PAGES

MISSING

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In the "Canadian Architect and Builder."

PAGES

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The Canadian Architect and Builder

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" W. H. ELLIOTT, Toronto.
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" A. F. DUNLOP, R.C.A., Architect, Montreal.
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Scarcity of Slate.

Unusual activity in building construction coupled with difficulty in securing skilled quarrymen are believed to be the principal causes of the present scarcity of roofing slates. Scarcity of skilled labor in this line also prevails in Wales, so that no workmen can be imported with which to extend operations on this side the Atlantic. The past winter is said to have been an unfavorable one for slate quarrying operations, frequent thaws and rains causing the loss of large quantities of material. If the necessary labor can be obtained this should be a favorable time for the development of the extensive slate deposits in Newfoundland, as prices are said to be higher than at any period during the last twenty years.

The Colonial Style Run Riot.

We are pleased to note the tendency in the United States to substitute for the Colonial style in domestic architecture; half-timber and other forms of construction following closely the best English examples. The supremacy of English house and church architecture cannot be doubted, while the so-called Colonial architecture of these days has become an abomination. In some of the newly built up residence districts of Toronto and other Canadian cities may be seen whole streets of houses, the fronts adorned with porches and verandahs of the so-called Colonial style, each being an exact duplicate of all the others. The effect is monotonous in the extreme, and the person who is obliged to look on these houses day after day learns to abhor white porches and verandahs. True, these serve a useful purpose in our climate, but why should there not be variety in design and material, thus imparting to them individuality and interest? Of course they could not then be designated Colonial, but they would be none the worse for that.

Protection of Buildings from Lightning.

The Committee of the Royal Institute of British Architects and the Surveyors Institute appointed two years ago to investigate the subject of the protection of buildings from lightning, expect to present their report at the close of the present year. Meanwhile some details have been given out of the reports already sent in by the committee's observers. These contain a list of sixteen protected buildings struck by lightning and more or less seriously damaged, including a considerable number of churches, lighthouses and factories. One of the most interesting cases so far reported, and one which seems to show that the so-called protectors sometimes tend to induce lightning stroke, is that of a large country house in Sussex, erected some twenty-eight years ago, and till recently without any form of protection. In 1901 a church in the immediate neighbourhood having been struck, the owner of the house, for greater security, decided to have lightning rods put up. An elaborate system was installed and completed in March, 1902, nearly every portion of the building having its own finial and conductor. During the storm season of last year the house was twice struck—on June 17 and

August 8. On each occasion, besides other injuries a chimney stack was damaged, the brickwork being split up and the capping-stones dislodged and hurled about in all directions. The lightning-rods on the damaged chimneys were torn from their supports and much bent. Careful study will be given by the Committee of all the cases reported, and an effort will be made to suggest better methods of protection than those at present employed.

Over-Production of Cement.

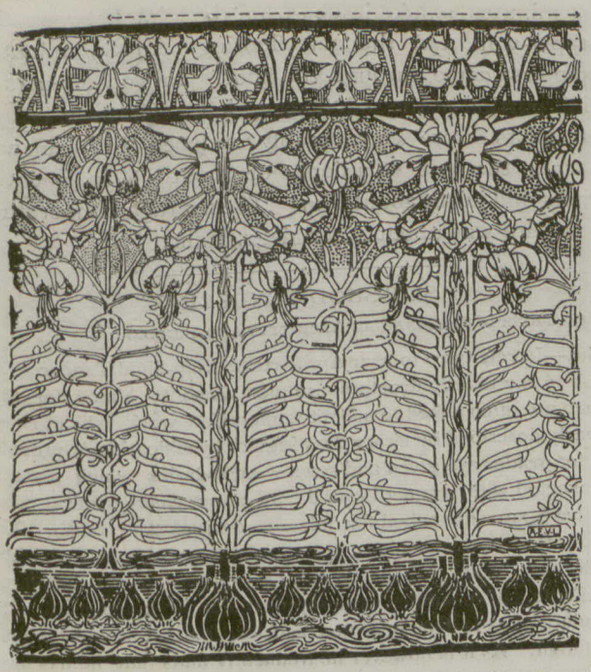
The losses arising from over-production in the manufacture of Portland cement in Great Britain and Germany have already been alluded to. From data recently published it appears that in Russia from the same cause the industry has also become unprofitable. Until 1896 there was only one cement factory in Russia, the Black Sea Company, a German concern, at Novorossik, with a yearly output of 30,000 barrels. Two years later owing to increased demand, there were eight factories. In spite of the fact that the consumption of cement rose from 409,000 barrels in 1896 to a million and a half barrels in 1901, the rapid increase in manufacturing capacity forced prices down in 1900 to a point where the older factories paid no dividends and the newer ones suffered heavy losses, and in some instances were obliged to go out of business. Efforts are now being made to put the industry on a paying basis by forming an association of the manufacturers to control prices and by manufacturing at home the cement casks which heretofore have been imported from Poland. There is a lesson in all this for the present manufacturers of cement in Canada and more especially for persons who contemplate engaging in the business. The manufacturing capacity in this line has increased very rapidly in Canada within the last five years, and has almost if not quite reached the safe limit. Notwithstanding the greatly increased demand of late for cement for construction work in which other materials were formerly employed as well as for new uses, manufacturers of cement should take warning by the experience of the countries we have mentioned, and be careful not to let the supply outrun the normal demand.

Defensive Methods of Employers.

There is a growing disposition among employers of skilled labor to co-operate with each other in resisting the ever growing and intolerant demands of organized labor. It is beginning to be understood that if employers are to have any rights whatever or any control over the businesses to the building up of which their capital and best efforts have been devoted, they must stand together and support one another in a more determined manner than they have done in the past. The benefits of such co-operation received illustration recently in one of the smaller cities of Western Ontario. The union workmen in the employ of a contractor struck work because some fault had been found with them. They were aware that building mechanics were being advertised for by some of the other local contractors who were expected to welcome them. Their former employer, however, advised his fellow contractors by telephone of the circumstances of the case, and when the strikers applied for employment they were invariably met with the reply that no help was required. This had the effect of reducing their arrogance and they returned to work. Another case was that of the Penberthy Injector Co., of Detroit, to whom the alternative was presented by the Brass Workers' Union of discharging a non-union workman or contending with a strike. The Penberthy Co. brought the facts to the attention of the principal manufacturing firms of the city, forty-seven of which met and passed a resolution asserting the equal right of every man to employment, and pledging their support to the Penberthy Co. in resisting the unjust demands made upon them. It is understood that a movement is now on foot having for its object the organization of employers of labor throughout the province of Ontario.

No Outside Interference.

A strong protest has recently been entered in several quarters against interference with and control of Canadian labor organizations by the leaders of the International Unions of the United States. Archbishop Bruchesi recently caused to be read a pastoral letter in all the Roman Catholic churches of Montreal, urging Catholic workmen to keep clear of entangling alliances which would make them subservient to the mandates of foreign organizations having little knowledge or sympathy with the conditions existing between employers and employes in this country. The letter goes on to say: "Calmness and reflection will make you realize that there are just limits to your demands. You cannot reasonably expect that the workingman's wages will be ever on the increase, and that at the same time the hours of labor will decrease proportionately." In the Senate at Ottawa a discussion recently took place on this subject in connection with a Bill to amend the Criminal Code respecting offences connected with trade and breaches of contract. Hon. William Gibson was not opposed to labor unions per se, but objected to foreign dictation. He referred to a case in Hastings County where a company was wiped out by a strike ordered from Washington. Almost every labor union was directed from Washington. He advocated prohibiting international unions. They would effect settlements more easily, and have fewer strikes. He hoped the bill would be made so that they could indict the lodges. He read a letter received on May 17 from the Beamsville branch of the Journeymen Stonecutters' Association of North America, demanding $3.50 a day for nine hours. The letter went on: "We have been notified by the Niagara Falls branch not to send stone into their jurisdiction." He was not only told what he was to pay the men, but that he must not cut stone to be used in another jurisdiction. He hoped the bill would be enlarged, so as to make the men amenable to the law, and strike at the root of the matter. Hon. James McMullen said it Canadian labor organizations were to be controlled from the United States, Canadians would be unable to take contracts, because they did not know when a strike might be ordered. If some American institution was desirous of crippling a competitive institution here, all they had to do was to approach the head center, tip them the wink, point out how a service could be rendered. A strike would ensue, and the Canadian owner would be the loser. He was surprised at the attitude of the press. There did not appear to be a paper in Canada that had the courage to come out boldly on this question.



DADO DESIGN BASED ON LILIES. FROM "PLANT FORM AND DESIGN."

APARTMENT LIFE.

The growth of the apartment idea is not an unmixed gain. There are few more important words in the English language than the word "home," and it is about to acquire but a modified meaning to those persons who intend to adopt a life in the apartment houses that are beginning to rise in our big cities.

Home is a place which shuts off the world at the street door; a place must be separate, self-contained, and in some sense our own to give properly the feeling of home; and an apartment is these things only in a modified sense. It is little more separate or self contained than a suite of rooms in a boarding house would be; and proprietorship in an apartment, even if held by purchase, cannot compare with the proprietorship which extends down to the ground and includes some portion of it. A lodging in the air is not perfectly a home "barring you're a bird."

In the second place, though home to be home must shut its inmates off from the world, it must also, for people of refinement, provide for their separation from one another. The essence of house planning is in the effort to keep functions and people apart. The upstairs and downstairs arrangement of a house gives a definiteness for this purpose which one never realizes so clearly as when looking over a "flat." On a level, particularly when, as so often happens, it is made necessary to pass all the bedrooms on the way from the entrance to the living rooms—privacy is more difficult. A delicate woman, who wishes to lie down during the day, imposes restraint on all the inmates; or else becomes accustomed to less consideration than she would receive in a house. There is too great nearness of the inmates as a matter of feet and inches, and this is likely to result in too little distance in the matter of relations with one another. A delicate woman is apt to become an indelicate woman in the matter of appearances in dishabille, which the comparative privacy given by the different levels of a house should prevent.

The ideas of home and family are closely connected, but what is to be done with children in a flat? There is no upper room where they can play and make as much noise as they like; nor is there likely to be any ground outside, and if there is it is public ground. This is not the same thing as ground, however small, apart from the rest of the world, where children can have room for their own numerous private affairs. A very simple habitation, if it has room for these, will, to a family of children, be dignified by all the sentiments which home inspires; sentiments which make childhood a memory and prepare the way for the domestic and patriotic ideas with which it is so important that the manhood and womanhood of a nation should be possessed. Large families are in themselves the making of a home; but what is to be done with a large family in a flat? What was always a troublesome joy is likely to preponderate so much on the side of trouble as to cease altogether to be a joy; and then there is danger of it's ceasing to be at all. The happiness of a woman does not seem to consist now as it did in the early days of the world, in being the mother of children. Domestic life has ceased to be to her her necessary field of work. Men, much as they hate work, do seem to acquire a sort of enthusiasm for the proper fulfilment of it; it is their life. But women seem not to regard domestic duties as their life, but as an irksome addition to their life. Their confabulations about it have a tone of discontent. They incite one another continually to desire greater freedom from care. The woman who is most envied is she who has the least care. Not only is pride in their families vanishing but pride in their housekeeping as well; and apartment life will complete the process. With no families and almost no housekeeping—for, with soup in paper boxes and fried potatoes in a bottle, a woman has little to think of now if she has credit and a telephone—with nothing to do at home, women may fulfil their ideal; but will they not also fulfil the warning of St. Paul and "learn to be idle, wandering about from house to house; and not only idle, but tatlers also and busybodies, speaking things which they ought not."

It is pertinent to enquire whether the solution of the housing question, most suited to our national traditions and character, does not lie in radial railways, that will enable us to keep touch with the town while spread over the country, rather than in a system of housing that will pack us, six or eight families deep, over so much land only as is comprised within the area of a concreted cellar.

