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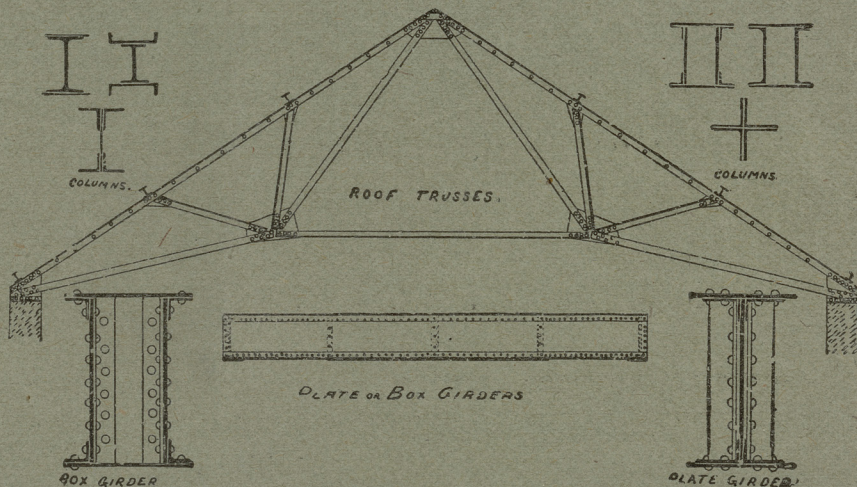
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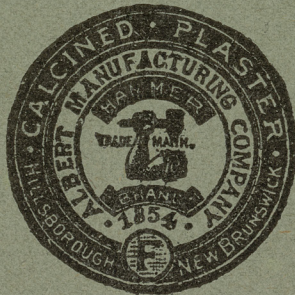
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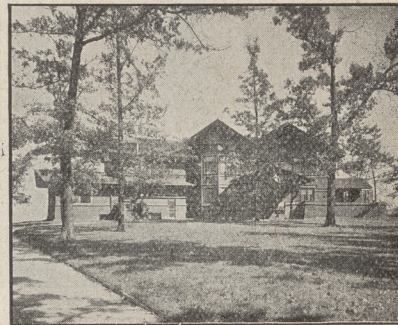
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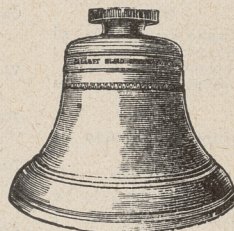
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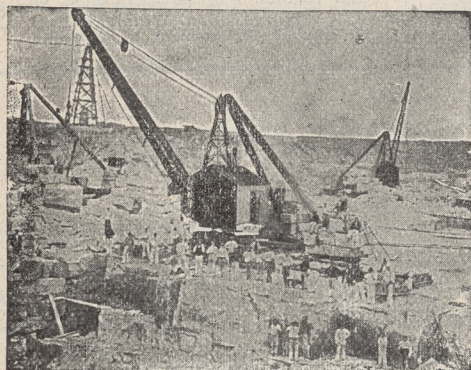
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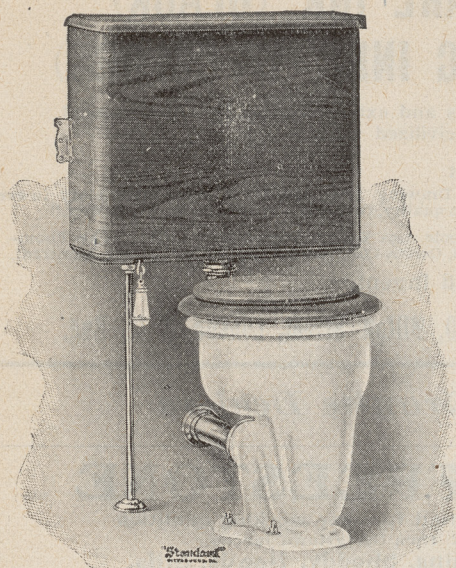
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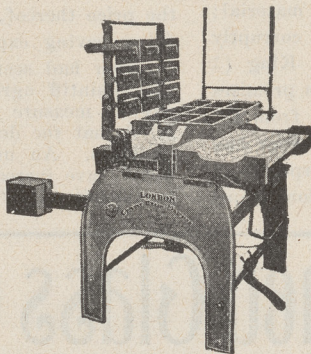
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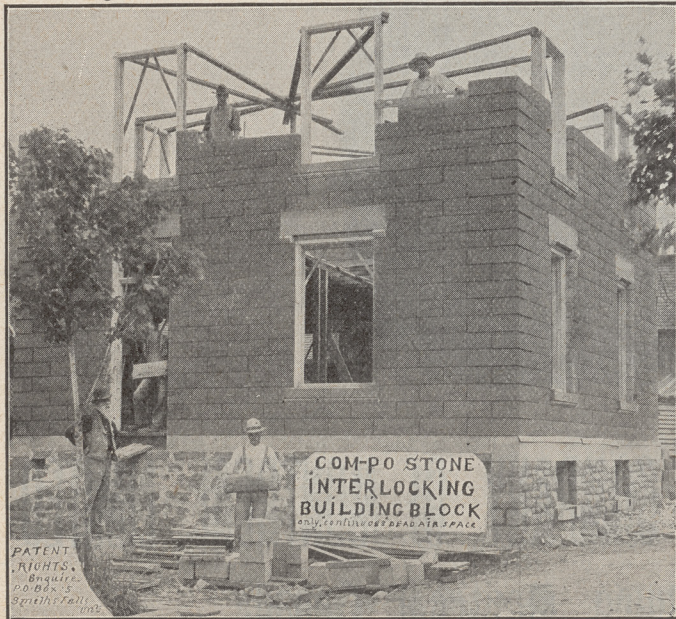
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## LEGAL.

In *Cotterell v. Apsey* (6 Taunt. 322) a builder contracted in writing to build a house and furnish the necessary materials according to a plan. In the course of the work some deviations from the plan were carried out. In an action by the builder against the owner for work and labor and goods sold and delivered, it was held that the plaintiff could not recover, although by reason of the deviations from the original plan the contract as to the price is superseded. A builder entered into an agreement with the defendant to complete a public-house according to an approved plan. The builder was to expend £300, and the defendant was to provide any balance necessary to complete the work. The defendant's surveyor by a trick got possession of the plan, and would not give it up to the plaintiff, who proceeded to fulfil his contract without it, giving the defendant notice. In an action for specific performance by the builder against the defendant, the defendant pleaded certain deviations from the plan, and it was held that small deviations from a plan agreed upon were not material; it is otherwise if they were made obstinately or corruptly (*Craven v. Tickell*, 1 Ves. J., 60). In *Lovelock v. King* (1 Moo. and Rob., 60) a carpenter agreed to alter certain premises for a fixed sum. Considerable deviations were made from the original plan, which, it was alleged, the defendant owner had seen and had not objected to. In an action by the carpenter to recover a measure and value price for all the work done, Lord

Chief Justice Tenterden held that the employer was not liable for any larger sum than that fixed by reason of his consenting to deviations, etc., unless he was expressly or impliedly informed that such deviations will increase the cost, and the jury found for the defendant. In *Pepper v. Burland* (1 Peake, 139) a builder contracted to execute the carpenter's work of a certain house for a fixed sum. The plan of the roof had been deviated from. In an action by the builder for work and labor, it was held that when a builder agrees to erect a building for a fixed sum and additions are made, he is bound by the contract as far as it can be traced, and entitled to sue on a *quantum meruit* for the excess only. In *Johnston v. Weston* (1 F. and F., 693) a builder entered into a contract with the owner (a woman) of certain premises to build a house for a certain sum by a given date, according to plans and specification, to the satisfaction of the owner or her surveyor. In the progress of his works the builder suggested to the owner certain deviations or alterations. In an action by the builder for the price thereof, there was no evidence of the owner or surveyor having expressed satisfaction with the work, but the surveyor had seen the work going on and had not objected. The plaintiff agreed that the defendant had not promised to pay by measure and value, and only slight evidence was offered that the defendant had agreed to pay extra for the alterations. An unskilled person would not have known they would have increased the cost. The judge, therefore, ordered a non-suit.—*Contract Journal*.

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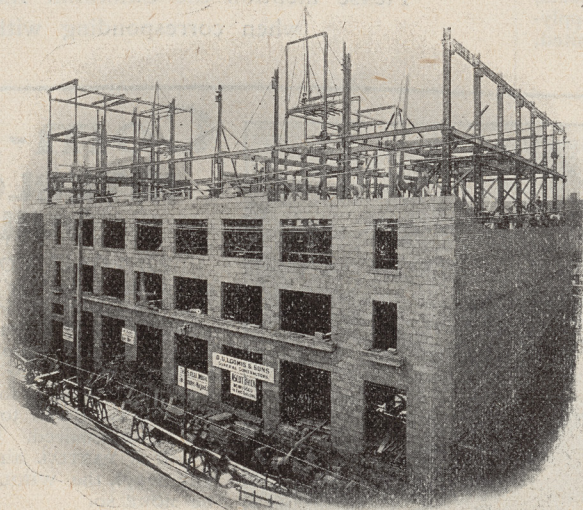
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## NOTES.

John Mann & Sons have decided to establish a sand lime brick plant at Brantford. The machinery has been ordered from the American Clay Machinery Co. of Bucyrus, Ohio.

Arthur H. Allen, formerly a member of the contracting firm of H. B. Cummings & Company, of Boston, Mass., and more recently in business for himself, is now doing extensive work as part of the organization of Frank B. Gilbreth, contractor, of New York. Mr. Allen, with the larger part of his own organization, left Boston February 10th for San Francisco, where he will join Mr. Gilbreth's western office.

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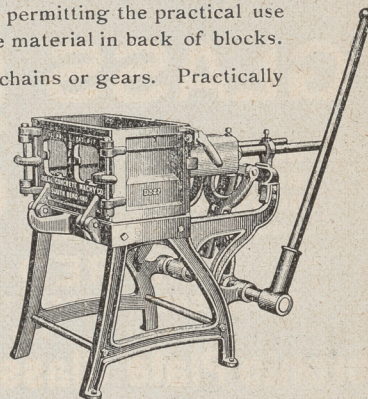
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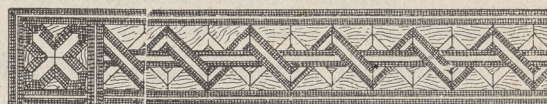
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# The Canadian Architect and Builder

C. H. MORTIMER PUBLISHING COMPANY - - PUBLISHERS.  
OFFICES: CONFEDERATION LIFE BUILDING, TORONTO, CANADA.

VOL XX.—No. 230.

FEBRUARY, 1907.

## ILLUSTRATIONS.

CANADIAN ARCHITECT AND BUILDER Students' Competition.—Design submitted by "Pthah."

## ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

New Club House for the National Club, Bay Street, Toronto.—Messrs. Sproatt & Rolph, Architects. Mr. S. G. Curry, Consulting Architect.

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### Care of Architectural Drawings.

Fifteen years or more ago the late Mr. Richard C. Windeyer, a Toronto architect, prepared drawings for a new Anglican Cathedral, to be known as St. Albans. The funds necessary to erect the building not being then available, the choir only was built. Further work on the structure was suspended until recently, when the Chapter decided to proceed with the undertaking. During the period of inactivity Mr. Windeyer died, and a search for the drawings revealed the fact that many of them had been destroyed by his family in the belief that they were of no further value. The circumstance shows the necessity for greater carefulness for the preservation of drawings of important buildings. The Chapter of St. Albans have now placed the work of completing the cathedral in the hands of Messrs. Chadwick & Beckett, of Toronto.

### Canadian Building Materials.

An interesting visit was paid by members of the Ontario Association of Architects during the recent convention at Ottawa to the Geological Museum in that city. Here are to be found classified specimens in large variety of Canadian building stones and marbles. The architects expressed regret that information was not available showing the location of quarries, the extent of the deposits and development, and the facilities at the command of the owners to meet the commercial demand for their product. Most Canadian architects would prefer, all other things being equal, to use native material, but in many instances are debarred from doing so by lack of knowledge of the characteristics of the material and the source and extent of the supply. It would seem to be the duty of the Government to amplify the information on the subject, as it is certainly to the interest of the quarry-owners to advertise their product and let it be known

to what extent they are in a position to fill orders. Because this information has not been forthcoming, a very large amount of United States stone and marble is every year going into the construction of Canadian buildings.

### The Outlook.

Indications point to another busy season for Canadian architects and builders. A large quantity of work of an important character is already on the drawing boards, which, with what is in prospect, amounts to almost a guarantee that 1907 will compare favorably with 1905-6. What effect the gradual tightening of the money market and steadily advancing prices of lumber and other lines of building materials, as well as labor, may have cannot be foreseen. The blocking of railway traffic in the west has prevented the turning into money of a large quantity of grain, and caused at least a temporary stringency, which, it is hoped, may pass away before the money for new building projects is required.

