhile the intermediate bars were heated and expanded, and the nuts screwed up as before. The lamps being again withdrawn, they contracted in cooling, and the walls were further drawn together. This process was continually repeated, until at length the walls were restored to their perpendicular position. The gallery may still be seen with the bars extending across it and binding together its walls.

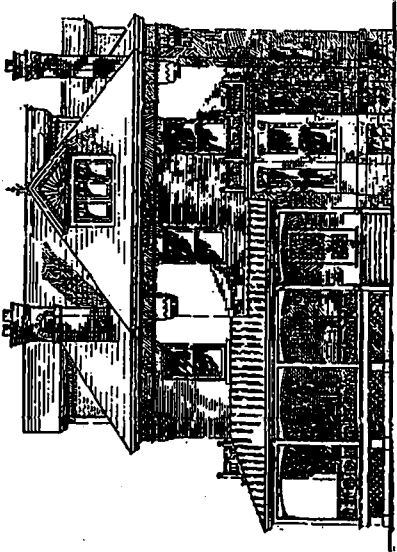
SCHOOLROOM SPACE.

MR. H. COURTHOPE BOWEN, whose opinions on all matters connected with the proper construction of schoolrooms are entitled to great weight, and are regarded as authority by the leading medical Journal of England, expresses somewhat as follows what, in his judgment, should be considered a good schoolroom. Taking the case of a room 14 feet high, fairly ventilated and always well aired in the recess, he should assign two-thirds of the floor-space to the scholars and their desks, and keep the other third for the teacher, the blackboard, etc. With single desks, twenty-two inches should be allowed from side to side, and three feet from back to front, for each scholar. The passages need not be more than eighteen inches for those running from back to front, and one foot for those running from side to side. In such arrangement, counting the passages, each scholar has (without reckoning the share of the space allotted to the teacher) a trifle more than forty inches from side to side, and just four feet from back to front. In a room twenty-five feet by twenty feet, the floor-space for scholars' desks will be sixteen feet by twenty feet, with four feet from back to front per row, and accommodation is provided for twenty scholars. The whole floor-space is 500 square feet, and the cubic contents of the room 7,000 cubic feet, with twenty square feet and 280 cubic feet per person.—*Science.*

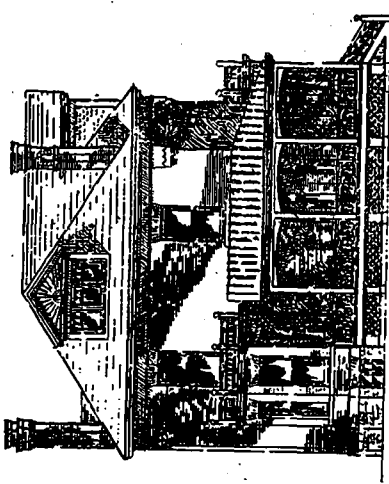
HOW TO SAVE CRACKED CEILINGS.

A CORRESPONDENT in the *Scientific American* gives the following remedy: The ceiling must be pressed back firmly into place. To do this, take two pieces of scantling, long enough to reach over the defective part. Place this framework, lath side up, against the ceiling, driving wedges under the floor end of the supporting scantling, which will bring the ceiling in place and keep it there.

To prepare the nails: Put them in a vise. With a hack saw, saw slots in their heads like a screw (only slightly), but so that a sharp screwdriver will hold in the groove), then with the screwdriver turn the nail to the right and then to left, gently pushing it, first through the plastering, then into the lath above, still pushing and gently turning. The head of the nail can be screwed into the plaster fluff, so as to make a neat job, and hardly be noticeable on the floor beneath. The nails hold very firmly. Once in every 6, 8, or 10 inches square for a nail is usually sufficient. If the plaster is very porous and shaly, small copper washers may be used on the nails, but it must be very far gone to need them. Driving nails in with a hammer would destroy the whole fabric. Take down your lath framework, and there you have your piece of ceiling as firm and nice as ever it was.

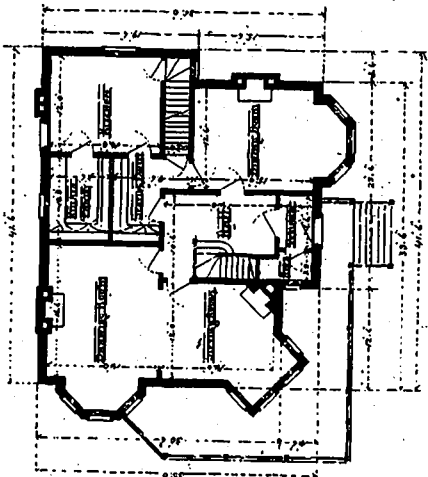


EAST ELEVATION

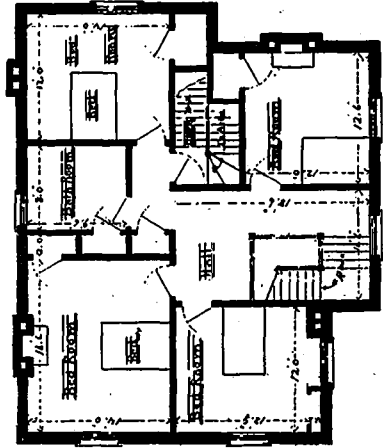


SOUTH ELEVATION

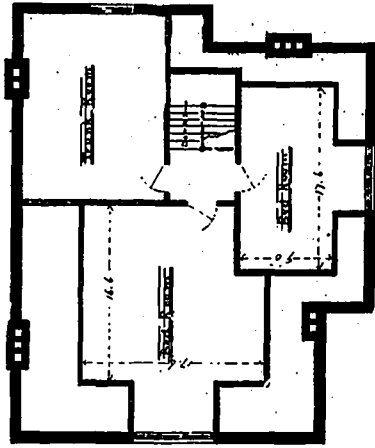
Scale, 8 ft. to an inch.



GROUND FLOOR PLAN.

