Regular Edition

THE CANADIAN ARCHITECT AND BUILDER

VOL XV.—No. 9. SEPTEMBER, 1902 PRICE 20 CENTS $2.00 PER YEAR

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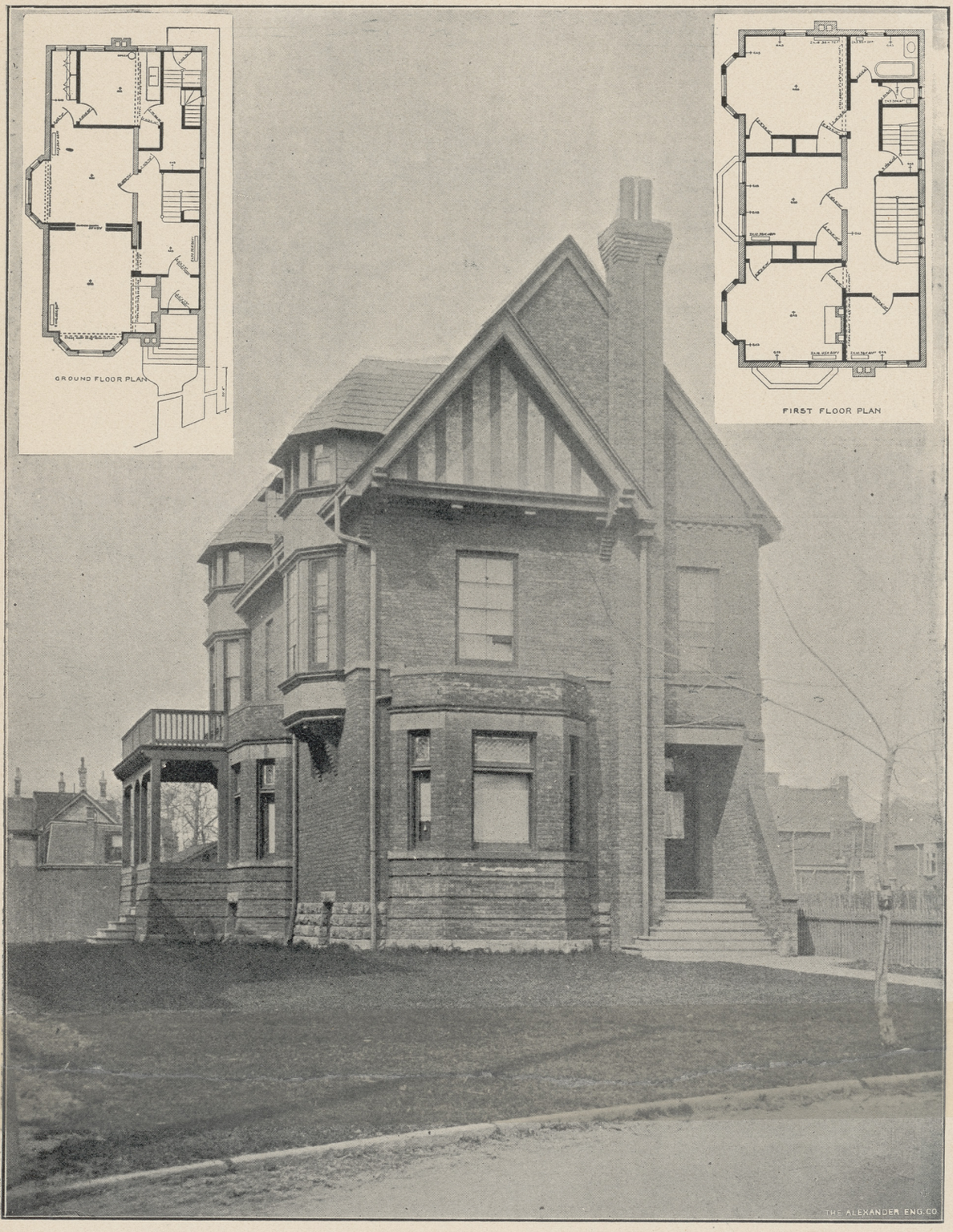
In the "Canadian Architect and Builder."



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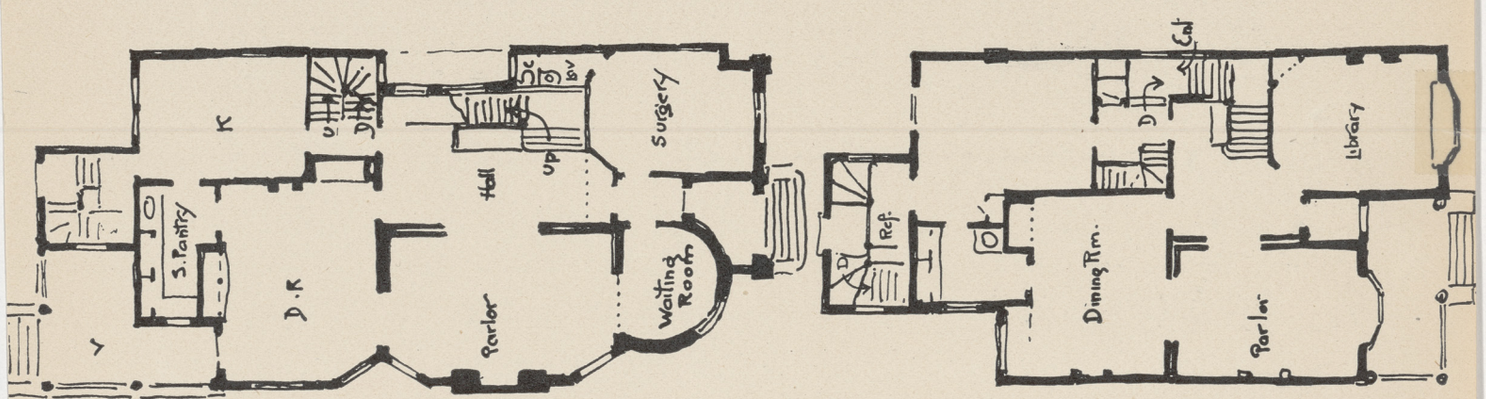

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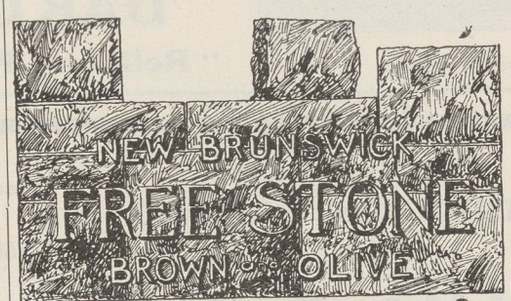

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The Canadian Architect and Builder

VOL. XV.—NO. 177. SEPTEMBER, 1902.

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St. Joseph's Church, Brighton, England.

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SPECIAL CONTRIBUTORS.

PROF. S. H. CAPPER, R.C.A., Department of Architecture, McGill University, Montreal
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" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal.
" W. H. ELLIOTT, Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.

Brick Fences.

BRICK fences which are so common a feature in England, have not been employed to any large extent in Canada, although the use of brick in conjunction with wrought iron for this purpose is noted in some recent work by Canadian architects. One difficulty which is said to attend the use of brick for this purpose in Canada, is that one side of the fence may be more subject to dampness than the other, leading to unequal expansion and contraction of the material, and ultimately to the toppling over of the structure. The use of cement instead of lime mortar in work of this character might prove a remedy.

The Preferential Tariff.

THE news comes from Berlin that the German customs authorities will in future require certificates of origin in the case of American grain. This is regarded as a retaliatory slap at Canada for having granted preferential duty on British goods coming into this country. The Dominion should now demand a certificate of origin in the case of all imports from Great Britain. This would have the effect of shutting out large quantities of German goods which now find their way into Canada as British imports and get the benefit of the preference which was intended to apply only to British manufactures. The statement is made on what appears to be good authority, that many German manufactured goods are shipped into England, where the assembling of the parts is done, after which the goods are exported to Canada and receive the benefit of the preference. At present there is nothing to prevent such a practice either by Germany or other countries. Means should be adopted to prevent the preference being accorded to any but bona fide British goods.

Province of Quebec Association of Architects.

THE Council some months ago passed a resolution recommending that the Association establish a Scholarship for Students in the Architectural Department of McGill University. It is proposed that this scholarship should consist of a sum sufficient to pay the fees of the successful student during his four year's course. The action of the Council requires ratification by the Association. Two meetings of the Association were called for this purpose, but much to the regret of those who had interested themselves in the matter, the necessary number of members to form a quorum could not be got together. The matter will therefore come up for consideration at the annual meeting in January, when it is hoped the proposal will be approved. Meanwhile, by reason of the apathy of the members, the proposals, if adopted,

cannot go into effect until the opening of the winter term next year. The establishing of a scholarship of this character should awaken a deeper interest by the students in the study of Architecture, as well as in the P. Q. A. A. and the work of the Architectural Department at McGill.

A Peculiar Objection

THE ways of the trades unions, like those of the heathen Chinee, are sometimes peculiar. News of what appears to be the very latest cause for a strike comes from Grand Rapids, Mich. The union bricklayers of that city have refused to work on a building because the foundation walls are constructed of cement and are carried up a few feet above the ground level. Members of the union state that the action was taken because of the effect the use of cement as a building material will have on their trade, the new construction not requiring the services of skilled bricklayers and stone masons, and threatening, in case of the universal adoption of the cement construction, to deprive them of a large part of their employment and thus drive them into other fields. It is a foregone conclusion that this action must fail to seriously retard the use of cement for building purposes. The adaptability of the material for foundations and for the entire construction of certain classes of buildings, such as warehouses and factories has been so far established that its extended use in this direction in the future is assured. On the other hand, it does not seem probable that it will become popular in the construction of residences and other buildings in which a high standard of architectural effect is sought for. After all, therefore, its effect on the employment of bricklayers will probably not be serious. In any case the unions will not be permitted to dictate to owners, architects and builders what materials they shall employ in the construction of buildings.

A Uniform Size for Bricks.

A correspondent writes that the table on page 110 of the new edition of the Canadian Contractor's Hand Book, showing the number of bricks in walls of various thicknesses, will not apply to bricks manufactured in Toronto. This is no doubt true, but the table is correct for some other localities, as for example the Maritime Provinces. Our correspondent's complaint again draws attention to the fact that there is scarcely any limit to the variations in size of bricks manufactured in this country. As an illustration in point, an architect who has some work in progress in a northern town writes "I am putting up a block of stores, and because of the brick famine in this section, I am compelled to use three makes of bricks—one from Barrie, another from Stayner and the third by a local manufacturer. No two makes are alike in size. This causes a great deal of trouble in bonding." The three manufacturers from whom this architect obtained his bricks are distant from one another not more than fifty to sixty miles. It will thus be seen how sizes vary even in what might be considered the same locality. In short each manufacturer appears to be a law unto himself. In another column will be found a table similar to the one in the Hand Book, but based on the largest size brick made in the Dominion so far as we can discover. This may be of some value, but from what has been stated it will be seen that no table that could be compiled would meet the requirements. Steps should be taken by the government or by the Architectural Associations and Builders' Exchanges to compel Canadian manufacturers to adopt a standard size for bricks, and put an end to the inconvenience arising from existing conditions.

