Oct. 8, 1935. J. S. RAYNOR 2,016,874

BUILDING CONSTRUCTION

Filed May 23, 1931 4 Sheets-Sheet 1

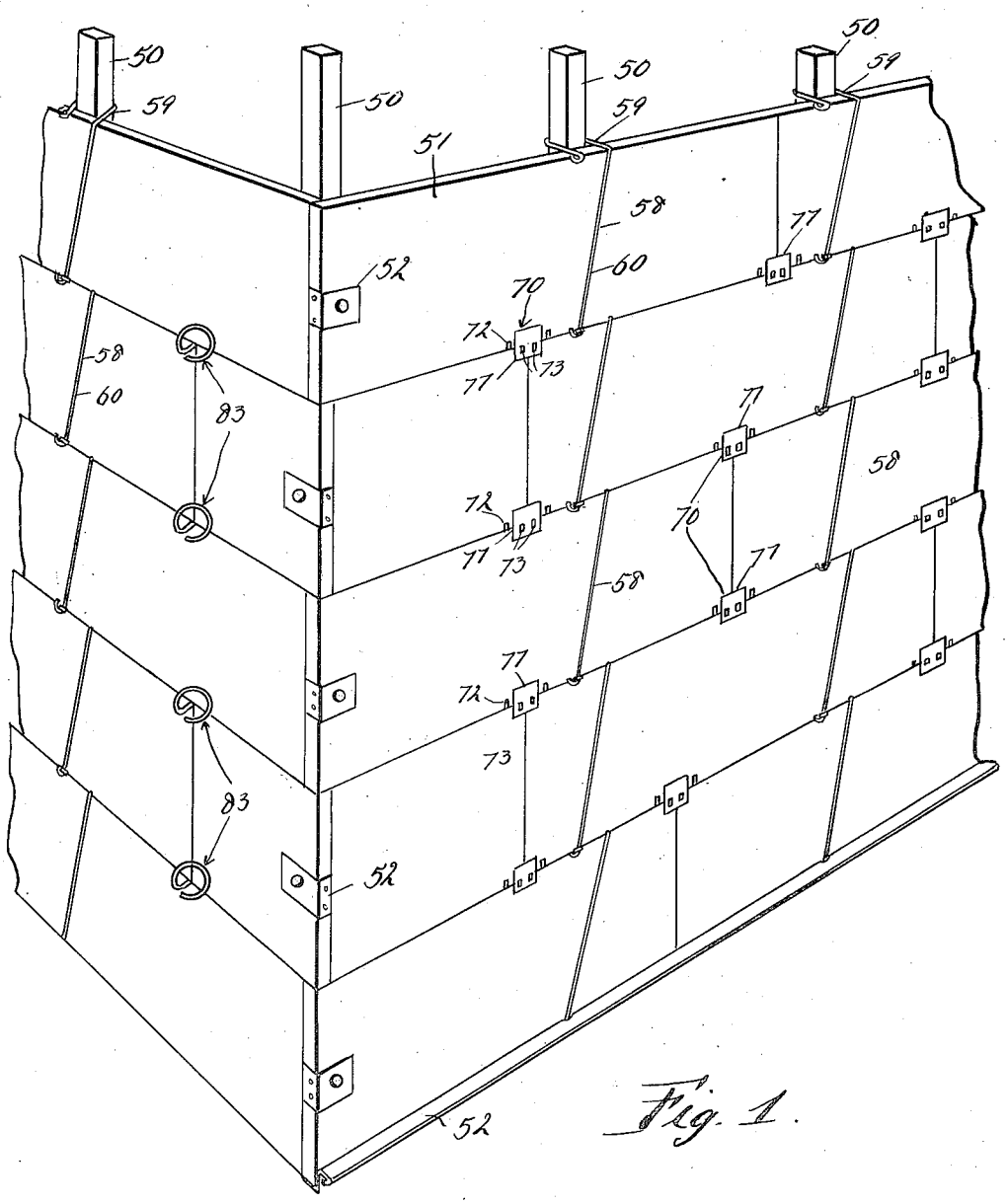

Fig. 1.

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Fig. 2.