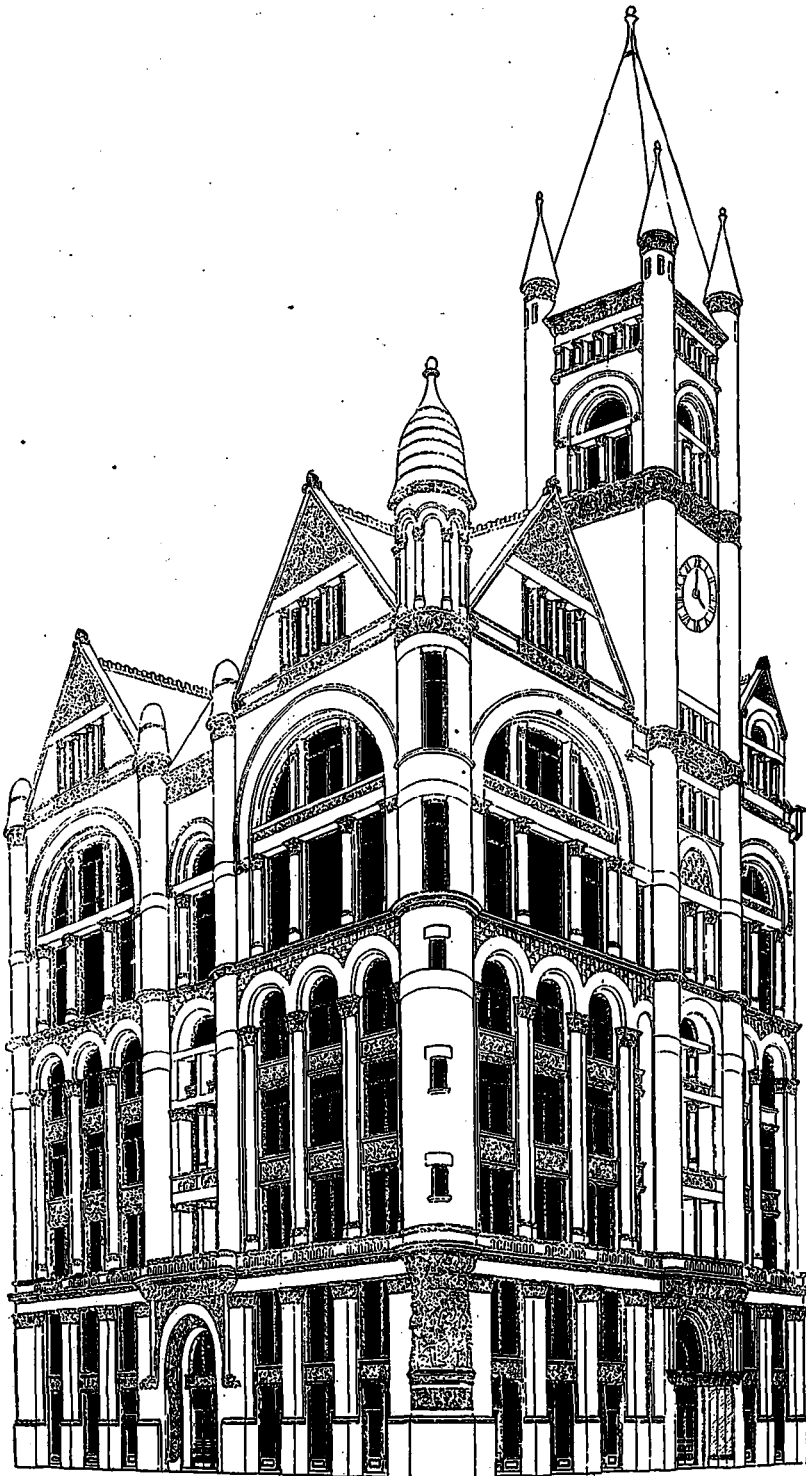


FIRST FLOOR PLAN.

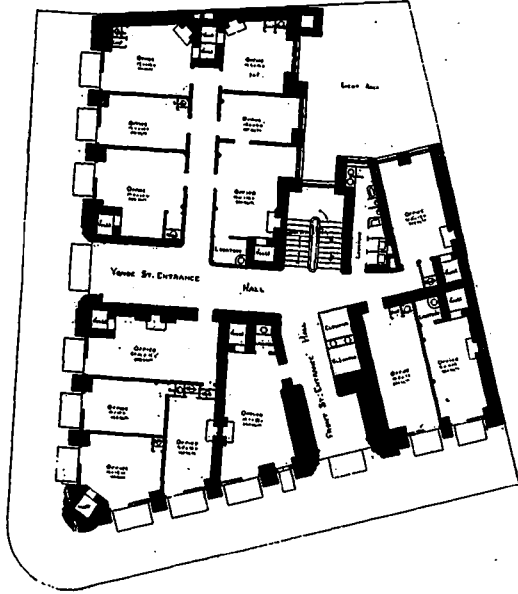


ATTIC PLAN.

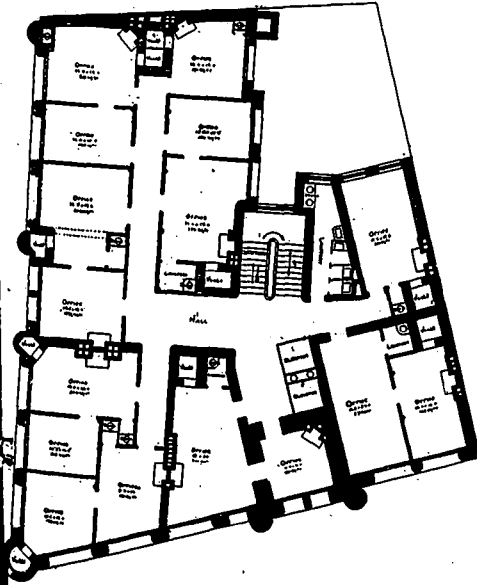
DESIGN FOR HOUSE OF MODERATE COST.—DARLING & CURRY, ARCHITECTS, TORONTO.



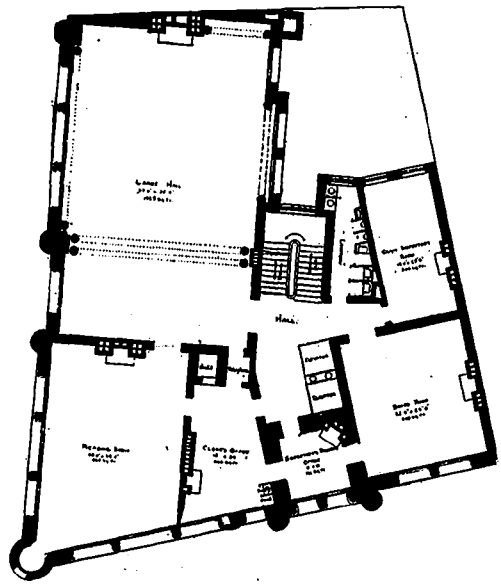
COMPETITIVE DESIGN FOR NEW
MESSRS. GORDON & HEL



GROUND PLAN.



4th FLOOR PLAN.
(First, Second and Third Floors similar).



5th FLOOR PLAN.

ONTARIO ASSOCIATION OF ARCHITECTS.

A MEETING of the Board of Directors of the Ontario Association of Architects will be held at Toronto on Wednesday, the 19th inst., to arrange a programme for the annual meeting of the Association in November next. It is hoped that every Director will make it a point to attend this meeting, and by his counsel assist the objects to be promoted.

OUR ILLUSTRATIONS.

PHOTOGRAVURE PLATE—NEW DEPARTMENTAL BUILDINGS, OTTAWA, ONT.—THOS. FULLER, R. C. A., ARCHITECT, PUBLIC WORKS DEPARTMENT, OTTAWA.

COMPETITIVE DESIGN FOR NEW TORONTO BOARD OF TRADE BUILDING.—MESSRS. GORDON & HELLIWELL, ARCHITECTS, TORONTO.

DESIGN FOR HOUSE OF MODERATE COST—MESSRS. DARLING & CURRY, ARCHITECTS, TORONTO.

OUTSIDE TESTIMONY.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—I have read with interest the letter written by "Protection of all Interests" and there is doubtless reason for complaint about the way in which some Canadian competitions have been managed lately, but to advise all young men of ability with whom he comes into contact to emigrate to the States, is just about as wise as the elder Weller's decision to "keep a pike." I could give P. O. A. I. an eye opener as to competition decisions in the States, and also an instance of young men of ability having a rough and tumble time after arriving in the land of Washington. The architectural pilgrim would find the same evil here—for often enough designs of architects from other States will be selected in preference to those of superior merit executed by local parties. The whole thing resolves itself into a question as to whether the aforesaid young men should "endure the ills they have or fly to others they know not of."

Yours,

C. G. M.,
Columbus, O.

QUERIES AND ANSWERS.

(No. 6.)—Will you please advise me what styles of plaster finish are being adopted for drawing rooms, sitting rooms, and libraries of small houses? Is the rough finish adopted in some large buildings used at all for private houses, and for small rooms, and do you think such would be desirable?

Yours truly,

J. WIDMER NELLES.

[We do not consider the rough finish suitable for private houses. It is open to strong objection on the ground of cleanliness. It is used but little, if at all, in Toronto, preference being given to the hard, smooth plaster surface.—THE EDITOR.]

(Reply to No. 5.)—There is no definite law laid down as to what part of a room the vitiated air should be removed from. Some maintain that it should be removed at the ceiling, others at the floor, and both are positive that they are right. The method of heating determines to a very large extent the point at which the foul air should be removed. If a room is warmed on the indirect principle, and fresh, warm air is brought into the room at either the floor or ceiling, it will escape by an opening at the ceiling without warming the room or purifying the air. The warm, fresh air, being lighter than that in the room, will pass across the ceiling to the outlet and escape. If the outlet is at the floor, the fresh air will displace that already in the room, although the ventilation from the floor may not work as satisfactorily as could be desired. Air escapes by cracks in a room, if it does not by the way provided for it, and so long as fresh air is entering the room the air in the room cannot become injurious. Ventilation openings should be placed where circumstances may require. They certainly cannot be placed at the ceiling, or the floor, or between the floor and the ceiling, under any rule which will not have any number of exceptions. My advice to "Student" is to read a sufficient number of works

on ventilation to thoroughly understand the question. It is not safe to accept the opinion of any one person on a matter so important, more especially the opinion of one who can decide so important a matter without consideration of minor, but very often most important points.

JULY.