City House Exteriors.

WIDE differences of opinion exist among architects with regard to what must be considered important features of their work. A discussion took place recently among members of the profession with reference to the outside appearance of city dwellings. A certain well-known house in Chicago was cited, which in the opinion of one architect had more the appearance of a prison than of a residence. The answer was that the interior of this house was entirely satisfactory and that the windows and doors faced upon an attractive inner court. Some of the parties to the debate contended that the exterior of a house facing the street might be of almost any character ; that the owner and architect were not under obligation to make the exterior of such a building pleasing to the public ; that the main requirement was to make the interior satisfy the desires of the owner. Others strongly combated these views, and held that in order that cities might be pleasing and interesting, it was necessary that attention should be given to the exterior treatment of residences as well as other buildings. Against this opinion was cited the American style of street house, which is so designed as to convey the idea that the occupants live, to a large extent, on the street. This style of house has large porches and verandahs, bow and other windows set low so that the interior is plainly visible from the street. There is something to be said in favor of both sides of this question. Perhaps the solution lies in the architect taking a middle course—that is, in making the outside of the house as attractive as the funds at the disposal of the owner and architect may permit, without in any way sacrificing the interior. It is undoubtedly proper that a dwelling should afford those who occupy it the necessary privacy, but it does not therefore follow that it should present to the observer from the street the sppearance of either a barn or a prison.

OUR BRITISH OFFICE.

Owing to increased British business, the publishers of the CANADIAN ARCHITECT AND BUILDER have established a branch office at 22 Grand St. Helen's, London, E. C. Persons interested in the building trade are requested to avail themselves of the facilities thus afforded for securing information regarding the demand in Canada for constructive materials. Our representative will be pleased to call personally in response to a request. Address the C. H. Mortimer Publishing Co., 22 Great St. Helen's, London, E. C.

In Prussia the Minister of Public Works has determined to prescribe by circular the necessary rules which are to be observed for the proper control, in manufacture, of the qualities of cement. In future every depot will be required to have a test office. The tests will not make it impossible for any but a specialist to carry them out; a knowledge of the use of the instruments and reagents will be all that is necessary. This knowledge can be acquired in either the State laboratory or in one of the cement works. Thirty pounds is to be advanced to each depot for the purpose of buying the necessary instruments, which are to be of the same pattern as those in the Charlottenburg laboratory.

A DOMINION EXHIBITION.

At the Toronto Industrial Exhibition last week the Hon. Mr. Tarte spoke of the desirability of holding a Dominion Exhibition, and of holding it at Toronto, as a good central place, already possessed of an experienced organization capable of carrying such an exhibition out. Mr. Tarte's promise to personally endeavor to help forward such an exhibition may be taken to mean that he does not ignore the question of cost. A Dominion show will require Dominion money, and its advocacy by Mr. Tarte may be considered as bringing the matter within the sphere of practical politics.

The idea ought to be taken up with energy. On the question of general expediency there is no douot that it s a great idea, having incalculable possibilities in the way of developing trade within our own borders. We do not know each other well enough. There has been a rush of development in this country of late years that requires just such an opportunity as an all-Canadian exhibition to enable the different provinces and sections of the country to become acquainted with the nature and extent of each other's productions. We are apt, both in buying and selling, to think first of other countries, because we have not yet learned to expect our own country to supply us with either the products or the market we want. By dint of successes in the World Fairs of other countries, we have learned that the fruit and dairy products of Ontario rank first class in this planet. Our fisheries have long been a main support of the Roman Catholic church, in Europe as well as in this country ; and we have recently came to regard ourselves as one of the granaries of the world. Our northwest is indeed rapidly enabling us not only to sell wheat to the world, but gold, to buy it with.

Yet these are but specialties; points in which we range ourselves with other countries. There are, besides these commodities, plenty more, which ought to be as well known inside the country. It is only a few things after all that a nation can expect to supply to other countries ; but it ought to expect to supply itself with all but a few things. We give each other the least possible encouragement. We say Canadian manufactures cannot afford to be first class because they have not the market to justify it. The market is here ; gaping for first class articles; but importing them from the United States.

It is just such a state of affairs that a national exhibition of national productions will tend to rectify. For such a chance producers will produce their best, and we shall be able to see if we have not in our own country not only the necessaries of life—food, clothing and fuel ; but also its luxuries—books, plumbing supplies and objects of beauty.

Of course such an exhibition will do us no harm with the outer world. Canada is a great country for summer visitors from other countries, and Toronto is apt to be a place of call for most of them. To say nothing of the summer conventions, which find it a convenient and pleasant meeting ground, Toronto is in the way of Americans fleeing for July and August to our north-west fishing rivers and to Muskoka ; and it is near Niagara, which European visitors must see before they can face their friends at home. With a Dominion Exhibition going on, these visitors would " stop off " and " take in " the show ; and more would come because there was a show to see. All of which would be good for trade, both present and prospective; and would no doubt, sooner or later, pay the cost of the exhibition. But the idea which appeals most to the imagination and suggests the greatest possibilities is the national stock-taking and interprovincial acquaintance-making that would take place ; giving openings for trade, or producing at one stroke a market, for which both producer and purchaser have long been ready if they had only known of one another ; a grand national courting bee to promote marriage between industry and trade in our family connexion.

To take one example which is of interest to readers of the CANADIAN ARCHITECT AND BUILDER : There is abundance of building stone in Ontario ; limestones, sandstones, granites, gneisses, serpentines and marble. Specimens have been collected by the Bureau of Mines and made a striking exhibit at the Pan-American Exposition. Yet for these stones we go to Indiana, Ohio, Scotland and Italy ; and for all that can be seen at present will continue to go there indefinitely. Here is one sort of product that our deserted waterways might very well carry, and there is nothing so likely to cause them to do so as a National Exhibition, well carried out.

This brings us to the aspect of the question which is more within the province of this journal than the question of the general advantage of holding such an exhibition. If done it must be done well ; and in that need lies the chance of Toronto redeeming its lost opportunities in the way of both grounds and buildings for its Industrial Exhibition. It is at these grounds that the Dominion Exhibition will naturally be held. But while the Toronto Industrial Exhibition Association is no doubt the best available means of putting it on foot, the grounds of the exhibition are not only inadequate—a defect easily corrected by the juxtaposition of the extensive vacant military ground by the Stanley Barracks and the filling in which it is proposed to do on the lake shore—but, to have any adequacy at all as a mere portion of the show, the grounds will require an upsetting and reconstruction from which they will never recover ; and that is what they want. It is such a chance to get things pulled down and things built that is not likely to occur again for many years ; for the Park Commissioner, though stout, is temperate, and apparently healthy. Would he were a worse man, and had a better imagination ! The grounds of the Industrial Exhibition, regarded as fair grounds, are just about as near nothing as they can be. An annual visitor has still, every year, to think before he can find his way to the grand stand. As for finding his way from it—there is but one way for everybody, and that in the wrong direction. Happy is the suburban Parkdaler who alone, when the fireworks are done, gets home to bed, undegraded (and unbruised) by crushing in a street car. There ought to be an eastern exit connected with either trams or trains; and the necessary accomplishment of such additional exit for a big Exhibition might be made one of Toronto's permanent gains proceeding from the Dominion show. But these, through important considerations, are quite secondary to the absolute want of effect in the present fair grounds. The plan is mere confusion. There is no leading idea, no visible arrangement, no attraction for the eye. These wandering roads with incoherent

buildings on them make no recognition of the fact that, a Fair is after all a great out of doors assembly; that people are out of doors most of the time and want to find their pleasure in being there. By making proper effort a Dominion Exhibition might be made an occasion to change all this. Its principal court would suffice for the main portion of the permanent Toronto Fair; and matters should be so arranged that the buildings round this should be made permanent and the court designed to be sufficient both in size and beauty to make the Toronto Exhibition what it should be.

Mr. Tarte's proposal that the Dominion Exhibition should be held next year leaves too short a time to do the thing properly; on the other hand it is hard to do anything that will take two years to do, on a ground where an Exhibition is held every year. But there are preparations, drawings contracts, ironwork, etc., that would be all the better for having a year, or all that is left of it after getting under way; and the filling in of the lake front might also go on at once. It would be cruel to shorten the Street Commissioner's enjoyment of such a happy dumping ground for ashes to one brief year. Besides there is going to be a shortage of ashes this year. With one year to advance preparations as far as possible, and a season of great activity, the thing might be done for the June after next. It would take this time also, one would think, to make sure of good exhibits.

If it is to be accomplished so soon as this there is no time to be lost, and even if it is given another year there is no occasion to delay taking the preliminary steps.

BY THE WAY.

Referring to a crusade which has been started in Dundee against the defacing of buildings by smokers striking matches against the walls, the London Builders' Record points to the necessity of using for walls which are liable to defacement from any cause, materials which are proof against disfigurement. Glazed or glass tiles or bricks will meet this requirement in many positions.

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In remodelling the Union Loan Building, Toronto, Messrs. Burke & Horwood, the architects, have adopted the American plan of designating the ground floor as the First Floor, the floor above as the Second Floor, etc., and have so numbered the rooms as that the room number shall indicate the particular floor on which it may be found. For example, on the first or ground floor the rooms number from 10 to 19, on the 2nd floor from 20 to 29, on the 3rd floor from 30 to 39, etc. The numbers of the several floors are shown in bold figures on the sides of the elevator.

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The residents of a London street in which a large building was in process of construction appealed for and were granted an injunction restraining the contractor from operating a derrick before 7 a.m., on the ground that it spoiled their slumbers. The contractor did not let the matter rest there, however, but carried the case to the Court of Appeal, which discharged the injunction. The court held that there was no vested right which secured people living in a residential street from being disturbed before 8 a.m. It was to the interest of everyone to have the work executed as quickly as possible. The contractor also submitted the plea that he was under penalty to complete the building by a given date.

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The members of the Institute of British Clayworkers hold a yearly excursion and visit in a body places of special interest where combined with pleasure information of value to the trade may be obtained. The practice is a commendable one. This year a visit was made to the clayworking districts of France. In this connection the British Clayworker remarks: "The trade in brickmaking is a long way behind England as a whole. There are comparatively few facing bricks made in France, and those chiefly in the Burgundy district, which we did not visit. The common brick trade is, generally speaking, of a very inferior stamp, but those made at Vaugirard were of a very fair quality, and the fire bricks made at Boulogne were excellent. The glazed bricks made at Ivry cannot compare with those made in England by the best firms, but they were excellent bricks, and the question arises whether the perfection and costliness of the English article is justifiable or necessary for ordinary purposes. We should be inclined to think that a product equal to that of Ivry would find an immense market at its relative price in this country. The French tile is undoubtedly a very superior product and worthy of extensive imitation. It is universal on the Continent. It is cheaper and lighter than the plain tile and more ornamental. It is cheaper and cooler than the slate. Some very good work is done in terra cotta, but it has not the pretensions of English architectural terra cotta. The use of it is undoubtedly limited by questions of cost, and it is only on very superior buildings that the architectural stoneware produced at Ivy could be introduced."