The essence of the question is in reality the necessity of giving children an opportunity for outdoor life at home. Playing grounds are all very well as a remedy, but we should avoid the extremity that requires them. It has long been a subject of lamentation that the poor and the children of the poor should live and play on the street; it will be lamentable indeed if the children of the comparatively well to do are brought to the same condition. This extreme as well as the other is exemplified in New York, and should furnish a warning to aspiring cities. In New York, a long way up, in the Harlem neighborhood, the streets on which the residential flats are built are full of respectably dressed children; running about in the road among the horses, sitting on the dirty sidewalk, playing ball over the heads of the passers by. One receives an impression that they have just got out of school and are lingering before going home. The discovery that they have got home, that this is their home, gives a shock when it is first realized. All the streets in the neighborhood exhibit the same state of things. A little investigation

shows that it is unavoidable. A popular flat, only six storeys high, with a hundred feet of frontage; inhabited by marred people chiefly, clerks of some standing; a lawyer or so, a couple of doctors, and people of that sort; shows on its plan but scanty accommodation for children. Most of the apartments have one bedroom or two; none have more than three. Yet, when the rooms available for children are counted up, there appears without squeezing, and there must be a good deal of squeezing done in these apartments—possible room for fifty children. Across the road there is an apartment building of similar size, and others all along the street. This simply means that the children in that street might line both sides of the road; that, if they all played at home, the hundred running feet of street in front of the apartment building examined might have to suffice for the playground of a hundred children. It is not likely there are so many; but that is an evil on the other side, for there ought to be twice as many. It looked a miserable state of affairs. "Boys" John Boroughs says "live in a world that is inhabited entirely by boys;" but the boys in these streets must have another view of life thrust upon them, and perhaps this may have something to do with the elderliness of the American boy, about which his fellow countrymen sometimes complain.

There seems to be a tendency to hail the advent of apartment house building as a solution of every difficulty; but there is evidently something to be said on the other side. If they were regarded only as a final necessity; as something to be avoided as long as there is any other way of convenient housing; it would probably be nearer the truth, and we should turn our attention first to what is more really a development of our own times —the application of the means of rapid transit to enable men who work in the city to live in the country where land is cheap.

W. A. Langton.

FIREPROOF FLOOR CONSTRUCTION.

Mr. Frank Caws, F.R.I.B.A., recently gave an address on "Fireproof Floor Construction" before the Edinburgh Architectural Association. Referring to the modern use of Portland cement and iron in floor construction, Mr. Caws said that generally speaking the introduction of steel girders as supports for the concrete has been carried to a very unwise excess, inasmuch as the action of fire upon the steel, causing it to expand, made it most injurious to the concrete floors, and, instead of being a support, it proved in such cases the means of their destruction. Therefore, he advocated a method of constructing floors in large slabs of concrete, with a minimum amount of steel bearers, so disposed and protected from the fire as to give the necessary support without introducing an element of weakness. In this connection the results have been published of a test of two hours duration in October last by the British Fire Prevention Committee of a floor of fire supports and oak flooring. The floor was 22ft. 3in. by 10ft. in the clear, and consisted of two 10in. by 12in. beams of yellow fir placed across the testing-hut, with four 10 in. by 10 in. joists notched into them at 2 ft. 6 in. centres, oak boards 8½ in. wide and 2½ in. thick being spiked on top ; a 15 in. by 15 in. yellow fir post supported the floor in the centre. The floor was loaded with 232 lbs. to the square foot, distributed. In 4 minutes smoke issued from the joint between the parapet-wall and the oak flooring. In 89 minutes flame first came through the floor. In 109 minutes a small portion of the oak flooring fell. The post, beams and joists were considerably reduced in size and charred, the post to a depth of about 1¼ in. and the beams and joists about 2 in. The average temperature of the fire was about 1,400 degs. Fahr.

"SLIP-SHOD TENDERING."

To the Editor of the Canadian Architect and Builder :

Sir,—In reference to your April article "Slip-Shod Tendering," I wish to say that contractors are not alone to blame for this. They are often asked to submit tenders for work which is not clearly described by either drawings or specifications ; probably no lot grades are given and sewers and drains which must be connected with, are not located. In many cases several alternative figures are asked for different designs and finish. Now under these circumstances, a contractor must spend considerable time and perhaps money in preparing an intelligent estimate. If quantities were supplied him or compensation for tendering, as is done in some countries, the case would be quite different. As it is however he frequently finds that he has spent his time (which is the same as money to most contractors) for nothing, not even a chance for the job, which either does not go on at all or goes to a previously selected builder, estimates being asked for simply to set the price.

In my opinion these are some of the reasons why contractors are tempted to do so much guessing and why this will continue until such time as both architects and builders are organized to that extent that they can compel clients to pay a fair price for valuable information.

An architect should be competent to estimate to within 10 per cent. of the cost of most buildings ; close enough at least to enable his client to decide when and what to build. To call upon perhaps a dozen busy men to give their time gratis to help to decide these points is scarcely honest.

Yours truly,

A. C. C.

Vancouver, B. C., May 18, 1903.

A POSSIBLE SOLUTION OF THE SKY-SCRAPER QUESTION AS BEARING ON THE SUBJECT OF CITY HYGIENE.

To the Editor of the Canadian Architect and Builder.

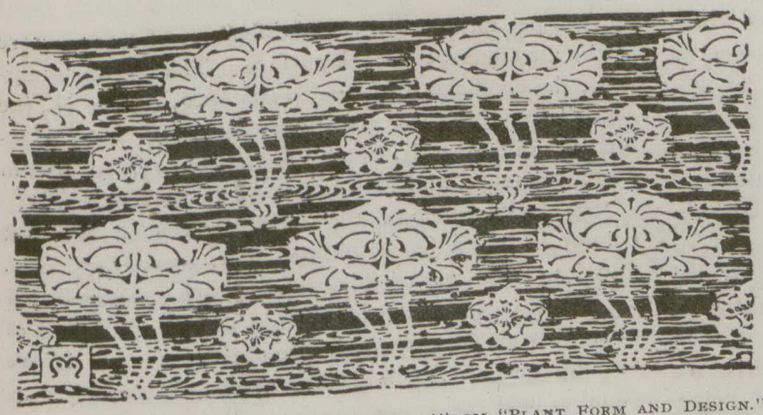
Sir,—Mr. Langton's pertinent treatment of the question of "High Buildings" in your last issue leads me to suggest a possible way out of the dilemma might be for Manhattan and other cities to legislate in a way to limit them to two out of every three of the buildings forming the line of the street tenements.

Two tall buildings could thus adjoin each other—the lots supposed to be some 25 to 30ft. frontage, more or less—leaving a space between for light and air. In this way each of the taller structures could have windows along one side or party wall of the building. This would form a not objectionable crenelated series of tenements ; the vertical protuberances starting from above the 5th, 6th or 7th story of the row of structures, according to width of street, as along the Paris boulevards, with a continuous cornice or entablature at that height.

Each proprietor of a high building adjoining the lower structure, should be bound to equalize advantages by making over to the proprietors of the low or stinted block, one-third of the net profits derivable from the upper stories of the higher structures after duly allowing for interest on net cost thereof, and other charges considered fair in the premises.

Chas. Baillairge, C. E., Quebec.

Professor Ramsey, in a lecture at Carpenters' Hall, London, said that it is a common practice to attempt to hasten the drying of new buildings by leaving the doors and flues open, but he thought it would be more rational to close these vents, and to use charcoal braziers in the closed rooms. The hot gaseous carbonic acid evolved from the burning charcoal would flow through the walls, and the carbonic acid would materially accelerate the conversion of the lime in the mortar into carbonate of lime ; the passage of the hot carbonic acid through the walls would not only dry out the water, but would increase materially he rate of conversion of the lime into carbonate of lime.



WATER-LILY STENCIL FOR WALL HANGING. (FROM "PLANT FORM AND DESIGN.")

BY THE WAY.

The latest specimen of "tinsel" architecture, of which alas! there are already too many examples, is reported from California. The builder of a frame house is said to have applied to the exterior while the paint was still wet, a rough-casting of sand and fine blown glass.

× × ×

The purchaser of a furnace sued the manufacturer to recover the price, alleging that the furnace would not perform the guaranteed duty. In proof that the furnace was a poor heater he cited the fact that while it was being run to its full capacity, a barrel of beer placed on top of it had frozen.

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A factory is to be established at St. Mary's, Ont., for the manufacture of Portland cement. The intention is to use in the process crushed limestone instead of marl. The promotors of the enterprise claim that by this means the cement can be produced more cheaply than by the method now employed.

× × ×

George Ley, whose luck at cards was proverbial, resolved to build his residence at Combe Martin, North Devon, England, in the form of a pack of cards, split up and erected castlewise. The idea was carried out thoroughly and the edifice equipped with fifty-two windows—one for each card—while its form necessitated a plethora of chimney stacks.

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The visitor to Washington is delighted with its clean streets, its extended boulevards, resembling those of Paris, and its magnificent public buildings, especially the Capitol, the Art Gallery and the Congressional Library. The latter with its beautiful mural decorations is alone worth many hundred miles of travel to see. The domestic architecture of Washington, with few exceptions, is however, the most commonplace of any that I have visited in the United States. We have been accustomed to believe that a few good examples of architecture placed about a city must tend to leaven the whole architectural lump. If that be true, Washington must be regarded as the exception which proves the rule.

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It is reported that Mr. Flavelle's handsome house in Queen's Park, Toronto, is likely to be purchased by the Ontario Government as a place of residence for the Lieutenant-Governors of the province. The house and its surroundings would seem to be well adapted to the purpose. If this change of location of the governor's residence be made, the City Council of Toronto should purchase for park purposes the present government house and grounds. The building, although somewhat out of date, appears to be in a fair state of preservation, and could be put to some public use, as for instance a museum. The grounds have been carefully kept, and contain some fine trees. They would give a pleasant breathing spot in the center of the city, the lack of which is becoming more acutely felt as population increases.

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Surgeon-Captain K. Tamura, of the Imperial Japanese Army, in a recent address to the military surgeons of the United States, called attention to the use of paper for windows in Japan, in place of glass. He referred to the fact that where no ventilation can take place through glass, the air passes through the paper quite freely. Moreover, the texture of the paper is such that, while admitting the air, it prevents in some degree the passage of germs through it. This point was determined by counting the number of colonies of bacteria developed on media inside and outside the house. It was thus found that 97 per cent. of the bacteria of the air were removed. The speaker summed up in the adroit Oriental way: "It is well known that a citizen of Paris inhales 7,500 bacteria germs in a day; one in Berlin, 5,000 of them. We Japanese, who live in air containing three times as many as Berlin and twice as many as Paris, inhale only 2,000 bacteria germs in a day, simply because we use paper for the windows of our homes."

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"Punch" in the following lines depicts the sorrows of the professional man who is regarded as being either too young to be trusted or too old to be efficient:—

Two men there dwelt upon a time
Within a certain city.
Both were distinctly men of parts
Well versed in their respective arts.

To fell diseases of the kind
That everyone who can shuns
One of the pair had turned his mind,
The other's forte was mansions.
They were, as you'd no doubt expect,
A doctor and an architect.

The latter, when but twenty-nine,
Planned a Titanic building,
A house of wonderful design,
All marble, stone and gilding,
Said he: "My fortune's made, I wis,
Men can't resist a thing like this."

With eager hope his heart beat high,
He took his plans up boldly,
And thrust them in the public eye:
The Public viewed them coldly.
"Pray take that rubbish right away,
You're far too young for us," said they.

The doctor's was a novel treatment for consumption, but the public sternly rejected it also—

Apparently you quite forget
That you are barely thirty yet.

The years rolled on,

And then—the Public changed their mood!
Their hearts began to soften.
They felt the doctor's cures were good
(They'd had that feeling often).
They also chanced to recollect
The merits of the architect.

"Come plan us mansions, bring us pills."
Their cry no answer rouses.
No one alleviates their ills,
No one designs them houses.
Upon enquiry it appears
Each has been dead for several years.

On April 26th the feast day of St. Mark, the Count of Turin, representing the King of Italy, laid the corner stone of the New Campanile at Venice in the presence of 30,000 spectators.

HEAT RESISTANCE OF BUILDING MATERIALS.

At the recent meeting of the American Society of Mechanical Engineers a paper was presented by Mr. William Kent proposing the use of the reciprocals of the values of heat conductivity of substances in order to facilitate the comparison of different combinations of the substances. As stated in the report of the convention, he makes the coefficient of heat resistance or heat insulating power of a substance equal to unity divided by the number of British thermal units transmitted in one hour by a slab 1 square foot in area and 1 inch thick per degree Fahrenheit of difference of temperature between the two faces of the slab, both surfaces being exposed to still air. In this way the total resistance of a combination can be indicated by the addition of the several resistance coefficients. The author points out, however, that while the coefficient is thus a constant quantity for a given substance, it can only be so considered when the differences in temperature of the air on the two sides of the slab are small—say, less than 100 degrees Fahrenheit. When the temperature range is great, experiments on heat transmission indicate that the quantity of heat transmitted varies not directly as the difference in temperature but as the square of that difference.