### East vs. West

What is the meaning of the fact that all but one of the prizes in our recent competitions for designs for a Moderate Cost Suburban House and a Farm House, have been won by Montreal Students? A few years ago the majority of prizes in such competitions went to students in the West. Is the improvement in the work of the students in the east attributable to the new life which has been infused into the Architectural Department of McGill University, or should the credit go to the enthusiasm awakened among the students by the Montreal Sketch Club? Perhaps both have had their influence, and conversely, to the lack of such facilities as those now afforded students in the east may possibly be traced the standing of the western com-



petitors in these competitions. It is undoubtedly the fact, as stated by the President of the Ontario Association of Architects at the Ottawa convention, that the facilities do not exist for the proper training of Architectural students in Ontario. The Ontario government should provide these facilities at the School of Practical Science, where for years there has existed an Architectural Department that has a name to live but is dead. The matter is of the utmost importance to the future of Architecture in this province and country, and cannot too soon receive attention at the hands of the O. A. A. and the legislature.

#### Production and Consumption of Iron.

In a Consular report recently issued from the Department of Commerce of the United States, it is stated that the world's iron production in 1903 was 40,004,837 tons; in 1904, 45,225,628 tons; and in 1905, the last year for which figures were furnished, 53,997,965 tons. "The United States," the report continues, "is striding forward so fast in the production of iron that it promises not only to lead the great iron-producing countries, but to lead the rest of the world combined. While the absolute gain in the United States is almost equal to the entire gain between 1904 and 1905, the advance in Canada in 1905 over 1903 is still more remarkable, for the output nearly doubled. Still more remarkable is the advance in Japan, where a gain in the two years of nearly 600 per cent. is shown." It will thus be seen that at the present rate of production the world's visible supply of iron is becoming rapidly exhausted.

#### Convention of Cement Users.

The third convention of the National Association of Cement Users held at Chicago from the 7th to the 12th of January was attended by nearly one thousand persons. The manufacturers and agents of cement machines and equipment were largely represented and the exhibits in this line were most interesting and instructive. A number of valuable papers were presented treating of the proper handling of cement and concrete in the lines of construction in which these materials are principally employed—the subjects including "Cement Sidewalks," "Cement Testing," "Finish for Concrete Surfaces (printed in the Cement and Concrete Department of this number)" "Artistic Treatment of Concrete," "Progress in Cement Block Construction," "The Fire Resistive Qualities of Concrete." H. Welderhold, Philadelphia, described one of the largest pieces of work done in that city, being the widening of Delaware avenue, and in connection therewith the concrete sea wall along the Delaware River. His method was waterproofing with asphalt mastic, and in the course of his paper he gave his experiences of the last 25 years in his researches in several countries with a view to obtaining the best results. He then described the proper way to prepare asphalt mastic and how it should be manipulated by the experienced workman. The author pointed out that he was unable to give a uniform mixture to be used for all floors and waterproofing, as the mixture depends entirely on the use to which the floor is to be put, and it is here that the experienced workman comes in. Other papers treated of "Tests of Concrete Blocks," "Forms for Concrete Construction," etc.

### C. A. & B. COMPETITION FOR A FARM HOUSE.

#### JUDGES' REPORT.

No. 1, "Westward Ho."—The author of this design has entirely caught the spirit of a Canadian farm house, and is to be highly commended for his very admirable design. It would have been well if possible to have had the living room somewhat larger, but apart from this there seems to be very little to find fault with. The arrangement of the rear entrance, with the office and bathroom easily accessible, is a very good feature. The exterior has all the simplicity which such a building requires, and is treated in a very broad and interesting manner. The rendering is quite charming and shows great promise.

No. 2, "Wood."—This design makes a very close second and is very good, but falls below No. 1 in several respects; the arrangement of rear hall and office is not as good, and the bedroom floor is cut up a little too much; no arrangement is shown in the basement for a dairy, which is very conveniently placed in No. 1. The elevations are simple and generally in keeping with the subject, but the hip dormers on the wings are rather out of harmony with the general design. The drawing is very neat and indicates a good draughtsman.

No. 3, "Byzantine."—This design is a good one, but does not come up to the first two. It is very doubtful if it could be built anywhere near the limit of cost, unless possibly in a country where stone was abundant and could be had for the cost of hauling. There seems to be too much room lost in the halls for a building of this character, and it would almost seem better to have had the larger bathroom for an office. The bedroom floor is commendable, and the idea of having the dormitory and room for the men separate is a good one; the basement plan is also good. The exterior has a nice broad treatment and is in harmony throughout. The drawing is good.

No. 4, "Parsnips."—Although this is a good design and has been thoughtfully prepared, the author has not caught the spirit of a Canadian farm house nearly as well as the preceding ones. The drawing room is entirely out of place in a farm house, and we think it would be much better if the author had adopted the arrangement of the first three designs showing a very large living room and a dining room just large enough for its proper use. The exterior is very nicely rendered, but is rather too pretentious.

Nos. 5 and 6, "Homesteder" and "Couchiching."—These two last designs are in a class by themselves, but if submitted by the veriest beginners in architecture the authors can be commended for the amount of thought and work which has been put into them. We would strongly recommend the authors to very carefully study the architectural magazines of the present day, both for ideas of design and rendering. Neither of the designs at all suggest a country farm house, and, moreover, are very bad compositions. The authors should learn to leave the ruling pen alone when rendering perspectives.

(Signed) C. H. ACTON BOND.

A. H. CHAPMAN.

JOHN GEMMEL.

J. WILSON GRAY.

[The names of the prize-winners in this competition are:—First, Mr. Douglas Ritchie, 74 Guardian Building, Montreal; second, Mr. Chas. Dolphin, 73 Park avenue, St. Henri, Montreal; third, Cecil Burgess, 230 Wood avenue, Westmount, Montreal.



## OUR ILLUSTRATIONS.

NEW BUILDING FOR THE NATIONAL CLUB, BAY STREET,  
TORONTO.—MESSRS. PROATT & ROLPH, ARCHITECTS.

MR. S. G. CURRY, CONSULTING ARCHITECT.

C. A. AND B. STUDENTS' COMPETITION FOR \$3,000.

HOUSE IN SMALL COUNTRY TOWN.—DESCRIP-

TION OF MATERIALS TO BE USED IN

CONSTRUCTION OF DESIGN BY

"PTAH" (MR. W. L.

SOMERVILLE).

The entire ground floor walls to be a dark red common brick, with a wide (4 courses to the foot) black joint.

The first floor walls to be of frame, with stucco finish outside (see details). This to be of a rich cream color, pebble dashed.

Exterior wood work painted or stained a dark golden brown. Window frames and sash white.

Roof, if not too expensive, to be dip stained a dark brownish green.

## BOOK REVIEW.

"Principles and Practice of Plumbing," by J. J. Cosgrove, published by the Standard Sanitary Manufacturing Company, Pittsburgh, Pa. The author of this work, recognizing the need of a book dealing with the plumbing trade, has compiled a great deal of very valuable information, given to the reader in a clear and concise form. That the author is thoroughly conversant with his subject is undoubted, and a feature worth noting is that the book is written, not only for architects and persons advanced in a knowledge of the plumbing business, but also will be found of great advantage to any person of ordinary intelligence who is interested in this line of work. The contents first appeared in serial form in *Modern Sanitation* which is also published by the Standard Sanitary Company, and was afterwards put into book form on the request of architects and engineers. The book consists of 275 pages, is illustrated throughout, and is indexed in such a way that information on any subject desired can be readily found.

## THE SELECTION OF AN ARCHITECT.

Under this heading Messrs. E. M. Storey and Van Egmond, architects, of Regina, send out a leaflet to prospective clients, as follows:—

How to obtain the best architectural service is a question which presents itself in every building operation. No matter how small the building proposed, this question should receive earnest consideration, for the proper selection of an architect always saves the owner time, money and much worry. What follows can do no harm and may do good. Read it.

Architects should be selected as other professional men are, on the basis of their professional ability and integrity. It is sometimes thought that best results can be obtained by inviting architects to submit designs in competition, with the privilege retained of returning drawings with or without a "Thank you." Is this reasonable? Would you desire the services of a doctor, lawyer or artist who would enter such a "free" competition? Legitimate competitions, with proper fixed awards, are right and sometimes advisable, but architects who serve their clients best have no time for free competitions.

Regular architects' fees are small in proportion to the advantage gained if you get proper service, and the fees are not based on the supposition that part of the work can be done gratis.

An architect should be in closer touch with his client than is possible in a competition. Efficient architectural service

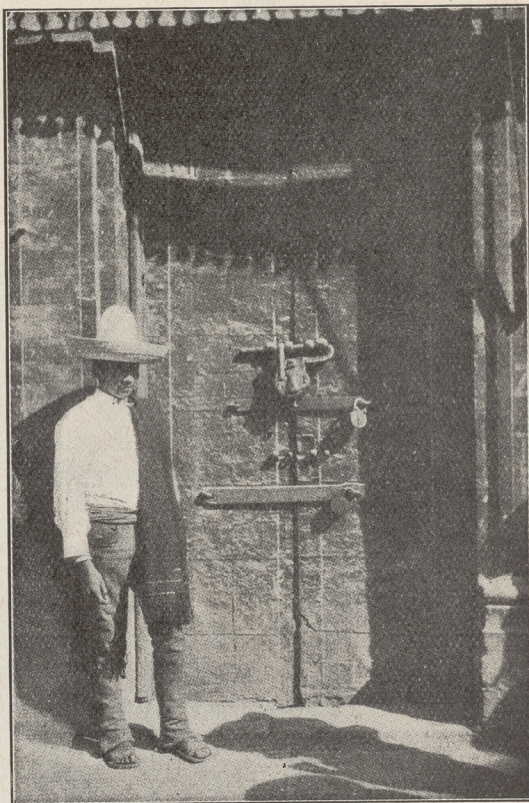
like good clothes, should be made to order. It always saves more than it costs.

An architect should be an adviser and agent of his client, whose duty it is to carry out the problem in hand to the best advantage of the owner. If it require numerous preliminary plans he should cheerfully make them, provided he is assured that he is not working on an uncertainty. An architect who has been retained for a certain building will not be tempted to misrepresent matters relative to cost, etc., but will make the best possible use of the amount to be expended.

An architect should not be asked to guarantee the cost of a proposed building. While he may be able to give a fairly accurate estimate of what a building should cost, it is impossible to foretell what it will cost. Many local causes beyond the control of any architect may affect this.

We are always glad to make preliminary sketches and re-design them as often as desired until the owner is thoroughly satisfied, provided we are retained solely for the work. In this way the owner's ideas and our practical experience combine to result in a successful building as regards costs, utility and design.

We do not keep "stock plans." We will cheerfully show prospective clients plans we have on hand for the purpose of



HOW A FRONT DOOR IS LOCKED IN MEXICO.  
Where burglaries are uncommon.

suggesting ideas, but we will not duplicate any building prepared for a former client. We make original designs for all work entrusted to us.

Our charges are based on the usage of the profession throughout America and are proportionate with efficient service.

We are in receipt of so many applications for service, which, while honest in their intent, give evidence of a misunderstanding of an architect's proper position, that we take the opportunity of stating what we believe to be the best procedure for both client and architect.

The velocity of the air in heating flues with only a natural draft rarely reaches eight feet per second, no matter what the condition; and two feet, four feet, and five feet, respectively, are fair averages of velocities for first, second and third floors of a house.

During the examination of a witness as to the locality of the stairs in a house, the counsel asked him, "Which way did the stairs run?" The witness, who, by the way, was a noted wag, replied that "one way they ran up, and the other way they ran down."