CANADIAN CHURCH ARCHITECTURE.

WE notice that a committee of the Anglican Synod brought in a report on church architecture. They deplored the fact that many of their churches were being erected according to very inferior designs. Any one who knows good from bad architecture will agree with them, but we do not believe that the cause which they ascribe is to blame for all the inferior architecture. It is well enough to ascribe to local causes and poor circumstances some of the bad work, but the real trouble is, that to a very large extent, the clergy and the people do not know good church work from bad. In Toronto the Church of England is building a Cathedral Church according to a design which, to say the least, is very weak. There is one thing of which we are positive, that the building will not be a fair exponent of the condition of architecture in this province. There are men in Canada who have the talent necessary to design a good Gothic church, and when a design is being carried out which is not by any means the best, or even the second best that could have been obtained, there is cause for much dissatisfaction with, if not condemnation of, those who had charge of the construction of so important a building.

PUBLICATIONS.

WE are indebted to the City Engineer of Toronto for a copy in pamphlet form of the report of Messrs. Hering & Gray on the methods which should be adopted to increase the city water supply. The report is accompanied by diagrams illustrative of the scheme as recommended by the experts.

We have received from Mr. Geo. F. Bostwick, Toronto, manufacturer of Amberg's Cabinet Letter Files, a copy of his handsome new catalogue, containing numerous Canadian testimonials regarding the merits of his labor-saving office device.

The Hibbard Electric Manufacturing and Supply Co., of Montreal, have favored us with a copy of their new trade catalogue.

NEW BRUNSWICK GRANITE.

THE granite business is destined to be a very important one in this province says the *St. John Sun*. There is at St. George a mountain of red granite of the best quality in the world. Builders throughout the United States are unanimous as to its superiority over the Scotch granite. Then the grey granite got at Spoon Island is of the very best quality. Several firms are engaged in the business at St. George. The extensive works of the New Brunswick Red Granite Company at Carleton present just now an exceptionally busy scene. These works were erected in 1877, and for the first two or three years gave employment to about 30 men. The business has increased wonderfully since then and at the present time 100 men are employed there. This company manufacture all descriptions of materials for building purposes, and have turned out some of the finest pillars used in many of the large buildings in the United States. They also do a great deal of panelling work for buildings. At present the company are furnishing the granite for two large buildings in New York—one of which is being erected in Central Park. Fully 5,000 tons of granite will be required for this purpose. The company have a large quarry at St. George, where they obtain their red granite, and another at Spoon Island, where the grey is procured. About forty men are given employment at the quarries and the company's wages exceeds \$4,500 per month. The granite when polished, etc., is shipped to the upper provinces and the United States, about one-half of the product being sold in Canada.

PERSONALS.

Mr. Richard West, a well-known Toronto contractor, with his family sailed by the *Circassian* a few days ago on a three months' tour to Europe.

At the last meeting of the Royal Colonial Institute, in London, Mr. Sanford Fleming was appointed honorary corresponding secretary of the Institute at Ottawa owing to the resignation of Dr. Bourinot.

Arthur Mussy, civil engineer, of Paris, and a relative of President Carnot, who came to Canada to inspect the beet-sugar refineries in the interest of French capitalists, is reported to have been drowned May 20, while bathing near Montreal.



NOW that the question of putting all electric wires underground is being agitated in Toronto and other Canadian cities, it is well to look into the matter carefully, and ask: 1st. What is the cause of the agitation on the subject? 2nd. Is it possible to work all electric wires underground successfully? 3rd. Is it possible to attain the end sought by any other method than by burying the wires?

It is hardly necessary to discuss the first question at any great length, as it is now quite generally known that overhead electric light wires of any description are believed by the general public to be a source of imminent danger to life and property, and as far as telephone, telegraph, fire alarm, and other low tension wires are concerned, they, and the poles that carry them, are simply looked upon as a disfigurement to the streets, and hence the removal and burial of all electric wires is being demanded by civic authorities.

As regards the second question, it has been demonstrated by practical experience that it is quite practicable to work telegraph, telephone, fire alarm, and other low tension wires underground successfully, and in order to demonstrate this fact, we have only to look at the experience of New York, Chicago, Philadelphia, Boston, Detroit, Buffalo, London, England, and others of the larger cities, the authorities of all of which unanimously agree that the question of placing of such wires underground has now been practically solved, and that outside of the expense and the inconvenience caused by the opening up of the streets, there is no reason why overhead wires and poles of this description should not be immediately removed. In regard to wires carrying low tension currents for incandescent lighting, it has been found that they will work fully as well underground as overhead, provided that the very best of insulation is used, and that the details of the work are carefully carried out under the direct supervision of a skilled expert. There is, however, at least one difficulty to be surmounted in the burial of incandescent electric light wires, and that is the question of house to house or general distribution of the current from the main conduit or leads. This is generally accomplished by branching of wires from the manholes in the streets to the subscriber's premises, necessitating the frequent tearing up of the pavements and a portion of the streets, which is of itself fully as great, if not a greater source of danger and inconvenience than an ordinary pole line. In regard to wires carrying high tension currents of 1000 volts or more for arc lighting, and for the alternating system of incandescent lighting, although there are many places where such wires are at present working underground, still the expense of keeping them in proper working order is found to be such that the companies operating them have either to double their rates or else withdraw from the business altogether. It is true that the civic authorities in New York city are at present forcing all the companies to bury their wires, but what is the result? Gas explosions in the conduits are of frequent occurrence, workmen are instantly killed while working in the man-holes, and the lighting service generally is poor and unreliable.

Now let us consider the third question. With regard to the telephone wires, their number is increasing so rapidly and their underground working has proved so successful, that there is little doubt but that they will all have to go underground ultimately. Almost the same may be said of telegraph, fire alarm, and low tension electric light wires, but when it comes to the high tension arc light wires the case is entirely different, and the companies operating arc lights and alternating system incandescent lights, have certainly excellent reasons for fighting the movement to compel them to bury their wires. If these companies were to adopt the underground system in the Canadian cities (where high tension stations are operated on a much closer margin of profit than in the American cities where the

field is larger), they would be compelled to at least double their rates, and the question here arises as to whether the ends gained by burying the wires are not more than off-set by the consequent increase in rates and unreliable service rendered. It is not our purpose here to go into details in order to show why the higher tension wires do not work successfully underground, as the reasons are only too well known to the electrical fraternity, but we wish to draw the attention of the authorities of Canadian cities to the fact, that it is perfectly feasible for electric light companies to build pole lines in such a manner that they would be an ornament instead of an eyesore to the streets, and at the same time the danger from accidents would be entirely removed. It does not seem to be recognized by the general public that the liability to accidents from high tension electric light wires is almost entirely due to the fact that the insulation of the wires in general use in Canada is not waterproof, the consequence being that in moist or rainy weather the wires are almost as dangerous as if they were bare, and if a telephone wire (or any other conductor in connection with the earth) comes in contact with them, the deadly current is diverted from its proper course and in all probability will deal death to some unsuspecting individual before the trouble is discovered and removed. Now, there is no necessity whatever for the existence of this state of affairs, as there are any number of makes of wire on the market at present provided with insulated covering that, besides being absolutely water-proof, is so tough and durable that it will stand abrasion for years without cutting through to the wire. It is easily seen that even if wires of this description were to come in contact with other wires, the current would not be diverted from its course, and consequently no harm could possibly result. Of course, in order to build a neat and safe pole line, it is necessary to use nothing but the very best of material, but as the cost of these is but a trifle compared with the expense of burying the wires, it will be found that electric light companies generally would willingly rebuild their pole lines to the satisfaction of the civic expert, if offered this as an alternative to placing their wires underground. These being the actual facts of the case, we contend that by far the wisest course for civic authorities who are dissatisfied with the overhead wires, would be to compel the burial of all low tension wires within a reasonable time, and at the same time compel the companies operating high tension wires to rebuild their overhead lines in a safe and sightly manner, and to allow these companies to operate their overhead lines until such time as some perfectly practical method is discovered for working high tension wires underground as successfully as *low tension*.