The question of the effect of surface resistance when the surface is in contact with air or with another body, the author treats as follows: "Authorities on the subject of heat transmission generally agree that the resistance to the passage of heat through a plate consists of three separate resistances; viz., the resistances of the two surfaces and the resistance of the body of the plate, which latter is proportional to the thickness of the plate. It is probable also that the resistance of the surface differs with the nature of the body or medium with which it is in contact. Thus a very rough surface on a metal plate would be likely to transfer more heat to adjacent air than a smooth surface would, since it has a greater area in actual contact with the air, while two rough surfaces of metal touching each other would transmit from one to the other less heat than two smooth surfaces."

He has computed the figures for heat resistance of several insulating substances from the figures of conducting power given in a table published by Mr. John E. Starr, in a paper on "Insulation for Cold Storage," published in "Ice and Refrigeration" for November, 1901. Mr. Starr's figures are given in terms of the British thermal units transmitted per square foot of surface per day per degree of difference of temperature of the air adjacent to each surface. The author's figures, the coefficients of heat resistance, given in the second column of the accompanying table, are calculated by dividing Mr. Starr's figures by 24, to obtain the hourly rate, and then taking their reciprocals.

"Analyzing some of the results given in the last column of the table, we observe that, comparing Nos. 2 and 3, 1 inch added thickness of pitch increased the coefficient 0.74; comparing Nos. 4 and 5, 1½ inches of mineral wool increased the coefficient 1.11. If we assume that the 1 inch of mineral wool in No. 4 was equal in heat resistance to the additional 1½ inches added in No. 5, or 1.11 reciprocal units, and substract this from 5.22, we get 4.11 as the resistance of two ⅞-inch boards and two sheets of paper. This would indicate that one ⅞-inch board and one sheet of paper give nearly twice as much resistance as 1 inch of mineral wool. In like manner any number of deductions may be drawn from the table, and some of them will be rather questionable, such as the comparison of No. 15 and No. 16, showing that 1 inch additional sheet cork increased the resistance given by four sheets 6.67 reciprocal units, or one-third the total resistance of No. 15. This result is extraordinary, and indicates that there must have been considerable differences of conditions during the two tests."

HEAT CONDUCTING AND RESISTING VALUES OF BUILDING MATERIALS.

Brick Wall: Thickness.	Cond.	Res.	—Revised.— Res.	Cond.
4-in.	0.68	1.47	1.50	0.667
8-in.	0.46	2.17	2.30	0.435
12-in.	0.32	3.03	3.10	0.323
16-in.	0.26	3.85	3.90	0.256
20-in.	0.23	4.55	4.70	0.213
24-in.	0.20	5.00	5.50	0.182
28-in.	0.174	5.75	6.30	0.159
32-in.	0.15	6.67	7.10	0.141
36-in.	0.129	7.75	7.90	0.127
40-in.	0.115	8.70	8.70	0.115

Wooden beam construction, planked over or ceiled:	Cond.	Res.
As flooring	0.083	12.05
As ceiling	0.104	9.71
Fireproof construction, floored over:		
As flooring	0.124	8.06
As ceiling	0.145	6.90
Single window	1.030	0.97
Single skylight	1.118	0.89
Double window	0.518	1.93
Double skylight	0.621	1.61
Door	0.414	2.42

The author has also calculated the coefficients of heat resistance from the heat transmission figures of various building materials, as given by Mr. Alfred R.

HEAT CONDUCTING AND RESISTING VALUES OF DIFFERENT INSULATING MATERIALS.

	Conductance.	Resistance.
1. ⅝-in. oak board, 1-in. lampblack, ⅞-in. pine board (ordinary family refrigerator)	5.7	4.21
2. ⅞-in. board, 1-in. pitch, ⅞-in. board	4.89	4.91
3. ⅞-in. board, 2-in. pitch, ⅞-in. board	4.25	5.65
4. ⅞-in. board, paper, 1-in. mineral wool, paper, ⅞-in. board	4.6	5.22
5. ⅞-in. board, paper, 2½-in. mineral wool, paper, ⅞-in. board	3.62	6.63
6. ⅞-in. board, paper, 2½-in. calcined pumice, ⅞-in. board	3.38	7.10
7. Same as above, when wet	3.90	6.15
8. ⅞-in. board, paper, 3-in. sheet cork, ⅞-in. board	2.10	11.43
9. Two ⅞-in. boards, paper, solid, no air space, paper, two ⅞-in. boards	4.28	5.61
10. Two ⅞-in. boards, paper, 1 air space, paper, two ⅞-in. boards	3.71	6.47
11. Two ⅞-in. boards, paper, 1-in. hair felt, paper, two ⅞-in. boards	3 32	7.23
12. Two ⅞-in. boards, paper, 8-in. mill shavings, paper, two ⅞-in. boards	1.35	17.78
13. The same, slightly moist	1.80	13.33
14. The same, damp	2.10	11.43
15. Two ⅞-in. boards, paper, 3-in. air, 4-in. sheet cork, paper, two ⅞-in. boards	1.20	20.00
16. Same, with 5-in. sheet cork	0.90	26.67
17. Same, with 4-in. granulated cork	1.70	14.12
18. Same, with 1-in. sheet cork	3 30	7.27
19. Four double ⅞-in. boards (8 boards), with paper bet. three 8-in. air spaces	2.70	8 89
20. Four ⅞-in. boards, with three quilts of ¼-in. hair bet. papers separating boards	2.52	9.52
21. ⅞-in. board, 6-in. patented silicated strawboard, finished inside with thin cement	2.48	9.68

Wolff, based on German experiments. These values are reproduced in a table herewith, the first column giving the conductance, in British thermal units per hour, and the second, the reciprocals, or heat resistances. It will be noted that there is an irregularity of the differences in the value of the resistance for each increase of 4 inches in thickness of brick walls, which the author holds to indicate a difference in the conditions of the experiments. He finds the average difference is 0.80 and that the approximate formula for the resistance is $0.70 + 0.20\ t$, in which t is the thickness in inches. In the third and fourth columns are given the revised values of the resistance and conductance, respectively ascertained in accordance with his formula. —Engineering Record.

NORTHWEST LETTER.

WINNIPEG, MAY 11, 1903

The open spring this year has been most favorable for building of all descriptions and has allowed the work to get under way considerably earlier than last year. Excavations, large and small, can be seen everywhere from the centre of the city to the outlying districts in the suburbs, and everything is activity in the building line. Some of the foundations of the smaller work have already approached the ground level and where the building is frame many are well covered in.

Before taking up the new work it would be in order to mention the two or three large works that were started last year and are now at the point of completion.

The Strathcona Apartment Block is the most noteworthy in this list. It is a building that will be welcomed by the great class who live in "Rooms". The population of Winnipeg has increased so during the past twelve months that house accomodation has become a most serious question and one that is already having an adverse effect on incoming residents and resulting in temporary detriment to the city. The opening of the Strathcona will therefore be heralded with delight by a host who at the present moment may be living more or less like sardines in a box. It will relieve the pressure in this direction to some small extent, but will not in any way settle the important question of housing. Winnipeg is a most favorable place for apartment buildings as the population for the most part is a very transient one and buildings of this description are ensured financially as being a most paying investment. To describe the Strathcona building is not a very serious undertaking as everything inside and outside has been carried out in the most simple manner. The building is constructed of the common gray brick, it is four stories in height with a high basement. On plan it is a square with a large centre court. From this court is arranged an entrance in each corner to the building proper which divides the whole into four separate parts. On the ground floor, first floor, and second floor each part is divided into two suites of from six to eight rooms with bath room accommodation for each suite. The finish of the main portion on ground and first floors is in oak and on the second floor maple. The top floor is reserved for bachelors' quarters and divided into separate and double rooms. What appears to be an omission especially in a building of this description is the lack of a passenger elevator, but in the planning of the work it may have been found undesirable. The use of metal ceilings throughout is a feature that strikes one as being most objectionable, and one that would not be tolerated in a very ordinary residence.

St. Mary's Academy is another building that was started last year and will be completed in the course of a couple of months. This building has apparently been designed with the object of getting the most accommodation for the least amount of money. Externally, the work is so extremely simple and the lines so hard that the general effect is most disappointing and a crudity in design pervades the whole work. Inside everything has of necessity been kept as simple as possible and even the Chapel, which in these Institutions is generally made a special feature is, from all appearances, being treated in keeping with the rest of the work. The tenders for this building were originally much in excess of the anticipated cost and consequently everything had to be reduced to the simplest form.

St. Stephen's Church, although not yet complete, will from present indications be one of the most interesting Churches in the City. It is faced with Tyndall stone thoughout and makes a very substantial looking block. The Sunday School forms part of the same building and the uninitiated on entering is much surprised at the small area of the body of the church. This of course may not have the same effect when the seats, etc., are arranged in position. The Church will be open for service in the course of a few weeks.

Of the new work already begun the Bank of British North America is the largest. This is to be a four-storey building, the ground floor space reserved for the Banking room and the upper floors as Offices. The front will be of Bedford stone with pilasters, cornice, pediment, etc., and when completed will rank among Winnipeg's finest buildings.

The Steele Apartment Block which has already part of the foundations in is to be a brick building of simple character and has been designed on strictly utilitarian lines.

Of the Warehouses in course of construction, and there is a great number, the Stobart building is the largest. The foundation walls are now being rapidly pushed.

The postponing of the C. P. R. improvements indefinitely, is most regrettable, and it is an action that touches the general welfare of the City. The suspension of operations on this work will affect the North end most directly and will cause building in this district to be put off until arrangements have been finally decided upon. The cause of the delay is due to a question of legal claims that will be instituted against the City by property owners in the vicinity of the proposed subway. As the amount of these expected claims is an unknown quantity and might with all reasonableness reach an extremely high figure, it appears to be a most important factor in the negotiations as to who shall be liable for all such claims that may be filed. As these improvements must be proceeded with in the near future it is to be hoped that a satisfactory understanding can be arrived at immediately and work begun.

A deputation from the Winnipeg Board of Trade left here some days ago for the purpose of interviewieg the Dominion Government on behalf of merchants and contractors of this city regarding the tardiness of the C. P. R. in their efforts to facilitate the shipping of goods and materials into the city. This subject cannot be placed before the Government in too trenchant terms as the prosperity of the West and especially of Winnipeg is dependent upon the speedy supply of materials from outside. If the C. P. R. officials are not at fault in this on the plea of increased traffic throughout the country the Government should take steps to devise some scheme that will insure the necessary movement of goods in this district. Building has already been stopped for several days on account of the lack of stone. The stone is quarried and in some cases loaded on the cars but the delay in the transporation of same to Winnipeg has caused valuable time to be lost by waiting.

The real estate boom here is now at its meridian, and city property is, from what I can learn, at a price it will not exceed for some time to come. Outlying districts have been surveyed and laid out, and a sufficient area has been plotted to satisfy the demands of an increasing population for the next decade. Prices asked for local farm lands are so high as to be almost prohibitive to buy even as house property. Winnipeg is flooded with a myriad of real estate agents. Every other office is occupied by a real estate man or has desk room for one, and each has his alluring list of lands for sale to proffer the would be purchaser. Practically half of Winnipeg is for sale by this horde of ephemeral land agents, who foist up the price at each transaction and through whom property in some cases attains a remarkably fictitious value.

I regret that I am not able to forward you for illustration the plans of the Carnegie public library. Two sets of drawings have already been figured on, but the cost in each case is much above the stipulated cost. The plans of the third successful competitor are now being tendered on, and until the figures are received it is impossible to say what will be the next steps taken to proceed with the work of building a library.

W. PERCY OVER.

The cement, which was used in the decoration of the baptistry at Florence, was composed of wax, lime and resin. It was very good for its purpose, for it kept sufficiently moist for five to eight hours, and could during that time be worked as wax, and then it became as hard as stone and did not shrink.—Sir W.B. Richmond.

JOTTINGS FROM AN ARCHITECT'S NOTEBOOK.