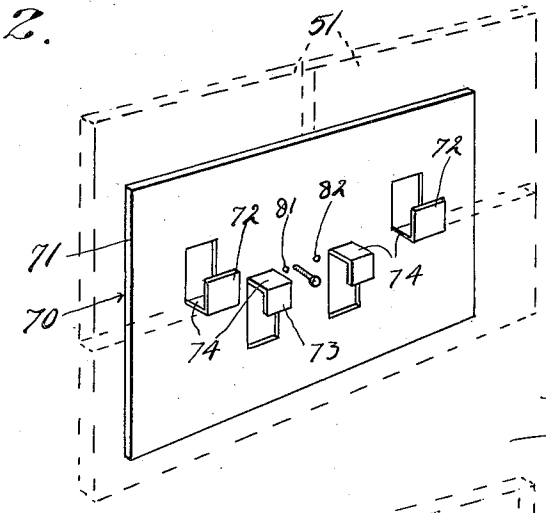

Fig. 3.

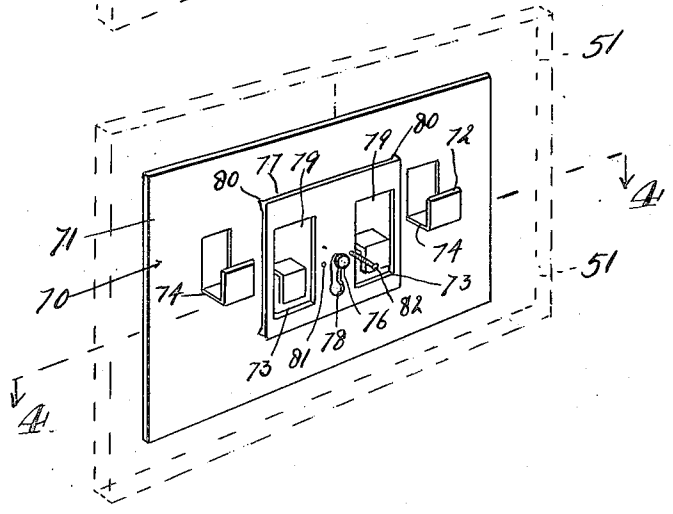

Fig. 4.

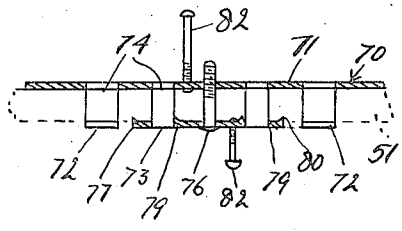

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Fig. 5.

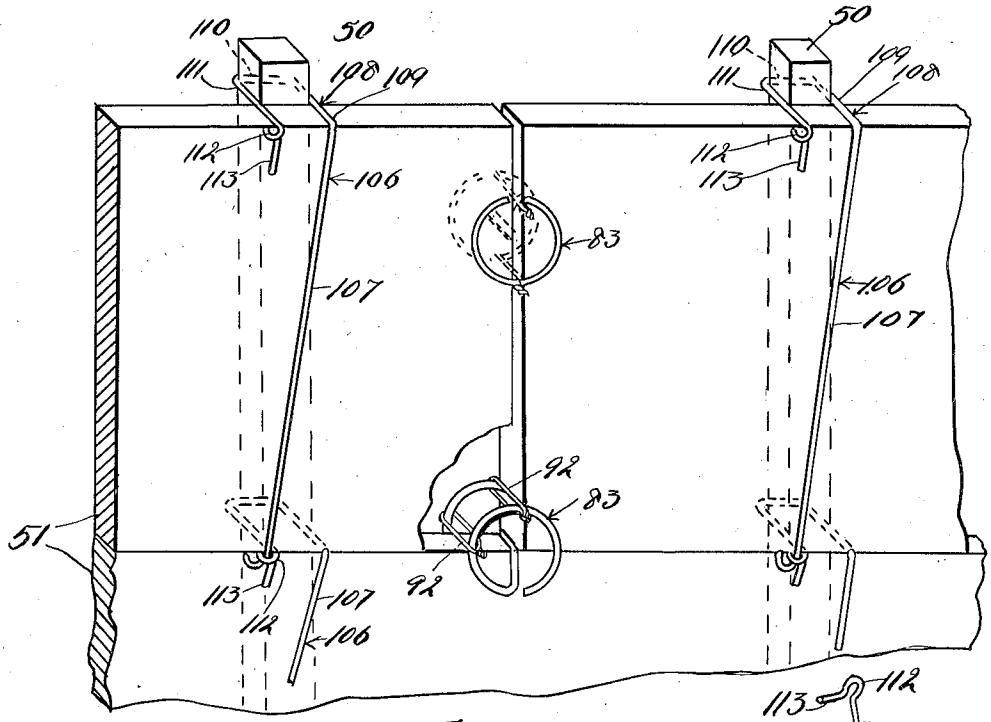

Fig. 6.