STAINED GLASS.

At a meeting of the Sheffield Society of Architects and Surveyors Mr. A. Jeffery delivered a lecture on "Stained Glass," in which he said that the first stained glass executed in England was in the time of King John. Previous to this all glass came from Italy, which even at this date boasted of eminent artists. The old masters taught us many lessons, and much could be learnt from them. We should try and embrace all the good qualities of the old men, ignore their shortcomings, and try to improve on what had been done before us. After the sixteenth century stained glass died out, and did not again revive until the nineteenth century. Mr. Jeffery went on to explain that a window should be part of a building, and should not be treated as a picture or wall decoration. If a man attempted a picture he spoiled his material as glass and made a very bad picture. The lecturer described the different methods of manufacture. He said that English glass was superior to foreign, both in material and workmanship. The most important point in a window, in his opinion, was permanency, and only the most permanent of colours should be used, at whatever cost. Speaking of domestic glass he did not think the modern style was a passing fancy, but that it had come to stay, but like all other transitions in art at the outset it seemed to have been let loose, and we appeared to be seeking after something we could not quite grasp. But the style would ultimately settle down and find its own level. He was eagerly looking forward to the time when there would not be so much commercialism in connection with artistic crafts, and hoped architects in the near future would come more into contact with the craftsmen, and by their joint ideas succeed in raising the standard of work.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries, neither do we undertake to answer questions in issue following their appearance.]

J. A. F. writes: Can you tell me of a material that would be suitable for building soldiers' barracks? It would have to have the following properties: be non-inflammable, vermin proof, a non-conductor of heat, easily worked and allow parts to be taken down and rebuilt?

Ans: We would suppose that cement blocks such as have been used in the new Dairy Building on the Toronto Exhibition grounds would meet the requirements of a building such as you mention. Another material would be expanded metal and plaster. The cement blocks for the Exhibition Building here were supplied by the National Portland Cement Co., Janes Building, Toronto. You could no doubt obtain full particulars by writing the above mentioned company, and for expanded metal construction write the Expanded Metal Company, 94 King St. West, Toronto.

From Contractor: I have a contract to build a residence which is to be roofed with slates, and the specification states that the "slates must be properly laid and bedded in mortar in the usual manner." The owner of the building had the plans made for this house several years ago, by an architect who lives in New England, and who was engaged to prepare plans and specifications only, and we have no communication with him, and as I do not know exactly what is meant by the phrase quoted, I apply to THE CANADIAN ARCHITECT AND BUILDER for information?

Ans: As we understand the term it is intended that a layer of mortar must be placed under the slates as they are fastened in place. The way the work is done is as follows:—The roof is first boarded over with sound boards laid close together. On these boards are nailed strips or battens from 1½ to 2 inches wide and from ¾ to 1 inch in thickness. These are nailed the proper distance apart to admit of the slates being nailed on them. The spaces between these slates are then filled in with mortar which is trowelled smooth and flush with the face of the slates. One or two spaces are filled in and smoothed off at a time, and while the mortar is still soft, the slates are nailed in place and are thus, to some extent, bedded on the mortar. This makes an exceedingly good and safe roof, and has the advantage of being warm in winter and cool in summer.

From A Country Builder: I am in want of a plan for a hall stair that is to make a half-turn at the foot, commencing in the corner, and having two or three treads with a sweep and then a landing from which the stairs proper start and run straight to next floor. I would also like to see a design for the newel-post, balusters, rail, outside string and panelling in spandril, if not asking too much. The house for which this stair is intended, is being built in rich Colonial style, so that the finish and trimmings on the stairs should be in a similar style.

Ans: We submit a plan and elevation of a stair at Fig. 1. which we think will suit the requirements of our correspondent. There are two risers to landing, which is much better than having three or four, as such a number would cause the newel-post to be too high to be pleasing. The two risers have curved or "swept" faces which give the stairs a graceful and inviting appearance. The rail turns out and joins the newel by a graceful ramp, the newel being set angle-wise in the

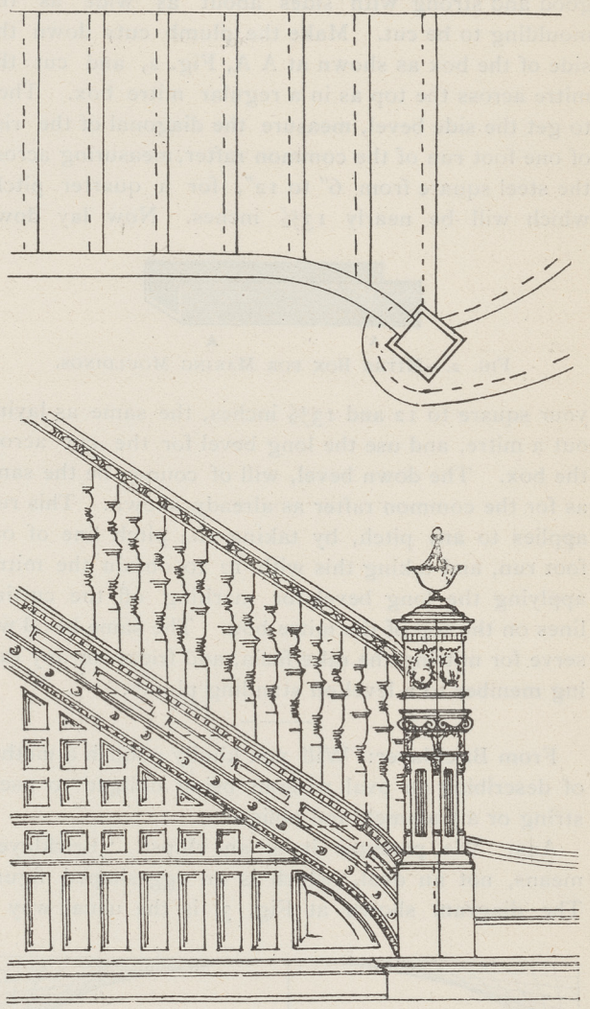


FIG. 1.—PLAN AND ELEVATION OF STAIRWAY AND RAILING.

first tread. The elevation is somewhat elaborate—but if too much so, it will admit of being trimmed down some, without destroying its symmetry. For instance, the angle and head mouldings on the rail and string may be dispensed with, as also may the carvings on the newel, but, if it can be afforded, the design had better be adhered to in its entireity. This work, is, of course, expected to be executed in oak, or other suitable hardwood.

From Young Draftsman: I have hunted through every book in my limited library for something on the proper proportion and size of doors and windows in a room of a given size. Is there anything published on the subject?

ANS.: We are not aware of any special work devoted entirely to this subject. If you have a Gwilt, a Chambers, a Nicholson, or a Palladio, you would find some pertinent remarks on the subject; as a matter of fact, however, there can be no definite rules laid down for obtaining the exact proportions of doors or windows for any given room, as conditions alone govern these, and on the skill and knowledge of the designer or architect beauty of proportion more depends than on any rules that can be laid down.

From "Carpenter": Is there a method of cutting raking mouldings for a roof gable by using a mitre box?

Ans.: Yes, there is a way a mitre-box can be made in which you can cut raking mouldings for gables or any similar work: First make an ordinary mitre box, good and strong with sides about as wide as the moulding to be cut. Make the plumb cuts down the side of the box as shown at A A, Fig. 2, and cut the mitre across the top as in a regular mitre box. Then to get the side bevel, measure the diagonal of the rise of one foot run of the common rafter, measuring across the steel square from 6″ to 12″, for a quarter pitch, which will be nearly 13½ inches. Now lay down

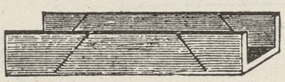


Fig. 2.—Mitre Box for Making Mouldings.

your square to 12 and 13½ inches, the same as laying out a mitre, and use the long bevel for the cut across the box. The down bevel, will of course, be the same as for the common rafter as already shown. This rule applies to any pitch, by taking the pitch line of one foot run, and taking this with 12 to obtain the mitre, applying the long bevel for marking off the cutting lines on the top of the mitre box. The same bevel will serve for mitring the rake facia, and frieze, or any raking member to a level on standing plumb.

From Bricklayer: Will you kindly publish a method of describing an oval without being obliged to use a string or a trammel, and oblige?

Ans: We presume it is an ellipse "Bricklayer" means, not an oval, which is an egg-shaped figure. The diagram shown at Fig. 3. is the usual way of

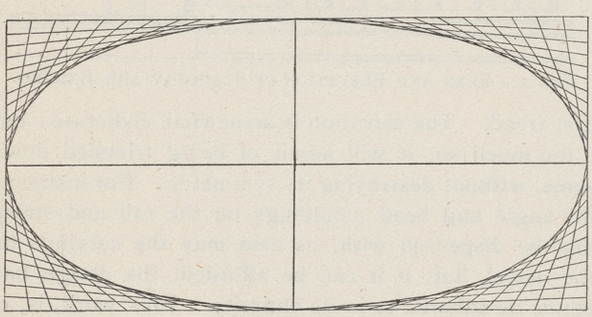


Fig. 3.—Method of Describing an Ellipse.

describing an ellipse by using straight lines or "ordinates". Half the end is spaced off into 12 divisions and half the side is spaced into 12 divisions. The straight lines are then drawn from these points, and the crossing of the lines forms the curve. Each quarter of the square is operated on in the same manner, thus forming the complete ellipse. The greater the number of spaces, the more correct the curve.

From Mason: Will you please describe a method of removing lime and cement stains from tiles that are laid in a vestibule?

Ans: It is easier to prevent stains, than to remove them after they have been made and allowed to stand for awhile. Anything that would dissolve or otherwise remove cement from the pores of the tiles would very likely ruin the tiles themselves. The surfaces of the tiles should be well cleaned, and all the cement washed off as soon as the work is done, and when dry, rubbed well over with raw linseed oil. The oil will subdue the stain, brighten up the tiles and make the stain almost invisible. Care should be taken in laying tile not to get the faces of them smeared over with cement.

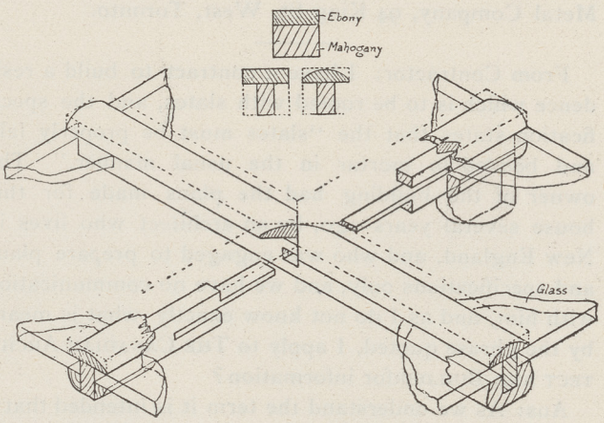
AIR-TIGHT CASE MAKING.*

By W. T. Sweett.

