

March 2, 1937.

J. S. RAYNOR

2,072,684

BUILDING CONSTRUCTION

Original Filed May 23, 1931

4 Sheets-Sheet 1

Fig. 1.

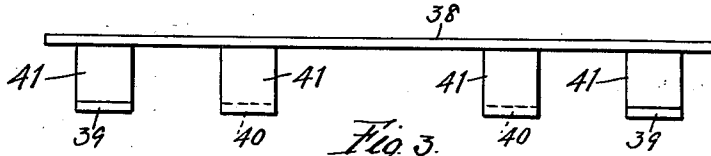


Fig. 2.

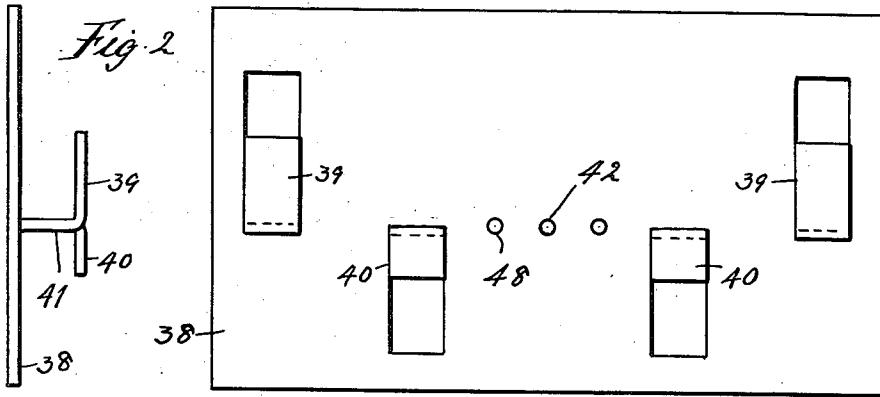


Fig. 4.

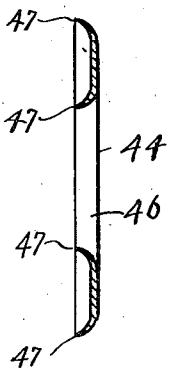


Fig. 5.

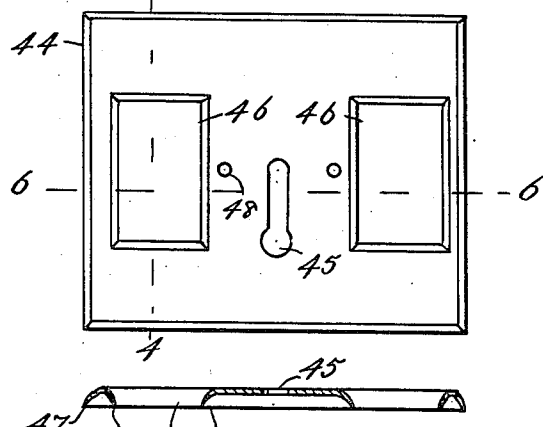


Fig. 6.

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Fig. 7.

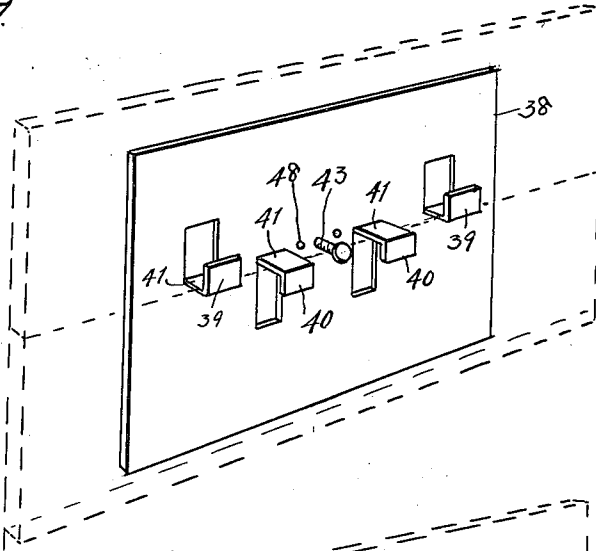


Fig. 8.