Plinths, string courses, cappings, and other running members worked in stone should be in as long lengths as possible to avoid a multiplicity of joints, which will assuredly take wet in when the pointing fails. Internal and external angles to all such dressings are worked solid, and not mitre jointed. When any horizontal member abuts against a vertical wall, the member should be worked solid on a block which is to be built into and form part of the wall surface. Projecting members in soft stone are sometimes weathered with 5-lb. sheet lead in short lengths, dressed closely down on the stone ; built at least 2in. into the horizontal joints along the inner edge, and projecting from ½in. to ¾in. over the most prominent member so protected. In using lead to protect stonework, it should be left free along one edge and end, for this material expands and contracts very perceptibly under the changes of temperature to which it is exposed in this climate ; for the same reason it should be used in as short and narrow pieces as possible. Portland cement and lime putty are ideal materials for pointing the joints of stonework, assuming that the latter does dot expand and contract when subjected to extremes of heat and cold. But as it is a well-ascertained fact that stone, like metal, increases in bulk with an increase of temperature, it follows that any material used for stopping a joint in stonework must be stretched and compressed alternately, which action will ultimately destroy the jointing material as a watertight seal where it is inelastic. Hence a perfect material for jointing stonework should be possessed of some amount of elasticity—say, like asphalt. An open joint ½in. wide will take in less water than one 1-16 in. wide, owing to the operation of a force called "capillarity." It is well known that if a piece of sugar is held in contact with water at one extremity, the fluid will rapidly pass into and moisten the whole lump. The same action may be observed by using a piece of ordinary mortar which has been thoroughly dried, especially if made with burnt ballast, or a piece of oven-dried sandy building brick. Where a stone or brick wall is damp on the inside, the bricks, stones, and mortar joints being perfect, the damp passes through the substance of these materials by capillary action. In a joint or crack where the adjoining surfaces are planes or irregular, and in contact at one or more edges or points, rain water will be taken up and held, or passed on to the inside by pressure from the outside. This peculiar action, due to what is sometimes called molecular attraction, another name apparently for capillarity, is observable in a closely slated roof, where a quantity of water is held after rain between the bed surface of one slate and the backs of those immediately underlying it. An open joint, where the surfaces are nowhere in contact, will be more weather proof than a close broken joint where the fissure is a mere crack. A window sill broken between the joints is generally the cause of a wet window back, and a sill damaged in this way should be wholly removed or repaired by cutting away the edges, and inserting a new block from 4 in. to 6 in. wide to the full width and depth of the sill. To attempt any repair of the cracked stonework by pointing with mortar, cement, or glazing putty is worse than useless. In this connection it is a question, when a wall is covered by a deep projecting cornice, whether it would not be advisable to set the stones on a sheet of lead, so that when the joints break, any water entering them may be caught and prevented from passing down through the wall. Sheet lead used in this way would perform the same office as a lead safe to a bath or w. c. apparatus; there is a difficulty, however, in the use of lead, especially in connection with lime or cement points, for the mortar may be converted into the carbonate (PbO, CO_2), in which case it would be quite useless. A stone gutter lying between the nave and aisle roofs of a sixteenth-century church was hollowed out 10 in. wide and 6 in. deep, the stones being from 16 in. to 18 in. long ; the hollow was lined with cast sheet lead, which weighed orginally about 12 lb. to the foot ; this lead lining leaked badly, and when removed it was found that more than half its thickness was converted into lead carbonate (white lead). Whether this was due to the presence of lime in the joints of the stonework or to rain-water, which was found between the lead and the stone gutter, it was not easy to determine, but the conversion of the metallic lead into the carbonate was no doubt commenced by pure rain water which in some way found an entrance to the joint between the lead and stonework. It is well known that clean metallic lead will, if dipped in rainwater exposed to the air, form a scale of what is probably lead hydrate, or hydrate and carbonate, a compound similar to ordinary pure commercial white lead. From the foregoing remarks it will be seen that the use of lead as a protective covering for structures may be advantageous in many cases, but it must be cautiously dealt with, allowing for free contraction and expansion, keeping it from contact with other metals in presence of moisture, and not exposing either surface to stagnant water in bulk, or merely a film which may be constantly evaporated and renewed. In many buildings it is a very common plan to let wrought-iron balusters directly into the ends of stone steps and landings. Where these are under cover, the oxidation of the ironwork does not take place so rapidly as when they are exposed ; but all the same, in course of time, from the water used in washing the steps, and hygrometric moisture, oxidation sets in, and the iron rails burst the ends off the stone steps. It therefore follows that iron stair balusters should not be leaded into stone steps, nor is there any reason why they should be, for the flange of a rolled-steel string fixed under the outer ends of the steps and landings will not only carry and strengthen the staircase, but the walls may be drilled to take iron brackets, which, in turn, will hold the iron balusters. By adopting this plan all the stonework rests in the walls at one end, and on steel girders on the other. A thrust against the balusters and rail does not try the cohesive strength of the stone steps, but is transmitted to the steel ring, and both steps and landings are supported in the best possible way to carry their own weight and the weight of any number of people that may suddenly be brought on them, and this latter is an important consideration in a public building. Solid steps set in masonry have usually a lap of about 1 in.—that is, the tread of one step underlies the riser of the next 1 in. Steps having the soffits or undersides exposed are rebated or splayed where the riser of one step rests on the step underlying it. Steps supported on a wall at one end are usually in not less than 4½ in. The underside of each step may be horizontal, or splayed to form what

is known as a "spandrel" step. In the first case the section of the step is a rectangle, in the latter a triangle.

Narrow staircases in church towers are worked circular in plan, a piece of the newel being worked in the end of each step; this newel is usually from 5in. to 6in. in diameter, and the whole staircase from 5ft. to 6ft. The steps may be rectangular in section or triangular. In such a staircase all the steps are worked to the same mould or template, and they are built in as the walls are raised. There is no ironwork needed in the construction of the stairs, as the steps are supported in the wall at one end, and on the newel at the other. The steps in each completed circle of a geometrical staircase should rise not less than 80in. which would give 6ft. headroom, and allow 8in. for the thickness of a step.—Building News.

WIRE-GLASS WINDOWS.

The subject for which I shall have the honour of asking your consideration will be "Wire-glass, the Fire Retardant," a building material which tends to reduce to the minimum the hazard of conflagration, and conduces to the elimination of some risks attending the lives of us humble fire-fighters. The range of possibilities in fire protection is too wide to speak of here, if I am to be favoured with your attention, and only a small portion of it can be engaged in during the short session. I shall endeavor to advance that which I believe to be the most important factor in the protection of buildings against conflagration, and I shall be amply rewarded if I enkindle in your minds an inclination to seek more information upon the subject than I am enabled to communicate.

It is manifest to all thoughtful minds that the phenomenal development of the real estate values in our cities has made the tall building a necessity, and this necessity has brought with it the need of adopting in building construction barriers to conflagration, and there are to-day buildings capable of enduring without structural injury fierce, long continued interior and exterior flames and the application of cold water upon their heated surfaces. Structurally a building of this class is admirable—the foundations are secure, the walls and roof fireproof, but openings in walls and roof are necessary to render it habitable. Obviously the vulnerable parts of a building are the openings in the walls and roof—its doors, windows and skylights. To these openings the spread of flame is almost wholly attributable. This has been the history of so many destructive conflagrations that experts have long agreed that no structure in a closely built city can be considered even approximately secure against fire so long as it is provided with only ordinary windows, skylights and doors. My experience and observation have been such as justify this opinion, and I have most strenuously maintained that the quantity of wood contained in what I have termed "a structurally fireproof building," taking into consideration also the furniture and fittings, would, in the event of fire, endanger the property and the lives contained within it.

Shutters of iron or of metal-covered wood may protect windows if they are carefully closed, but in practice such shutters fall short of the purpose for which they were intended. When the crisis comes the shutter is frequently found open. Under the most favourable conditions an iron shutter at a fire is not the thing that the firemen want to come in contact with. Its rusty fastenings and blistering sides are objectionable, to say the least, and its reach, when it swings open, is liable to knock a man off the ladder. This is a risk to which the fire-fighter should not be subjected. There is no braver, manlier or more faithful set of men in the public service or out of it than the brave lads enrolled in our fire departments. I know of whom I speak, and I am well acquainted with the chances they take. They are ready to fight with death every day. Every year sees them saving life heroically or dying in their duty. Their work is as trying, difficult and dangerous as there is in the world. Yet they are not safeguarded. I know what ready fellows they are, and I feel that all known means of protection should be adopted to render their calling less hazardous.

Wire-glass is, in my opinion, the fire-stop for window and skylight openings—wire-glass set in metal frames. It supplies the requisite light and ventilation as well as protection against fire; its installation obviates the necessity of the cumbersome and unsightly hinged shutters and the projecting lugs and adjusters which support and secure them. It affords protection regardless of the janitor's neglect, because the thought of fire is not necessarily present in the mind of the tenant to induce him to close the window-sash, and when closed it prevents the ingress, egress or communication of flame. It enables the fire chief to size the situation and direct his men intelligently. The location and volume of the blaze are immediately disclosed, and if the conditions warrant it the fireman can effect an opening for the stream with his fire-axe.

Hard conditions, great risks and the sacrifice of large property and many lives are preliminary to the establishment of standards, and by such means wire-glass has come to be recognized as standard, and the degree of honour which is its legitimate due should be generally recognized.

Succinctly stated, wire-glass has yielded two fixed values as its contribution to fireproof building construction:—

It retards fire without hiding it—permits the blaze to declare itself.

It can be cracked, but it cannot be scattered. If fractured it retains its place.

Now we have to remember what we cannot forget, and we are mindful, thereof, of experiences which enable us to fully appreciate the value first stated. Of the many embarrassments to which the fire-fighter is subject, that which prevents fire from disclosing its location in its incipient stage is the most serious. Within the congested districts of our great cities our organizations are such as enable us to reach the scene of action and have our nozzles in hand within two or three minutes of the alarm, and if we could immediately get at the fire we would, in most cases have little difficulty in confining the blaze within the limits of the apartment in which it originated.

Modern science has equipped our departments with devices necessary to combat fire, the most contagious, virulent and disastrous of all perils to which buildings are subjected, and modern science has devised the means by which fire can be confined within the walls of buildings without rendering the same inaccessible

*A paper by Edward F. Croker, chief of Fire Department, city of New York, read at the thirtieth annual convention of the International Association of Fire Engineers, New York.

to us, but the adoption of the means available is not general, and upon arriving at a fire we are frequently confronted with tin-covered and iron-clad shutters which obstruct our vision and our efforts to locate and conquer a blaze which becomes a conflagration, because of the precious moments lost in concentrating our energies upon the seat of trouble.

This condition has long been a serious menace in all cities, and it is now intolerable because the installation of wire-glass presents no technical difficulties. It is of acknowledged efficiency and no less economical than effective. It has withstood the severest tests, and its cost is well within the means of all building owners. The insurance companies give preferred rates when it is installed, and thus practically invest in it. Their scheme is to reduce hazards and in the belief that wire-glass effectually accomplishes this they induce its adoption by substantial endorsement. Its ability to abate horrors and loss which attend conflagrations in cities is ample justification of the reasonable laws providing for its adoption, and an exigent public duty is presented to building inspectors to prevent these laws being nullified by official inertia.

There is a region paved with good intentions, and many easy-going owners of buildings contribute to this paving fund by deferring the adoption of known means of protection and at the same time create occasion for regret from heavy financial loss and probable loss of life. I want to see the obligation placed upon owners of buildings to prevent such losses by the means which will effectually render fire non-communicative, and I think I have specified the means. The significance and overwhelming argument in favor of wire-glass as a fire-stop is the fact that when fractured it retains its place and continues to retard draught and its attending flames.

Doubtless many of the chiefs present have had occasion to recognize the efficiency of wire-glass as a fire-stop, and, of the many, Chief Musham's experience is especially worthy of reference. The fire which destroyed the Armour Lard Refinery, Union Stock Yards, Chicago, on the night of May 16, threatened for a time the entire district. Chief Musham was present, and he has stated that the wire-glass in the windows of the several walls prevented any communication through them and demonstrated the ability of wire-glass to prevent the spread of flame. The building destroyed was of recent construction, 100 feet by 400 feet, five storeys in height, and sub-divided into four sections by fire-walls, two of which were completely destroyed.

The quantity and nature of the material in combustion—refined lard—resulted in the hottest kind of a fire, and its intensity and duration are hardly comprehensible. The chief tells me that the flames reached to a height of 150 feet above the roof, and the combustion was so perfect that scarcely any sparks were observed.