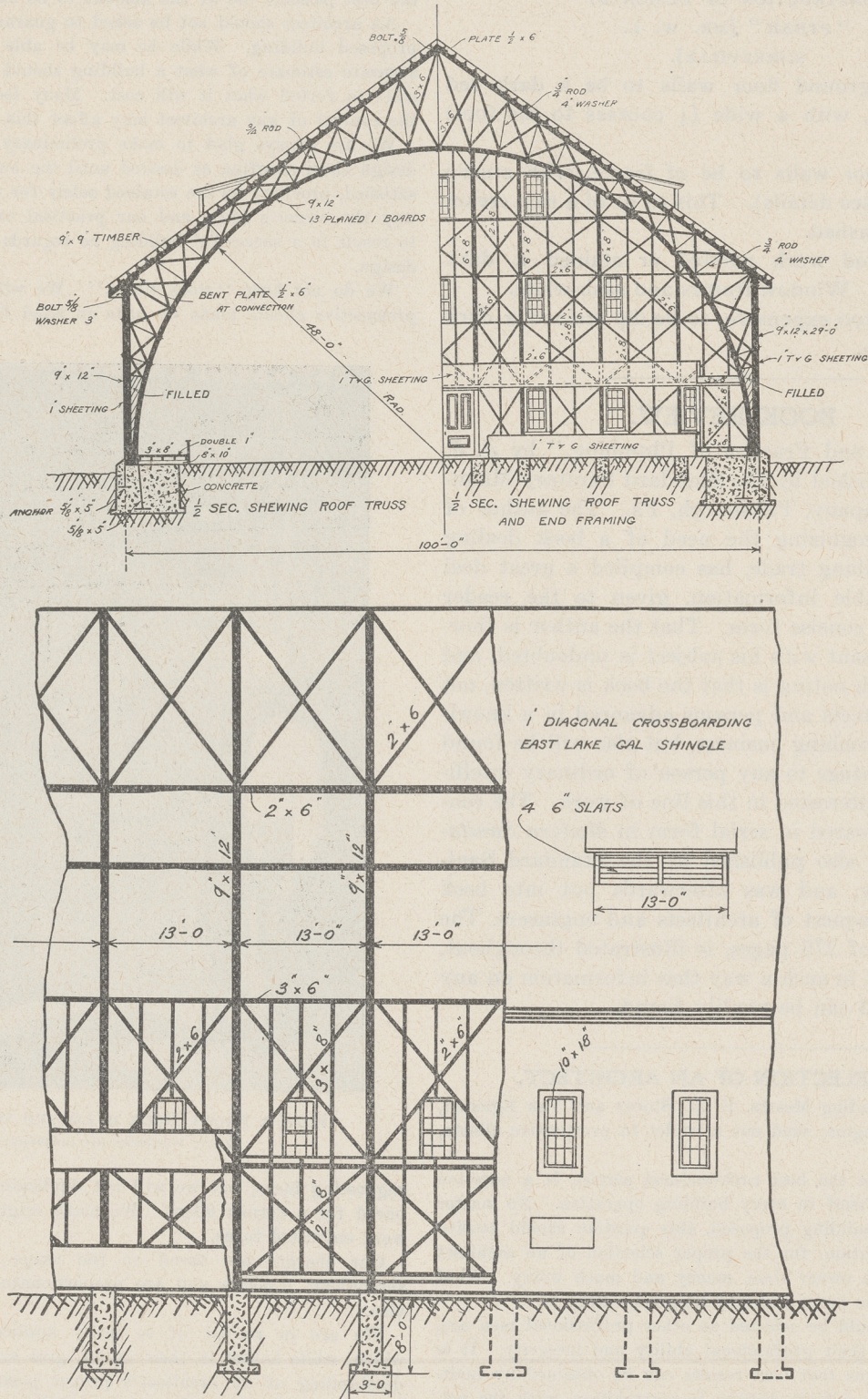
### A SCIENTIFIC WOODEN SKATING RINK.

The building of skating rinks has been carried on in Canada with a considerable degree of enterprise during recent years. The chances of success as a business venture are not always especially encouraging, and altogether too often we discover structures that have been put up without the proper expendi-

Morris, C.E., Pembroke, prepared the design and superintended the construction.

The total cost amounted to \$10,500, the Renfrew Manufacturing Company being the contractors.

The bottom chord of the roof truss is semi-circular to a radius of 48 ft., and built up of 13 planed boards,  $\frac{7}{8}$  in. x 9 in., bolted together and spiked, making a



SIDE ELEV. AND SECTION.

ture of money requisite for the amount of ground covered to ensure a safe structure.

It is with pleasure and relief that we find a town of the size of Pembroke furnishing such an excellent example of trussing and general lay out as is shown in the views presented herewith.

The company was started by citizens interested in hockey, and the young men of the town took up most of the stock in \$25 and \$100 allotments. Mr. J. L.

9 in. x 12 in. chord. The top chord is 9 in. x 9 in. sold timber, with  $\frac{3}{4}$  in. diameter tension rods at each apex point.

These trusses are spaced 13 ft., C to C, for the intermediate bays, and 12 ft. for the end ones, with 16 bays in all, making a total length of 206 ft.

The width of the building out to out of side walls being 100 ft. The height to ridge of roof being 65 ft. There are 2 in. x 8 in. purlins spaced 24 inches



centres, upon which was laid 1 in. cross boarding laid diagonally, and covered with Eastlake galvanized shingles.

The vertical side walls are braced with 2 in. x 6 in. diagonals, 9 in. x 6 in. caps, and 6 in. x 6 in. intermediate girths, as shown in illustration, with 2 in. x 8 in. vertical studs covered with 1 in. T. & G. sheeting.

The ends of the building are braced back to the end trusses by 3 in. x 6 in. struts, and stiffened by the galleries and rooms across the ends of the building. There is a promenade with a minimum clear width of 8 ft., completely encircling the skating area on the ground level, and a gallery of similar width at an elevation of 11 ft. above.

The skating area is 79 ft. by 176 ft., giving 13,900 square feet of ice surface.

Office, lunch room, public dressing rooms and lavatories are provided on the ground floor, and a smoking room, bandsmen's room and two hockey rooms on the gallery level, with a band stand in addition at an elevation of 13 ft. higher above the gallery level.

The wind pressure is taken care of by two steel anchor straps  $\frac{5}{8}$  in. x 5 in., well bolted to each heel of each truss, and connecting by large plate washers to concrete blocks 2 ft. x 8 ft. x 10 ft., sunk 7 ft. below ground level.

The gallery is supported direct from the concrete foundation upon 6 in. x 6 in. posts, with 6 in. x 6 in. longitudinals, 3 in. x 8 in. joists 24 in. cts., and covered with 1 in. T. & G. flooring.

The promenade floor at ground level consists of 1 in. rough boarding, with tar paper and 1 in. T. & G. flooring, all resting upon 3 in. x 8 in. joists in cts., resting upon 8 in. x 10 in. sleepers placed on top of the concrete bases.

This promenade floor is thus 18 inches above level of ice surface, and dampness is prevented from penetrating by the use of the tar paper, with the result that no discomfort is felt by the spectators from cold feet, and the whole rink, by reason of its freedom from draughts and dampness, enabled the spectator with ordinary winter apparel to sit out a hockey match with absolute comfort.

The railings at floor and gallery level are close sheeting, 2 ft. 6 in. above the floor, or 4 ft. above the ice, which adds to the safety of the spectators from chance shots of the puck, and also protects them from cold air off the ice, and at the same time gives a very substantial and neat appearance.

The whole design makes a very complete unit, well worthy of imitation by other towns in Canada, and reflecting credit upon the designer, Mr. J. L. Morris, C.E., and the Pembroke Rink Company. There are rinks in Canada to-day that have no margin of strength—one at Glace Bay blew down, one at Cobourg fell over like a pack of cards, one at Orillia crashed in 15 minutes after it had been filled to its capacity during a political meeting, and the habit of allowing a local carpenter to launch out as the designer of a roof with a wide span, that becomes subjected to snow and wind loads that he has no way of estimating or providing for, should cease, and the sooner these daring but incapable designers be made to see themselves as others see them, the better it will be for all concerned.—John S. Fielding, C.E., in *Engineering Journal of Canada*.

### P. Q. A. A. SKETCHING CLUB.

The second annual general meeting of the club was held at 5 Beaver Hall Square on the evening of Wednesday, January 16th. The report for the year 1906 was submitted and adopted, as follows:—

The last annual meeting of the club was held December 29th, 1905, when the officers of the year were appointed. During the financial year from January to December, 1906, twenty-one weekly meetings have been held, four sketch design nights, six lecture nights, six discussion or debate nights, two book reviews, two exhibitions of work done, viz., of work done during the winter session, 1905, and one of work done during the summer of 1906.

On the invitation of the P. Q. A. A., the club were invited to attend a lecture by Mr. Baldwin on "Some Board of Health Hospitals in Greater New York."

During the summer the club held seven outings, four of these being visits to local work in course of construction, the remainder being visits to Sault Au Recollet, Chambly and St. Genevieve, respectively.

The first annual dinner was held in the Oxford Cafe on November 28th.

Two visits were made to the Canadian Handicraft Shop by the courtesy of the Canadian Handicraft Guild.

A water color class was also formed, but was abandoned after three meetings, owing to the difficulty in obtaining rooms.

Prizes were also awarded for work done during the summer, to the value of \$32.50.

In the competition for the Canadian Handicraft Guild exhibition, the three prizes offered by the Guild were awarded, aggregating to \$25.

The thanks of the club for donations to the prize fund are also due to the P. Q. A. A. for \$40 for summer work; to W. S. Maxwell for \$15 for water color sketches, and to private members of the P. Q. A. A. for subscriptions paid or promised, amounting to \$45, for winter competition work.

The membership of the club consists of twenty-two paying, besides a number of non-paying members.

The following officers for 1907 were elected:—President, T. MacLaren, A.R.I.B.A.; Vice-President, Outhet; Treasurer, J. R. Smith; Secretary, Barwick; Joint Secretary, L. Labelle; Council, Messrs. Fortin, Ritchie, Rankine.

At a meeting on January 23rd Prof. Nobbs spoke on the subject of "English Architecture of the Nineteenth Century."

Mr. Lamasnie addressed the club on January 30th on "Design in Stained Glass." After pointing out, with the help of blackboard sketches, the forms to which leaded glass lent itself and those which were reprehensible for technical reasons, the lecturer went on to show the range of color motif of which the material was capable, and exhibited by means of samples the characteristic American treatment of glass, in which material full of brilliant mottlings and striations is carefully selected to take the place of painting upon the glass.

At the meeting of February 6th, Messrs. W. S. Maxwell and Prof. P. E. Nobbs criticized the work sent in for the monthly competition. In class A—a design for the entrance to a subway—the first place was awarded to Mr. J. Roxburgh Smith. In class B, Mr. C. Burgess' design for a clock tower in perpendicular Gothic was the only design submitted, but was adjudged to be highly creditable.



# CEMENT AND CONCRETE

## THE TREATMENT OF CONCRETE SURFACES.

The following paper was read by Mr. Linn White, engineer South Park Commissioners, Chicago, Ill., before the National Association of Cement Users, in Chicago, January 7-12, 1907:—

A pleasing and consistent surface finish generally has but little to do with the strength of a concrete structure, but it is not inconsistent with maximum strength in any structure.

Next to form or design the character of the surface has most effect on the appearance of concrete, whether in a building, arch, wall or abutment; in fact, when the view is had at a very close range, or in such structures as retaining walls or pavements, the surface finish may take precedence over proportion.

It is not intended to attempt a full discussion of the subject, but only to describe some methods used in trying to obtain satisfactory surfaces in the various classes of concrete work done in the South Park system of Chicago.

The imperfections in the exposed surfaces of concrete are due mainly to a few well-known causes which may be summed up as follows:—

1. Imperfectly made forms.
2. Badly mixed concrete.
3. Carelessly placed concrete.
4. Efflorescence and discoloration of the surface after the forms are removed.

Forms with perfectly smooth and even surface are difficult and expensive to secure. Made of wood as they usually are, it is not practical to secure boards of exact thickness, joints cannot be made perfectly close, the omission of a nail here and there allows warping, and the result is an unsightly blemish where least wanted.

Badly mixed concrete gives us irregularly colored, pitted and honeycombed surfaces, with here a patch of smooth mortar and there a patch of broken stone exposed without sufficient mortar. Careless handling and placing will produce the same defects.

But granting we have the best of labor, that all reasonable expense and care is had in making up forms, in mixing, handling and placing the concrete, that it is well spaded, grouted, or the forms plastered on the surface, the results are not satisfactory. All these efforts tend to produce a smoothly mortared surface, and the smoother the surface the more glaring becomes minor defects. The finer lines of closely made joints in the forms become prominent, the grain of the wood itself is reproduced in the mortar surface, hair cracks are liable to form, and, worst of all, efflorescence and discoloration are pretty sure to appear. We surely have been working on a wrong theory.

It is of doubtful efficiency to line the forms with sheet metal or oilcloth. Imperfections still appear.

Two methods suggest themselves as likely to overcome the defects alluded to above: (1) Treating the surface in some manner after the forms are removed to correct the defects, and (2) using for surface finish a mixture which will not take the imprint of, and which will minimize rather than exaggerate, every imperfection in the forms and which will not effloresce.

Methods of treating the surface by bush hammering, tooling and scrubbing with wire brushes and

water have been described in various published articles, all of which have for their object the removal of the outer skin of mortar in which the various imperfections exist. But the method most used in the South Park work is the acid treatment. It consists of washing the surface with an acid preparation to remove the cement and expose the particles of sand and stone, then with an alkaline solution to remove all free acid, and finally giving it a thorough cleansing with water. The operation is simple and always effective. It can be done at any time after the forms are removed, immediately or within a month or more. It requires no skilled labor, only judgment as to how far the acid or etching process should be carried. It has been applied with equal success to troweled surfaces, like pavements, to moulded forms such as steps, ballusters, coping, flower vases, etc., and to concrete placed in forms in the usual way. It, of course, means that in the concrete facing only such material shall be used as will not be affected by acid, such as sand or crushed granite. It excludes limestone.

The treated surface can be made any desirable color by selection of colored aggregates or by the addition of mineral pigments. The colors obtained by selection of colored stone are perhaps the more agreeable and doubtless more durable.