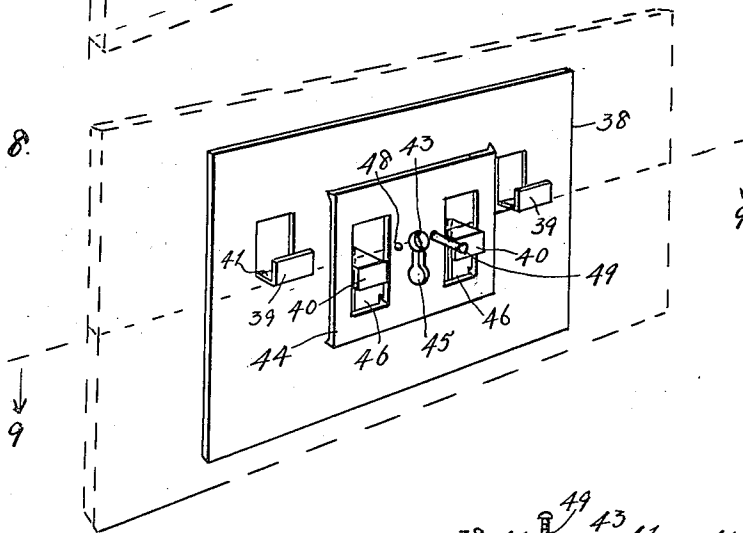
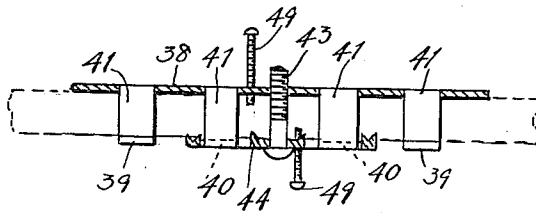


Fig. 9.



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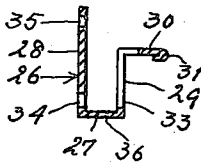
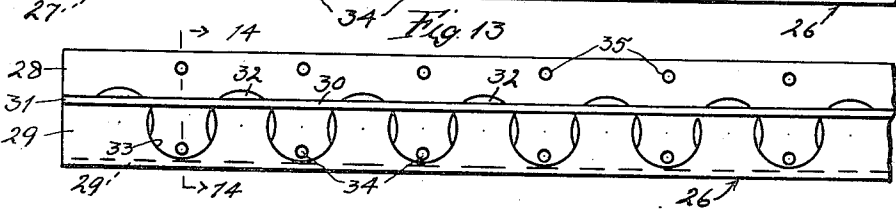
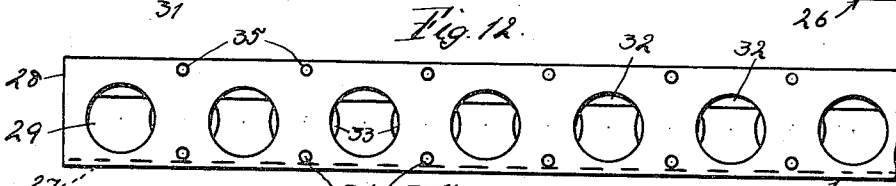
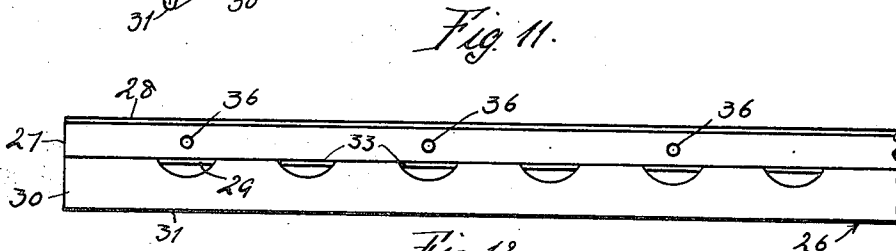
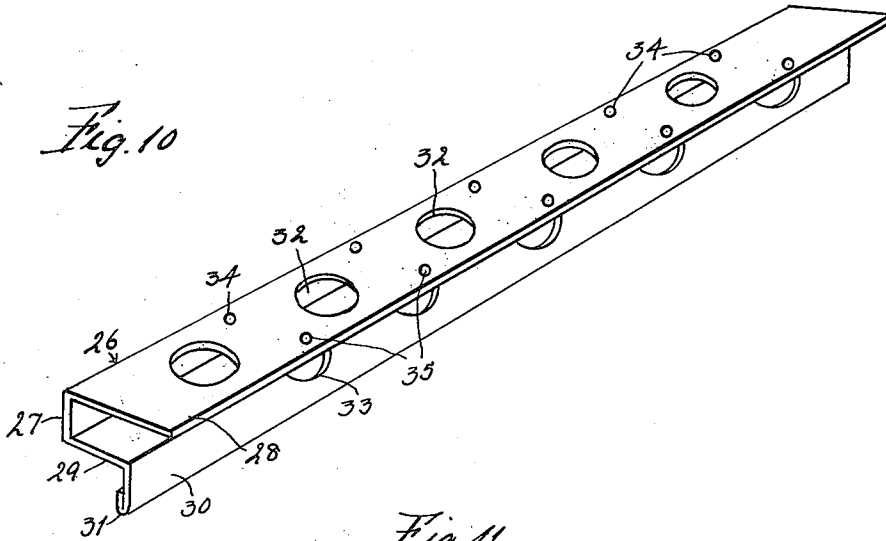
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4 Sheets-Sheet 3