For some years there has been forming quite a new branch of trade, that of air-tight case making.

In all the joints of doors and glass of show cases, window enclosures, etc., the interiors of which are to be air-tight and yet easily accessible, it is necessary to have perfect truth of surfaces and a minimum of friction. Air-tight cases may be divided into two classes, namely, exhibition cases (being cases which are very rarely opened after the exhibit has been enclosed) and shop show cases (those in which a shopman displays his wares).

It is very rarely that any system of tongues, or



Counter Cases: Joint of Top Cross Bars.

hooks, is used in the joints of the doors of exhibition cases. These doors are usually shot into a very close joint, so close in fact that the two surfaces touch one another, causing a considerable amount of friction when opened and closed. A velvet pad is placed in the rebate in order to make the joints perfectly air-tight.

In the second instance the cases required by the shop keeper must necessarily be made air-tight by something more substantial than velvet; so that, almost without exception, these cases have an arrangement of tongues, etc., which will be described later.

In designing show cases the great aim should be lightness of material, causing the least obstruction to a full view of the interior.

The majority of cases made by men not adept at the work are displeasingly substantial in appearance, for it is astonishing what strong cases and doors can be made with frail framework carefully glazed. Exhibition and show cases generally are known by the following names:

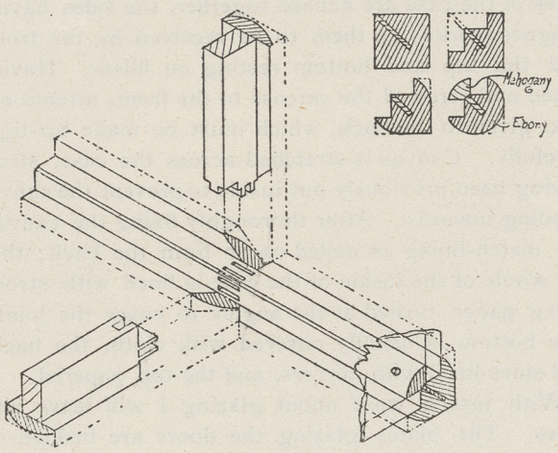
Wall Cases.—These have their backs, and sometimes their backs and ends, to the wall. When two cases of the same size are to be fixed back to back they should be of the wall-case type, the doors being in front.

Centre Cases.—These stand in the centre of shops, about exhibition floors, etc., so that the public can get all round them, the means of access being kept as

*A paper read before the meeting of the British Institute of Certified Carpenters held on August 4th, 1900.

nearly secret as possible (some of the devices employed will be dealt with later.)

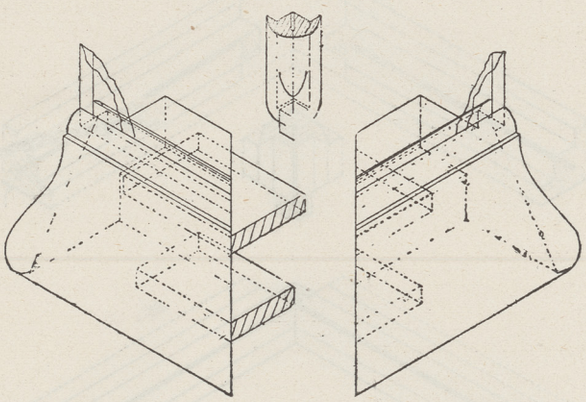
TABLE CASES.—These open at the top and are of the height of tables, and, as tables, stand upon legs. They are usually very shallow, the interiors being viewed from above. The table case is also made with the top leaning towards a ridge, sometimes very steep and sometimes very flat, but invariably placed so that the interiors



COUNTER CASES: JOINTS BETWEEN TOP RIM, CROSSBAR AND UPRIGHT FRONT BAR.

are viewed through the tops, which are hung to the ridge. The ends of these cases are sometimes hipped and sometimes of the gable or spandrel type. When table cases are made to fix against the wall they are known as wall table cases.

COUNTER CASES.—As their names imply, these act as counters when placed upon the under fittings and counter front. They have clear glass tops and risers, and are usually between 9in. and 12in. deep, with a width varying from 19in. to 27in. Access is obtained by the shopman from behind. The rim of wood is of the smallest dimension, never being more than ¾in., but usually ⅝in., round, and generally polished black. When the cases are to be polished black, the top rim, even in the most common kinds, should be of ebony, as by the continual wear caused by serving a stained deception very soon reveals its secret. Counter cases



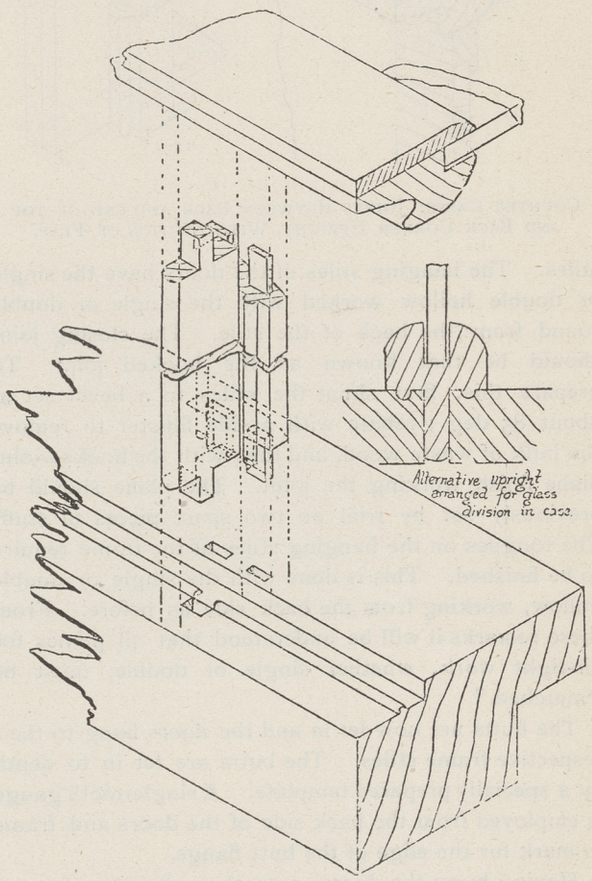
COUNTER CASES: JOINTS OF FRONT CORNER OF BASE AND CORNER UPRIGHT.

are made with square and semi-circular ends, and are not usually more than 14ft. long. When a greater length is required, two or more cases are butted together, the joints being kept in position by dowels in the base. As the accompanying details show, the work required will try the patience rather severely.

Air-tight drawers, sometimes air-tight in themselves and sometimes placed in nests in air-tight cupboards, also come within the scope of this paper.

PEDESTAL CASES.—These are usually of the centre or table-case type, and instead of being upon solid low bases or legs are placed upon pedestals, bringing the bottoms of the cases up to a height of about 3 feet or 3 feet 6 inches. The pedestals themselves are generally used as cupboards or for nests of drawers, &c.

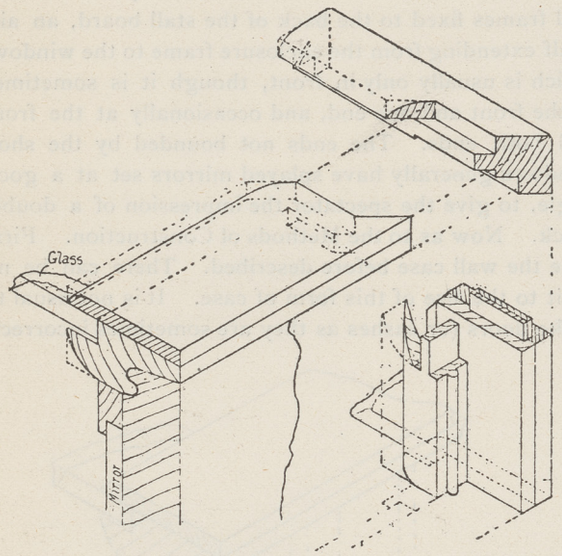
WINDOW ENCLOSURES.—These are composed of doors and frames fixed to the back of the stall board, an air-shelf extending from the enclosure frame to the window, which is usually only in front, though it is sometimes at the front and one end, and occasionally at the front and both ends. The ends not bounded by the shop windows generally have splayed mirrors set at a good angle, to give the spectator the impression of a double stock. Now as to the Methods of Construction. First take the wall case before described. There can be no limit to the size of this form of case. It is not usual to make doors (or sashes as they are sometimes incorrect-



COUNTER CASES: JOINTS BETWEEN BACK CENTRE UPRIGHT AND TOP AND BOTTOM.

ly termed) more than 2ft. 9in. wide. Everything is planed up and set out in usual way, but the first parts to be glued up must be the doors, all attention being given to the squaring, &c. The frame is then fitted up, all the tenons being made 1½ in. longer than the width of the stiles or rails, as the case may be (excepting when the case has a finished end). A hole is mortised through the tenons beyond the frame, in order that a wedge may be driven through to act as a key, or draw bore pin, to draw up the shoulders. The whole frame is put together in this manner, and is afterwards cleaned off flush on the back side, the sashes also being cleaned on the back side and carefully shot to size. The frame is then taken to pieces and the single-or double-grooving plane (whichever is to be used) is stuck in the edge from the back side of the hanging stiles of the frame, and tongues are glued preparatory for the double hollow. Then the single square-grooving plane

is, in every instance, stuck from the joint on the back side, preparing a groove for the air fillets on the top and bottom rails of the frame. These fillets are next glued in. The doors have a hollow worked in the back at the top and bottom with the single round plane, working from the joint, the hollow also crossing the



COUNTER CASES: JOINTS BETWEEN BACK AND END OF TOP AND BACK CORNER UPRIGHT, WITH SECTION OF FLAP.

stiles. The hanging stiles of the doors have the single or double hollow worked with the single or double round from the back of the stile. The closing joint should be that known as the hooked joint. To prepare this, first shoot the stiles to a bevel set at about 85 deg.; rebate with a side fillister to remove the bulk of waste wood, and then with the hooked-joint plane finish working the joint. The plane should be previously set by trial on two spare pieces of stuff. The tongues on the hanging stiles of the frame require to be finished. This is done with the single or double hollow, working from the back side as before. From these remarks it will be understood that all planes for air-tight work, whether single or double, must be "matched."

The butts are now let in and the doors hung to their respective frame stiles. The butts are let in to depth by a specially prepared template. A single-tooth gauge is employed from the back side of the doors and frame to mark for the edge of the butt flange.

Having hung the doors, note that all joints fit correctly, and then prepare to glue the frame. To do this, unscrew the butts and put the frame together as before and key up, put in the doors, the butts being placed in their places, though not screwed, slack the keys and glue up the frame, using the keys only to pull up the shoulders. Wedge the frame up very carefully, as much depends upon how the wedging is carried out. It is very easy to wedge too hard and bind the doors, or too lightly and make the carefully prepared joints ineffectual for excluding the air.

To control the wedging to a nicety, place the fingers under the rails of the doors, top or bottom, at the shutting joint, and the thumbs on the rail of the frame outside; by this means one can, by gently pulling the door, determine whether the wedges are binding the joints too hard or causing the frame to pinch the doors cornerwise.