There have been moulded in the South Park shops blocks for buildings, columns, architectural mouldings and ornaments with both red and black crushed granite surfaces, also pavements laid in patterns with red and black granite, all treated with the acid to bring out the natural colors of the stone. There has been a large quantity of concrete pavement laid with torpedo sand surface colored a buff sandstone color with a small quantity of yellow ochre and mineral red and treated with the acid. The buff color imparted to the surface is a welcome relief from the glare of the ordinary whitish grey concrete pavement in the sunshine, and the etching of the surface adds to the softness of the color, at the same time preventing any slippiness. This same buff color has been used to a large extent in steps, bases of lamp posts, and other moulded articles to be placed on or near the ground. With white sand as the aggregate thousands of pieces have been moulded for coping ballustrades, concrete seats, drinking fountains, pedestals, etc., which, when treated with the acid, appear like a fine grained, almost white sandstone.

Where there are projections or marks left by the moulds or forms they are tooled or rubbed down before treatment, and where it is necessary to plaster up rough places or cavities in the surface it may be done, and after treatment cannot be detected.

These various classes of work have been done on a large scale during the last three years in connection with the improvement of new parks and have in all cases proved satisfactory.

The second method of preventing or minimizing surface defects has also been tried in the South Park work with quite a measure of success.

During the years 1904, 1905 and 1906 groups of concrete buildings have been erected in nine different parks costing, with their accessories, from \$65,000 to \$150,000 for each group. These buildings are all monolithic structures with occasional expansion joints, the exposed surfaces of walls being of a concrete composed of one part cement, three parts of fine limestone screenings and three parts of crushed lime-



stone known as the one-quarter-inch size. This was thoroughly mixed quite dry so no mortar would flush to the surface and well rammed in wooden forms made in the usual manner. The result was an evenly grained, finely honeycombed surface, of a pleasing, soft grey color, which grows darker with time and blends admirably with the park landscape. In placing, it was not spaded next the form, it was too dry GAL SIX ..... to cause any flushing of mortar, so there is no smooth mortar surface, the imprint of joints between the boards hardly noticed and the grain of the wood not seen at all. There is no efflorescence apparent on the surface anywhere; there cannot be on account of the dryness of the mix and the porosity of the surface. The buildings are used as gymnasiums, assembly halls, reading and refreshment rooms, and as a rule the same grey concrete finish is given the interior walls as the exterior. In some cases a little color has been applied on the interior walls and the walls of shower and bathrooms have been waterproofed with plaster. The porosity of the surface makes it well adapted to receive and hold plaster.

This sort of surface is not capable of treatment with acid as a smoothly mortared surface, nor is it desirable. Consequently the only color obtainable is the natural color of the cement covered stone, but which is softer and far more agreeable than the grey of the usual mortar finished surface. It is not suited for the surface of a pavement and is not impervious to water. Although it is evident the water enters the pores to a considerable extent there is no evidence of injury from frost during the two winters some of these walls have stood.

The same finish has been used for retaining walls; arch bridges, fence posts, walls enclosing service yards, etc. In the buildings the thin walls were made entirely of this mixture, while in the heavier structures it has been used only as a fencing. Two reinforced arches of 60 feet span were faced with this mixture, but the steel was imbedded in a wetter, more impervious concrete. This same dry mixture can be used for moulded stones when the mould is open enough to permit tamping, and of course it is eminently suited to block machines.

The dry, rich mix, with finely crushed stone, has been found specially suited to another condition where a sound, smooth surface was particularly difficult to secure, viz., for the under water portion of a sea wall on Lake Michigan. It was mixed very dry and dumped in mass in sunken boxes joined end to end, made fairly water tight, but from which the water was not excluded. With the finely crushed stone a sound, smooth surface was obtained (when the sides of the boxes were removed) where it was manifestly impossible to plaster or grout the surface and where spading a mix of coarser stone simply washed the cement away from the surface stone. On account of the variable water level it was particularly desired to have a sound, smooth surface.

Of the work described, most of the monolithic buildings, the arch bridges and some of the walls and paving, have been done by contract. All of the moulded work, the buildings made of blocks, service yard walls, etc., and all the acid treatment has been done by the park forces. Nearly all the various brands of Portland cement sold in the Chicago market have been used in varying quantities with equally good results.

In both methods described honest work and careful inspection are as necessary for good results as in any other first-class construction. Neither method cheapens concrete work. The acid treatment slightly increases it, while the surfacing with fine crushed stone adds nothing to the cost.

By the acid treatment, together with rubbing and chipping, all irregularities can be corrected. With the fine crushed stone surface all irregularities and

form marks are not prevented, but they are greatly minimized.

In not all the work done by the second method were the results entirely satisfactory. The original specifications called for half-inch stone, which was afterwards changed to quarter-inch. Experience taught the correct quantity of water to use for best results. But altogether both methods are so satisfactory that their use will doubtless be continued in the South Park work until something better is developed.

### BRITISH INVESTIGATE CONCRETE.

A joint committee representing the Royal Institute of British Architects, the District Surveyors' Association, the Institute of Builders, the Association of Municipal and County Engineers, and the War Office, has been nominated by the Royal Institute of British Architects to consider and report upon the use of reinforced concrete in buildings and other structures. The committee has issued a statement outlining in part the scope of its investigations, which will first take the form of an inquiry into what has been done already. It will ask the owner, or architects, or engineers of such work for particulars, and how the buildings have stood the test of time. The statement continues as follows: "We shall have a secretary who can apply to railway companies, owners of mills, private owners, architects, engineers and others who will no doubt place the results of their experience at our service. Some of us may visit works; some have actual experience in the new system; and when we have digested this knowledge we can as a body express an opinion as to its usefulness, its safety, its permanence, and other qualities, which opinion we may fairly hope will be of value to our fellow-countrymen."

An important "Special Commission on Concrete Aggregates" has also been formed at the instance of the British Fire Prevention Committee from among its leading members and the representatives of the public bodies who are subscribers to the committee.

The Commission is to report upon and define the aggregates suitable for concrete floors intended to be fire-resisting, having due regard to the question of strength, expansion, and the chemical constituents and changes of the aggregates.

The constitution of the Commission is not yet announced, but it is known that Sir William Preece, K.C.B., F.R.S. (Past President, Int. C.E.), will be the chairman, and that Mr. Matt. Garbutt, F.R.I.B.A., A. M. Inst. C.E., will be the hon. secretary; and, further, that the Commission will be an eminently representative one, particularly strong in civil engineers of great practical eminence and in public officials of high technical standing.

It is to be anticipated that the work undertaken by the Commission will be of that thorough character generally associated with the investigations of the British Fire Prevention Committee, and that its findings will have considerable international bearing on the subject of the fire-resistance of building materials generally, for the influence of the committee reaches far beyond the confines of our Empire.

### CONCRETE CONSTRUCTION IN ENGLAND.

A forward step has been taken for the wider use of concrete construction in England, by the decision of H. M. Office of Works to build extensive additions to the new General Postoffice in London on the Hermbique reinforced concrete system. The new building will cover an area of two and a half acres and will have eleven and a half acres of floor surface. The British Admiralty are also employing concrete in the erection of important buildings and other works. It is claimed that the growth of the new method would be much more rapid were it not for the hindrance placed upon its use by out-of-date building regulations.

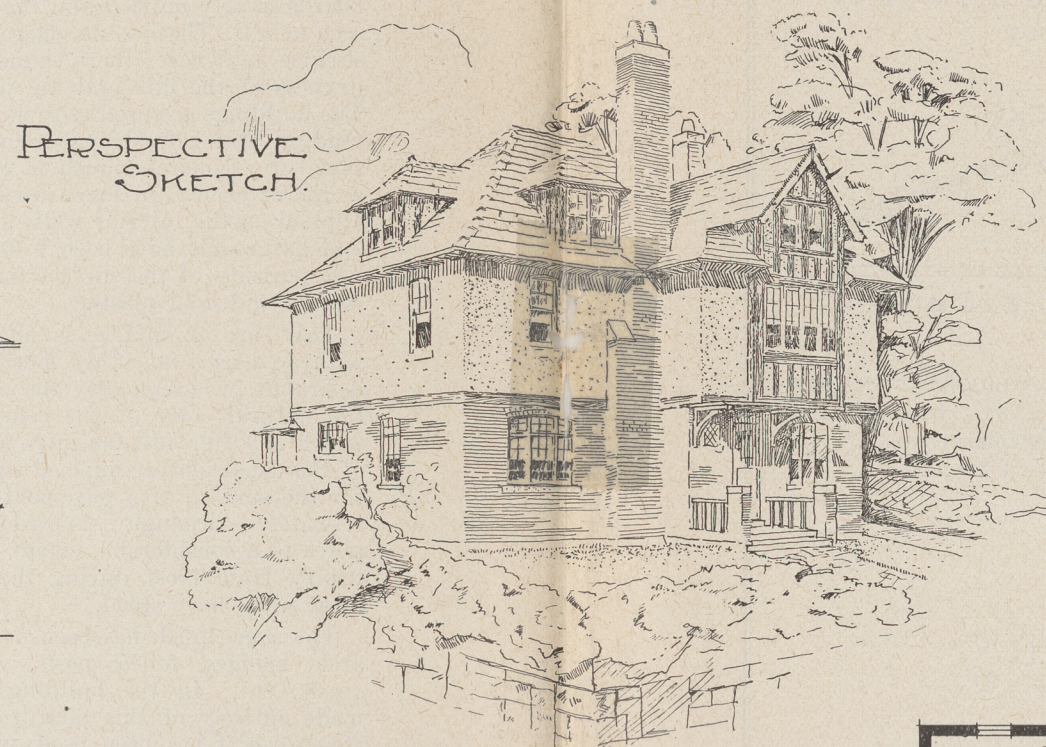


# DESIGN FOR A SMALL HOUSE IN A COUNTRY TOWN

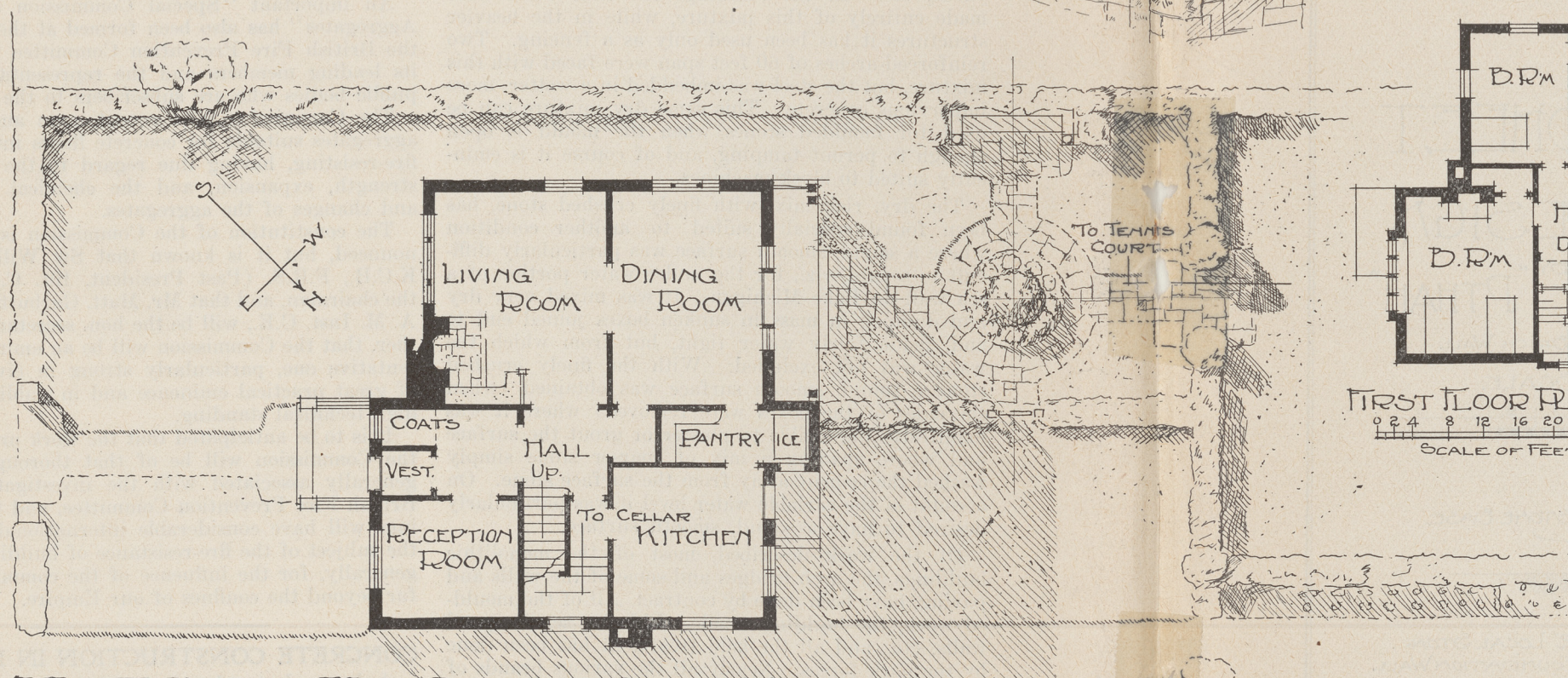
CANADIAN ARCHITECT AND BUILDERS' STUDENT COMPETITION



GARDEN ELEV.