Let us now glance at the results of such a policy and we find, that the mass of telephone and telegraph wires (which form by far the largest portion of the overhead system) have entirely disappeared, and in their place we see nothing but a single line of straight neatly painted poles bearing a small number of properly insulated high tension wires securely attached to their supports in such a manner that it impossible for one of them to fall, which indeed would now make little difference, as the insulation is calculated to stand abrasion and handling; and besides, there are now no other wires above ground to get crossed with the high tension. At first glance it may seem absurd to seemingly highly favor the high tension companies, but when we consider the many sweeping objections to the burial of their wires, we cannot but feel that for the present at least, it is to the public interest that all high tension wires of 1000 volts or over should remain above ground, subject to the restrictions enumerated above.—ELECTRICAL, MECHANICAL AND MILLING NEWS.

The by-law to raise \$6,000 for the purchase of an electric light plant for the town of Seaforth has been carried.

We are fearful lest the work of temperance reform at London, Ont., should be off-set by the statement that dogs are allowed to swim in the city reservoir.

The condition of the dairies from which milk is supplied to the citizens of Vancouver, B. C., is said to be such as should lead to the appointment of a sanitary inspector.

TORONTO PLUMBING.

THE officials whose duty it is to administer the Toronto Plumbing By-law state that its operation has resulted in a gratifying improvement in the character of plumbing work done throughout the city. About 75 per cent. of the plans submitted for the approval of the Plumbing Inspectors since the by-law came into operation little more than a year ago, have been referred back for necessary changes. Notwithstanding this, up to date more than eleven hundred plans have passed inspection. More than seven hundred of this number have passed during the present year.

Enquiry confirms the opinion expressed in a former number of this journal, that great necessity exists for regular inspection of old plumbing. The only inspection of old work at present is done by the inspectors of the Health Department, and only in cases where complaints are made to the Health Officer by the occupants of the premises. Remembering how indifferent the majority of householders are to the subject of sanitation, we fear that the present method of inspection is by no means as thorough as the public health demands.

If, as we are informed, the plumbing done under the Plumbing By-law is vastly superior to that of former years, we find here an additional argument in favor of regular inspection of the imperfect work done when there was no official inspection, a vast amount of which is still existing.

INTERNAL "EXTENDED SURFACE" IN BOILERS AND RADIATORS.

WE learn from the *Engineering and Building Record* that experiments have been made at the naval arsenal in Best, France, by the officers of the Government with a boiler furnished with tubes having longitudinal ribs on the inside, so as to present a larger surface for the absorption of heat. The projection of the flanges is about one-quarter the diameter of the tube, and eight of them are placed at equal distances around the inner surface. The results gained are said to indicate an economy of 18 to 24 per cent. in the consumption of coal, when compared with the ordinary smooth tubes.

This, however, could hardly be true except in the case of a boiler with insufficient heating surface, as when properly designed and operated a good boiler will abstract as much heat from the gases as may be desired.

For marine boilers, where economy of space is of great importance, this device may be useful in increasing the efficiency of the heating surface.

It also suggests the question whether it may not, in some cases at any rate, be economical to use "extended surface" on the inside as well as on the outside of hot-water radiators.

IMPORTANT SANITARY PROBLEMS.

AMONG the subjects selected for essays to be read at the forthcoming convention of the National Association of Master Plumbers of the United States to be held in Pittsburgh, Pa., from the 25th to the 27th inst., are the following: "The best method of obtaining for country houses an abundant supply of pure water"; "Would it be advisable, where supply of water for cities is limited, to encourage the use of water meters; that is, under what circumstances should they be adopted with a view to economy and equitable distribution?" "Taking into account the wonderful progress of electrical science and invention, what prospect is there in the near future of its application to plumbing?" "As a measure of practical utility and economy, should the circulation pipe ever be omitted in fitting up the hot water supply to bath rooms or basins?" "Should not plumbers, from their standpoint as mechanics, adopt and stimulate the hot-water system of heating dwellings or other buildings?" "Is it injurious or otherwise that Boards of Health fail to recognize the experience and mechanical knowledge of the plumber where accurate inspection of intricate details of work is required?" "In view of the fact that the sanitary regulations of municipal bodies are requiring the cast-iron soil-waste and ventilation-pipes to be air-tight, is it advisable to resort to the use of wrought-iron pipe and fittings?" "The best methods of putting in pipes in build-

ings with a view to protection against freezing; also desirable precautions against such pipes being affected injuriously during extremely cold weather. Incidentally, the danger of water-backs of ranges being frozen up"; "The best method of putting cast-iron pipes together to insure duration and non-liability to separation under any and all circumstances"; "What are the conditions under which success in the plumbing business can be best attained?" "The necessity of Plumbers' Associations taking an active interest in promoting beneficial legislation in favor of sanitary regulations within their respective localities"; "Upon what grounds do plumbers base their claim to recognition as authorities on sanitary rules and practice, and why is their advice indispensable?" "The ethics of plumbing; why should not the plumber establish a code similar to that of the profession and thereby enhance his social and moral status?"

Complaints are made that the streets of Ottawa are insufficiently lighted.

Campbellford, Ont., is putting in an electric light plant.

The city of London, Ont., has in view the erection of a garbage crematory.

Port Hope, Ont., is advertising for tenders for lighting the town by electricity.

Buckingham, P. Q., has completed arrangements for putting in electric light in the fall.

The Electric Light By-law voted upon at Stratford, has been carried by a majority of 51 for the light.

The by-law to guarantee 5 per cent. on \$40,000 to build an electric street railway in Victoria, B. C., has passed.

The Toronto Local Board of Health is consulting with manufacturers with a view to the abatement of the smoke nuisance.

Through the liberality of an old graduate, a course of instruction in sanitary science will in future be open to the students attending McGill University, Montreal.

One of the electrical projects in the air at the present time, says the *New York Electrical Review*, is the problem of heating dwelling houses electrically, without the use of any very hot substance. It is claimed that wall-paper can be made in such a way that the passage of currents of low electro-motive force will heat it moderately warm to the touch, and thus diffuse throughout the room an agreeable temperature. This is, of course, theoretically possible and may even become feasible in the more improved state of the art. A source of warmth coming from the entire surface of a room would certainly be the perfection of house-heating and would do much to make this so-called temperate zone of blizzard's sea blows endurable. Why may not the artificial illumination of the future be of the same nature? Recent developments are tending towards the possibility of infinite subdivision. The charm of a room illuminated with myriads of candles is one never to be forgotten, though it is one which few of the present generation have seen. We predict that the ultimate use of the glow-lamp for domestic purposes will be to diminish its size and increase its number.

STRENGTH OF BENT PIPE.

SOME experiments recently made on the strength of bent pipes have developed some things not commonly known, or, at least, not recognized. We mean the strain on the inside of the angles, due to the effort of the pipes to straighten themselves under pressure. The problem is one of considerable intricacy, resolvable, however, by computation, and is a good one for practice by our engineering students. In the experiment referred to, a copper pipe of $3\frac{1}{4}$ inches bore, three-sixteenths of an inch thick, was used. The angle was ninety degrees, and the legs about sixteen inches long from the centre. At a pressure of $9\frac{1}{2}$ pounds to an inch the deflection of the pipe was nearly three-eighths of an inch, showing an enormous strain on the inner side in addition to the pressure. A steam engine indicator is made in England on this principle. There is a curved pipe employed, and the tendency to straighten under pressure produces the recording movement.



HARMONY OF COLOR IN NATURE.

NATURE is very sparing of showy contrasts of warm and cold colors. Red and blue are very rare, and of yellow and blue the cases are but few, and black and blue are found in lepidoptera more often than white and blue are seen in our flora or fauna. It is not uncommon for one of two strong colors to be overcast with a tinge of its fellow, or for both of them to be reconciled by a common touch of black or of some third color, or for one of them to be lightened by a dash of white, while the other is lowered by as much black, and so red, off-hued with black—russet and green up-brightened with white—often meet in the autumn in dead and dying patches of fading leaves. It may be shown, I believe, by the refraction of light in chrysalized gypsum that brown is the true complimentary color to lavender gray; and how true to herself is nature we may go forth and see, in the fall of the year; in the dead and curled leaves of the mugwort, or meadow sweet, which are beautiful even in their death, with one side brown and the other the brown matching grey; and, if brambles be cut in the leaf-green season, their two surfaces soon wither in harmony of grey and brown.