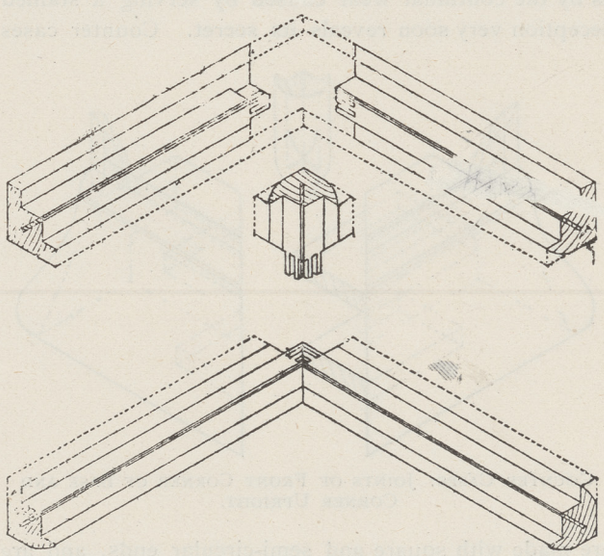
The frame should be wedged to the doors until these are just too tight to work easily, the tightness being afterwards remedied by glass papering and rubbing the joints with French chalk. It will now be seen that the doors must be glued up first, all joints being stuck from the back side, which is the flush side, and being fitted up before the frame is glued. The front of the case may now be considered complete, as it only requires cleaning off.

Now to consider the carcase. The top, bottom, and sides of the case are housed together, the sides having tongues worked on them to be received by the front, and the top and bottom resting on fillets. Having glued and screwed the carcase to the front, attention is next given to the back, which must be made air-tight carefully. Canvas is stretched across the case, struts having been previously put inside to prevent the canvas bending inwards. After thoroughly fixing the canvas. the match-lining is nailed on to form the back; then the whole of the inside of the case is lined with strong lining paper, turned at the angles to cover the joints. The bottom is usually covered with cloth, the backs and sides lined with mirrors, and the top papered.

With just a word about glazing I will leave wall cases. The plates glazing the doors are bedded on very thin putty, and the glass is packed on strips until the door is kept by the glass in the exact place where it was fitted. The glazing fillets are then fixed in and the minor details—such as cleaning off, fixing fastenings, cornice, plinth, &c.—having been attended to, the case is complete.

The other cases—table cases, centre cases, &c.—are constructed in a very similar manner so far as making the frame to fit the sashes or doors is concerned. The doors of centre cases, which have to be as nearly secret as possible, have no butts, but lift out as shutters, the form of joint usually being on the velvet-pad system. They are sometimes fastened in by four locks, two on each side, and sometimes by two dowels in the bottom and two locks at the top.

I will now pass on to counter cases, which may be considered to be the most intricate to make.



COUNTER CASES: JOINTS BETWEEN TOP FRONT CORNER OF RIM AND CORNER POST.

The first part to be made is the top rim, which is glued up. The next to be fitted and glued up are the base rim and bottom panelling. The uprights are then fitted into the top rim and base and the case is ready to glue up. It is now to be glazed. To do so turn the case upside down, the top rim being on the bench and

held by straight-edges. The putty is made very thin, and the top plates are the first to be firmly bedded; next the riser plates, then the glazing fillets are screwed in place, and finally the case bottom is screwed up. After this the case is turned upon its base, when the flaps are fitted and hung and the case cleaned off for polishing. The interiors of the cases are usually fitted with trays, their rims being fixed to their bottoms by pegs, which can be cleaned off and ebonised with the rims, which are usually of American walnut. This produces a fairly cheap and satisfactory tray. The bottoms are usually finished by covering them with cloth.

When the case has circular ends the top rim for the end is built up laminated by means of three strips of black walnut and one strip of ebony, bent round a shaped block; after being cleaned off, a cover-piece of ebony is glued on the top. The rim end is then ready for fitting and working.

All the fitting to the counter case is done with the ebony left flat, the rounding, or lipping as it is called, being done after fitting and before glueing up. The bottoms of these cases are usually of 1½ in. white pine and have 1 in. flush panels. After cleaning off they are very carefully covered on the top or flush side with calico, being afterwards lined with paper and blacked.

TWO KINDS OF TIMBER ROOFS.

Between two classes of roofs—those with parapets and those with projecting eaves— important structural differences are noticeable, says Geo. H. Blagrove. We must pronounce in favor of the latter form of roof, as

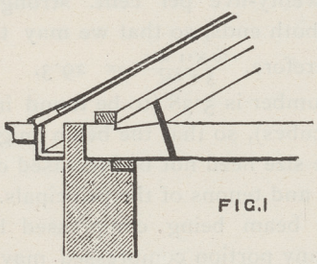


FIG.1

shown in section at fig. 1. True there is a greater length of common rafter and a greater extent of roof covering than in the parapet roof, as shown at fig. 2 ; but then, in addition to the advantages already enumerated, it will be seen that in fig. 1 the principal rafter

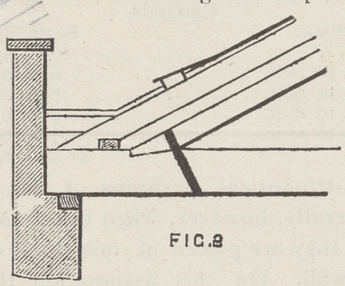


FIG.2

takes its bearing over the wall, whereas in fig. 2 it is necessarily brought in to allow space for the gutter, so that it takes its bearing upon an unsupported part of the tiebeam, and the latter has, in consequence, to be stronger than it need otherwise be. Some builders over-look this circumstance, and when they come to construct a roof as in fig. 1, they make the tiebeam the same depth as in fig. 2. Tables of scantlings for roof timbers, such as are given in books, are apt to be misleading in this respect, unless it is clearly understood under what conditions the tiebeam is to be used. For instance, in a recent edition of Tredgold's "Carpentry," by E. W. Tarn, we find the tiebeam for a king-post roof of 20ft. span specified as 7in. by 3in., while, for the same kind of roofs, Hurst's "Handbook" specifies 9½ in. by 4in. Before we can appreciate the value of these scantlings, we should know whether the tiebeam has to support the truss, and, if so at what points, and whether there is a ceiling to be carr ed. With a roof constructed as in fig. 1, with no ceiling to carry, the tiebeam would only be required to resist the outward horizontal thrust of the principals. Let us see what the scantling must be for a king-post roof of 20ft. span at quarter pitch, the trusses being 10 ft. apart.

The horizontal thrust at the foot of a principal rafter depends upon the weight of the truss and the loads or stresses which it has to sustain. The weight of a king-truss of 20 ft. span may be taken approximately at 360 lb., and on each s de there is half this, or 180 lb., to be carried. With trusses 10ft. apart, each truss carries 10ft. length of roofing, which includes the whole roof surface on each side, from ridge to eaves, with the stress of wind and weight of snow that may occasionally come upon it. At quarter pitch, the outer measurement from ridge to eaves is just 14ft. The roof surface to be carried on one side is therefore 14 by 10 which equals 140 square feet. The weight of common rafters and purlins may be approximately stated at 7lb. per square foot; boarding or battens, 2lb.: slates, including nails, 8lb.; and snow, 3lb., making a total of 20lb. per foot. Stress of wind may be taken at 40lb. per foot; but as this only acts upon one side of the roof at a time, it will be sufficiently accurate to estimate it at one half, or 20lb., taking the entire stress at 40lb. We have, therefore, 40 x 140 = 5,600lb. to be carried on one side of the roof. To this we must add 180lb. for the half truss, making a total of 5,780lb. or, say 51½ cwt.

It is worth while to remark that when there is no truss, the feet of the common rafters being tied in by means of ceiling joists, the horizontal thrust is only one-half what it would be in a king truss, if the weight and stresses were the same in both cases. In fig. 3, let

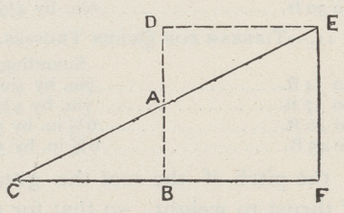


FIG 3

E C F represent one-half of a roof. The weight upon the slope, C E, may be considered as concentrated at A, midway between the ridge and the foot of the rafter. Draw D B, parallel and equal to E F, and if D B represents the weight and stress upon C E then C B will represent the horizontal thrust against C. At quarter pitch, D B is equal to C B, so that the thrust is equal to the load.

But it is obvious that when the pitch is lowered, the horizontal thrust is increased. At present the rafter is only supported as high as E; but if we suppose it to be also strutted from F to A, this will be equivalent, as far as thrust is concerned, to lowering the head of the rafter to a point midway between E and F, because these two points will now take an equal share of the horizontal reaction, D E. Therefore, the proportion of the load to the thrust in a trussed roof is as A B to C B, or as E F to C F; and at quarter pitch the thrust is double the load

The load being 51½ cwt., the tiebeam will have to resist a tensile stress of 51½ x 2 = 103 cwt. The ultimate tensile resistance of fir timber, according to statistics quoted by Tredgold and others, varies from 13,448 lb. to 8,506 lb. per square inch of sectional area. E Dobson, in "Rudiments of the Art of Building," gives five tons = 11,200 lb. But it would appear that these figures have been deduced from experiments upon selected specimens of wood, and perhaps the writers referred to were accustomed to deal only with structures of an expensive character, in which only superior qualities of material were used. Certainly, the timber ordinarily supplied at competitive prices at the present day does not possess anything like the strength stated. J. T. Hurst, a modern authority, and one admittedly safe and reliable, gives in his "Handbook" one and a half tons per inch for the tensile strength of fir. This is equal to 3,360 lbs., or less than a quarter of the highest figure quoted, and Hurst is careful to state that materials of the quality ordinarily found in the market will seldom reach even this standard. The present writer is led to recommend one and a quarter tons—equal 25 cwt.—as a safe limit for the ultimate tensile strength. The working stress should not exceed one-third of this, or, say, 8 cwt. per inch. Our tiebeam must therefore contain $\frac{103}{8}$ equals thirteen square inches of sectional area, and might, it would appear, be 4½ in. by 3 in., or less. But an allowance of four square inches must be made for cutting into the beam for the shoulders and tenons of the principals, so that it must contain seventeen square inches, and may be 6in. x 3in.

The tiebeam must have sufficient breadth for lateral stiffness, as well as to receive the feet of the principal, and a reliable rule is to make the breadth not less than 1/80 of span for the king trusses and not less than 1/100 for queen trusses. The following scantlings have been calculated according to the principles explained:—

TABLE I.— TIEBEAMS FOR KING TRUSSES.

Span.	Scantling.
20 ft.	6in. by 3in.
21 ft. to 24 ft.	6in. by 3½ in.
25 ft. to 27 ft.	6in. by 4in.
28 ft. to 30 ft.	6in. by 4½ in.

TABLE II.—TIEBEAM FOR QUEEN TRUSSES.