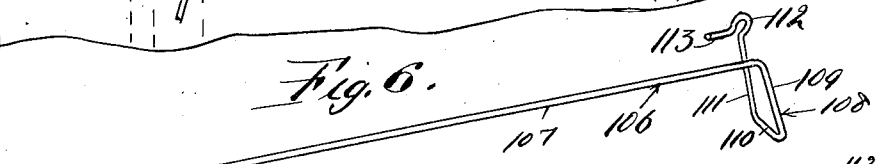

Fig. 7.

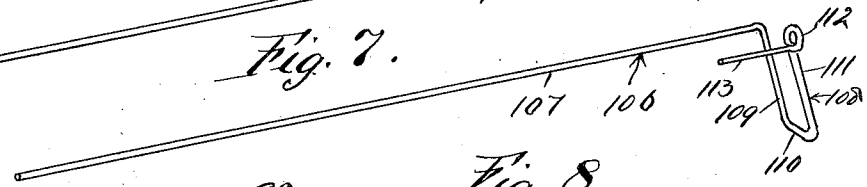

Fig. 8.

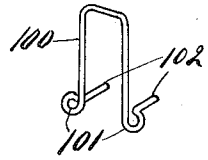

Fig. 9.

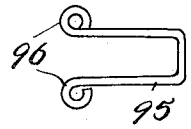

Fig. 10.

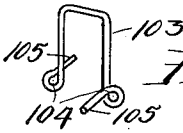

Fig. 11.

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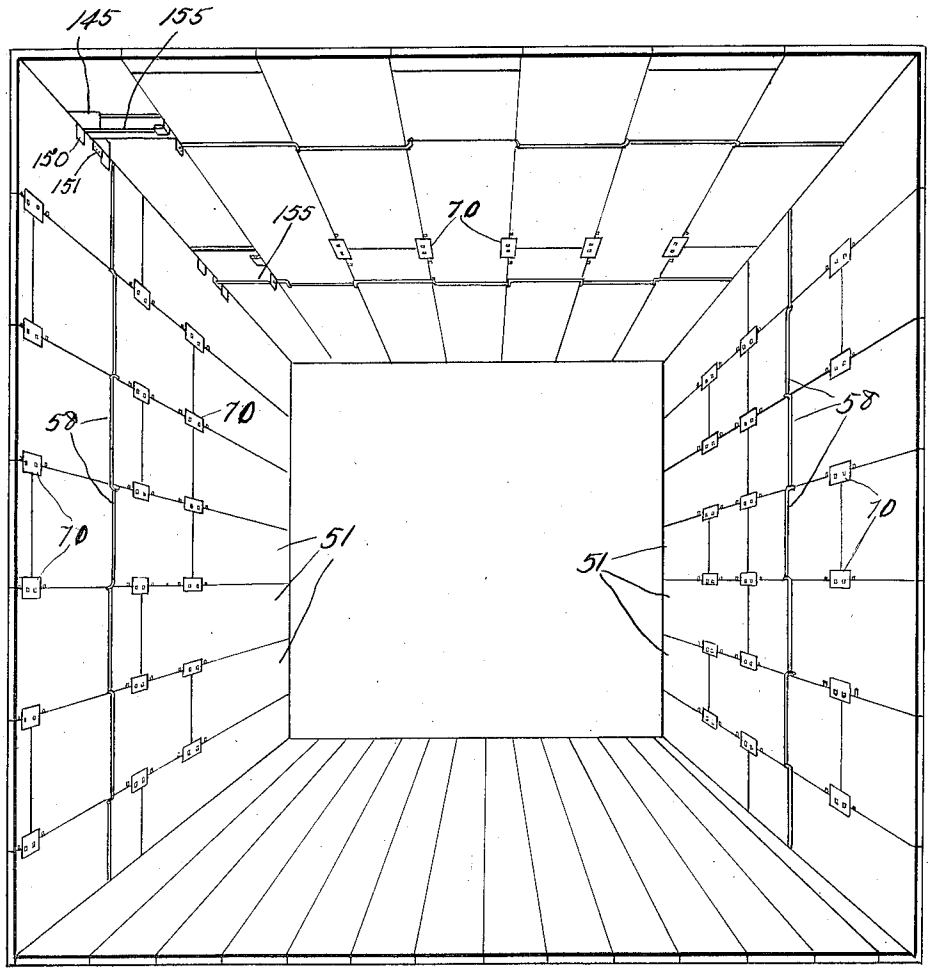
Fig. 12.