And what use are we to make of these hues of nature? They are warrants for a grey mantle under locks of brown hair, or a brown bonnet or trimmings, or a grey room wall with brown furniture; and if, in a hot summer's day I see the park leaf-shades playing on the grey bark of a young beech, I can boldly lay darkish leaf shades on a wall of the beech bark's hue; or if, after the winter rains, I find a barkless pole in railings, tinted with the palest blue-grey, and upon breaking off a splinter of it I find its inner wood of the true color pale brown yellow, why should I not take the inner tint for my wall and the outer one for the skirting? Nature is the best school of art, and of schools of art among men, those are the best that are nature's best interpreters.—*The Architect.*

THE IDEA IN ART.

SPEAKING of the "Idea in Art," J. S. Blackie says: "The value of the Platonic idea may be shown by an illustration from the region of the beautiful. The marble figure which some stone-working poet has baptized a Corinne or a Sappho, and whose features, expression and attitude combine all that is most dignified in a queen, all that is most simple in a shepherdess, all that is most inspired in a poetic thinker, and all that is most attractive in a Venus—this figure, for the possession of which to adorn their museums, the heads of the great monarchies will contend with rival diplomacy and emulous gold, when dashed to pieces by a sudden precipitation, is only so much lime which the farmer can fling upon his land like straw or dung or any other refuse. Its value is gone as soon as it has lost its form; the material is common and worthless. Whence, then, is this form, this species, the superaddition of which imparts so much value to an otherwise trivial material? Whence did it come, and what is it? It is plainly neither more nor less than an image impressed by the plastic power of mind on a material utterly destitute of formative force, and the value of the work consists altogether in the amount of this force, or organizing intellectual energy, which has been made to act upon it from without. But this formative force is a thing altogether bloodless and untangible. Shatter the substance of the finest statue in the world to pieces, and the amount of calcine substance or earthly matter of lime remains the same as before the disintegration. It follows, manifestly, that the only real element in the admired object is that which according to common phraseology has no reality in it, viz., the idea in the mind of the artist which has been transferred to stone. This idea is, in fact, the only thing which truly exists so far as the work of art is concerned. It is the only thing also that possesses permanency; for whereas the marble may be broken at any moment, the idea may at any time be recovered from the intellect of the artist where it was

originally generated, and where it permanently resides. That the ideas which belong to genius or original creative power are innate, in the highest Platonic sense of the word, most people will be willing to concede. For, if not, why cannot every eye see in a daisy as much as a Burns or a Woodsworth saw? Why is not the physiognomy of every dog as eloquent as and pregnant with profound expression to me and to you as it was to Landseer? A common observer 'wants the eye' to see in common objects what the great artist sees—that is to say, he wants an internal plastic and organizing force; for it is by this mental force only, and not by mere pupils, corneas, retinas, and other apparatus of mere sensuous vision that the man of genius obtains his superior insight.

HINTS ON INTERIOR DECORATION.

THE occupant of a house called some weeks ago on a master painter to have him look at the dado of his drawing-room, a series of sunk panels in golden brown, which he considered too plain. His idea was—for he had caught hold of a technical phrase—that an "all-over pattern" would be "the thing." The painter at once saw that such a design would conflict with that of the wall space above. He suggested mouldings in corners and centres, as partaking of the structural character of the dado, and on the impulse of the moment determined to fashion them himself from plaster composition. This done, he directed his foreman to have the pieces put in place, and to be painted in purple, vermilion, orange and red. The owner was satisfied; he had got additional ornament, and thus without detracting from the effect of the really handsome wall pattern on the space above.

The writer's attention was excited by the remarkable, and yet tasty style, in which a dwelling by no means large had been decorated, illustrating, too, the little difference in cost between the color effect of painting and wall paper. The parlor walls are in oil, a clear French grey. The ceiling is a delicate cream tint, with a large panel in moulding corresponding with the shape of the room. The moulding consists of three members, a bend in the centre and two quirks on each of the outer edges. These are colored in gold, bronze and the panel tint; this is followed by a broad band of the tint of silver maple edged with deep red, with fine gold lines in ornament; the styling is two shades deeper than the panel tint, warmed with burnt sienna; the upper members of the cornice are the same as the moulding of the panel. In this cornice are three coves, the upper one in wood color, same as broad band around the panel, the middle is bronze and gilded, the lower or main cove maroon. The lower moulding of cornice is bronze color, same as found in panel, but a shade deeper, with gilt picture moulding, which divides cornice from wall. The frieze is yellow ochre with greenish-blue stencil ornament in Eastlake style. The walls in oil are a medium shade of Antwerp blue, with small diaper stencil rosettes in gilt. Thus there is a great deal of positive color employed in the decoration, but the whole is so toned down as not to produce any loud effects.

The Master Painters' Association of the city of Hamilton was organized January, 1887, and has at present a membership of 22.

Red or white oak, stained in imitation of the old oak of England, properly filled and finished in hard oil, gives a richness and tone to any apartment. It is especially suitable to halls and dining rooms.

For French polish for hardwood doors: 1. Shellac, 3 lbs.; wood naphtha, 3 pints. 2. Shellac, 2 lbs.; powdered gum mastic and gum sandarac, 1 ounce each; copal varnish, ½ pint; spirits of wine, 1 gallon. Mix and shake cold till dissolved.

To obtain a hard, smooth, glossy surface on wooden panels for art decorating purposes, dissolve gum shellac in alcohol, add enough drop ivory to make it thick enough to apply with a brush; put on three or four coats, rub down with rottenstone; when dry wipe off with a woolen rag, then varnish with a first-class thin varnish.

Mr. James Morrison, Toronto, has acquired the right for Canada to manufacture the Montgomery sewer gas trap.

CONTRACTS

CONTRACTS AWARDED.

Mr. Cameron, of Almonte, has been awarded the contract for the erection of a new public building at that place.

The contract for the erection of a new post-office at Brandon, Man., has been awarded to Mr. Hanbury, contractor, of that place.

The contract for the erection of a public building at Annapolis Royal has been awarded to Rhoads, Currie & Co., of Amherst, N. S.

Messrs. W. Ganster & Co., of St. Catharines, have been awarded the contract for constructing water works for the town of Picton.

Mr. C. F. Babcock, of Windsor, has been given the contract for the erection of the new public building at Chatham, for town and county purposes. The figure is \$31,286, exclusive of the heating apparatus.

Contracts have been awarded as follows for materials required for the extension of the City of Toronto water works system: For 3 in., 4 in., and 6 in. valves, \$7.50, \$9.30, \$14.85 respectively, to Rice Lewis & Son; for 12 inch valves, \$37.70, to John Parkins; for flexible joints, 6 in. and 48 in., \$188 and \$139.40 per set, to Camden Iron Works, Philadelphia; for 124 inch, 30 in., 26 in., and 18 in. valves, \$166, \$270, \$515, \$712 each respectively, to R. W. Dempster, Manchester; 4 in., 6 in., and 12 in. cast iron pipe, \$40, \$38, \$37.50 per ton respectively, to the St. Lawrence Foundry; for 36 in. cast iron pipe, \$37.50 per ton, to Alex. Garshore, Hamilton. The 3-million-gallon pumping engines will be supplied by the Blake Manufacturing Company, Boston, for \$28,980.

CONTRACTS OPEN.

SUDBURY, ONT.—A \$16,000 school house is to be built.
ST. ALBANS, P. Q.—The erection of a free hospital is spoken of.

VANCOUVER, B. C.—St. Andrews' congregation is about to erect a new church to cost \$12,000.

BERLIN, ONT.—An agitation has been begun for the introduction of a system of sewerage.

KINGSTON, ONT.—St. George's Cathedral is to be enlarged and beautified at a cost of \$25,000.

MONCTON, N. B.—The Y. M. C. A. has purchased a \$5,000 lot and will erect a \$10,000 building.

ESSEX CENTRE, ONT.—A by-law will be submitted to the people to raise \$30,000 for water-works.

COLLINGWOOD, ONT.—The town clerk asks tenders until the 19th inst. for the erection of a town hall.

WINDSOR, ONT.—Mr. John Davis, inspector of distilleries, will it is said get out plans for a \$10,000 residence.