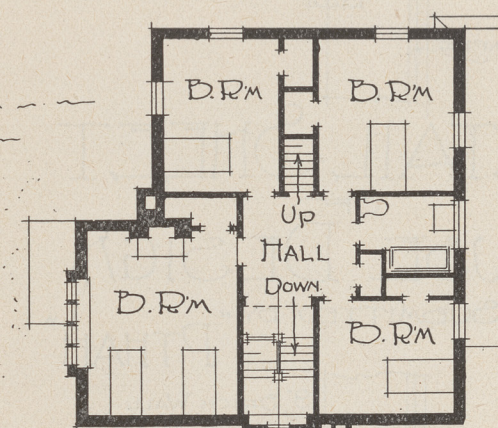
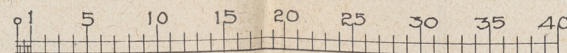
PERSPECTIVE  
SKETCH.

N.E. ELEVATION.



PLAN SHOWING GARDEN ETC.

SCALE

FIRST FLOOR PLAN  
0 2 4 8 12 16 20 24  
SCALE OF FEET.

SUBMITTED BY

"PIHAN"



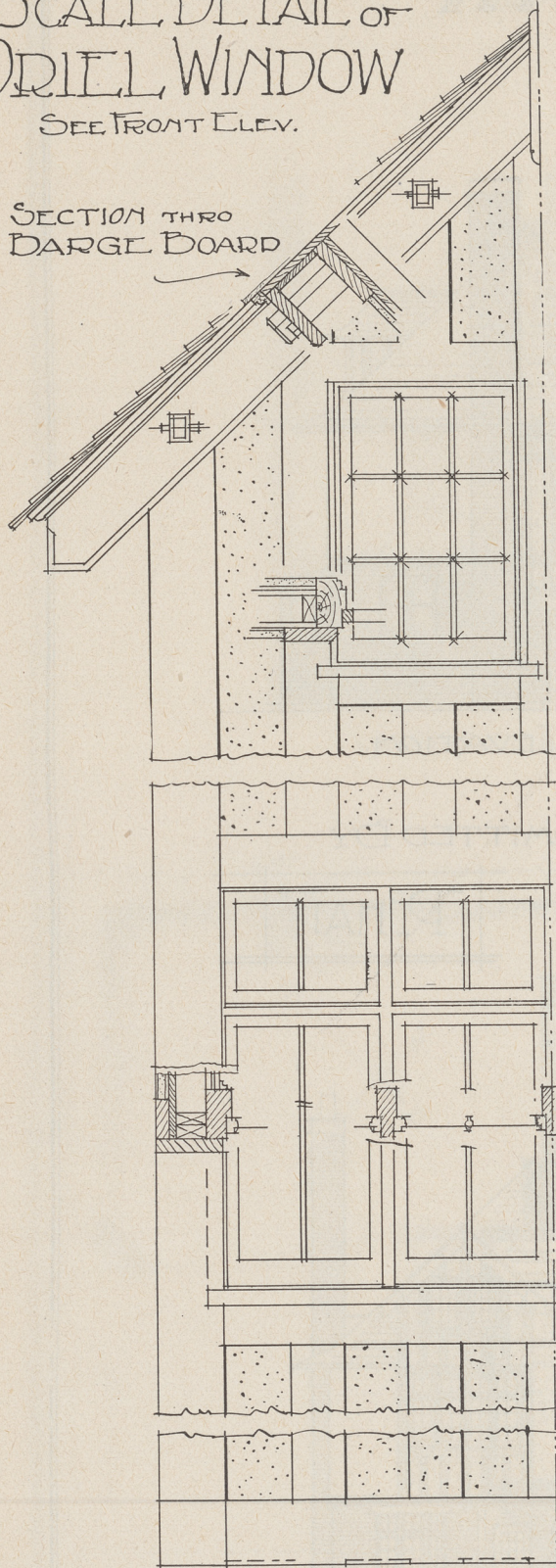
STREET ELEV.



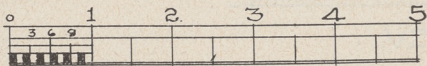
# SCALE DETAIL OF ORIEL WINDOW

SEE FRONT ELEV.

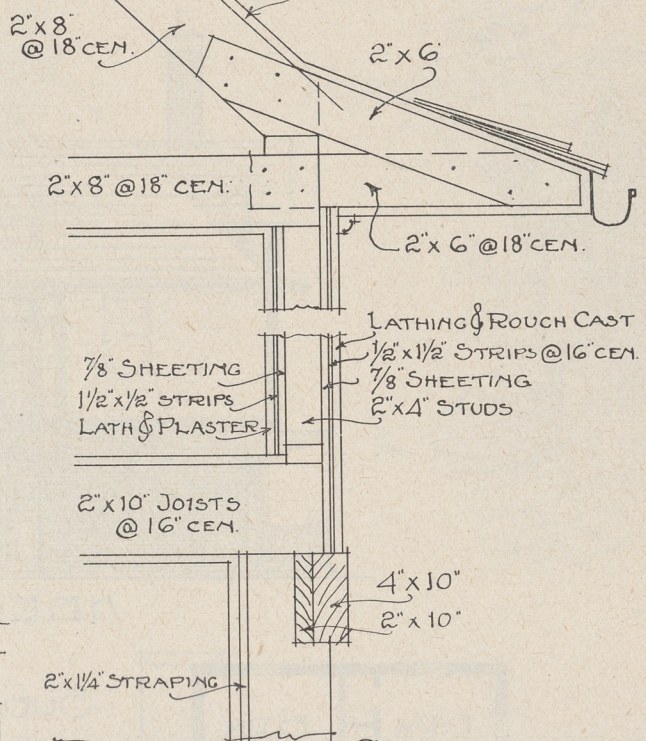
SECTION THRO  
DARGE BOARD



SCALE :-

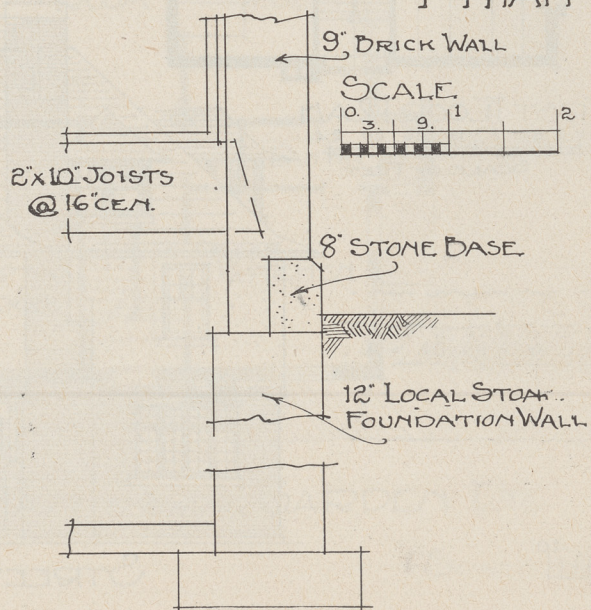


# VERTICAL SECTION THRO WALL ETC.



# DETAIL SHEET OF HOUSE DESIGN

SUBMITTED BY "PTAH"







### INDOOR ILLUMINANTS.\*

BY JAMES SWINBURNE, F.R.S., M.I.C.E.

It is quite worth the while of the man who has to look after the lighting of a big building to become a specialist to some extent in illumination. The only difficulty is that an engineer-in-charge has to be a specialist in so many branches of engineering that he has not very much time available. Some day we may have illuminating engineers who are not supply electricians or gas engineers, but concern themselves with the application of electrical power, gas, petroleum, and acetylene to lighting, dealing with each on its merits without partiality. At present the question is left generally to architects, house decorators, and chance has far the most to say in the matter.

Before going further I may as well say at once that I have no claim to be called an illuminating engineer, and I am not going to try to lay down the law in any way; all I want to do is to bring various points forward that seem most interesting and important, and to start a discussion in which we may all compare experiences. The first point to consider is what we want to produce and what the real goal of our labor is. If, instead of beginning at the manufacturing end of the matter, we go to the other extremity, we find that what we want to do is to affect the retina of the eye. The object of all lighting is to get the maximum of light on the part of the retina desired, at a given cost. People use artificial light for reading, writing, and seeing one another, and for finding their way about. Women also use it for sewing.

In all cases the important point is that the eye should receive plenty of diffused light from the objects that are to be observed, and as little light as possible from any other surface. The last part of this is most frequently overlooked in lighting a building. Most people photograph in our days, and no one dreams of making an exposure with the sun shining into the lens, that is to say, the camera is always arranged so that, treating it as an eye, it does not see the sun. The eye is something like a camera provided with a portrait lens with a very large circle of illumination. That is to say, the lens of the eye gives very fine definitions over a very small area and gives very little definition over a very large area; in fact, if you are looking straight in front, the eye can notice the movement of a piece of paper, not only at one side, but even a little behind, so that it corresponds to a lens taking in more than 200 deg. It is, therefore, sometimes difficult to arrange lights so that they do not shine into the eye. The eye is shaded above by the eyebrows, however, and this makes the problem easier to solve.

If the sun is allowed to shine into a camera, light gets reflected from the brasswork of the lens mount,

or from some of the surfaces of the elements of the lens, and makes marks on the plate, or it illuminates the bellows so strongly inside that the plate receives a lot of light which is not meant for it. In the case of the human eye this does not happen so much. What happens in the case of the eye is that it finds it is getting more light than it likes, so that it automatically closes its iris diaphragm. This is one effect which is probably produced by strong lights, even if the eye is not looking directly at them; but a much more serious matter is that if a strong light comes into the eye at all the eye is automatically turned to look at it, so that the image is formed on the most sensitive part of the retina. This produces two results: the iris is automatically closed and the retina becomes fatigued, or the eye is dazzled, and the sensitiveness is lost until the eye gradually recovers it. It is, therefore, most important that the eye should not be exposed to bright lights. It would be almost impossible to light a public or any other building economically entirely by diffused light with all the lamps out of sight; but the evil of direct lighting can be very much reduced by arranging lamps so that they are high enough not to shine directly into the eye, except from a good distance, and so that they are small as to candle-power, and large in area, and give diffused light. From a physiological point of view, therefore, the sources of light should not be intense, but should be small and numerous, or should be out of sight.—

### FLANGED JOINT WORK.

Carelessness in bolting up flanged joints frequently leads to disastrous results. It often happens that when joints do not come squarely together, the workmen, instead of seeing that the line is made square so that the joints will come together properly, will undertake to spring a very rigid piece of work in the bolting, the result being that if something does not give way under this strain on the bolts, it very likely will do so when the pipe is subjected to expansion and contraction.

Another blunder frequently made by workmen is in not taking pains to tighten the bolts evenly so that they will all be brought up together to the same tension. They will start in and tighten up one side, hard, and then when they come to tighten the opposite side, it throws a very severe strain on the side first tightened. If the flange is not broken by this strain, there is the same danger we have mentioned above, that is, that it will break under the strain of expansion and contraction.

It also frequently happens that when leaks occur after steam is turned on they are not promptly and properly attended to. This, of course, is very bad practice, for every engineer knows that if a leak is allowed to run for any length of time it will injure the material, either the metal or packing of both. Furthermore, it will then be impossible to tighten it by screwing up the bolts.

\*Abstract of a paper read before the Association of Engineers-in-Charge, November 14th, 1906.





### SOME REMARKS ON TILES.

The art of tiling may be considered the connecting link between the fine and useful arts. The combination is of beauty and utility, says the *Decorator's and Painter's Magazine*. The glazed tiles for decorative uses are of four classes, and are commonly called art tiles, enamelled tiles, embossed tiles of majolica, and encaustic tiles.

The first are hand-painted, and are used for decorating grate-checks, pilasters and cabinet works. The enamelled tiles are also used for these purposes, as well as for handsome flower pots, wall linings, and purposes of general utility and architectural decorations. The embossed majolica is used in the same way. Encaustic, plain and mosaic tiles are used for pavements. Inlaid encaustic tiles of extra thickness are used for hearths, and self-colored glazed tiles of white celadon, turquoise, olive and buff, in squares and geometrical figures, are used for wall linings.

The encaustic tiles, now commonly made of an earthenware intermediate between common tiles and porcelain, are extensively used for paving churches, halls, baths, conservatories and other places. They differ from those of antiquity in the manner in which they are finished. The ancient artists made use of the stylus and wax, which gave rise to the term—from the Greek *en*, and *kaustikos*, burning. The exact mode of burning-in the design has not been learned by the modern artists, who made use of oil instead of wax.

The manufacture of the celebrated Minton decorative tiles is as follows: The clay is first put through a variety of washings and purifications, and then passed through fine lawn-sieves in a liquid state. It is then boiled until it is in a plastic condition. The pattern is cast in plaster and placed in a metal frame of required size. A piece of the clay is then rolled out like pie crust and pressed upon the plaster pattern to receive the correct outline of the design. The metal frame containing the plaster mould is divided horizontally and the surface put in, the frame being put together again and filled with coarser clay of the required thickness. The tile is then put under a screw-press to receive the proper degree of solidity.