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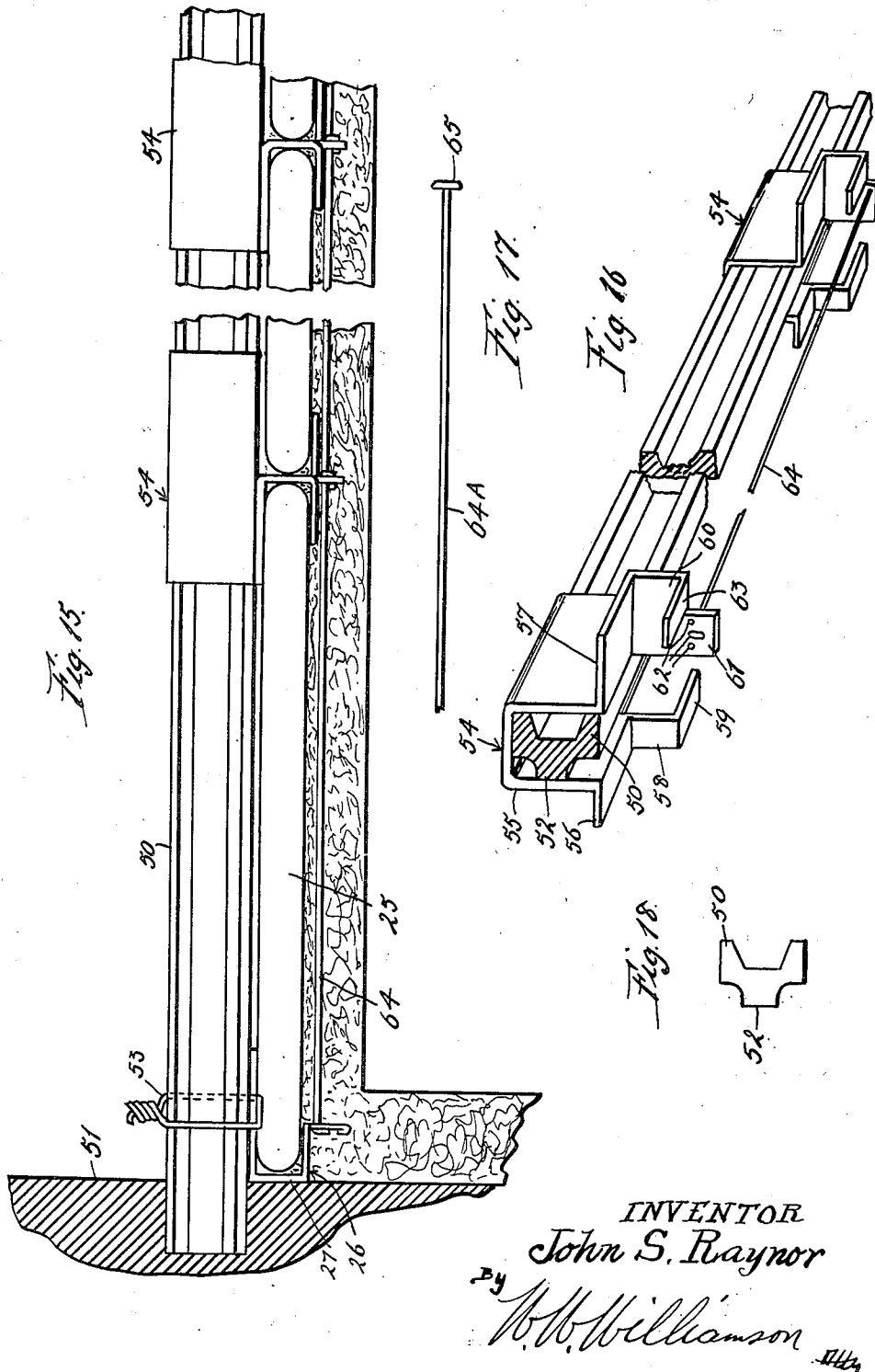
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BUILDING CONSTRUCTION