KINCARDINE, ONT.—The citizens are considering the matter of the construction of a system of water works.

BRACEBRIDGE, ONT.—Mr. Croker, of Orillia, has completed plans for a block of stores and offices for Mayor Myers.

NIAGARA FALLS, ONT.—The people vote on the 17th inst. to raise \$27,500 to put in a new system of water-works.

ASHBURNHAM, ONT.—The ratepayers will vote on a by-law on July 2, to raise \$4,500 for a new town hall and market building.

NEWMARKET, ONT.—A by-law to raise \$6,000 by way of a loan for the extension of the water-works will be voted on next month.

CAMPBELLFORD, ONT.—By-laws have been carried appropriating \$15,000 for a system of water-works and \$10,000 for electric lights.

LONDON, ONT.—The City and County Jail Committee have approved of plans for improvements to the jail building, to cost \$12,000.

DARTMOUTH, N. S.—The matter of providing a system of water-works and sewerage, has by a vote of the ratepayers, been postponed for a year.

CHATHAM, ONT.—The ratepayers have voted by 256 majority in favor of borrowing \$11,000 to assist the county in erecting joint public buildings.

SHERBROOKE, P. Q.—The site for the Protestant Hospital has been secured and paid for, and subscriptions are coming in towards the building.

OTTAWA, ONT.—Plans have been prepared for the enlargement of the Morrisburg Canal, and tenders for the work will be called for shortly. The estimated cost is \$7,000,000.

KINGSTON, ONT.—The site for the "John Carruthers Science Hall" on Queen's University campus has been selected. The structure will be of stone and in keeping with the present building.

VICTORIA, B. C.—It is proposed to erect a new Protestant Orphans' Home, the present structure being too small.—A substantial brick block will be put up on the corner of Yates and Douglas streets, to cost \$20,000.

WINNIPEG, MAN.—The sites of the new Government buildings have been decided upon. The reformatory will be located in Brandon, the Deaf and Dumb Institute in Portage la Prairie, and the Home for Incubables in Winnipeg.

TORONTO, ONT.—An appeal is being made for \$70,000 for the enlargement and improvement of Trinity University buildings. A considerable amount has already been subscribed.—The following building permits have been issued from the office of the City Commissioner since the date of our last issue: E. Hewitt, pr. 2 story and attic bk. dwellings, Linden st., cost \$9,000; Fred Wyl, 2 story bk. coachman's residence and stable, cor. St. George and Bloor sts., cost \$4,500; Jas. Cuttrel, 2 story and attic r. c. dwelling, Cotingham St., cost \$1,200; John Turner, pr. 3 story bk. stores, Yonge, near Wood st., cost \$4,400; Public School Board, 2 story bk. school, Davenport Road, cost \$18,652, 2 story add. to Landsdowne school, cost \$9,381; 2 story add. to Rose Ave. school, cost \$8,629; Jas. Hedley, 2 story and attic bk. dwelling, St. Joseph st., cost \$5,000; J. K. Fiske, 2 story and attic bk. dwelling, Queen's Park; John Fortune, 2 story and attic bk. dwelling east side Brunswick Ave., near College st., cost \$3,000; F. F. Pickering, 2 story and attic bk. dwellings, Gwynne st., cost \$5,000; H. Howcroft, pr. 2 story and attic bk. dwelling, Huron st., near Sussex Ave., cost \$2,500; Fred Sole, pr. 2 story bk. stores, n. e. cor. Yonge and Wood sts., cost \$6,000; Mrs. Allingham, pr. s. d. 2 story and attic dwellings, Suffolk Pl., cost \$2,500; R. Baird, alterations to dwellings, 10 and 12 Baldwin st., cost \$1,200; H. A. Massey, 2 story and attic det. residence, Jarvis, north of Wellesley St., cost \$7,000; G. Vair, 3 story and mansard dwelling, Marlborough Ave., cost \$2,500; E. E. Thomas, 2 story and attic bk. residence, Carlton st., cost \$6,000; W. Stewart, pr. 3 story bk. stores and offices, Spadina Ave. and College st., cost \$6,500; Geo. M. Miller, 2 story and attic bk. residence, St. James Sq., cost \$5,000; W. M. Adams, pr. 3 story bk. stores, 544 and 546 Queen st. West, cost \$5,000; W. McBean, three 3 story bk. stores, Spadina Ave., near Cecil st., cost \$12,000; Mrs. Allen, pr. s. d. 2 story r. c. dwellings, Cumberland, near Yonge st., cost \$2,000; J. C. Goddard, one story bk. workshop, Sherbourne st., cost \$2,000; Trustees St. Margaret's Church, bk. church, Spadina Ave., near Queen, cost \$15,000; W. G. Slocumbe, pr. s. d. and one det. 2 story bk. dwellings, Spadina Ave. and Harbord st., cost \$11,000; Mrs. H. Brown, alterations and additions to dwelling, cor. Sherbourne and Gerrard sts., cost \$7,000; J. Rankin, mansard roof and alterations to 110, 112 and 114 Peter st., cost \$2,000; W. Hall, 2 story and attic bk. residence and stable, Ossington Ave., cost \$5,000; Geo. Noble, pr. 2 story bk. stores and stables, Ossington Ave. and Dowson st., cost \$4,500; H. Howcroft, det. 2 story and attic bk. dwelling, Sussex Ave., cost \$2,500; R. Allis, 3 story bk. add.-to hotel, Queen and Soho sts., cost \$2,800; D. Sole, pr. 2 story bk. stores, Wellesley east of Sherbourne st., cost \$2,400; Moulton's Ladies' College, Bloor st., additions and alterations, cost \$15,000; A. G. Smyth, 4 story bk. temperance hotel, Simcoe and Adelaide sts., cost \$8,000; Wm. Forbes, add. and alterations to dwelling 487 Sherbourne st., cost \$3,000; P. H. Dryton, alterations to residence 127 Bloor st. east, cost \$1,000; Mrs. Cornish, 2 story bk. add. to dwellings, n. s. College, west of Robert st., cost \$1,000.—Ten thousand dollars is to be expended in enlarging the Women's Medical College building. The work will be undertaken in about a fortnight.—The Richard Institute, Bloor St., is to be enlarged at a cost of \$10,000.—The waterworks committee re-advertise for tenders for steel pipe.

GEO. F. BOSTWICK,

Agent for Messrs. W. Stahlshmidt & Co., manufacturers of Office, School, Church and Lodge Furniture, Preston Ont.,

ALSO HANDLING

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AMBERG'S CABINET LETTER FILES,

Church and Opera Seating and Other Furnishings.

24 Front St. West,

TORONTO.

MANUFACTURES AND MATERIALS

FINE BUILDERS' HARDWARE.

HAMILTON, CANADA, June 4th. 1889.

EDITOR CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—We notice in the May issue of your valued publication, your remarks respecting the finer grades of builders' hardware, which are at present being imported from the United States, but which we hope to supply in due time. When we decided upon manufacturing locks and other builders' hardware, it was and is now our intention to put before the building public such a line of bronzed goods as would bear favorable comparison with the best produced anywhere, not only in design, but in the quality of material and workmanship, and with this result in view, we have now a large staff of pattern makers busily engaged in the construction of patterns for such a line of goods. It however, takes some time, but we hope that by the close of the present year we shall have our architects advocating and specifying Canadian made goods for all their buildings.

We invite your critical inspection of our illustrated supplementary lock catalogue which we forward by this mail, and considering that it is only seven months since we commenced work upon our first spring lock, you will be able to form some idea of the possibilities of the future.

Yours respectfully,

THE E. & C. GURNEY CO.

John H. Tilden, Managing Director.

A patent has been granted to Mr. John O. Parker, Toronto, for a flushing tank.

The Napance Cement works had a narrow escape from destruction by fire a few days ago. Loss \$500.

Thos. A. Owens, Toronto, Ont., has been granted a patent for a paving composition composed of Portland cement, pulverized glass, and any suitable coloring pigment compounded, substantially in the proportions specified.

Mr. D. M. Bowerman owns five acres of land about two miles from Picton on which he has recently discovered a rich deposit of amber and mineral print. Experts pronounce the amber to be a particularly pure article.