Span.	Scantlings.
31 ft. to 34 ft.	7in. by 4in.
35 ft. to 37 ft.	7in. by 4½ in.
38 ft. to 40 ft.	6½ in. by 5 in.
41 ft. to 45 ft.	6½ in. by 5½ in.

The lower the pitch of the roof the greater is the proportion of thrust to weight, so that for roofs flatter than quarter pitch stronger tiebeams will be necessary. But such flat pitches, being unsuitable for covering with slates, need not be considered here. With roofs steeper than quarter pitch, the vertical stresses are greater; but the proportion of thrust to weight is so much reduced that it more than compensates for the increase of vertical stress, and the scantlings given above will suffice for roofs steeper than quarter pitch. In large roofs it becomes convenient to substitute iron ties for timber beams. We shall consider such cases subsequently.

Let us now ascertain the scantling of a tie-beam to carry an ordinary ceiling. With a span of 20 ft. the beam, being hung up in the middle, may be treated as of 10 ft. span, so that with trusses 10 ft. apart there will be 100 square feet of ceiling as an evenly distributed load. The weight of the ceiling, including joists, lathing and plaster may be reckoned at 1200 lb. or, say, 11 cwt. By the ordinary rule, $\frac{S \times W \times F}{B \times C} = D^2$, where S = span in feet; W = load in hundredweights; F = factor of safety; B = breadth in inches; C = coefficient of strength; and D^2 = square of depth in inches. Here S = 10; W = 11; and, taking the safe load at one-fifth of the breaking weight, to avoid unsightly deflection, F = 5; and B may be assumed to = 3. The value of C is often overstated in books, with the result that erroneous calculations are made. In Tredgold's tables the values of C in pounds are for Riga fir 530 and 670 and for Memel 545; and Barlow's experiments showed C = 577 in pounds for Memel. These figures give an average of C = 5·17 in hundredweights when the load is on the middle of the beam; and it would be double, or 10·34, with the load distributed. Again we must remark upon the impossibility of procuring timber of such quality for cheap building, such as the public will insist upon having now. Hurst gives C = 3·6 for a central load in hundredweights, or 7·2 for a distributed load; and he appends the following note, which every student of carpentry should observe with attention: "For wood, as the experiments were made on small and selected specimens, a reduction of quarter to half should be made on the above values of C in large and unselected beams." This would make C = 2.7 to 1·8 for central loads, and 5·4 to 3·6 for distributed loads. The present writer's experience has led him to adopt 2·5 for the former, and 5·0 for the latter.

In the case before us we might take C = 5. But the tiebeam, which is supported upon the wall, may be considered as fixed where it is hung up to the king-post; and a beam supported at one end and fixed at the other is twenty-five per cent. stronger than one supported at both ends, so that we may take C = 6¼. We have, therefore, $\frac{10 \times 11 \times 5}{3 \times 6\frac{1}{4}} = 29{\cdot}3$. The square root of this number is 5·38 (to be found in a table of squares and cubes), so that the beam might be 5½ in. by 3 in. The size need not be increased on account of the shoulders and tenons of the principals. The upper portion of the beam being compressed by the transverse strain, any portion compressed may be cut out without reducing the strength, provided that the aperture is filled up again with solid timber as in this case. We have only to take care that the scantlings of the beams are not less than those in Tables I and II.

TABLE III.—TIEBEAMS IN KING TRUSSES TO CARRY CEILINGS.

Span.	Scantling.
20 ft.	6 in. by 3 in.
21 ft. to 22 ft.	6 in. by 3½ in.
23 ft. to 25 ft.	7 in. by 4 in.
26 ft. to 28 ft.	7 in. by 4½ in.
29 ft. to 30 in.	7 in. by 5 in. or 8 in. by 4 in.

In queen-trusses the positions of the queens may vary. Generally, however, when there are no rooms in the roof, they are placed at one-third of the span from the wall. On this assumption the following table has been calculated. The central part, between the queens, is virtually fixed at both ends; but we are bound to calculate the scantlings for the weakest parts—between the queens and the walls.

TABLE IV.—TIEBEAMS IN QUEEN TRUSSES CARRY CEILINGS.

Span.	Scantling.
31 ft. to 36 ft.	7 In. by 4 in.
37 ft. to 45 ft.	8 in. by 5 in.

When rooms are formed in queen-post roofs, the distance between the queens may conveniently be half the span or more. We will assume that it is half the

span. The tiebeam has now to carry a floor as well as a ceiling, and both may be reckoned at 1¼ cwt. per square foot, to include all loads likely to come upon the floor in an ordinary dwelling-house. The proportion of the depth of the beam to its unsupported length will now be so high that it may be loaded to quarter of its breaking weight without unsightly deflection. The factor of safety is therefore four. In the largest span, between the queens, the beam may be considered as fixed at both ends, so that it will carry fifty per cent. more than if supported at both ends, and the co-efficient of strength will be seven and a half.

TABLE V.—TIEBEAMS FOR QUEEN TRUSSES TO CARRY CEILINGS AND FLOORS.

Span.	Scantling.
30 ft.	13 in. by 10 in. or
	10 in. by 16 in.
31 ft. to 32 ft.	13 in. by 11 in.
33 ft. to 36 ft.	13 in. by 13 in.
37 ft. to 41 ft.	14 in. by 15 in.
42 ft. to 44 ft.	15 in. by 15 in.
45 ft. to 47 ft.	15 in. by 18 in.
48 ft. to 50 ft.	18 in. by 18 in.

The full scantlings given above are only required in the central spans between the queens. The spans between the queens and the walls, being each only half the central span, with one end supported and the other fixed, require beams only three-tenths as strong. Hence for instance, at 30ft. span, the scantling 10in. by 16in. might be made up of one 10in. by 6in. beam running the whole length, and two 10. by 5in. pieces, bolted to it on each side, and extending only from queen to queen.

Plates, 4in. by 3in., should be bolted to the beams, and notched to receive the joints.

Heavy floor beams are conveniently substituted by rolled-iron sections, which can be bolted to the tiebeams of a roof. The use of iron in this and other ways will be subsequently considered.

TABLE

SHOWING NUMBER OF BRICKS REQUIRED IN ONE SQUARE FOOT OF SURFACE WALL, THE THICKNESS OF WALL BEING GIVEN, AND THE SIZES OF BRICKS USED BEING 9 x 4¼ x 2¼ INCHES, AS IS SOMETIMES THE CASE IN CANADA. THIS NUMBER OF BRICKS TO THE SURFACE BRICKS, COVERS WASTE AND DEFECTS.

Thickness of Wall in inches	Thickness of Wall in No. of Bricks	No. of Bricks to surface foot
4½ inches	One half brick	7 bricks
9 "	One brick thick	12 "
14 "	One and a half thick	17 "
18¼ "	Two bricks thick	24 "
22¼ "	Two and a half thick	31 "
27½ "	Three bricks thick	38 "

Bricks, even burned in the same kiln, rarely even up in size. Often there is as much as a quarter of an inch difference in the length, and half that difference in width or thickness.

The above table provides, to some extent, for such differences in size.

CONNECTING DOMESTIC WATER HEATERS.

At the meeting of the Ohio Gaslight Association, a paper on domestic water heaters was preseuted by W. B. Calkins, in which he laid great stress on the mode of connecting these heaters, as follows:

1. If possible always connect the heater to the boiler so that the base of the heater will be on a level, if not a little below the bottom of the boiler. This allows for the free circulation of all the water in the boiler.

2. Connect the hot-water outlet from the heater to the top of the boiler. This connection answers all purposes much better than the side connection.

3. Flush cocks should be placed on the bottom connection of all heaters by which the heater, boiler and pipes can be flushed as often as needed.

4. All water heaters should be connected by a flue pipe to the chimney.

5. Cocks should be placed on the coldwater connections between the boilers and the heaters. By this arrangement any back movement of hot water can be stopped after the fire is turned out under the heater; this prevents the heater from becoming a cooler. Other directions for the economic use of the water heaters should be prepared for the use of the people buying them, but as these will be more or less of a local nature, we will not discuss them.

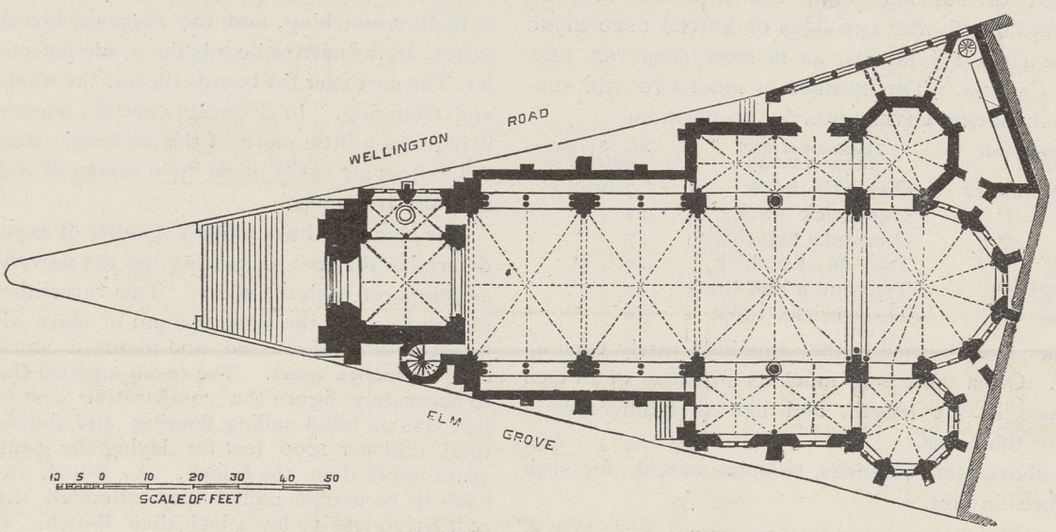
THE WINNIPEG BUILDERS' EXCHANGE.

The Winnipeg Builders' Exchange, portraits of some of the principal officers of which appeared in our August issue, was organized in June, 1899, and has met with a fair measure of success. Through its instrumentality a uniform contract has come into use. Steps are now being taken to bring about the amalgamation of the contractors in the various building trades, thus forming one strong organization which would be in a position to exert its influence for the protection of the interests of all concerned.

ADVANTAGES OF NARROW LUMBER.

As a result of a number of tests a leading lumber manufacturing company claim to have demonstrated that the wider the board the greater the shrinkage and the wider the opening, and as a consequence the narrower the board the less the shrinkage and the smaller the opening. The narrower the board the more the tongue or lap divides the shrinkage. The narrower the board and the more the spring the quicker it is possible to make a matching, and the narrower boards are laid faster. In the narrow boards the grade defects are smaller. The narrower the boards the less the waste incutting and trimming. In covering a certain amount of space it requires a little more of the narrower stock, but the differences are easily made up in saving of waste in cutting and trimming.