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,072,684

BUILDING CONSTRUCTION

John S. Raynor, Holmesburg, Pa.

Original application May 23, 1931, Serial No. 539,456. Divided and this application May 19, 1933, Serial No. 671,833

5 Claims. (Cl. 72—118)

My invention relates to new and useful improvements in building construction, the same being a division from my copending application Serial Number 539,456, filed May 23, 1931, and one of the objects is to provide unique means for constructing a wall core or base from a plurality of sheets or blocks of material, which when erected will be securely held in place to permit the application of plaster.

Another object of the invention is to provide a combination of elements coacting in such a way that the final result is the construction of a unitary structure from securely fastened core units.

Another object of the invention is to provide means for fastening together and to support different sized core units disposed at random relative to one another, whereby many joints will be staggered, which is preferable, thereby practically eliminating the possibility of cracks in the finished wall structure.

Another object of the invention is to so construct the wall core or base that there will be little or no loss in the use of the sheet or block material since the only cutting and fitting required will be at the end of a run and short or narrow pieces may be disposed between regular full sized units.

Another object of the invention is to provide a wall structure including rails and hanger clips for holding block or sheet core elements relative to supports, such as beams, studding, furring bars or joists, and then locking or securely fastening contiguous blocks or sheets to each other to form, in effect, a permanently supported slab, panel or core for applied plastering.

A further object of the invention is to provide a rail of unique construction as a subcombination, which rail is particularly adapted for use as a starting element in the construction of a wall or ceiling, but which may also be used for other purposes.

A still further object of the invention is to provide, as a subcombination, a fish plate or joining means which in addition to clamping similar core units together, may act as a gauge or guide for the applied plastering and generally known as a screed which will generally be more accurate than a screed made from plaster.

With these and other ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its con-

struction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:—

Fig. 1 is an edge view of one member of a fastening device, which fastening device will be termed a fish plate throughout the specification.

Fig. 2 is an end view of said member.

Fig. 3 is a face view of the same.

Fig. 4 is a section of the clamping member of the fish plate on the line 4—4 of Fig. 5.

Fig. 5 is a face view of said clamping member.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a perspective view of the base member of the fish plate showing the manner in which it is applied to the sheet material, the latter being shown in dotted lines.

Fig. 8 is a view similar to Fig. 7, showing the clamping member of the fish plate in place relative to the base member and the material sheets which are also shown in dotted lines in this view.

Fig. 9 is a section on the line 9—9 of Fig. 8.

Fig. 10 is a perspective view of the rail generally termed a corner brace or bead rail.

Fig. 11 is a fragmentary view of said rail as though looking on top of Fig. 14.

Fig. 12 is a view of the rail as though looking at Fig. 14, from the left hand side thereof.

Fig. 13 is a view of the rail as though looking toward Fig. 14, from the right hand side thereof.

Fig. 14 is a cross sectional view of the rail on the line 14—14 of Fig. 13.

Fig. 15 is a view partly in elevation and partly in section showing a specific construction of wall or ceiling utilizing the several elements of the invention.

Fig. 16 is a perspective view of a rafter or beam with my improved hangers thereon and illustrating how they may be tied together for suspending base material.

Fig. 17 is a fragmentary view of a headed tie rod.