I am quoting Chief Musham because I think perhaps his observation of wire-glass in this instance was under a better condition than can be conceived for an actual service-test of wire-glass. The entire interior of the building was of inflammable construction, made more so by being saturated with lard, and its five great floors were loaded with tons of this highly combustible product. Tanks containing thousands of gallons of rendering were exploded and their contents dashed against the walls and windows, and the intensity of the heat was so great that the walls holding the frames and sash which accommodated the glass crumbled, but until they fell the wire-glass retained its place.

This fire establishes conclusive proof of the efficiency of wire-glass as a fire-retardant and its staying qualities, and for the purpose of illustrating my subject I have considered it preferable to my own experience.

ARCHITECTS' ACCOUNTS.

General practitioners in medicine usually decline to give particulars of their charges, or even to state the number of times they have visited a patient. An Architect's account say the Builders Reporter, is presumed to offer less difficulty to those who wish to examine it, for it is taken to be at the most 5 per cent. on the outlay. When it is found that an account will not work out at that rate there is discontent. An example of the difficulty which people find in recognising any other basis was presented at some late meetings of the Guardians of Newton Union in Devonshire. New works were to be carried out in connection with the workhouse. For that purpose it was necessary to make plans of existing buildings, which were to be removed in order to furnish part of the site. Mr. Seger, the architect for that survey, claimed seven guineas. Some of the Guardians, including the chairman, declined to approve of the account, on the ground that the 5 per cent. commission was to include everything. The chairman repeatedly asserted that there should be only one charge, 5 per cent., and that he had never heard before of payment for plans of sites. However, the good sense of the majority prevailed, and the charge was admitted. It is hard that gentlemen holding administrative offices know so little of architectural practice as to imagine it is of so simple a nature that one charge can cover the vast variety of incidental work which may arise, and which the architect can no more be compelled to execute than to discharge the functions of a lawyer in connection with the building.

NOTES.

The death is announced of Prof. T. Roger Smith, for many years Professor of Architecture and Building Construction at University College, London. The late Prof. Smith was twice elected President of the London Architectural Association. He was also the author of a valuable work on acoustics.

France is about to start schools of architecture in the towns of Lille, Rouen, Nancy, Lyons, Bordeaux, Marseilles, and Toulouse. The course of study will last seven years, diplomas will be given, and the professors, from twelve to fourteen in number, according to the schools, will be elected by the Conseil Superieur des Beaux-Arts.

At a recent architectural conference in England, the ethics of the profession were made the subject of a paper and a discussion, but nothing practical followed. What is necessary in the interests of the profession says the Building News, is that fundamental points or questions should be settled once for all; such questions, for instance, as touting, interference with brother architects' work, calling on other architects' clients, inclosing testimonials to clients and members of committees, to competition promotors, accepting any work that would compromise any professional brother's position, giving evidence in courts of law prejudicial to architects, &c. These and other matters, if once decided upon in a representative conference of the profession, and the conclusions issued in a code to every practising architect, might be the means of uniting the profession; but it may be asked whether architects can ever agree on any subject of this nature?

ARCHITECTURAL EDUCATION IN GERMANY.

The usual requirements for admission to a German technical high school is a certificate showing that the student has completed his course in a "gymnasium" and has passed the graduating examination. This admits the holder to any university in the country. Foreigners are admitted if they can show that they have pursued a course of study in their own country approximately equivalent to that of a "gymnasium," but they are not allowed to take the Government examinations.

Anyone who wishes to take up some course or separate subject at the Hochschule, but is not able to fulfil the requirements for admission as a student, may be admitted as a Hospitant, or guest, simply attending the lectures, but not receiving any diploma at the end of his course.

The course occupies four years, and leads, for those who wish to enter the Government service, to the title of Baufuhrer, or "Director of Building," and, since October, 1899, also to the degree of "Doctor of Engineering." Those who do not enter the service of the Government, but have successfully completed their four years' course, receive a diploma to that effect.

The first two years are devoted almost entirely to theoretical subjects, or, at any rate, to subjects which do not pertain directly to architecture, but which it is well for an architect to know something about.

The subjects taught during each term are as follows :—

Winter Term : First Year.—This the first term of the first year (from the middle of October to the middle of April) :—

Differential and Integral Calculus. —(5 hours' lecture : 1 hour's recitation.)

Analytical Geometry.—(2 hours' lecture.)

Descriptive Geometry.—(3 hours' lecture : 6 hours' drawing.)

Mechanics.—(3½ hours' lecture : ½ hours, recitation.)

Construction (Masonry and Carpentry).—(3 hours' lecture : 4 hours drawing.)

Architectural Drawing.—(3 nours.) Instruction here consists of copying architectural subjects in different mediums—pencil, charcoal, pen and brush, so as to become familiar with the handling of different materials.

Elements of Mineralogy.—(2 hours' lecture : 1 hour's recitation.)

Experimental Physics.—Mechanics, heat, acoustics and optics. (4 hours' lecture.)

The Summer Term is shorter than the first, lasting from the middle of April to the end of July. During this time, in the first year, the following curriculum is prescribed :—

Differential and Integral Calculus.—(3 hours' lecture : 1 hours' recitation.)

Descriptive Geometry.—(3 hours' lecture : 6 hours' drawing.)

Mechanics.—(7 hours' lecture : 1 hours' recitation.

Construction.—Foundations ; walls and supports of wood, stone and iron ; stairs and elevators of stone, wood and iron. (2 hours' lecture: 4 hours' drawing.)

Architectural Drawing.—(6 hours.) Devoted to the same subjects as during the winter term.

Elements of Geology.—(4 hours' lecture.)

Elements of Chemistry.—(6 hours' lecture.)

There is no summer work prescribed, and, therefore, none done. The drawing rooms are left open for the convenience of the students who have back work to make up. There are usually plenty of them.

During the Easter and Whitsuntide vacations, excursions (headed by some of the professors) are undertaken, places of special architectural interest being selected. These expeditions usually last about ten days.

The winter's work in the second year consists of 51 hours a week : 26 devoted to lectures and the other 25 to recitations and drawing. During this year the student gets to know a little more about architecture itself, but most of the subjects are still very theoretical and rather auxiliaries of architecture than architecture itself.

Here is the list of subjects taught during seccond year.

Mechanics of Elasticity.—(5 hours' lecture ; 1 hour's recitation.)

Graphical Statics.—(1 hour's lecture.)

Study of the Forms and History of Ancient Architecture.—(3 hours' lecture : 6 hours' drawing.) This course also includes a careful and detailed study of the Orders, the copying of the best examples of ancient architecture, and one large and carefully executed design in either the Greek or Roman style.

Ancient Ornament.—(2 hours' lecture : 2 hours' drawing.

History of Ancient Art.—(3 hours' lecture.)

Construction.—(2 hours' lecture : 4 hours' drawing.

Architectural Building.—(1 hour's lecture.)

Modelling.—(4 hours).

Figure-Drawing from Casts.—(6 hours.)

Elements of Civil Engineering.--(3 hours' lecture.)

Elements of Surveying.—(2 hours' lecture.)

Technology of Building.—(3 hours' lecture.) By this is meant instruction in the manufacture of bricks, plate-glass, mining, casting of metals, and so on, the lecture being illustrated by the inspection of factories and plants in operation.

The summer term has 49 hours a week, of which 25 are taken up by lectures and 24 by exercises. The subjects are almost identical with those of the winter session. The lectures on the "History of Ancient Architecture" are replaced by others on "Romanesque Architecture"; likewise those on "Ancient Art" by others on the "Art of the Middle Ages." However, the drawing and designing of the course in ancient architecture is kept up. With the third year the real architectural work begins. All the preparatory work is accomplished, and now the students are first acquainted with the various styles of architecture and with the principles of design.

A few large problems are very carefully worked out, with a couple of smaller ones interspersed. The styles in which these designs are to be carried out are usually prescribed, the idea being to make the student thoroughly familiar with the forms and ornaments of all the historic styles. Having thus become conversant with the historical development of each style, and having tested its applicability to practical design, he may then accept, modify or ignore them in his later work, as he may see fit.

This system of studying each style separately from the design point of view is carried so far in Germany that, for their Gothic and Romanesque year, many students will visit a Hochschule where some professor who has made these styles his specialty has charge of the course, and for their Renaissance year will go to some other Hochschule where a master of that style holds his lectures.

The programme for the winter of the third year is as follows :

Planning of Dwellings and Public Buildings.—(2 hours lecture.)

History of Renaissance Architecture.—(2 hours lecture.)

Designing and Detailing of Dwellings.—(1 hours lecture ; 5 hours drawing). Besides instruction in the designing of dwellings, this course includes the making of working drawings and full-sized details.

Mediæval Ornament.—(2 hours' lecture: 2 hours' drawing.)

Designing in the Early Christian and Romanesque Styles.—(3 hours' drawing.) This includes sketching and careful working-out of a problem from a given programme, also the making of perspectives from drawings and also from nature.

History of Gothic Architecture.—(3 hours' lecture.)

History of Renaissance and Modern Art.—(3 hours' lecture.)

Arrangement and Planning of Buildings. — (2 hours' lecture: 3 hours' drawing.) This course considers the treatment of buildings of every class.

Landscape-drawing and Water-colouring. — (2 hours' drawing.)

Life Class.—(6 hours' drawing)

The only difference between the winter and summer terms is that during the winter the course of lectures on machinery takes the place of the 2 hours a week devoted to landscape-drawing and water-colouring.

Of the 35 hours a week of the fourth year's winter term 24 are devoted to design, so that the absence of design from the first two years of the course is made good to a certain extent in the last year. During this last year the following subjects are taken up:—

Renaissance Design.—(6 hours' drawing.)

Monumental Buildings and Laying-out of Cities. —(1 hours' lecture: 4 hours' drawing.) In connection with this course a series of 5-hour sketch-problems is given out, subjected later to a comparative criticism.

History of the Useful and Decorative Arts.—(2 hours' lecture.)

Interiors with Coloured Decorations.—(5 hours' drawing.)

Designing of Public Buildings in the Styles of the Middle Ages.—(2 hours' lecture: 9 hours' drawing.)

Lighting, Heating and Ventilation.—(3 hours' lecture.)

Elements of Engine-building.—(3 hours' lecture.)

The student who has successfully completed this course is deemed ripe to begin his existence as an architect. To those who have passed the Government examinations, position and a future are assured. This brings one to the subject of examinations.

At the end of every term each student may take an examination in any subject in which he has registered. This is, however, entirely optional on the part of the students, and, as a rule, but few avail themselves of this privilege. For the students of architecture are no more prone than others to go to the trouble of preparing for an examination which is not obligatory and is not required for graduation. The real object of these examinations is to give those students who, for some reason, do not intend to take the regular prescribed examinations a chance to find out how much or how little they have learned during the term.

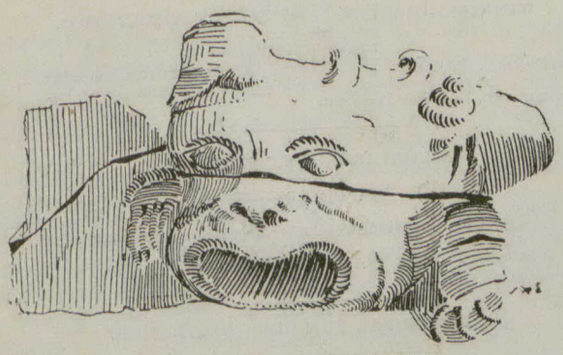
There are two distinct types of examinations, one the Staatsprufung, or Government examination, the other the Diplomprufung, or diploma examination. The subjects required are the same in both cases. The only difference between the two, as far as the examination itself is concerned, is that the one is held by an Examination Board appointed directly by the German Government, whereas the other is conducted by officers of the school. Whoever successfully passes the Government examination receives the title of Regierungs-baufuhrer, or "Government Director of Building," and can enter the Government service if he so wishes. As we have already seen, only those who have completed a nine years' course at a German gymnasium are entitled to take this examination. Naturally, all students who have fulfilled these requirements take the Government examination in preference to the other, if only for the sake of the title, even though they do not intend to enter the Government service. There are many of this class. For although the Government service offers a sure berth and a regular salary, and also a pension after retirement, the conditions are so unfavourable that but few are willing to undertake it.