The durability of these tiles is such that nothing short of the destruction of the world would destroy them. Their durability relates both to the strength of the material and to the depth and intensity of color.

The oldest specimen of glazed tiles discovered in England was the ruined priory church in Norfolk, a portion of which is in the British Museum. These tiles are ornamented with escutcheons of arms, and on each is the name of "Thomas."

Scarcely a house in Pompeii seems to have been without mosaic pavement.

In Greece, inlaid pavements of variously colored marbles were used for the sumptuous decorations of the time of Alexander of Macedon. They were in fretwork and geometrical patterns, but the most famous is the one mentioned by Pliny as the masterpiece of one Sosos of Pergamos, called the "Unswep Hall." It is inlaid so as to represent crumbs and fragments which would be found on a floor after a banquet, with the doves which had flocked in to partake of the feast.

Another masterpiece of the tiler's art was the floor of the great ship Hieron II., which was of small cubes

of stone of every color, representing the history of the siege of Troy; a work which occupied 300 workmen a year.

Mention is made of a tiled court in sacred history as early as 521 B.C. It is described as a pavement of red and blue, and white and black marble. This was the garden court of the palace of Ahasuerus, and the art of enamelling in glazed colors was well known to the artisans of that locality at that time. Blue was a favorite color, combined with black marble.

The "Dutch tiles" are famous the world over. Washington Irving, in "The Alhambra," gives the history and origin of these tiles, which have figured so largely in the useful arts. He says they were brought into Spain by the Moors, and were used by them in the building of their Spanish palaces. From this country they were introduced into the Spanish Netherlands by the Dutch soldiers, and from there into Holland. The polished surfaces of the tiles commended them to the Dutch housekeepers, who have always been famous for cleanliness. They took such hold upon the people that manufactories were set up, and the numbers turned out rendered the cost within the limits of the householders in general.

The polished surface of tiles and the durable nature of the material still commend their use strongly for the maintenance of exquisite cleanliness. From a sanitary point of view, tiled floors for apartments commend themselves. From an artistic point of view, tiles present the most captivating forms of beauty.

The highest artistic talent is employed in the conception and execution of the designs with which tiles are decorated. Even giving the colors to tiles is an operation requiring great skill and care. It requires three days, and the tiles are then dried from two to three weeks and then fired, being exposed to an intense heat for sixty hours.

### PRODUCTION OF STRUCTURAL MATERIALS.

The latest report of the Dominion Geological Survey gives the production of structural materials in Canada for 1894.

We would like to see these official reports brought more closely up to date, as at the present rate of development in Canada, statistics that are two years old are of comparatively little value.

The report states that owing to the intermittent working and large area covered, it is impossible to give accurate statistics of production of the quarrying and brick-making industries. The total value of the various products for 1904 is stated as follows:—

Building stone .....	\$1,930,000
Marble .....	.....
Granite .....	150,000
Slate .....	23,000
Flag stone .....	6,720
Cement .....	1,338,239
Lime .....	780,000
Bricks and terra cotta .....	2,983,000
Sewer pipes .....	440,894
Fire clay .....	8,592

The Bullen Brick Company, of Chicago, are reported to have purchased 156 acres of land at Weston, on which to establish a brick manufactory.



### DESCRIPTION OF DESIGN FOR MODERATE COST HOUSE.

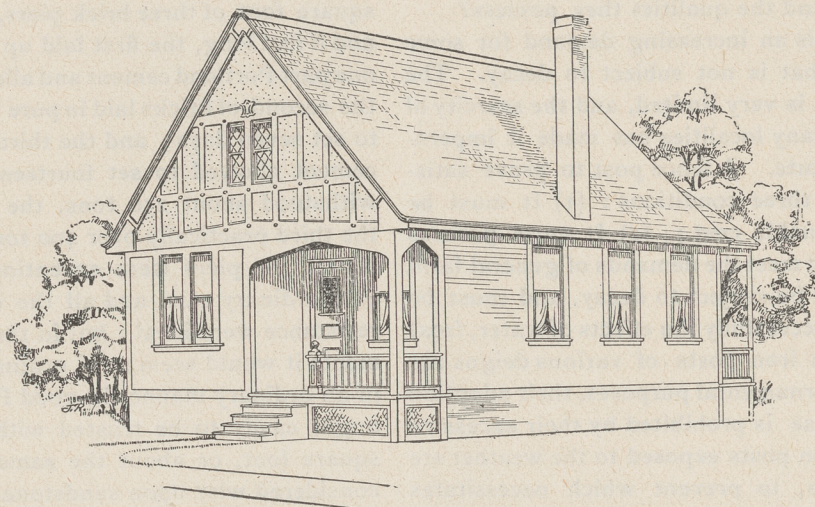
A four room plaster gable house built of frame on a brick foundation. No basement. Main body of house is 24 feet by 30 feet. Has pantry and three closets in addition to the four rooms. Front and rear porches. Arranged to be heated by stoves. Estimate cost is \$600.

### HEATING A COTTAGE.

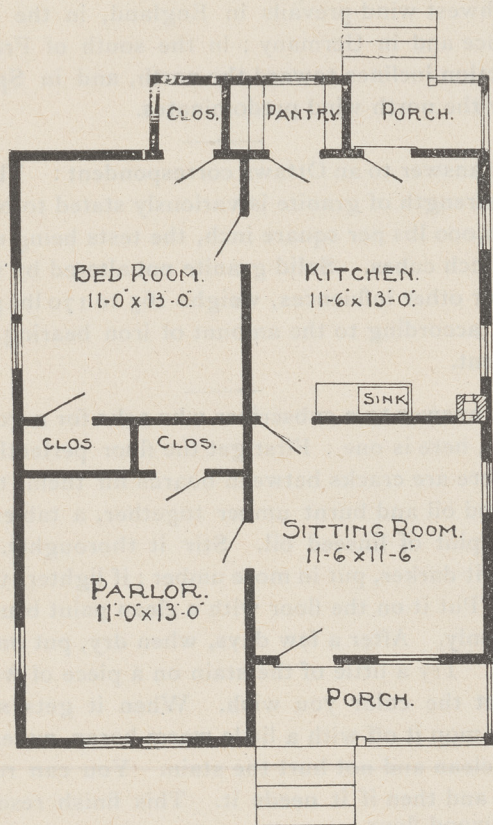
In discussing the question of heating a village dwelling by means of stoves, Dr. Harvey B. Bashore

To reduce these defects to a minimum it is necessary to alter somewhat the construction of the rooms. Everyone knows the value of the open grate, not so much as a heater, but as an equalizer of room temperature, and herein lies our remedy. Every room should have such a grate, or its equivalent, simply an air shaft connected with the chimney and opening into the room at the floor level. An air shaft so arranged and of suitable dimensions answers almost as well as an open grate and furnishes the means whereby rooms may be heated very well with ordinary stoves.

When a room which has no fire place is heated, the



MODERATE COST HOUSE.



—FIRST FLOOR PLAN—

states that the halls are usually cold, and, in addition, even in the rooms where the stoves are placed, the floors are from 6 to 8 degrees colder than the temperature 4 or 5 feet above, a fact easily proved by experiment, says Carpentry and Building. As a consequence one's feet are just so much colder than head and shoulders. These two defects, cold halls and floors, are certainly factors in producing catharral inflammation of the throat and nose, if nothing worse.

heated air rises and spreads along the ceiling in a thick cloud, and if a window is opened the warm air rushes out before it has done much good; if, on the other hand, there is an open grate, some of the hot air escaping up the chimney creates a partial vacuum; this consequently creates in the room a movement toward the opening, and the upper heated air is more diffused about the room, making the temperature more uniform.

The halls, whether they contain a stove or not, should have an air shaft, for it will assist somewhat in "sucking out" the heated air of the adjoining rooms. A small oil heater placed in the lower hall will be of assistance in keeping the hall temperature at the right point.

A case was recently tried in the High Court of Justice at London, Ont., by the Hon. Mr. Justice Clute, the plaintiffs being the Ideal Concrete Machinery Company, of South Bend, Ind., and the defendant Mr. Henry Pocock, of London.

The dispute arose over the question as to whether or not Mr. Pocock was infringing on the patents of the plaintiffs, in manufacturing and selling London concrete block machines. His Lordship's remarks and judgment were as follows:—

With reference to the main question, the validity of the patent and as to whether or not the defendant has infringed the same, it has not been seriously contended before me that the plaintiff's patent is not a valid patent, that it is not a new invention—indeed the experts upon both sides concurred in the statement that they believe that it is. Upon the whole case, therefore, I am of opinion that the defendant has infringed the plaintiff's patent; that in manufacturing and offering for sale machines corresponding with that produced, called Exhibit No. 6, there was an appropriation of the plaintiff's invention, that it is only colorably different from the plaintiff's, that it is appropriating that for which the plaintiff has been granted a patent, and that he ought not to be permitted to continue such infringement. The judgment will, therefore, go to continue the injunction already granted, with a direction that a list that has been kept of the proposed purchasers from the defendant be delivered over to the plaintiff in terms of the order and direction of the learned Chancellor. The plaintiff is entitled to his costs. I direct judgment to be entered for the plaintiff, and that the injunction be continued; that the judgment declare that the plaintiff's patent is valid, and that the defendant has infringed the plaintiff's patent, and that the defendant deliver to the plaintiff a list of the probable purchasers, as directed in the interim injunction order.





"Concrete Worker" asks:—Can you give me any information regarding "Reinforced Concrete Posts," their composition, and the qualities they possess?

Answer:—There is an increasing demand for some form of fence post that is not subject to decay. The life of wooden posts is very limited, and the scarcity of suitable timber in many localities has made it imperative to find a substitute. A fence post to prove satisfactory must fulfil three conditions: (1) It must be obtainable at reasonable cost; (2) It must possess sufficient strength to meet the demands of general farm use; (3) It must not be subject to decay, and must be able to withstand successfully the effects of water, frost and fire. Although iron posts of various designs are frequently used for ornamental purposes, their adoption for general farm use is prohibited by their excessive cost. Then, too, iron posts exposed to the weather are subject to corrosion, to prevent which necessitates repairing from time to time, and this item will entail considerable expense in cases where a large number of posts are to be used. At the present time the material which seems most nearly to meet the requirements is reinforced concrete. The idea of constructing fence posts with concrete, reinforced with iron or steel is by no means a new one, but on the contrary, such posts have been experimented with for years, and a great number of patents have been issued covering many of the possible forms of reinforcement. It is frequently stated that a reinforced concrete post can be made and put in the ground for the same price as a wooden post. Of course this will depend in any locality upon the relative value of wood, and the various materials which go to make up the concrete post, but in the great majority of cases wood will prove the cheaper material in regard to first cost. On the other hand, a concrete post will last indefinitely, its strength increasing with age, whereas, the wooden post must be replaced at short intervals, probably making it more expensive in the long run.

A Toronto subscriber asks: "What class of lime and what proportion should be used to lay pressed brick in white mortar?"

Answer—One part of white lime to two or three parts of good, live sand, with a sufficiency of clean water, thoroughly incorporated together. The mortar will require to be more pliable than what is used for ordinary kiln-burned brick, as the joints for pressed brick are generally thinner.

"Architect" asks: "What would be the cost per cubic foot of a brick and unprotected steel building to be used for store purposes?"

Answer—Buildings of this type range around 18 cents per cubic foot, but the cost varies according to the area, perimeter, party walls and street fronts.

In answer to a correspondent, who asks for informa-

tion regarding the strength of brick piers, some tests were recently made to determine crushing strength per square foot of three brick piers, each 12 inches square and 8 feet long, the first laid up in mortar composed of one part Portland cement and allowed to set seven days; the second, of bricks laid in pure Portland cement allowed to set seven days; and the third, of bricks in Portland cement allowed to set fourteen days. The first pier withstood about 250 tons, the second over 325, and the third practically over 400 tons per square foot. Of course the piers were exceptional ones, laid up with extraordinary care, and all the conditions of test and resistance were ideal; but in the face of such experiments it would seem as if ordinary brickwork laid up in an ordinary manner in good Portland cement mortar ought easily to be trusted with at least 25 tons per square foot, or about the same stress per foot as is considered wise upon sandstone.

Replying to the recent enquiry of a subscriber: The southwest wind prevails in England, in the north of France and in Germany; in the south of France the direction inclines toward the north, and in Spain and Italy the north wind predominates.

In answer to an Ottawa correspondent: The crushing strength of granite is variously stated to be 12,000 to 20,000 lbs per square inch, the tests being made on two inch cubes. Solid granite not altered by weathering or other influences, weighs 165 to 170 lbs per cubic foot, according to the amount of iron bearing mineral present.

In answer to a subscriber who asks for a good floor stain, here is one: First get the floor perfectly clean. If there are cracks between boards fill them, then mix linseed oil and burnt umber together, a tablespoonful to a pint of linseed oil. Stir it thoroughly. If you wish it darker, put in more umber; if lighter, use more oil. Put it on the floor with a clean paint brush. Rub it evenly. After a few days, when dry, put on second coat. Try a little of the stain on a piece of wood first to get the color you wish. When it gets soiled or dirty mop it off with a little warm borax water, which will clean and not hurt the stain. You can retouch it now and then if it needs it. This finish resembles a hardwood floor.