Fig. 18 is an end view of a specific beam or rafter utilized in my invention.

In carrying out my invention as herein embodied, I dispose sheets of stiff material in the form of plaster board or blocks of desirable thickness, length elements and width or the equivalents thereof at random across suitable supports, such as studs, furring bars, joists or beams which may be positioned any suitable distance apart so long as they will support the applied load. When I refer to placing the stiff material elements at random, I mean that no construction has to be given to where the joints may be located, and therefore short pieces of

stock may be used in the body of the wall being formed or at the ends thereof, and the joints between the elements do not have to be positioned relative to the supports.

5 As the base or core of the wall is formed by the assembly of the sheets or blocks, they may be attached to the supports by the clips illustrated in my copending application, from which this application is a division, or otherwise.

10 Where a wall or partition is started from a floor which is already laid, I prefer to first install a rail 26, Figs. 10 to 14 inclusive, but it may also be used as a top or finishing rail, and likewise may be used about rough door buck, or frames, or similar openings, or other place where applicable.

15 The rail 26 is produced from suitable sheet metal fashioned to provide a back or web 27 with a long leg 28 projecting from one edge at right angles to said back and a short leg 29 also projecting at right angles, but from the other edge of said back, and from the shorter leg 29 extends an outwardly projecting flange 30, the longitudinal edge of which is turned back upon itself to provide a bead or finished edge 31.

20 In the longer leg are formed a number of large openings 32 and in the shorter leg 29 are also formed relatively large openings 33, preferably of the same diameter as the openings 32, but in staggered relation thereto and portions of the openings 33 extend into the flange 30 as plainly shown in Figs. 11 and 14, thus permitting a fastening device to extend along the outer face of the shorter leg 29 and through that portion of any opening 33, which projects into the flange 30.

25 A series of holes 34, which are relatively small, are formed in the longer leg 28 near the back wall or web 27 and in alignment with the openings 33, but not concentric therewith. Another series of relatively small holes 35 are formed in the longer leg adjacent its longitudinal free edge and still another series of relatively small holes 36 may be formed in the back or web 27.

30 After the first row of material sheets has been erected, a second course is placed in position with the lower edges abutting the upper edges of the preceding course, and said second course is suitably fastened to the supports. Such operations are continued until a core for a wall or partition is completed, or practically so, and on the last course of erected material sheets a rail such as above described may be installed, but in an inverted position relative to the one used at the bottom of the wall.

35 The sheets or blocks of stiff material may be fastened along their joints at any desirable number of locations and particularly at joints formed by meeting ends or edges of edgewise abutting sheets by means of fish plates or clamps 37 shown in detail in Figs. 1 to 9 inclusive. Each fish plate includes a base member 38 having a number of sections partially cut therefrom and bent or fashioned to provide oppositely projecting hooks 39 and 40, the shanks of which are all on the same line or in the same plane, as will be obvious by reference to Figs. 2 and 3, said shanks being indicated by the numeral 41.

40 In a threaded hole 42 in the base 38, which hole is in the same line as the shanks of the holes, is mounted a screw 43 over which is passed the clamping plate 44 having a key hole 45 therein so that the larger part will register with the screw head and then the whole clamping member moved lengthwise of the key hole for passing said clamping member. The screw 43 is then screwed into its hole 42 until the clamping member 44

is drawn tightly against the sheets of material between the two members of the fish plate as shown in Figs. 8 and 9. The clamping member 44 is also provided with openings 46 to register with certain of the hooks, as 40, and also has fangs 47 along the edges of its body and along the edges of the openings 46, and said fangs may be coextensive with the edges from which they are formed or they may be serrations.

45 In both the base 38 and the clamping member 44 are formed other threaded holes 48 to either temporarily or permanently receive screws 49 of various lengths because they are designed to indicate the thickness of the applied plastering. These screws guide the plasterer in applying the rough coat, in particular, and give the proper line for the finish of at least said rough coat, and are therefore known as screed setting screws. After the plaster has been applied and set, the screed screws may be removed or screwed in a sufficient distance to carry their heads below the plaster surface after which the recesses formed by the screw heads may be filled up.