The company have made a number of experiments to determine the cost of putting on the narrower widths as compared with the wider. Two carpenters were employed to cover the same amount of space with the different widths of dressed and matched stock, on studding 16 inches apart. The result enabled the company to accurately figure the comparative cost. The first test was on blind nailing flooring and showed that the total cost per 1000 feet for laying the 4-inch was 31 cents more than the 6-inch. As 8-inch stock would have to be double nailed they estimated that it would cost $1.29 less to lay 4-inch than 8-inch. In a test of single nailing 4-inch, double nailing 6-inch and 8-inch flooring, drop siding the shiplap, the cost per 1000 feet was 58 cents less on the narrower width than on the 6-inch and 96 cents less than on the cost of double nail-8-inch stock with tenpenny nails. In a test for single nailing and double nailing alternate pieces of 4-inch, and double nailing 6-inch and 8-inch drop siding and sheathing the cost per 1000 feet was only 17 cents more on 4-inch than on 6-inch, and 20 cents less than in double nailing 8-inch stock.



Ground Plan.

ST. JOSEPH'S CHURCH, BRIGHTON, ENGLAND.

A "FLAT-IRON" CHURCH.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR,—In an editorial last month (September) you made reference to the much advertised "flat iron" building recently erected on the corner of 5th Avenue and Broadway, New York. Many people imagine this building to be the only one of any importance ever erected on a similar gore. To show this to be a mistake, I enclose you herewith the plan and perspective of St. Joseph's Church, Brighton, England, built in 1879, on a gore similar to the flat-iron" gore. It will be seen the tower and steeple stand on the narrow end of the plot, and rise to a height of some 200 fee above street grade. This illustration is taken from the Builder of March 13th, 1880.

The church at the time came in for considerable criticism, because a perspective view of either side of the building obtained at certain angles, gave to the building a narrow and stilted appearance. Taken from the other end of the church gave it an appearance of being larger than it actually was.

F. T H.

Collingwood, Ont., Sept. 8, 1902.

BUILDING STONE IN THE NORTHWEST.

Until recently the impression prevailed that there existed in the Canadian Northwest but little building stone. Investigation has revealed however that extensive deposits of more or less excellent quality, are to be found between Winnipeg and Lake Winnipeg extending as far west as Stonewall and east to Whitemouth Outcroppings are noticeable at Stonewall, Stony Mountain, Little Stony Mountain, Lower Fort Garry and East Selkirk. Stone from these points was used by the Selkirk settlers very soon after their coming to the country. Lower Fort Garry gives evidence of the use of this stone by the Hudson's Bay Company; the Kildonan church, and St. Andrew's church at the rapids are later examples. The early tombstones were made of the same material.

The Stonewall quarries have been considerably developed. Those at Stony Mountain have been used very largely for building in connection with the penitentiary. The main quarry at little Stony Mountain is owned by the city of Winnipeg and from it enormous quantities of stone have been used on the streets of the city, both as curb and foundation stone and for concrete and macadamizing. From the Selkirk quarry has come most of the ornamental stone used in Winnipeg.

Mr. Garson, formerly a contracter of St. Catharines, while erecting some buildings at Rat Portage, searched this territory for a stone which would meet his requirements, and located a deposit of 60 acres about two miles from Tyndall station on the C. P. R. and 29 miles from Winnipeg. He proceeded to develop the quarry and has already taken out 75000 tones of stone from an area of an acre and a half at a depth of less than 20 feet. As to the appearance of the stone, Mr. D. A. Dowling, B. A. Sc., in his report on the geology of the district says : " It presents a peculiar mottled appearance, which adds much to its beauty as an ornamental stone. This strange mixture of brown and white is difficult to account for. In some cases it appears as if its origin might be due to seaweed remains. Often the colo re portion approaches the color of yellow ochre and seems impregnated with iron, while the intervening spaces are more or less colored. So marked is this mottled condition that stone from this section can be distinguished at once from other stone in the Lake Winnipeg district."

The death is announced of George Farquhar, a prominent contractor of Toronto.

PUBLICATIONS.

Modern Carpentry — a Practical Manual — by Fred T. Hodgson, Architect; Frederick J. Drake & Co., Chicago, publishers.

This new work, by a well known author, consists of 195 pages enclosed within cloth covers, and copiously illustrated. It treats in plainly understood language of carpenter's geometry and joiner's work, and gives many practical examples of best methods of performing various kinds of work. The book concludes with a number of useful tables and memoranda for builders.

The London Builders' Journal tells of a contractor who has carried sleight-of-hand (on a large scale) into the domain of building construction. He was recently building a dozen houses, each with a kind of underground kitchen which the local authorities required to be connected with the rooms above by a staircase. Now a dozen staircases are expensive, and it occurred to this enterprising contractor that it would be much more economical to have one only. So he bought a substantial staircase and fitted it up to the first house, got the local inspector to examine it, and obtained his certificate. The staircase was then removed to the second house, where another inspection took place, followed by another certificate, and so on through the whole twelve houses. In the last house the staircase was allowed to remain, but—verb. sap.—in the others its place was taken by a step-ladder.

—THE—

CANADIAN ARCHITECT AND BUILDER

A Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUMBERS, DECORATORS, BUILDERS, CONTRACTORS, MANUFACTURERS OF AND DEALERS IN BUILDING MATERIALS AND APPLIANCES.

The C. H. MORTIMER PUBLISHING CO. of Toronto, Limited,
Publishers,
Confederation Life Building, - TORONTO, CANADA.

Telephone Main, 2362.

Branch Offices:

IMPERIAL LIFE INSURANCE BUILDING, MONTREAL.
Bell Telephone 2299.

22 GREAT ST. HELEN'S, LONDON, E.C.

SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States on the following terms: Architects' Edition, $3.00 per year; Regular Edition, $2.00 per year. The price to foreign subscribers is: Architects' Edition, 16 shillings; Regular Edition, 12 shillings. Subscriptions are payable in advance. The Journal will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, will be continued until instructions to discontinue are received and all arrears of subscription paid.

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

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The Canadian Coral Marble Company has been incorporated, with head office at Toronto, and authorized capital of $500,000. The provisional directors are: S. M. Brookfield and H. J. Crowe, Halifax; E. D. Davison, Bridgewater, N. S.; J. W. Hutt, Liverpool, N.S.; H. W. Bickell, C.R.S. Dinnick and J. W. Moyes, Toronto, and T. M. Kirkwood, Owen Sound. The company is empowered to manufacture a composition known as coral marble for flooring, etc.

LEGAL.

The City Solicitor of Toronto has given it as his opinion that when once a building permit has been issued the civic authorities have not power to revoke it. This opinion is the outcome of a petition by the residents of a certain district in the city of Toronto to have the same included in the brick limit, and pending the change to withhold authority from the holder of a building permit for a row of rough-cast houses.

It is satisfactory to learn, says the London Engineering Times, that the (British) Court of Appeal has confirmed the judgment already given that a building owner is responsible for the payment of provisional sums for work performed by special artists or tradesmen, or for other works or fittings to the building whenever the architect shall so direct. Building owners sometimes imagine that when a tender is accepted they have no liabilities except to the contractor, and in such cases it is difficult to explain to them that there are sub-contractors who have also claims, the payment of which does not necessarily increase the total amount they had undertaken to pay. In the caae in question, Hobbs v. Turner, the contract form of the Institute of British Architects was employed. Clause 28, relating to the payment of provisional sums, was therefore accepted by both parties. It was mentioned in the specification that railings of the value of £20, ezclusive of carriage, fixing and profit, were to be provided for, and they were supplied by the plaintiff. A certificate certifying that plaintiff was entitled to £27 10s was sent to the defendant, the building owner, by the architect. The defendant declined to pay, repudiating his liability, and alleging that he had a claim against the builder for bad work. The Master of the Rolls interpreted clause 28 as meaning that the building owner and not the builder sbould be considered as the principal in regard to it. In such matters the builder was only the agent of the building owner. But his Lordship declined to decide whether under clause 28 the architect had authority to determine who was to pay, as well as to whom payment should be made. Apparently it was the intention of those who drew up the form of contract that the architect was to have the power of choice, for the sums are to be paid at such times and in such amounts as the architect shall direct, and sums so expended shall be payable by the contractor or by the employer. The only directing power is the architect and it is not suggested that it is optional on the part of the employer to pay or decline to pay. It is to be regretted that the Court was not more decisive in dealing with this part of the question, although it may hereafter be accepted that the initial liability in respect of this class of work was established.

STRUCTURAL WORK IN AMERICA.

In the course of a very interesting series of papers on structural costs recently published in the Engineer, the practice in tall building construction in America is set forth in a manner which shows clearly how economy is attained by keeping down the labor costs, says the Engineering Magazine.

The framework is so designed that the metal shall be handled the least number of times in the making. Planing is generally conspicuous by its absence, rolled or sheared edges taking its place. Rivets are so disposed that power driving can be used to the best advantage. Joints are so arranged that they require the minimum of work on site, and their rivets can be readily put in by pneumatic tools. Hand work is seldom to be detected—everything is as the machine has left it; as many girders, stanchions, beams, etc., are duplicated as is possible; stanchions are throughout spaced regularly; girder riveting is made alike in like spans—plates being added or dropped off as required for strength, thus one girder web plate template will often answer throughout the building; cast iron bases, pockets, shoes, and connection, where used, are just as the fettler or the tumbling barrel has left them; holes are cored or punched according to material; everything, in fact, is made most evidently for work and not for show. When first seen one is tempted to think off-hand that there seems much waste of material in places and much skimping of it in others. Brackets seem large and unwieldy, whilst cleats seem small and insufficient; girder flanges appear light, and stanchions ruggedly gigantic, or vice versa, according to the object of the building. But one has only to study things out a little to realize that all this is of set purpose. We are so used at home to providing against so many chances that are never likely to happen concurrently, that our structures have taken a character of their own, and we miss these characteristics when viewing other work. If workmanship can be saved by a slight sacrifice of material, the American carefully considers it. In no land are scientific principles better understood than in his, but he is much keener after the dollar than to sacrifice it for the sake of theory, and he will unerringly fix on the cheaper way of carrying out his principle. He keeps as far way from the smith's fire as he can, and does not enlarge his scrap heap with useless croppings and clippings, and as a direct consequence gets work made very much quicker, on the whole much cheaper, and quite as good and sound and equal to what is demanded of it as though it had been made to a government specification and was finished all over.

It may be argued that this sort of thing is not compatible with good work, but there is no reason why it should not be so. In masonry structures there is no attempt made to dress the inner faces of stone which is to be backed by rubble or brickwork, and since the structural work of a modern steel building is entirely imbedded it should be made to fulfill only those demands which legitimately come upon it.

Tommy—Say, Papa, what is a wash drawing?

His Papa—A picture to be used as an advertisement for a new brand of soap.

Please mention the CANADIAN ARCHITECT AND BUILDER when corresponding with advertisers.

NOTES OF THE TORONTO EXHIBITION.

The Exhibition which has just closed must be classed among the best, if not the best, held during the twenty-two years since this annual Fair was inaugurated. A noticeable improvement has been effected by the removal of some of the older buildings and the erection of several new ones, and the consequent re-arrangement of the grounds and exhibits.

The improvement would have been much greater had the new main building been completed. As it was the large unfinished structure served only to remind the visitors of the unwisdom of placing the control of such an enterprise in the hands of the Municipal Authorities, whose dilly-dallying methods made impossible the completion of this building for use this year.