An Owen Sound subscriber asks the origin of the various colors employed in decoration.

Answer.—The cochineal bug furnishes many of the most brilliant colors, including the bright carmine, crimson, purple lake, and scarlet. The cuttlefish gives the sepia, and Indian yellow comes from the camel. Ivory chips produce ivory black and bone black, and the exquisite Persian blue was discovered accidentally by fusing horses' hoofs and other refuse animal matter with impure potassium carbonate. Crimson lake comes



from the roots and barks of certain trees; blue-black from the charcoal of the vine chalk; and Turkey red comes from the root of the madder plant found in Hindustan. Indian ink is made from burned camphor by the Chinese.

A London subscriber asks for the best method of removing stains from an oak floor.

Answer—A good bleaching agent is a clear solution of one pound of chloride of lime and 2 ounces of soda crystals in one gallon of water. The stains should be kept constantly saturated with the solution for a few hours, then washed with weak sulphurous acid and finally with clear water.

### IMPORTANT LEGISLATION.

There are at present before the Dominion Parliament and the Senate several Bills of the utmost importance to the builders and contractors of this country.

A most important amendment will likely be made to the law referring to the compulsory arbitration in certain trade disputes. The Bill, which has already been read once, is, in part, as follows:—

5. Wherever any dispute exists between an employer and any of his employees, and the parties thereto are unable to adjust it without having recourse to a lock-out or strike, either of the parties to the dispute may make application to the Minister for the appointment of a Board of Conciliation, to which Board the dispute may be referred under the Act.

57-61. Strikes and lockouts (in the industries as above limited) prior to and pending a reference to the duly constituted Arbitration Board, are declared illegal, under heavy penalties.

62. If an employer dismisses from his employment any employee by reason merely of the fact that the employee is or is about to become a member of a trade union, such employer shall be liable to a penalty not exceeding fifty dollars for each employee so dismissed.

63. If an employee goes on strike by reason merely of the fact that his employer has employed or is about to employ some person not a member of a trade union, he shall be liable to a penalty not exceeding fifty dollars.

The Montreal Builders' Exchange endorse this Bill, but suggest that its scope be not confined to the few industries specified, but be extended to include building and general industries where such disputes contemplated by the Bill are continually arising, and, in their opinion, the reference to the Minister should not be optional but compulsory. Hence the word "may" in section 5 should be amended to "shall."

A Bill is now before the Dominion Senate, the intention of which is to prevent the foreign agents and delegates of trades unions from acting on Conciliation Boards under the Conciliation Act, 1900, and to make it a criminal offence for foreigners to interfere in any difference between employees and employers.

The Bill is as follows:—

1. Paragraph (3) of sub-section 1 of section 4 of The Conciliation Act, 1900, is hereby amended by adding thereto, after the word "conciliation," in the fifth line thereof, the words "but no person who is not a citizen of Canada and a British subject shall be so appointed."

2. The following section is hereby added to the

said Act, immediately after section 4, as section 4a thereof:—

"4a. Everyone is guilty of an offence and liable, on summary conviction, to a fine not exceeding \$100, who, not being a citizen of Canada and a British subject, in any way intervenes in a difference, whether existing or apprehended, between an employer or any class of employers and workmen, or between different classes of workmen."

The above amendments are endorsed by both the Montreal Builders' Exchange and the Canadian Manufacturers' Association.

The trades unions of Canada are endeavoring to have passed a Bill whereby all workmen and laborers engaged in work for the Government, whether under contract or by day labor, shall only be required to work eight hours per day. The Canadian Manufacturers' Association, the Montreal Builders' Exchange and many individuals are strongly opposed to this Bill, which is thought to be the commencement of the compulsory eight-hour day throughout Canada.

The Bill is as follows:—

1. Every contract to which the Government of Canada is a party which may involve the employment of laborers, workmen or mechanics, shall contain a stipulation that no laborer, workman or mechanic in the employ of the contractor, or sub-contractor, or other persons doing or contracting to do the whole or a part of the work contemplated by the contract, shall be permitted or required to work more than eight hours in any one calendar day, except in cases of extraordinary emergency caused by fire, flood or danger to life or property.

2. Every such contract hereafter made shall contain a provision that unless the person or corporation making or performing it complies with the provisions of this Act, the contract shall be void and the person or corporation shall not be entitled to receive any sum, nor shall any officer, agent or employee of the Government of Canada pay or authorize payment from the funds under his charge or control to the person or corporation for work done upon or in connection with the contract which in its form or manner of performance violates the provisions of this Act.

3. This Act shall apply to work undertaken by the Government of Canada by day labor.

### NATIONAL ASSOCIATION OF BUILDERS' EXCHANGES.

At the present time, when the formation of a national or provincial association of Builders' Exchanges in Canada is being advocated, the fact may be noted that the American Exchanges have organized as the National Association of Builders' Exchanges.

The organization meeting was held on January 15th at Scranton, Pa., when delegates were present from several States. The proceedings of the meeting consisted of merely the election of officers and other work of a preliminary nature. The following officers were elected:—President, E. S. Williams, Scranton, Pa.; 1st Vice-President, W. N. Hagy, San Antonio, Tex.; 2nd Vice-President, J. M. Phillips, Wilmington, Del.; Secretary-Treasurer, A. E. Pearson, Henry street, Orange, N. J. B. Griffen, Pittston, Pa., was elected to act with the other officers as the Executive Committee.



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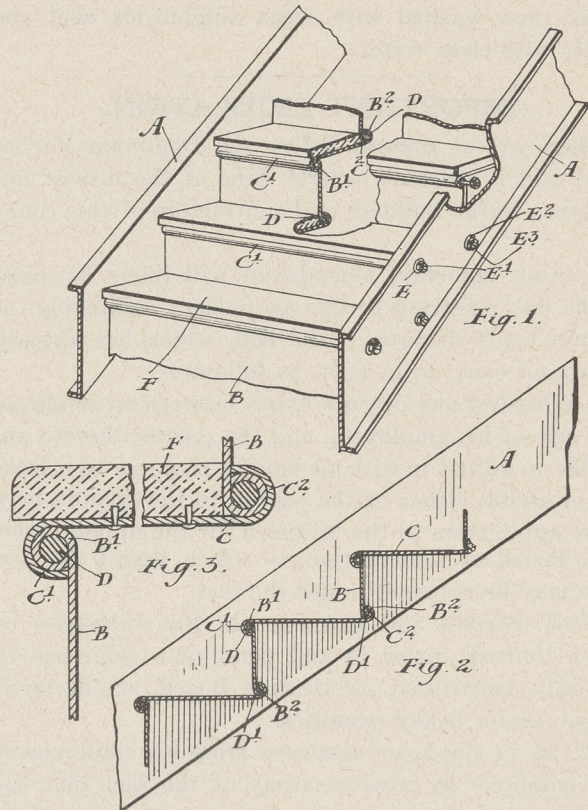
**NEW PATENT STAIR.**

Mr. Joseph Lea of the Canadian Ornamental Iron Company, Toronto, is the patentee of a new stair illustrated herewith, which is characterized by extreme simplicity in construction, and in neatness and beauty of finish.

The interlocking device of riser and tread constitutes one of the best features of the patent. The riser and tread thus interlocked and bound to the strings by tension bolts result in a construction which in strength and rigidity are claimed to be unparalleled in stair construction.

Moreover, it is estimated that there will be a reduction of 30 to 40 per cent. in the weight of material used.

With the use of this patent the construction of stairs may be



of steel throughout and the permanent steel treads will render temporary treads unnecessary. It is further claimed that this patent will make possible the specification of stair building; the material will be on hand—delays and expense unavoidable in pattern making and foundry work, together with the fitting and drilling of brackets, string, risers and treads, will be obviated; and it will be possible to put the stairs in position on briefest notice.

This should be a boon to architects and contractors to whom the necessary use of ladders and temporary stairs has been hitherto an unavoidable bugbear.



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## PRESERVING BRICK ARCHES WITH PAINT.

Mr. Peter Matthews, in his "Painters' Pocket Book" (John Heywood), says he has seen arches built of poor mortar, which were always a source of trouble. Even when the front was pointed down, the mortar in the arch was not strong enough to hold the pointing in front, and it was found to soon drop out. In such cases, if these arches were painted, the work would stand. Mr. Matthews gives his method as follows:—First rub down the surface with a piece of soft stone and wire brushes if they are at hand. Get it as smooth as possible, and then fill in all the joints with putty, mixed rather stiff. By

way of precaution it is well to cut back the joints a little, so as to form a key and hold the stopping in position. When the putty is fairly hard, and the whole surface of the arch is quite level, as well as the soffit, give a good round coat of paint, using yellow, or Venetian red if it is to be finished red. Rub this down and give two more coats, taking care to leave the surface between each rather dull so as to give good binding between them. When the arch is finished, paint in the joints with a straight-edge and pencil, or use a special brick lining-brush, which can be purchased, and the arch, when viewed from a distance, will look very neat.

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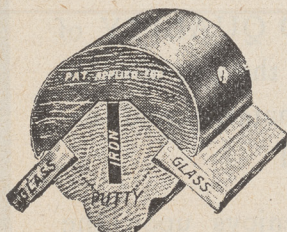
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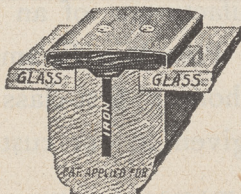
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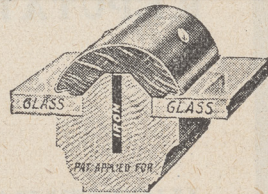
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## THE ALBERTA ASSOCIATION OF ARCHITECTS.

The annual meeting of the above association, which was incorporated in May last, was held in the offices, kindly lent for the occasion by Mr. F. Degendorfer, Edmonton, for the purpose of electing officers for the ensuing year.

The meeting, which was opened at 10.30 in the morning, was well represented by members from the northern part of the Province, but owing, no doubt, to the severity of the weather and the uncertainty of travel, Southern Alberta was in the minority.

The notice calling the meeting was read by the secretary, after which the minutes of the general meeting held in June last were read and adopted.

The president then delivered his address, giving a resume of the work done by the Council for the past year, congratulating the members on their having procured an Act of Incorporation and the approval of the Lieutenant-Governor in Council of the by-laws and schedule of professional charges. He then went on to suggest some very important measures for the incoming Council to take up, amongst others that of endeavoring to induce the public corporations to recognize a uniform code of regulations governing architectural competitions, such regulations as are now used in the sister associations of Ontario and Quebec, to be a basis to work on.

He also impressed on the members the importance of studying carefully the code of ethics of this association and carrying them out to the letter, by that means raising the standard of the profession in the Province.

He thanked the Council and his fellow-officers for their assistance in the organization of the association and work generally during the past year.

The secretary then read his report of the work for the past year, the meetings held and the attendance of members at said meetings. The treasurer then read his financial statement, which was very satisfactory.

After the appointment of two scrutineers, the election was proceeded with, the result being as follows:—R. Percy Barnes, Edmonton; W. S. Bates, Calgary; W. Stewart Campbell, Ed-

monton; F. Degendorfer, Edmonton; W. M. Dodd, Calgary; E. C. Hopkins, Edmonton; H. D. Johnston, Edmonton; Roland W. Lines, Edmonton; H. A. Magoon, Edmonton; H. M. Whiddington, Strathcona; Jas. E. Wize, Edmonton.

The general meeting was then adjourned for the purpose of holding a Council meeting for the election of officers for 1907, with the following result:—President, F. Degendorfer, Edmonton, re-elected unanimously; 1st Vice-President, W. M. Dodd, Calgary; 2nd Vice-President, H. D. Johnston, Edmonton; Secretary, R. Percy Barnes, re-elected unanimously; Treasurer, H. A. Magoon, re-elected unanimously.

Council:—Jas. E. Wise, Edmonton; W. S. Bates, Calgary; E. C. Hopkins, Edmonton; Roland W. Lines, Edmonton; W. Stewart Campbell, Edmonton; H. M. Whiddington, Strathcona.

The general meeting re-assembled at 4 o'clock, when the result of the election was read and received the hearty assent of the meeting.

A great many questions of importance were discussed during the rest of the afternoon, and it was decided to leave the matters in discussion to be dealt with by the Council at a meeting called for Wednesday next, the 6th of February.

After the usual votes of thanks the meeting was declared closed.

Experiments were recently made in Munich to determine the cost and relative advantages of indirect illumination for school and draughting rooms. The arc lamp was found to give the best results, but intensifying gas burners more economical. This method of lighting has been strongly recommended to the school authorities.

In the New York custom house two pairs of semi-circular fireproof stairways have been built, leading from the sub-basement to the top floor. In many respects these stairs represent an extreme advance in the fireproofers' art. They consist of hard burnt tile slabs built up in the form of the arch, so that they are self-supporting and entirely secure against any damage from fire.