50 The fish plates are used especially for strengthening the meeting edges of the material sheets and prevent the latter from warping out of line or being forced out of their proper positions during the application of the plaster. They may also be utilized for strengthening or mending broken or otherwise damaged sheets of material, and likewise may be used in connection with the erection of short pieces of material sheets known as fitters or pieces which it has been necessary to cut out and then replace, or the filling in of a space purposely left vacant, such filling piece generally being known as a dutchman.

55 In erecting a ceiling, supports or beams 50 are installed in any suitable and well known manner and for purposes of illustration one of such beams has been shown as having one end embedded in a solid wall 51 and the opposite end may be supported in a like or any other manner. While various forms of beams may be utilized, I have designed one which is particularly advantageous for use in the erection of suspended ceilings and where sheets of stiff material are used as the core. This support or beam 50 is in the form of a channel having a rib 52 formed on its back extending along the longitudinal center thereof, and when in use, one web rests upon the supports for the beam, while the other web is parallel therewith but spaced above the first mentioned web.

60 When the beams 50 are in place, a rail 26 is positioned beneath the beams crosswise thereof with the back 27 of the rail against the wall or other upright support 51 and with the longer leg 28 against the underside or lower webs of the beams. The rail is fastened in place by any suitable means and for purposes of illustration, such rail is shown as tied with wire 53 passing through adjacent openings 32 or one of said openings and around the end of the rail.

65 The rail now being in place, the longer and shorter legs 28 and 29 respectively thereof project outwardly from the upright support or solid wall 51, and the flange 30 is in a pendent position. Sheets or blocks are now erected one at a time by placing an edge of each of the sheets of the first row in the channel formed between the two legs of the rail, and the opposite edge is supported by hangers 54 which are placed over the beam and tapping said hanger into place over said opposite edge of the sheet or block.

70 Each hanger 54 is so constructed that it will not

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tilt or turn over when assembled on a beam and is of unique construction, the same being produced from a section of suitable sheet metal fashioned to provide a channel body 55 oppositely projecting wings 56 and 57 extending from the edges of the legs or flanges of the body at one end of the latter. With the inner end of the wing 56 which is at a point approximately midway the length of the hanger body is formed a leaf 58 projecting at right angles from said wing away from or below the body and with said leaf is formed a step 59 projecting at right angles from the leaf and extending from the leaf at the side opposite the wing 56, but in a parallel line.

With the inner end of the wing 57, which inner end is also approximately at a point midway the length of the body is formed a leaf 60 at right angles to its wing and projecting downwardly or away from the body, and the end of this leaf is split leaving an anchor plate 61 having a number of holes 62 therein, and the part of the leaf beside the anchor plate is bent up at right angles to form a rest 63 which underlies the wing 57 in spaced parallel relation thereto.

In use, the hanger is placed upon the beam 50 so that the body 55 straddles said beam with either the rest 63 or the step 59 in engagement with the outer edge of the sheet of metal 25. In erecting the next adjacent sheet, its edge will be placed on the unoccupied rest 63 or step 59 which ever it happens to be and then another hanger will engage the opposite edge of the sheet so as to support the same in the proper position. To prevent any possibility of canting the several hangers on a beam, it is advisable that all of the hangers be placed so that the anchor plates of all of the hangers will be on the same side of the beam.

After the first row or course of material sheets has been erected, the fish plate connectors should be mounted at all right angle joints but left in a loose condition for the reception of the second row or course of sheets.

The hangers may be clipped together or anchored by suitable hawsers 64 in the form of sections of wire having an end bent down and hooked into that portion of one of the openings 33 projecting into the flange 30 of the rail 26, the other end of said hawser being passed through one of the holes 62 in the anchor plate 61 of a hanger and its end bent down as the hawser is pulled taut. In the same manner, two of the hangers may be securely anchored in place. If found desirable, a hawser 64a may be provided having a head 65 on one end in which case the hawser is threaded through one of the holes 62 in the anchor plate of a hanger and then through a hole in the anchor plate of another hanger or through that part of an opening 33 which lies within the flange 30 and the end bent over to securely fasten the parts relative to one another.

In place of wire, the hawsers may be produced from stiffened warp rope or any other suitable stiff material providing it can be bent or formed as may be required to draw the parts together or to prevent their separation. The hawsers in addition to tying the hangers together or in place also act as supports for the material sheets as reinforcements for the applied plaster as will be apparent from the proceeding description.