An exchange says: In lettering or working granite, you will find that your tools will hold an edge much better if you dip the cutting edge into turpentine occasionally. Keep a dish with some in where you can put the end of the tools in after every three or four blows.

An exhaustive test of the resisting power of Kingston and Wolfe Island limestone, was made a few days since. The Kingston stone was fractured with a pressure of 36,000 lbs., while the Wolfe Island stood all the pressure the machine could supply (52,200 lbs.) without visible effect. Two-inch cubes were placed under the pressure. The Kingston stone was fractured under a weight of 5,000 lbs., and ground into powder under a force of 14,000 lbs. The Wolfe Island cube was fractured under a power of 41,000 lbs., and burst with the weight of 50,000 lbs., making a noise like a cannon and flying from under the machine. The resistance was found to be equal to 11,250 lbs. to the square inch.

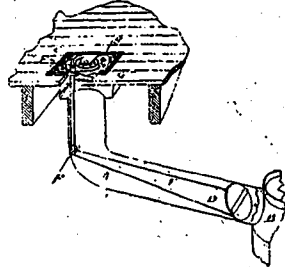
A manufacturing firm in Milwaukee had an experience recently with a rat, which is instructive says the *American Architect*. Noticing that the

bill for water delivered through the meter were unusually large, the managers ordered an investigation, and at last discovered that the lead supply pipe in one place ran in contact with a waste pipe, also of lead. A rat, who frequented the waste-pipe, happening to be thirsty, and diving, by the curious instinct peculiar to such animals, the proximity of a supply of water, had gnawed a hole through the walls of both pipes, in order to get a drink. He succeeded in getting his drink, but omitted to close the hole again, and the water continued to flow through the meter, and out again through the waste-pipe, until the investigation revealed what had been done. Possibly some architect, who has had experience with rats, may do the profession the service of writing an essay on the subject of catching them, as well as of preventing them from doing mischief. We have heard it said recently, that a rat will not gnaw a hemlock board, and that a grain-bin in a stable, if made of hemlock, or lined with it, is as safe against rats as if it were lined with galvanized iron. Whether this is so we cannot say, but some one ought to know about the matter, and if that person will come forward with his information, he will deserve the thanks of the building community.

The following table shows the capacity, in gallons, for each foot in depth of cylindrical cisterns of any diameter:

Diameter.	Gallons.	Diameter.	Gallons.
25 feet.....	3,059	7 feet.....	239
20 ".....	1,958	6 ".....	206
15 ".....	1,101	5 ".....	176
14 ".....	959	4 ".....	122
13 ".....	827	3 ".....	99
12 ".....	705	2 ".....	78
11 ".....	592	1 ".....	44
10 ".....	489	3/4 ".....	30
9 ".....	396	3/8 ".....	19
8 ".....	313		

Regulating Device for the Distributing Pipes of Hot Air Furnaces.
No. 30,787. Thos. G. Wanless, Toronto, Ont., dated 14th February, 1889.



Claim.—1st. A valve located within a hot air distributing pipe in proximity to the hot air chamber of the furnace, in combination with a cord or chain attached to the said valve, and leading to the room with which the distributing pipe connects, substantially as and for the purpose specified, and. A valve pivoted within a hot air distributing pipe in proximity to the hot air chamber of the furnace, in combination with a cord or chain connected to the said valve, and conveyed over guiding pulleys to a point within or near the discharge mouth of the distributing pipe, where it is connected to an operating lever or spindle, substantially as and for the purpose specified.

J. D. BARSALOU

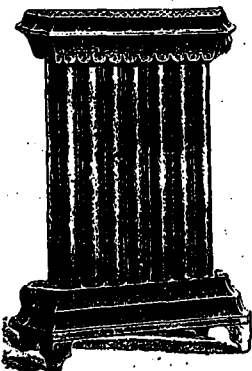
—) MANUFACTURER OF (—

STEAM AND
HOT WATER

Heating Appliances

BROCKVILLE, - ONTARIO,

Will occupy this space in future.



The contract for the supply of Portland cement for use by the corporation of the City of Toronto has been awarded to Messrs. John Battle & Son, of Thorold, Ont.

The contract has been given to the Wallace, N. S., quarries to supply 10,000 tons of stone to be used in the construction of the Grand Narrows bridge on the Cape Breton Railway. It is understood this will exhaust the entire output of these quarries for the present year and the greater part of 1890.

CONFEDERATION LIFE.

Notice to Architects.

THE Directors of the Confederation Life Association invite from architect competitive designs for the proposed Head Office Building in Toronto. Four prizes are offered for the four best designs: First, the superintendence of the building; second, \$500; third, \$400; fourth, \$300. Necessary information may be obtained on application to the undersigned. Designs must be in by 15th September, 1889.

J. K. MACDONALD,
Toronto, and May, 1889. Managing Director.

U.S. BRANCH: CANADA BRANCH:
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Established 1865.



Stained Glass
CASTLE & SON.

Decorations, Fabrics, etc.

—DESIGNS SUBMITTED—



TORONTO WATER WORKS.

Tenders for Coal Shed.

TENDERS addressed to the undersigned, and marked "Tender for Coal Shed" will be received by registered post only, up to noon on TUESDAY, JULY 2ND, for the erection of a Coal Shed. Plans and specifications may be seen, and any information obtained, at the Water Works Department, City Hall. A deposit of \$100 will be required with each tender.

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

JAS. B. HOUSTEAD,
Chairman Com. on Water Works

Water Works Department,
Toronto, 11th June, 1889.



Tenders for Steel Plate Riveted Pipe.

NOTICE is hereby given that sealed tenders addressed to the undersigned and marked on the outside, "Tender for Steel Pipe," will be received by registered letter only, delivered at the office of the Water Works Department, City Hall, Toronto, up to the hour of 2 o'clock p. m. on TUESDAY, 2ND JULY NEXT, for 6,000 feet of Steel Plate Riveted Pipe, 60 inch inside diameter, and 4,600 feet of Steel Plate Riveted Pipe, 48 inch inside diameter.

Specifications, forms of tender, and any further information can be had on application to the office of the Superintendent of the Department.

The lowest or any tender not necessarily accepted.

JAS. B. HOUSTEAD,
Chairman Water Works Com.

Water Works Dep't, City Hall, 12th June, 1889.

- THE NEW TROPIC HOT AIR FURNACE -

Latest and Best Steel Plate Furnace in the market.

LITTLE GIANT FURNACES,

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PENINSULAR FURNACES

The Largest and Best Assortment of Cast and Steel Furnaces ever made.

Patent Peerless Registers.

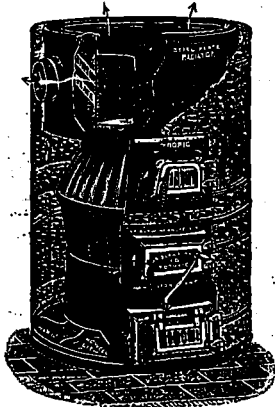
UNION STEAM and HOT WATER RADIATORS.

Laidlaw Mfg. Co.,

HAMILTON

AND

279 Queen St. West, Toronto.



J. H. WALKER
DESIGNER

—AND—

Engraver on Wood,
Forestry Chambers,
Old Post Office Building,
enter by 132 St. James
St., or by 116 St. Francois
Xavier St., Montreal.

Fine Art Engraving,
Portraits, etc.

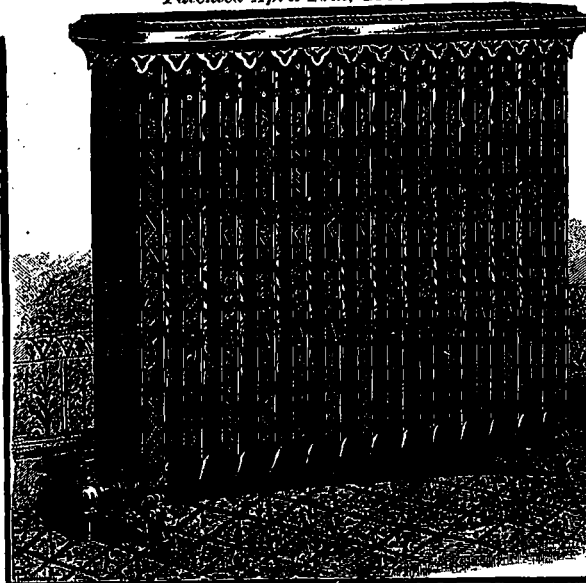
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HOT WATER AND STEAM HEATING

Patented April 16th, 1887.