The young Baufuhrer has to give the first year or year and a half of his services to the Government without receiving any remuneration whatever. Before becoming a Baumeister, the next rung of the Government ladder, an exceedingly difficult examination requiring a full year of preparation must be passed. The Baumeister receives a fairly good salary, and most who have reached this stage stick there till they are middle-aged men, when, if they are fortunate, they may be appointed Baurath. In spite of the fact that these unfavorable conditions have led to a great scarcity of Government architects, the German Government has till now refused to improve them, but will surely be forced to do so. Under existing circumstances, only those men who have not enough confidence in their own ability to hope for success in their battle with the world are apt to enter the Government service. This naturally leads to a deterioration of the work done for the Government and a change is sure to be made, and made soon.

The student who passes the other examination receives a diploma from the Hochschule to that effect. The purpose of these diplomas is to give the students who cannot take the Government examination an opportunity of proving that they have successfully completed the entire course in their special subject. The same subjects are required for the Government and diploma examinations.

A thesis design, for which two months are allowed, is required. Admission to the Final Examination depends on the acceptance or rejection of this design.

Most of these examinations are oral. In the mathematical subjects they are partly written, partly oral. Naturally, drawing plays a large part in them. The examination in each subject lasts either an hour or an hour and a half, and, usually, three students are examined at a time.



GARGOYLE, CORHAMPTON CHURCH.

PROPOSED TECHNICAL INSTITUTE FOR MONTREAL.

The Committee representing the educational institutions and various public bodies in Montreal appointed to enquire into the question of the establishment of a Technical Institute in that city has presented the following report:—

"Your Committee is of opinion that the time is ripe for the establishment in this city of a technical institute suitable to the needs of the people. Should the citizens be in earnest in the desire, which has been so frequently and widely expressed, for such provision as will enable the boys and girls, the young men and women, to have better facilities for securing an education along the lines indicated in the report submitted by the delegation which visited the States, your Committee has no hesitation in saying that such an institute could be erected, equipped and placed in working order, in a satisfactory manner without delay.

Such an institute should be built in sections, commencing with the departments for which there seems to be the most pressing need. In every case these sections should be built with a view of future extension. The work could then proceed so as to allow of expansion as funds become available.

Sec. 1. It is further recommended: That courses of instruction in mathematics, English, French, science, the elementary principles of mechanical and electrical engineering, and in mechanical drawing, etc., be commenced in September next.

Sec. 2. That as soon as practicable, steps be taken for the erection of a section devoted especially to technology, and of the general dimensions and character indicated in the accompanying rough sketches.

On the ground floor is located offices and a machine shop.

On the second floor is placed the wood-working shop, together with a suitable lecture room and other offices.

The third floor is sub-divided into laboratories for wood-carving, art metal work, etc.

The whole of the fourth floor is set aside for descriptive geometry and mechanical drawing.

In recommending a building of this type, for immediate erection your Committee is influenced by the fact that there is evidently a very wide demand for such courses of instruction as would then be possible. As a proof of this it may be stated that considerably more than $100,000 per annum is being paid to correspondence schools in the United States by mechanics in this city desirous of obtaining instruction in the elements of mechanical engineering, etc.

Sec. 3. The second main section of the institute, which your Committee considers of great importance, should be devoted to applied art and design and to domestic science. These branches could be provided for in a building of the same general dimensions as that devoted to technology.

The fourth floor of such building might be devoted to the domestic science department, including biology, the study of foods, cooking, dressmaking, millinery, needlework, art needlework and embroidery, together with the necessary lecture rooms.

On the third floor provision may be made for the freehand drawing, drawing from the model, modelling in clay, and drawing from life.

On the second floor provision may be made for applied art and design in its various branches, including drawing from the life, painting in water colors and in oils, the design and painting of fabrics, wall papers, book engravings, posters, etc., and all different kinds of art work.

On the ground floor are placed the administrative offices of the whole building, also a museum, library, etc.

Your Committee is of opinion that there is an increasing demand for instruction in art and design, and also in domestic science. This is proven by the fact that large numbers of young people of Montreal are obliged to leave the city to obtain the instruction in question, while the demand for classes in domestic science is far greater than can be met by present arrangements.

Again, as has been already pointed out, the great success of the Philadelphia Textile school has been largely due to the fact that it has been worked in connection with a school of art and applied design. Your Committee, therefore, considers that it is of the highest importance to all interested in textile industries, to note that in the proposed department of applied design they will have the fundamental provision which is so necessary to the complete success of textile work. Your Committee would suggest that the textile department be erected, with a school of art and applied design, as shown on sketch. The general equipment and arrangement of these must be decided upon by authorities on textile work, of whom we have many able expositors on our Committees.

TRADE DEPARTMENTS.

Sec. 4. Next in order, and, in the opinion of your Committee, of great importance, is the proper establishment of suitable departments for the various trades, carpentry, plumbing, bricklaying, stone cutting, galvanized iron work, blacksmithing, fresco work, house painting, wiring, etc. There is undoubtedly a very large demand for courses of instruction in these departments, and this work should be commenced as soon as possible.

Your Committee is of opinion that steps should be immediately taken to provide, by correspondence, such courses of instruction as may meet the demand of those in this country who are too far from the city to take advantage of the special courses to be provided in the proposed technical institute.

Your Committee recommends that other departments be added from time to time as the demand may justify.

Your Committee would conclude this report by expressing the opinion that all students of the Institute should be required to pay fees. It is recommended that the fees for the evening classes be much less than for the day classes, and that the charges for the former be moderate. All the investigations of the Committee go to show that the best results have been obtained in those Institutes where fees are levied, as the students themselves prefer the feeling of independence which they naturally possess with the knowledge that they are paying for the instruction they obtain."

FOLDING.

We have the folding bed,
The folding bath-tub, too,
And folding chairs, its said,
Are nothing very new.

Some hat-racks shut up tight
In most ingenious way;
A couch for use by night,
A Sofa by day.

The folding table's found
Wherever man may roam,
And folding doors abound
In every modern home.

But one thing now we need,
And soon we will have that,
For in brief time, indeed,
There'll be a folding flat.

The Department of Buildings at New York has been conducting a series of tests to discover leakage of illuminating gas in many of the prominent theatres and hote's and Dr. Lloyd, of that city, has been making similar tests in dwelling-houses. The latter experiments had reference to the condition of certain patients who exhibited symptoms bearing close resemblance to those noted in typhoid or malaria, without manifesting the usual stigma of those diseases. As a result Dr. Lloyd found present in the rooms of these patients sufficient quantities of carbon monoxide, one of the constituents of illuminating gas and of sewer gas, to account for the symptoms noted. The device used to ascertain the presence of gas when it could not be detected by the sense of smell was one which brought the air supposed to be contaminated with gas into contact with a strip of paper sensitized. When the gas is present this becomes discoloured, and the depth of discolouration, ranging from rose pink to black, indicates approximately the percentage of gas in the air.

—THE—

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NOTE.

Mr. Vincent Groom, of Llanrug, Wales, is said to have solved the problem of the disposal of the refuse of slate quarries by perfecting a process by which, it is claimed, the waste can be made into solid blocks, capable of taking a highly-glazed surface in any number of colours. It is claimed that the new substance thus produced will stand a pressure of 100 tons to the inch—more than any natural stone—that it will be lighter in weight, and can be placed on the market at a cheaper rate than ordinary tiles.

NOTES.

A writer who has demonstrated the fact says that 3 pecks of lime and 4 bushels of sand are required to each perch of 22 cubic feet of masonry when built in a wall.

The belfry of the fine old cathedral at Chartres has been found to be in a defective condition. By the winds of centuries and the vibration of the bells the masonry has become dangerously insecure. Repairs are to be promptly made.

In connection with a recent discussion before the Boston Society of Civil Engineers on Foundations Mr. E. W. Howe mentioned a novel method of driving inclined piles in foundations for the Atlantic Avenue bridge by the aid of a steel case 13 inches square and 39 feet long placed at the desired inclination. With this apparatus 95 piles were driven in 10 hours. Mr. R. A. Hale mentioned a chimney 225 feet in height imposing a load of 2,250 tons on an area of 1,225 square feet, the foundation being sharp river sand 19 feet below the surface of the ground, into which piles had been driven to a depth of 5 feet; allowing for wind the extreme pressure is 2.4 tons per square foot and no settlement has occurred.

The United States Fidelity and Guaranty Company, one of the largest, strongest and most favorably known surety companies on this continent with a cash capital and surplus of over three million dollars have established their Canadian head office in Toronto at 6 Colborne st. The joint managers are Mr. Arthur E. Kirkpatrick, one of Toronto's most enterprising young business men, and Mr. J. A. Kennard, late of Baltimore, a lawyer of experience and ability. The bonds of this Company are accepted by the Canadian Governments, municipalities and by railroads and corporations in all cases where a bond guaranteeing the specific performance of a contract is required. They are prepared to furnish bonds at once up to any amount.

It has always been a wonder to us why architects should be so fond of the blocked column, for to our mind it is an ugly feature. It has neither the solidity of the pier nor the grace of the column, and always produces a lumpy effect. The lines of the column are quite spoiled by the clumsy-looking blocks, strung like so many chunks on a rod. We can call to mind a score of buildings which are marred by this feature. Without doubt it has been used by architects of great eminence, but that does not change its inherent defects. And not only is it ugly, but the additional cost of the stone is considerable. We should like to see it altogether abandoned, and, in place, either a solid-looking pier or a column with its graceful lines uninterrupted from base to cap. But we fear the blocked column is being increasingly used rather than set aside, probably more for ill-considered fashion than deliberate choice. Ill-considered fashion is not a thing to foster.—Building News.

O. A. A. EXAMINATIONS.

The Examinations of the Ontario Association of Architects were held in April. The following were the successful candidates:

1st Examination.—Messrs. W. F. Sparling, L. C. Montizambert and Edwin Menger.

2nd Examination.—Mr. J. A. Mackenzie.

PAINTERS' AND DECORATORS' CONVENTION IN TORONTO.

At the Ninteenth Annual Convention of the National Association of Master House Painters and Decorators of the United States and Canada, held in Richmond, Va., in Eebruary last, a cordial invitation was given the Association by Messrs. Jas. J.O'Hearn and Stewart N. Hughes, President and Secretary of the Toronto Association, to hold its convention of 1904 in Canada's Queen City. The invitation was backed by a letter from the Mayor of Toronto, and was accepted. Mr. Hughes was elected a member of the Executive Committee.

TESTS OF MATERIALS.

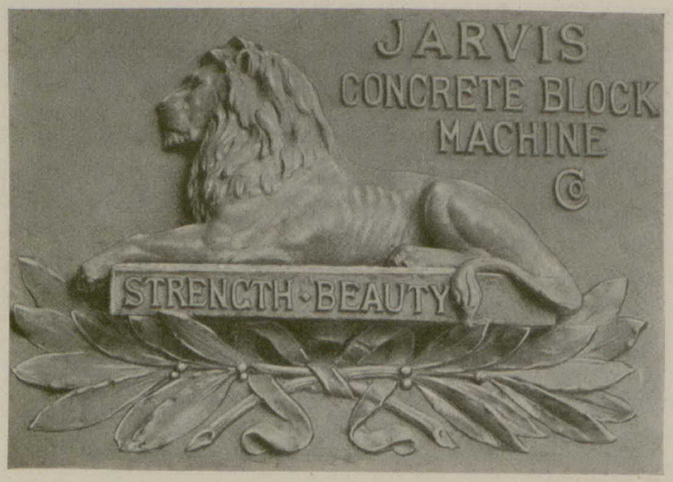
The care exercised in Germany to demonstrate the qualities of materials employed in construction, is illustrated by a recently published report of the operations of the Imperial testing station at Charlottenburg. During the year in question 32,580 tests were made, against 31,982 tests in the preceding year. Some of these were carried out at the request of foreigners. Of the 1901 tests 20,391 were of binding material; 12,189 of various kinds of stone. Armed cement was especially dealt with. But many tests were made with trass-lime mortar. There was a considerable increase in the number of samples of lime sandstone, showing that this is coming into use. Another notable feature of the tests was the number of samples of jointless flooring in imitation of linoleum and woodword. For this purpose for the first time the sandblast has been employed in producing patterns on these materials. A committee appointed by the Minister of Public Works and for Trade and Commerce was charged with the testing of gypsum; samples are being obtained from abroad as well as at home.

FIXING TILES.