After all the hawsers or under-supports are in place, there will be spaces between the material sheets and said hawsers, but when the plaster is applied to the face of the core, it will be forced

in between the core and the hawsers and all about the latter, and therefore the hawsers will act as reinforcements for the plaster and will also act as supports for the core through the plaster between said hawsers and adjacent face of the core made up from the material sheets.

When the last sheet, or last course of sheets is to be erected, or a dutchman is to be put in place, one of the hangers 54 is placed on the beam and both the rest 63 and step 59 are bent down into endwise alignment with their respective leaves 60 and 58. This will permit the leaves to be placed in contact or engagement with an upright support or wall as the end of the body without the wings is driven into said upright support or wall.

The last material sheet or dutchman is then placed in position and the rest 63 may be bent back into its proper position to support the co-acting edge of the material sheet or dutchman.

When the core or base of a ceiling is erected in this manner it will be of considerable strength and can withstand even extraordinary loads, and since parts of the rail, hangers and hawsers are embedded in the plaster material, they should remain intact for the full life of the building. Upon the assembly of the fish plates, the screed screws may be properly adjusted and will accurately guide the workingman in applying the plaster and as before stated, upon the completion of the plastering job, said screws may be removed or they may be screwed into the fish plates so that their heads will pass beyond the exposed surface of the plastering and any holes formed thereby can be filled in at any time. The use of the screed screws eliminates the necessity of forming plaster screeds and waiting for the same to dry with the subsequent loss of time as well as eliminating the necessity of driving screws or nails into the core material and puncturing the same, which might result in further damage thereto.

Fish plates as herein described were used at all joints and all of said fish plates were made absolutely tight after the partition core was assembled. After completing the assembly, the supports were cut away at different points but leaving the complete core supported only along its upper edge, thus the wall core construction was without any means of backing. I then pulled the entire core out of line at the bottom and every inch of it moved as though it were one sheet or block, since the fish plates held adjacent material sheets or blocks together and prevented any separation. Then when I let go of the core, it fell back into its exact original plumb position. I did this many times and the stock never pulled apart, indicating that I had discovered a construction never before accomplished and having many advantages.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is:—

1. In a device of the character described, a fish plate consisting of a base member, a plurality of hooks projecting from said base member on one side thereof with the shanks of all of said hooks in a straight line and the tangs of some of said hooks projecting in one direction and the tangs of the remainder of said hooks projecting in the opposite direction, a screw hav-

ing threaded connection with said base member, a clamping member having openings to register with some of the hooks and also provided with a key hole for registration with the screw where-
5 by the clamping member may be projected over the hooks and moved into a position to permit the head of the screw to draw the clamping member tightly against objects between the two members, and means on the clamping member
10 to penetrate the objects between the two members.

2. In a device of the character described, a fish plate consisting of a base member, a plurality of hooks projecting from said base member
15 on one side thereof with the shanks of all of said hooks in a straight line and the tangs of some of said hooks projecting in one direction and the tangs of the remainder of said hooks projecting in the opposite direction, a screw hav-
20 ing threaded connection with the said base member, and a clamping member for disposition in parallelism with the base member and having openings for registration with the hooks project-
25 ing from the base member which fall within the area of the clamping member and further provided with a key hole for registration with the screw to permit positioning of the clamping member without removing said screw and the

final clamping of said clamping member by means of the screw against objects between the two members.

3. The structure set forth in claim 2, in combination with screed screws removably and adjustably mounted in both of the members. 5

4. In combination, a series of supports, sheets of stiff material, means to sustain said sheets from the supports, fish plates for positively fastening several material sheets together into one
10 complete core to receive applied plaster, and means to tie the sustaining means together and function as reinforcements for the applied plaster and as supports for sections of the core
15 through the applied plaster.

5. In a device of the character described, a fish plate consisting of a base member, a plurality of hooks projecting from said base member on one side thereof with the shanks of all of
20 said hooks in a straight line and the tangs of some of said hooks projecting in one direction and the tangs of the remainder of said hooks projecting in the opposite direction, a clamping
25 member, and means engaging the two members to draw them toward each other for fastening objects between them.

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