The ONLY Radiator in the Market Built WITHOUT Bolts and Washers.

The MOST EFFECTIVE ever invented.

The FIRST ORNAMENTAL Radiator manufactured in Canada.

No Cumbersome Base, No Bolts, No Packed Joints.

Free, Unobstructed Circulation, Even Castings, Nipple Connections, Absolutely Tight and Permanent Joints.



OVER 10,000 NOW IN USE.

Beware of weak imitations by unprincipled competitors, as we are the only manufacturers in Canada of the

"SAFFORD" RADIATOR,

ALSO MANUFACTURERS OF THE

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THE TORONTO RADIATOR MFG. CO.

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14 to 24 Dufferin St., - Toronto.

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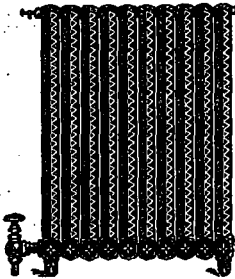
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55 and 57 VICTORIA ST., TORONTO.

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Plate and Sheet Window Glass of Every Description.
Including Single and Double Thick, Kept in Stock.

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A COMPLETE ASSORTMENT OF ORNAMENTAL GLASS ALWAYS CARRIED IN STOCK. EXPERIENCED PLATE GLASS GLAZIERS SENT TO ALL PORTS OF THE DOMINION.



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Sectional Hot Water and Steam Radiator

Patented in 1886 in Canada and the United States.

THE BEST HOT WATER RADIATOR IN THE MARKET.

Quick Circulation; Easily Repaired; Its Capacity increased at very little cost; does not need a Fancy Cast Iron Top or Marble Slab; in fact, just the Radiator that suits the requirements of the Market.

By the construction of this Radiator, each section has (entirely distinct from each other) a separate and positive circulation within itself, producing not one slow, sluggish, continuous circulation, but as many sharp and constant circulations as there are sections composing the Radiator, thereby maintaining a greater heat from a given surface. It has another advantage that will be appreciated by the Trade; the inlet and outlet are both at the same end, and has been arranged that it may be used for Hot Water or Steam without making any changes to the connections, or any alterations whatever—a feature possessed by no other Radiator that we are aware of. We also claim that with this Radiator any person in the trade can replace a section, or add sections to increase its capacity, without returning it to the manufacturer. This alone is an advantage, particularly in cases outside the city in which manufactured. These Radiators are now fitted up in the following buildings, viz. Hull Post Office, Peterborough Post Office, Pictou Custom House, N. S.; Pictou Marine Hospital, N. S.; Wainwright Custom House, Kingston Custom House, Three Rivers Custom House, Point St. Charles Post Office, and many other private dwellings.

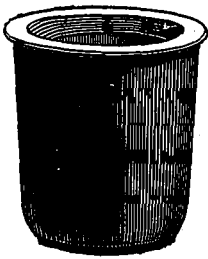
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GARTH & CO., - 536 to 543 Craig St., MONTREAL.

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DESIGNERS & ENGRAVERS
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FLOOR STONES,

Made of best Portland Cement, wired throughout, neat in appearance, and easily adjusted.

STRING COURSES, PANELS, NECKING, WINDOW SILLS, ETC.
From Architects' special designs.

Also Lettering and all kinds of Artificial Stone Moulding.
Sample stones and prices on application.

J. B. STRINGER & CO.,
68 VICTORIA STREET, TORONTO.

MILLER BROS. & MITCHELL,

—MANUFACTURERS OF—

HYDRAULIC, STEAM AND HAND

ELEVATORS

— FOR —

PASSENGER AND FREIGHT SERVICE,

*In Hotels, Warehouses, Office Buildings,
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SEALED TENDERS, addressed to the undersigned and marked "Tenders for Dredging, Pipe Laying, Etc.," will be received by registered post only up to 12 o'clock noon on **TUESDAY, JULY 24th, 1889**, for the several works required in the laying of a Steel Conduit, Pipe, with cribs, etc., from the Engine House well to a crib on the Island.

All plans and specifications and any further information can be had on application at the Water Works Department, City Hall.

The lowest or any tender not necessarily accepted.

JAS. B. DOUSTEAD,
Chairman Water Works Committee.

Water Works Department,
Toronto, 21th June, 1889.

**Notice to Contractors.**

TENDERS will be received by registered post, addressed to the Chairman of the Committee on Works, up to 2 o'clock p. m. of the 18th day of June, 1889, for the following supplies for the year ending 30th June, 1890:

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BRICK.
IRON-WORK.

Specifications and forms of tender can be obtained at the City Engineer's Office on and after the 11th inst. A deposit in the form of a marked cheque, payable to the order of the City Treasurer, must accompany each and every tender as follows: Stone, \$20; brick, \$20; iron-work, \$50. All tenders must bear the bona fide signatures of the contractor and his sureties (see specification) or they will be ruled out as informal. The committee do not bind themselves to accept the lowest or any tender.

WM. CARLYLE,
Chairman Committee on Works.

Committee Room, Toronto, June 4, 1889.



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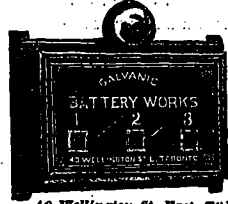
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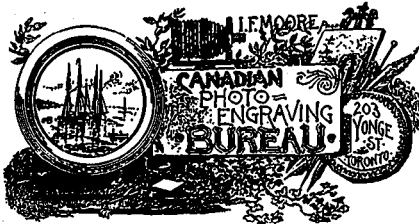
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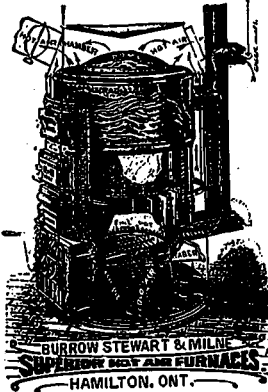
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CITY ENGINEER'S OFFICE,
Toronto, May 31st, 1889.

Notice to Contractors.

TENDERS will be received by registered post, and addressed to the Chairman of the Committee on Works, up to 2 o'clock p. m. of the second day of July, 1889, for the

STEEL SUPERSTRUCTURE OF THE KING STREET SUB-WAY.

Drawings, Specifications and forms of tender for the above work can be obtained at the City Engineer's Office on and after the 11th of June, 1889. A deposit, in the form of a marked cheque, made payable to the order of the City Treasurer, Toronto, for the sum of 2 1/2 per cent. of the value of the work tendered for, must accompany each and every tender, otherwise it will not be entertained. All tenders must bear the bona fide signatures of the contractor and his sureties (see specifications), or they will be ruled out as informal. The Committee does not bind itself to accept the lowest or any tender.

WM. CARLYLE,

Chairman Committee on Works.

Committee Room, Toronto, May 31st, 1889.

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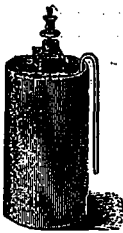
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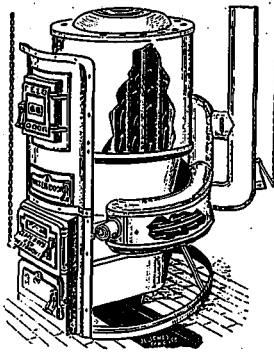
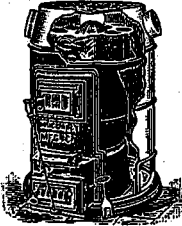
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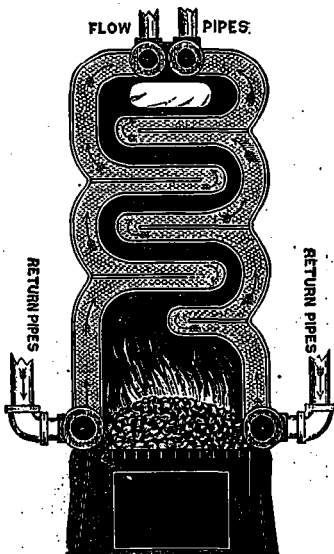
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