The general custom nowadays, says the Builders' Record, seems to be to use copper nails for fixing tiles or stone slates, that is, in work where some little pretention is made to doing the thing well. Of course a speculative builder uses the cheapest thing he can get hold of so long as it lasts long enough for him to sell the house, and he may use iron nails unprotected or perhaps coated with tar. If he adopts galvanized iron nails he no doubt considers he is doing the thing handsomely. But let the conscientious architect avoid being misled into them by the persuasive builder. Zinc or composition nails are better—but not good enough. Wooden pegs seem to have gone out, but they were fully as good as iron nails. In some ancient buildings the tiles were fixed with splinters of bone, and excellent they were for the purpose. And now another instance has recently been offered by a writer in the daily press of an old building at Mansfield which was a good many years ago roofed with stone slates fastened with hundreds of the prongs or tynes of the antlers of deer. They were pegged into holes pierced in the slabs —two to each slate—in the ordinary way. Their use was evidently traceable to the ancient builder's desire for quaintness. It is these little tricks and fancies of the old workmen which more often than not give the quaintness and charm to old country houses so much admired by all our architectural students. All the striving after effect so characteristic of to-day does not make up for the interest we derive from the evidences of the loving hand and thoughtfulness and resource of the craftsmen of old.

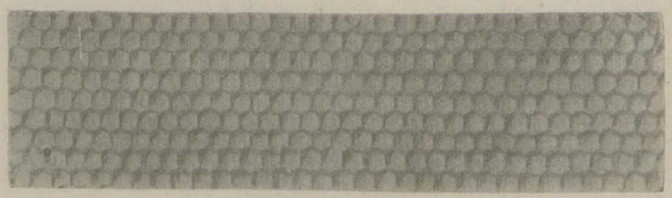
Cassidy—Oi want a wreath av flowers, an' put on it, "He rests in pieces." Florist—Don't you mean "He rests in peace?" Cassidy—Oi mane phwat Oi sed. 'Tis fur Casey, thot was blowed up in the quarry.—"Tit-Bits."

Jarvis Concrete Block Machine Company

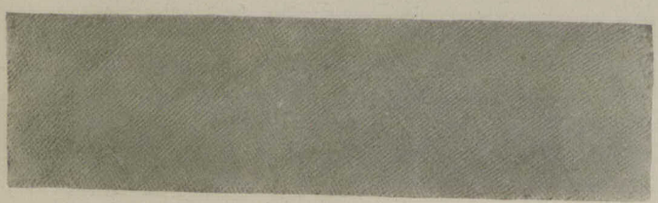


McKinnon Building Toronto Canada

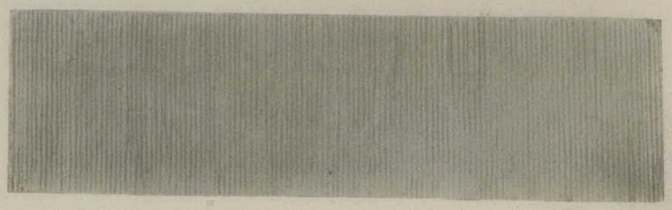
ROCK FACE BLOCK [Patent Pending.]



DUCK BILL TOOLING [Patent Pending.]



CROSS TOOTH CHISELED [Patent Pending.]



TOOLED FACE BLOCK [Patent Pending.]

These are facings that the Jarvis Machine will cast, besides three other rock faces not shown here.

This is the Concrete Era. Concrete made of Portland Cement, sand &c., is fast superseding natural stone, as well as brick and steel for buildings, and all kinds of constructions, such as bridges, dams and foundations of every description.

In view of the foregoing facts a Company has been formed for the purpose of manufacturing machines of all descriptions, for the making of concrete constructions.

This Company has acquired from Beaumont Jarvis, Architect, of Toronto, Canada, several of his inventions and patents, relating to machines for forming concrete walls, and concrete facing stones for buildings.

The science and art of manufacturing concrete building stones has advanced with leaps and bounds, so that with any of our machines in one simple operation, durability, beauty, economy, and sanitation together with insulation from heat, cold, damp, or sound, is absolutely effected since a hollow wall is perfect proof against heat or cold, and concrete is stronger than brick and more durable than most natural stones; any prominent Engineer will verify that.

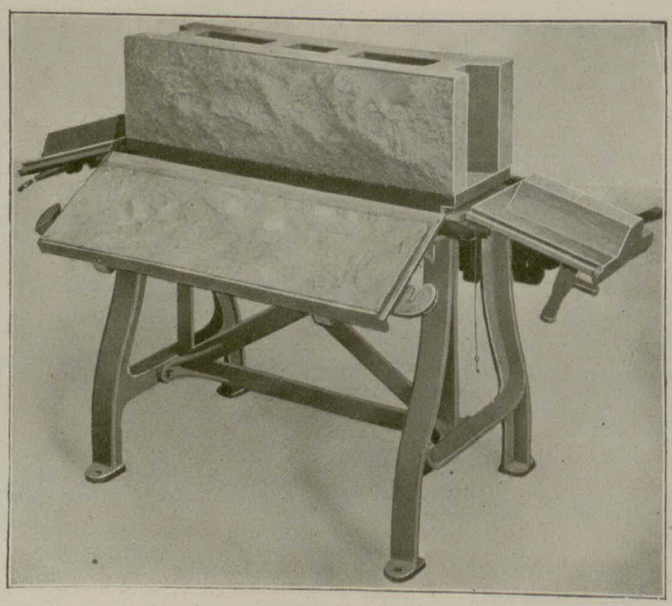
For a few hundred dollars any one may equip a plant with these machines which will absolutely dispense with the manufacture of brick buildings, having the appearance of natural stone, at about the same cost as brick.

One block has the same cubic capacity as about forty bricks, so that it must necessarily cost so much less for the laying of our hollow blocks per cubic foot than tor brick. Then again, the walls being hollow, the building must necessarily be lighter and stronger because concrete is stronger than brick and the hollow space makes the wall lighter than a solid wall.

We have in our employ an architect, engineer and artist. Without these no artificial stone or concrete stone company can have any great success and those who buy our machines will have full instructions, and the benefit of their knowledge as to manipulation. We also employ none but the very best machinists and foundry men, and skilled mechanics in every branch.

For fifty years concrete stone has been used in England for the facing of many important buildings and stands to-day, without any apparent weathering.

At the present time in France many important buildings have been faced with concrete stone and also many cities throughout the United States and Canada.



JARVIS MACHINE SHOWING MOULDED HOLLOW BLOCK
[Patent Pending.]

This hollow block is a registered design, and was invented by a practical architect, Mr. Beaumont Jarvis, of Toronto, Can. The object of this invention is to make a stone facing to a wall, having a hollow space, which is a non-conductor of heat, cold, or sound. The advantage of the hollow cement blocks made by the Jarvis Concrete Block machine, as compared to other blocks is in the fact that it only requires one half the time and labor to manipulate the machines than any other on the market. The new machine is more simple, and one half the expense of any other.

We supply with each machine six plates, so that the stone cast by the Jarvis Concrete Block Machine may have any tooling or rock face that may be required, the same as the natural stone. The size of the stone is 5" x 8½" x 2' 6", or in case of hollow blocks the size is 8½"x10"x30". Three men doing their own mixing without any other machinery, can make from 100 to 150 blocks per day, which is equal to 250 to 350 feet.

The above block is a registered design, and any one infringing on this will be prosecuted, and a reward will be given to anyone for information that will lead to the conviction of any person or persons infringing on the said invention.

These blocks can be manufactured at about 11 cents per foot, and sills and heads should not necessarily cost any more.

Most natural stone costs from sixty-five to eighty-five cents per foot. Is it any wonder these blocks are bounding into popular favor?

The Jarvis Concrete Block Machine Company is also prepared to undertake all kinds of concrete construction such as dams, bridges, and foundations of all descriptions.

The Portland Cement industry throughout the world is developing to stupendous proportions and has superseded natural stone in addition to wood and steel.

A properly made concrete stone should have all the appearance of natural stone, and every engineer is aware that concrete is everlasting.

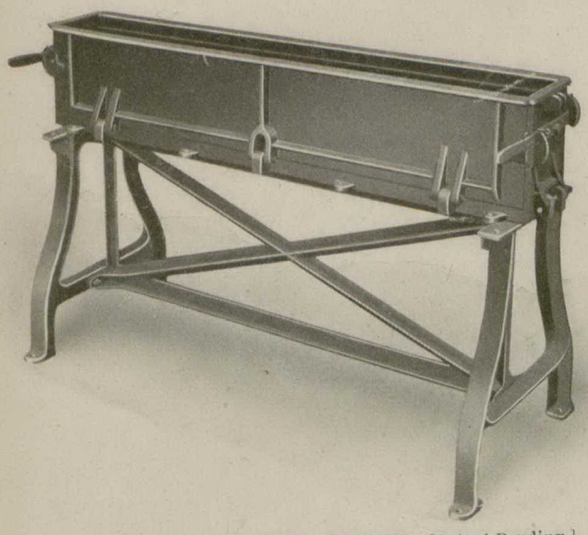
The Pantheon, at Rome, has a concrete dome of 142 ft. in diameter and has weathered the storms and other destructive influences for nearly two thousand years and is to-day, apparently, in as good a condition as the day it was built.

In England, where natural stone was used for facing and concrete for the backing, the natural stone has crumbled away and the concrete backing, which was intended to play the secondary part is better than ever.

JARVIS CONCRETE BLOCK MACHINE COMPANY - McKINNON BUILDING, TORONTO, CANADA

Jarvis Concrete Block Machine

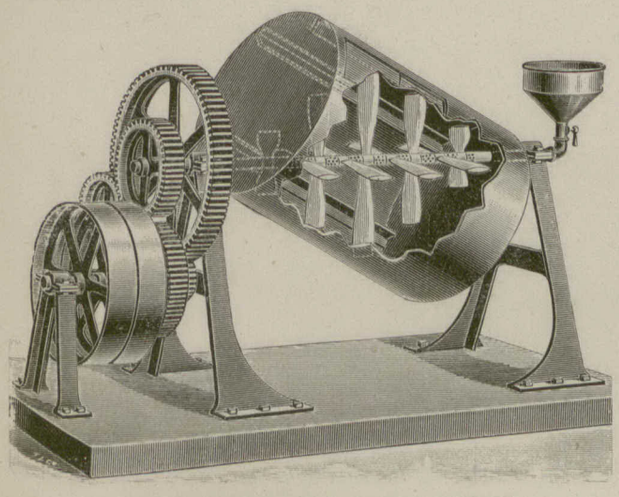
PATENT APPLIED FOR



JARVIS SILL MACHINE READY FOR USE. [Patent Pending.]

MACHINE OPENED SHOWING CAST WINDOW SILL [Patent Pending.]

JARVIS SILL MACHINE OPEN [Patent Pending.]



JARVIS CONCRETE MIXER. [Patent Pending.]

Concrete Mixer

This is the best Concrete mixer known. Each revolution without the aid of the blades inside will turn over the mix four times in the opposite direction to one turn the drum, should make it equal to about 16 turnovers at one revolution of the drum.

The only way to get a good concrete is to have the proper proportions of cement and sand &c. well mixed—men with shovels are not always reliable, and most mixers on the market are still more unreliable than the men. The mixer may be run by hand or motor power.

The axle of the machine is hollow and perforated, so that the water is sprayed gradually into the mix—any other method does not give the best results.

A FEW INTERESTING POINTS

It is only a drum having the axle going diagonally through and having blades revolving in opposite directions.

A gentle spray is gradually sprinkled through the mix by pouring the required number of pails into the hopper.

There is nothing to break off the blocks as in some mixers.

It is the most efficient and up to date mixer, doing the quickest work of any on the market.

There is nothing complicated about it.

Jarvis Concrete Wall Mould

is an invention for the forming of concrete walls for foundations, also bridge piers, dams, &c., &c.

The usual way of building Concrete walls by using scantling and boards is very crude and expensive and also difficult to get straight and plumb.

By this method and device the mould box is moved along the wall thereby actually casting individual stone of any breadth, length, width, or depth in position in the wall.

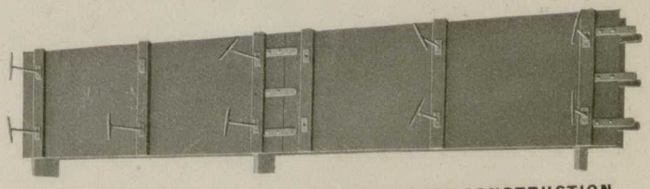
This ingenious device telescopes in every direction and may be 16 feet long if necessary.