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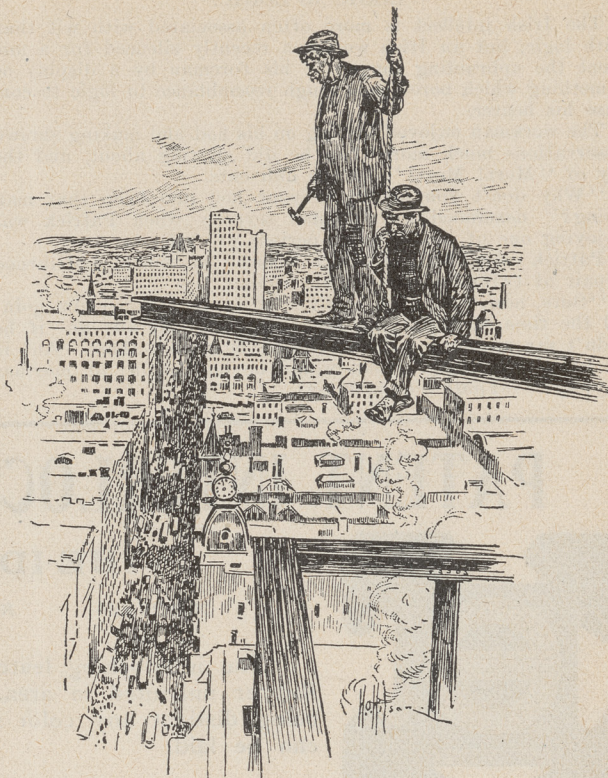
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## FASTENING IRON HOOKS AND CLAMPS IN STONE.

This is best effected by means of cement and not with plaster of paris, which under some circumstances exercises a very deleterious influence on iron articles, especially when both are exposed to the damp, or are placed in a room where the atmosphere is inclined to be humid. The truth of this statement may be demonstrated by the following case cited in a foreign paper: The swinging gate of a hotel had been hung to a red sandstone post. There were three hinges used, the upper and lower ones being cemented and the middle one fastened with plaster of paris (probably after the gate had already been hung). After the gate had been in use for some time a shell-shaped piece of masonry broke off from the inside of one of the posts, although no outward deterioration was visible. This laid bare that part of the supporting hinge which had been fastened with plaster of paris and proved that the work of destruction was already pretty well advanced, a saboteur one-eighth of an inch of rust scales could be easily picked off. The mass of plaster of paris also showed the characteristic rusty reddish-brown color. As the gate had not in any way injured the middle hinge, the only explanation is that the rusting of the clamp itself caused the increase in volume and subsequent decomposition of the otherwise sound stone. Pure cement, on the contrary, has a most favorable influence on any article as a preventive of rust; in fact, iron embedded in pure cement can be even kept in water without rusting. A thin coating of cement has also proven efficacious in the same way, and its comparative cheapness should recommend it as a substitute for red lead.



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"It's a wonder them street cleaners doesn't git run over."  
 "I'd hate to have their job. I'd be scared stiff all the time."—  
 Life.

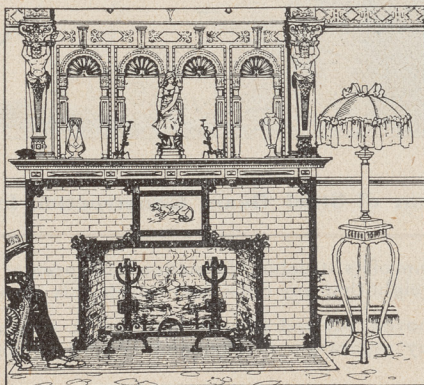
Floors of teak wood are recommended for hospital wards by Mr. Alexander Cullen, F.R.I.B.A., of Motherwell, near Glasgow, Scotland, in a paper on the construction of hospitals, read at the Sanitary Institute Congress. The surface is shellaced and wax polished and the skirting constructed of the same materials as the floor.

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## LOGIC IS LOGIC.

The Irish intellect is more often associated with wit than with logic, but an Irish workman recently silenced for a moment the upbraiding tongue of his foreman by a display of something which bore just enough resemblance to logic to confuse his hearer.

The workman enjoyed leaning on his hod and making shrewd observations much more than he did stirring about, and the cry of "Mort! Mort!" fell on dull ears.

"Why don't you attend to your hod and keep that man going?" demanded the foreman severely when Patrick was enjoying one of his frequent periods of rest.

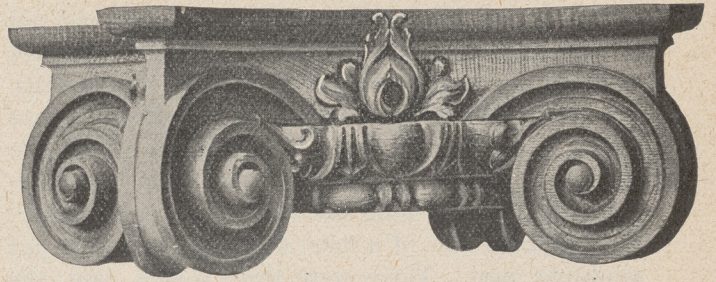
Patrick raised his hod with a leisurely movement and turned a pair of twinkling eyes on his accuser.

"Sure, now," he said, easily, "if I was to keep him goin' all the time sorra a thing he'd say at all, at all; an' if he didn't say anything I'd be thinking he wasn't there. An' if he wasn't there sorr, what would he be wantin' of morthar anyway?"—*Youth's Companion.*

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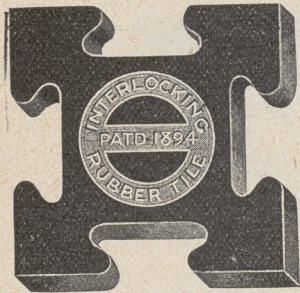
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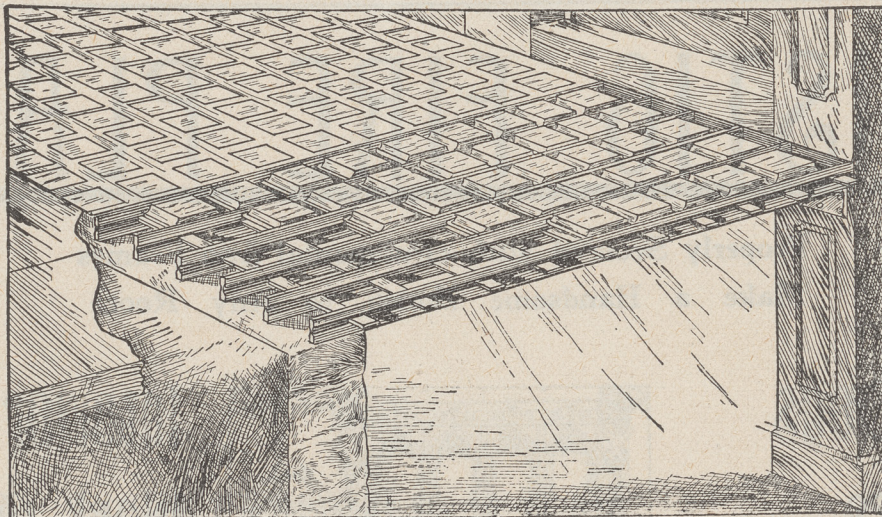
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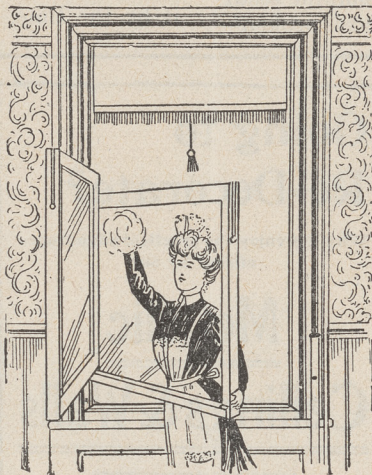
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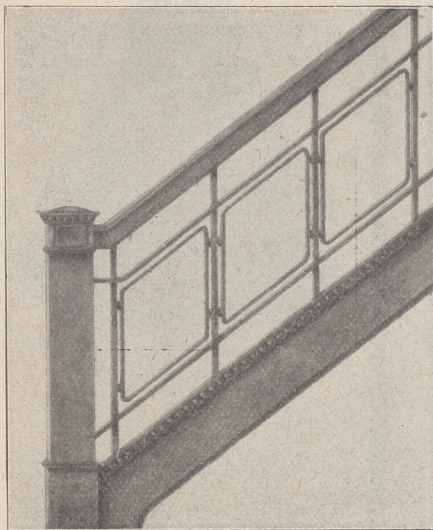
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Various tests have been made with a view to ascertaining the advantage to be derived from the use of manila fibre, as compared with other substances, in plastering work. One of the most conclusive of these tests was made with four plates of equal size, one containing manila hemp, a second sisal hemp, a third jute, and a fourth goat's hair of the finest quality, and the operation consisted in suspending weights from the middle of each plate, the ends of which were properly supported. The result showed that the plaster mixed with goat's hair broke at 144½ pounds weight, the jute at 145 pounds, the sisal at 150, and the manila at 195—in the latter case the hemp not breaking, but cracking, and, though cracked in the centre, the lower half of this plate, when it was suspended, held on to the upper half, the manila securing it fast. The three other plates were broken—

that is, the two parts of each plate had severed entirely, in contrast with the manila plastering. Another experiment consisted in mixing two barrells of mortar, each containing equal portions by measure of sharp sand and Thomaston lime, one of the barrels, however, being mixed with the proper quantity, by measure, of manila hemp, cut in length of one and a half to two inches, and the other of best goat's hair. On being thoroughly mixed with the usual quantity of water, the respective mixtures were put in the barrels and stored away in a dry cellar, remaining unopened for nine months, when, on examination, the hair mortar crumbled and broke apart, very little of the hair being visible, showing that it had been consumed by the lime; but the other, containing hemp, showed great cohesion, it being quite an effort to pull it apart, the hemp fibres permeating the mass, and showing little or no evidence of any injury done to it by the lime.—*Improvement Bulletin.*

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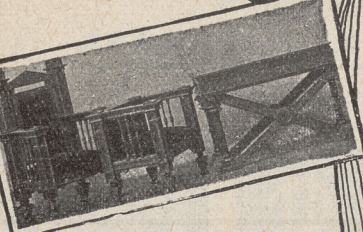
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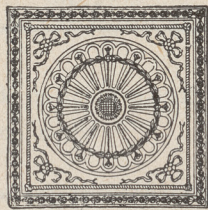
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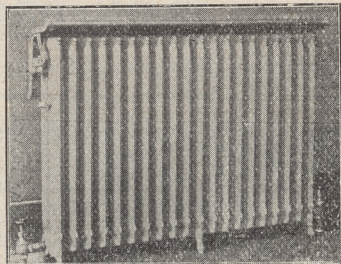
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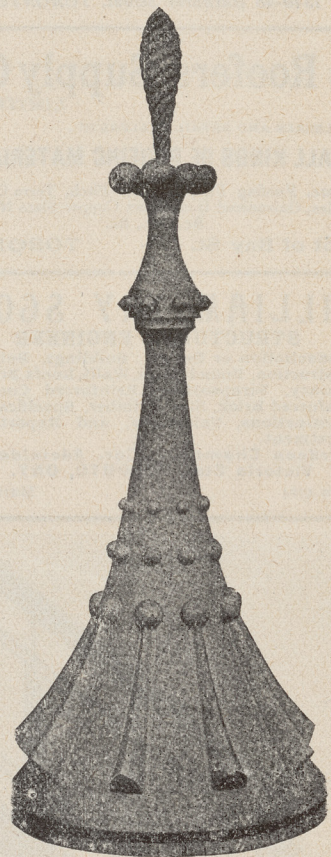
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## PAINTING CEMENT.

The following method of painting a cement wall was described at a recent convention of master painters. The building had become discolored in places and the joints were of a different color from the surface of the blocks. Two parts of Portland cement were mixed with one part of marble dust and mixed with water to the consistency of thin paint or a thick whitewash. The wall must be well wetted before the application of this paint and kept constantly wet while the material is applied, and then must be kept for a day longer, in order to make the cement wash adhere to the cement surface. The wash was applied with ordinary whitewash or calcimine brushes, and a man was kept busy playing a hose on it while the work was being done. The whole secret of success lay in keeping the wall constantly wet. At price could not well be quoted on such work, but on a scaffolding job should be worth less than a dollar a yard.

A well-known painter, who is one of the largest contractors in the country, in commenting on this, said that he had frequently been called upon to paint the cement panels in half-timbered houses, and the best material he could find for the purpose was an English material known as Duresco. This comes in paste form and is thinned with water to the consistency of thin cream and to this a little of a so-called "petrifying liquid" made by the manufacturers is added. This material is the same color when it is wet as when it is dry—differing from ordinary water paints in this respect. It can also be used on pressed brick fronts. The results are said to be as durable as oil paint, without the gloss of that material, and consequently well adapted for painting cement work. The same material is sold in this country under the name of Onresco.

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