Having in mind the damage sustained last year by rain owing to the leaky roof of the old main Building, exhibitors of the finer classes of goods made but a very small display this year, and the attractiveness of the Exhibition as a whole was from this cause somewhat impaired.

Our space will not permit more than brief mention of some of the principal exhibits in the line of materials and apparatus for buildings.

The Canada Foundry Co. made an interesting display of wrought iron fencing, grille work, spiral staircases, columns, beams, etc.

The Pease Furnace Co. had as usual an interesting display of heating apparatus, a prominent feature being their new Economy hot water boiler.

The Globe Paint Co., Limited, of Toronto, exhibited a fine grade of mixed paints and varishes, fillers, oils, etc., arranged in immense pyramids. One of these pyramids was composed of an extra fine grade of ground pure white lead, oak varnishes and hard oil.

The Metallic Roofing Co., Toronto, showed some beautiful designs in metal ceilings and shingles. Their display included finials, pillars, columns, center pieces, etc., also a large lion's head, one of many embossed by the company for a large bank building to be constructed in Montreal. The decoration of the company's exhibit with flags of all nations was very effective.

The Adams Automatic Sash Lock, exhibited on a model window in the Main Building is a very ingenious, simple and durable contrivance. There appears to be nothing about it to break, even by careless handling. These fasteners can be put on any window, are finished to suit trimmings, and windows cannot be closed without locking. Mr. Adams also exhibited a mortise lock which can be inserted in the door without cutting away the wood-work. It is made from sheet steel and brass, being a combined lock and latch. Both the sash lock and mortise lock are sold through the hardware trade as cheaply as the commoner locks.

The exhibit of the Otis Elevator Co., (Ltd.) was a prominent feature of the main building. The spur-geared elevator is a special feature of this company, as well as their machines under the Magnet Control System. The Automatic Electric House Elevator, combined with a dumb waiter and worked electrically by "push button" received much attention and favourable comment.

The Dairy Building and the Art Gallery at the Toronto Exhibition attracted considerable attention, being constructed of cement blocks. The Cement Block Machine Co., 4 & 5 Janes Building, Toronto, of which Mr. P. W. Stanhope is President, are the manufacturers of this new building material and take contracts for buildings, window sills, and other featurers of buildings for which stone has hitherto usually been employed. Their factory at the Queen's wharf is turning out this new article in large quantities.

THE MAKING OF VENEER.

The Imperial Veneer Company, Limited, have large works in Sundridge, Parry Sound District. Their Manager, Mr. W. T. Chambers was kind enough to explain the process of manufacture to our representative. First the logs are put in large vats, or tanks, and boiled for from six to twelve hours. Then after being peeled they are carried with large cranes, and put into the veneer machine, which works automatically, and cuts the veneer, from 1/32 "up 3/8" as required. The veneer comes off in one continuous sheet, but for convenience is cut into about 30 ft. lengths. It is then taken to the clipper, and cut to size; from there it goes to the dry kilns, where it remains until perfectly dry. If it is to be used as single stock, it is taken to the shipping room and done up into bundles, or crated ready for shipment. As the company make a specialty of built up stock, suitable for all kinds of panellings and furniture, the building up is the most important part of their work. For this purpose the company use a water-proof glue. They exhibit samples of wood that have remained in water for twelve hours, and are seemingly as perfect as possible. The process of glueing up the veneer is of itself very interesting. When the veneer comes from the dry kiln, it is taken to the glue rollers or spreaders. Two large sixty ton presses stand near by; on the bottom or base of the press is laid a large cawl suitable for the panel to be pressed; on this is laid the first or face sheet of veneer; then the center or filling is run through the glue roller, and laid with the grain of the wood running opposite to the face; then the back is laid on that with grain running same as face. When forty or fifty panels are laid up, the press power of sixty tons is turned on, and under this immense weight, the material is compressed into a small space. When the pressure is at its greatest the upper and lower cawl are bolted together and it is then wheeled to a drying room and allowed to dry thoroughly; from there it goes to the trimming table once more to be cut to exact size and then to the sander and polisher, when it is ready to ship. The company have orders from some of the largest English and German firms, as well as the local trade.

PERSONAL.

Mr. John J. Honeyman, architect, has recently removed from Rossland, B. C. and opened an office in the Molson's Bank Building, Hastings Street, Vancouver, B. C.

The death is announced at St. Louis of Mr. James Stewart, the contractor who recently made a record for rapid construction in England in connection with the the new Westinghouse factories at Manchester. The late Mr. Stewart lived for many years in Kinston Ont. following his arrival from Scotland, in 1842, and erected a number of prominent buildings in Kingston and Ottawa.

The announcement of The York Manufacturing Co., 1027 Yonge St., Toronto, manufacturers of laundry apparatus, first appears in this number.

Wm. H. Sumbling, who has had much experience in the manufacture of laundry machinery, has established a factory in this line at 643 Yonge St., Toronto. His announcement appears in this number.

HOLLOW WALLS OF ARTIFICIAL STONE.

Mr. Harmon S. Palmer of Washington, D. C., was one of the first men in America to foresee the merits and possibilities of Portland cement in the construction of buildings, and for the last fifteen years has been exclusively engaged in cement building. About eleven years ago he devised the Palmer Hollow Block process which he has improved on at different times since. Mr. Palmer realized that the great strength of Portland Cement did away with the necessity of a solid wall and that hollow walls were cheaper and more sanitary. These were the fundamental ideas. He advanced the art step by step from the first crude and cumbersome way of moulding beween planks and then building with solid bricks, until now but one single operation is necessary.

The time required for laying these blocks is one-third less than the time required for laying brick, and the mortar required is far less.

With the use of hollow concrete building blocks, the sanitary conditions are claimed to be superior to those of any solid wall, as the outside resists the rain and dries quickly, while a solid wall often remains damp all winter. The hollow space affords facilities for inserting gas and water-pipes, electric wires, speaking tubes, ventilators, etc., thus cheapening construction.

One part of Portland Cement and five parts of sand are used to make the concrete. The blocks may be made where the building is erected, only a few days being necessary for them to harden sufficiently for use. One skilled hand alone is sufficient to superintend the work which can be done by ordinary laborers. One block is equivalent to some forty bricks; the saving in labor, time and mortar is evident. Then again, the wall being hollow, an air space is provided and there is no need of lathing, the finishing plaster being applied directly to the inner face of the wall.

Thomas McLaughlin, Secretary-Treasurer Raven Lake Portland Cement Company, Limited, 16 King St. West, Toronto, is the sole authorized agent for the Dominion of Canada for the sale of Palmer's Patent Hollow Concrete Building Block Machinery and Process and the Right to use the same in exclusive territory.

NOTES.

Recent excavations at the Phillipsburg Railway and Quarry Company's quarry at Stanbridge, Que., are said to have disclosed the existence of large quantities of stone for dimension, bridge, monumental and decorative purposes.

A recent visitor from China to Toronto, states that a great deal of building is going on in Hong Kong, with an active demand for structural steel and other building material that could be supplied by Canada if a steel plant was in operation on the Pacific coast.

The Royal Academy has made an appeal to its members and to the public for subscriptions towards the rebuilding of the Campanile at Venice. We are disposed to join in the protest made by the London Architectural Record, against the unwisdom of rebuilding the structure in the original style instead of making it as our contemporary expresses it "a product of its own time in its design."

The automobile has attained considerable popularity in Toronto, where the asphalt pavements and easy gradients are extremely favorable to its use. Quite a number of the new residences constructed this year have automobile stables attached. No doubt in the near future these will be regarded as necessary adjuncts to all residences of a certain value.

THE GARGOYLES.

The Gargoyles are a grewsome group ;
Their styles are really various ;
They always live in "Singles," and
Are not at all gregarious,
For their expressions are so sour,
So vicious and nefarious,
And their positions socially
Are certainly precarious.

For they must live beneath the eavers
And on the copings balance,
And form around the roofs and tiles
A most unpleasant valance.
They make "bad faces" from the roof
(There's no one they've respected),
They hold themselves aloft, aloof,
With jeers
And leers
And sneers gives proof
Of manners much neglected.

NOTES.

"Comfortable Homes" is the title of an unusually attractive booklet referring to and descriptive of the "Economy" hot water heating boiler recently placed on the market by the Pease Furnace Co., of Toronto.

Elsewhere in our columns will be found the advertisement of the oldest established bell foundry in America, that of Meneely & Co., West Troy, N.Y. Their specialty is in casting the highest grade pure copper and tin bells, and their chimes and peals are all attuned by a new, special process said to be far superior to any other method. This firm recently furnished a chime of 10 bells to the St. Peter's Lutheran Church, Berlin, Ontario. They also supplied the fine chime of bells in St. James Cathedral, Toronto, said to be the heaviest set of chimes in the Dominion. The firm is now making a chime of 10 bells for the next oldest church in Canada, St. John's English church, Lunenburg, Novia Scotia, the giver of this chime being the Hon. Lieut.-Col. E. C. Kaulbach, M. P. ; the bells will be suitably inscribed. This firm quite recently furnished a fine bell for St. Mary's R. C. church, London, Ont., besides many more too numerous to mention here. Architects wishing to secure bells of best quality will do well to communicate with this old, reliable foundry.

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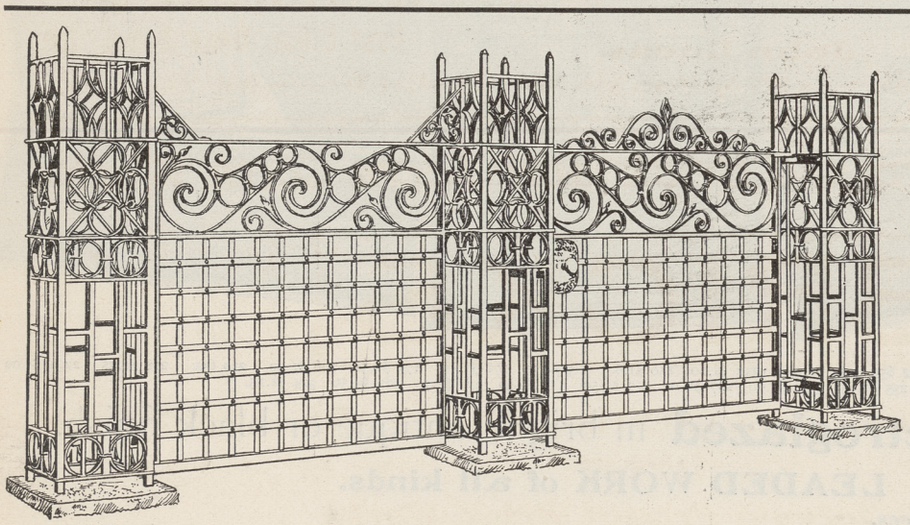

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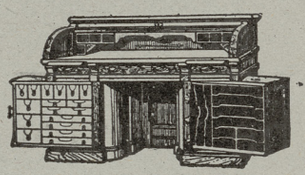

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