In three days the next layers of stone or concrete may be cast so that if your mould box is 3 feet deep it means only twenty days to build a wall 20 feet high.

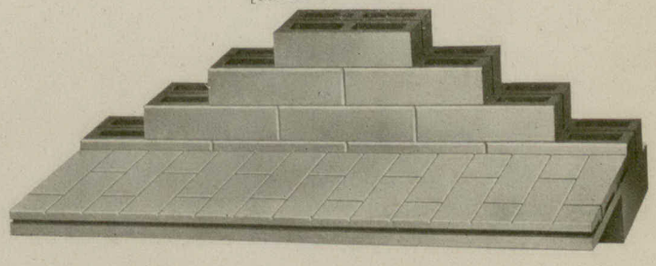
The size of the building does not signify as it only means more moulds and more gangs of men.

Further particulars will be sent to the purchaser with each machine.

JARVIS CONCRETE BLOCK MACHINE COMPANY



JARVIS MOULDING FORMS FOR MONOLITHIC CONSTRUCTION
[Patent Pending.]



JARVIS METHOD OF CONSTRUCTING FOUNDATIONS AND BASEMENT FLOORS.
[Patent Pending.]

It can be seen from the above cut that walls and floors formed in this way are absolutely non-conductors of heat, cold, damp and sound. There are 3 air spaces in the walls. Walls of this construction will cost less than brick.

If a whole house were built in this way a great saving of fuel would be the result.

The Jarvis Concrete Block Machine Co. is prepared to arrange with parties to sell district rights, and is also prepared to appoint agents in various districts, who will be allowed a liberal commission for any sales they make.

THE JARVIS TELESCOPE MOULD BOX

This mould box is a telescoping arrangement, so that a stone of any length, breadth, depth or height may be cast. It is also applicable for moulded sills courses or any moulded course by simply dropping down in the bottom of the box a reverse wood mould of what the stone casting is to be. This is probably one of the most ingenious devices ever invented for the conccete stone industry and bids fair ta revolutionize all other forms of moulds for casting stone.

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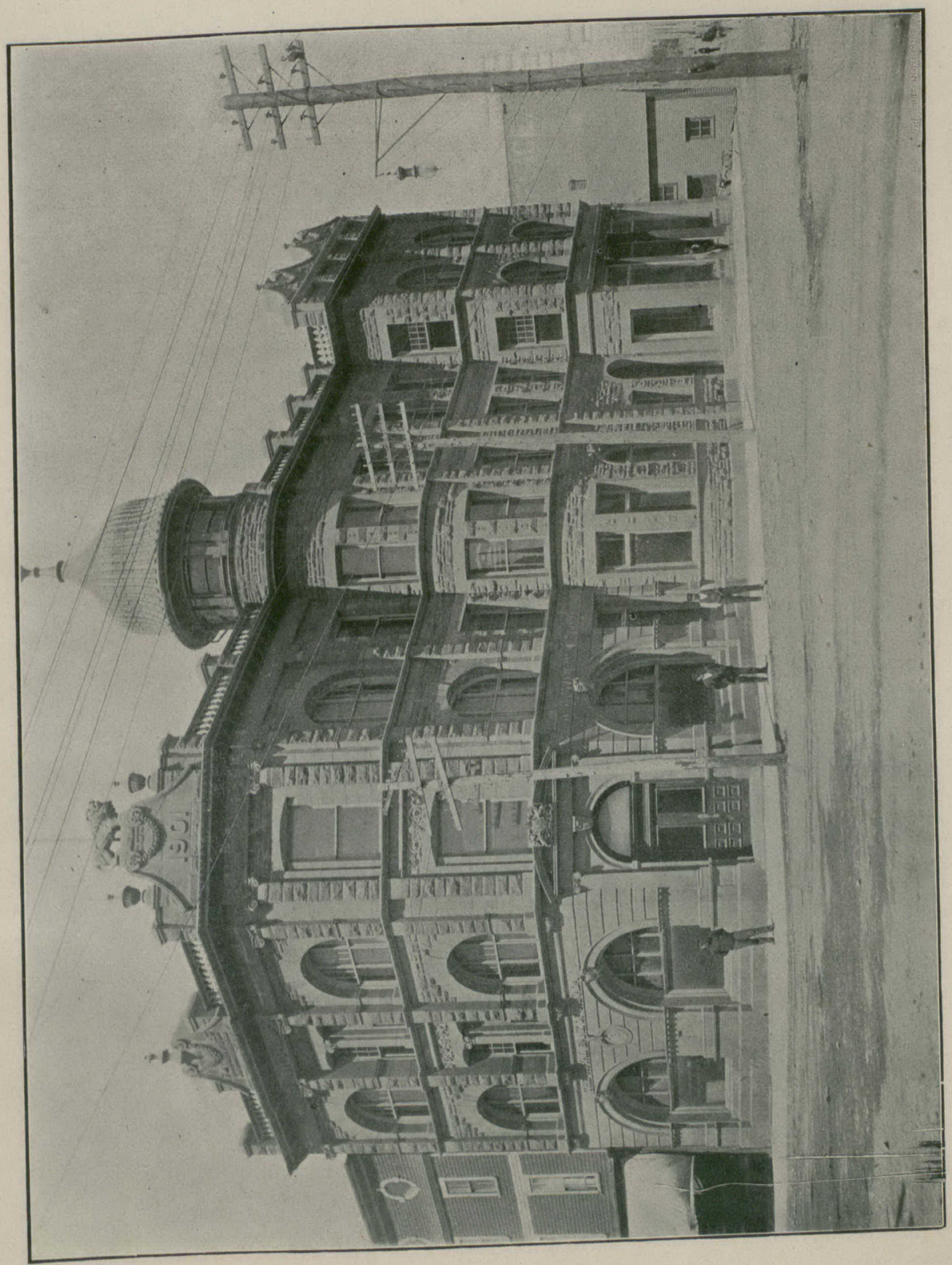

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THE ALLEN HOMESTEAD, MOSS PARK, TORONTO.

IN PROCESS OF DEMOLITION.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
MAY, 1903

THE TRIUMPH OF THE DRAMA.

DECORATIVE PAINTING FOR CENTRE PANEL OF PROSCENIUM ARCH, RUSSELL OPERA HOUSE, OTTAWA.

BY FREDERICK S. CHALLENER, R.C.A.

NOTICE TO SUPPLIERS OF MATERIALS.

Samples and catalogues of building materials will be received, free of charge by the Quebec Association of Architects, 112 Mansfield Street, Montreal, Canada.

NOTES.

The Toronto Architectural Eighteen Club has put on record its opinion that the most advantageous position for the proposed new public library would be on an ample site as near as possible to the intersection of College street and Queen's avenue.

Piles made of one-to-six concrete, 28 feet long, 12 inches square, tapered at the end, and enclosed in steel wire bands 18 inches apart, are being driven like an ordinary wooden pile for the foundation of a new building now under construction in New York.

Recently carborundum powder mixed with sodium silicate has been successfully applied as a refractory surfacing to furnace bricks. The bricks may be coated with a brush or by immersion It is claimed that a layer about one-twelfth inch thick will protect the bricks from injury by temperatures met in any ordinary operations.

Mr. Ernest Caron of Quebec has recently commenced the manufacture of artificial marble. The attention of our readers is called to his announcement in the advertisement pages of this number. The material has been successfully used in many important buildings in Montreal, and is endorsed by leading architects of the Province of Quebec.

In the District of Columbia, surveys of buildings during erection are required. An official plat of each lot to be used as the site of a building is also required. These regulations went into effect March 1st, 1902. Up to June 30 probably fifteen cases of errors of builders in location of party walls were discovered before it became difficult to correct the error.

At a recent meeting of the Master Plumbers' Association of Montreal, the following officers were elected for the ensuing year: Hon. president, J. Date; president, T. O'Connell; 1st. vice-president, C. E. Thibault; 2nd vice-president, R. Egan; 3rd vice-president, E. Lesperance; secretary, John A. Gordon; English corresponding secretary, J. W. Hughes; French, J. Lamarche; financial secretary, F. Brunet; treasurer, J. A. Giroux; chairman sanitary committee, P. C. Ogilvie; arbitration committee, John Watson; auditing committee, J. A. Sadler; legislative committee, T. Christie; apprenticeship committee, T. Moll.

New building regulations have just come into operation in San Francisco. Buildings are divided into three classes. Class A includes absolutely fire proof buildings, which are limited in height to 201 feet. Buildings in Class B are required to have the exterior walls and piers of masonry or of masonry and steel, and all exterior surfaces other than masonry covered with noninflammable materials. The height of buildings of this class is limited to 100 feet. Buildings in Class C are the same in requirements of construction as those of Class B, except as to requirements for interior lathing, and are limited in height to 82 feet. Pitched roofs must not have a slope of more than 45 degrees. The height of frame buildings is restricted to 50 feet. Towers and spires are to be covered with metal.

NOTES.

The value of building permits issued in Toronto during April was $297,400, as compared with $575,624 in the same month in 1902.

The Winnipeg Stone Co., Winnipeg, Man., has been incorporated with a capital of $10,000, to manufacture and dress stone. The provisional directors include L. T. LeFebvre, P. A. Desauriers, and J. M. LeFebvre, of St. Paul, Minn.

"Samson Spot Cord" is the name of the highest of three grades manufactured by the Samson Cordage Works, of Boston. Although Sash cord is not an important item in the construction of a building, from the cost stand point, there is economy and satisfaction in using the best.

The Mississippi Wire Glass Company, of New York, write that the defects in the roof of the South Terminal Station at Boston referred to in an article in our April issue, copied from the American Architect, are not to be attributed to wired glass. The material used in this roof is said to be not wired glass but a substitute material. It is said that wired glass is now being put in to replace the substitute material in the roof of the building referred to.

Many times painters have great difficulty in stopping the suction on brick or plaster work which they wish to paint. A perfect article of this kind, and one that is very economical to use by reason of its great covering properties is Breinig's Lithogen Primer. By its use a gloss finish can be obtained without its flatting in spots, or a flat finish without its getting glossy in some places. Where difficulty is met in preventing stains from coming through the Lithogen Primer has accomplished the purpose where everything else has failed. The manufacturers of this article, The Bridgeport Wood Finishing Co., of New Milford, Ct., New York, Chicago and Philadelphia, would be pleased to give information or submit samples.

NOTES.

A Committee of the National Association of Master Painters of the United States, is drafting a standard form of specification which will be submitted for the approval of the American Institute of Architects at the annual convention of the Institute in December.

The City Council of Montreal, have rescinded the resolution passed last year accepting the offer of $150,000 by Mr. Carnegie towards the erection of a public library. The principal reason given for this action is that it is feared that in the selection of books and of a Board of Management discord might ensue among citizens of different races and holding different beliefs on moral and religious subjects.

The discovery has been announced by Mr. Miximilian Toch, a distinguished Chemist, that while structural steel is protected from rust when covered by cement containing only oxides, silicates and aluminates of lime, its corrosion is induced by contact with cement containing sulphites and sulphates. Plaster of Paris with which some of the foreign cements are said to be impregnated, also acts as a destructive agent.

British Trade Supplement

The Publishers of "The Canadian Architect and Builder" have arranged to furnish information respecting British Exporters of Building Materials and their goods advertised in this paper, and will keep on file at their Offices, Imperial Building, Montreal, and Confederation Life Building, Toronto, Catalogues, Price Lists, Etc.

Catalogues will be forwarded to Architects and Building Supply Houses in Canada on application.

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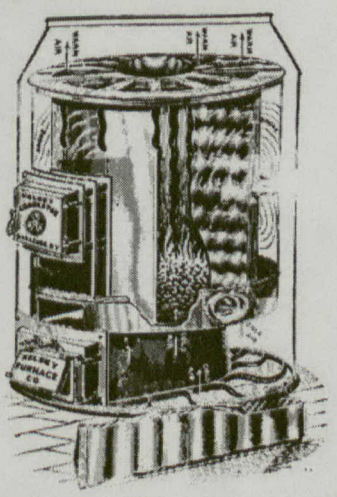

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The Kelsey warm air Generator is built in six sizes, being composed in part of long hollow sections, the number of sections varying in the different sizes from eight to sixteen. Each section is an independent heater; besides assuring economy it overcomes that difficulty experienced by the common hot air furnace in conveying warm air through long pipes to distant rooms. The heating capacities range from 5,000 to 90,000 cubic feet.

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