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Patented Oct. 8, 1935 2,016,874

UNITED STATES PATENT OFFICE

2,016,874

BUILDING CONSTRUCTION

John S. Raynor, Philadelphia, Pa.

Application May 23, 1931, Serial No. 539,456

6 Claims. (Cl. 72—46)

My invention relates to new and useful improvements in building construction and more particularly the portion which relates to the erection and fastening of solid and hollow wall elements, partitions, ceilings and the like, especially the elements forming the base for applied plastering.

The invention herein described utilizes, to some extent, the objects features and constructions illustrated and described in my Patents #1,640,468 granted August 30, 1927, #1,641,903 granted September 6, 1927, #1,764,748 granted June 17, 1930 and #1,796,959 granted March 17, 1931 as well as the co-pending applications Serial #195,946, filed June 2, 1927 and Serial #399,358, filed October 12, 1929.

One of the objects of the present invention is to provide improved methods for erecting and fastening sheets of stiff material such as plaster boards or blocks at random relative to studding, furring bars and joists or other supports regardless of their arrangement or positions and which when properly erected will be rigid and the applied plastering will firmly adhere to the base elements.

Another object of my invention is to provide means and arrange the parts whereby the completed structure may be fashioned along straight or curved lines either concaved or coved, or convex or bowed. This is possible since small sized stock can be used and the spacing of the studding, furring bars or supports does not have to equal the lengths of the stock.

A further object of the invention is to provide a relatively cheap but strong or durable construction which may be easily and quickly erected and which when completed will be rigid and safe particularly since the elements entering into the construction can not become dislodged due to deterioration or other causes and will remain intact until such time as the superstructure gives way or is razed.

A still further object of the present invention is to provide a building construction which while rigid as a whole has a certain inherent resiliency to stand certain stresses thereon without breaking and which would also be capable of standing the shock of minor explosions without the likelihood of dislodgment of the parts so that the construction actually acts as a fire preventive or as a means to confine a fire and prevent its spread to other parts of a building.

With these and many other objects which will become apparent from the following description, this invention comprises certain details of construction and combination of elements hereinafter set forth and specifically designated by the claims.

In order that those skilled in the art to which the invention appertains may understand how to make and use the same, I will describe its construction in detail; referring by numerals to the accompanying drawings, forming a part of this application in which:—

Fig. 1 is a perspective view looking at the salient corner formed by the meeting of two walls under construction and illustrating some of the details and elements embodied in the building construction in accordance with my invention.

Fig. 2 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. 3 is a view similar to Fig. 2, showing the capping member of the fish plate in place relative to the base member and the material sheets which are shown in dotted lines.

Fig. 4 is a section on the line 12—12 of Fig. 3.

Fig. 5 is an isometric view of a wall section with a portion broken out to show different fastening means for the sheets of material and illustrating how the coils of a spider may be drawn toward each other in order to provide an extra secure fastening whereby it will function similar to one of the fish plates.

Fig. 6 is a perspective view of one form of clip for fastening the sheets in place when disposed across furring bars, studding or similar supports.

Fig. 7 is a similar view of a modified form of clip.

Fig. 8 is a side elevation of a substitute clip or clip leg for use in connection with a clip head.

Fig. 9 is a perspective view of an independent or substitute clip head.

Fig. 10 is another form of independent or substitute clip head.

Fig. 11 is a perspective view of a modified form thereof.

Fig. 12, is a perspective view looking into a room, hallway or other compartment to illustrate an installation or erection of walls, or partitions and a ceiling in accordance with my invention and showing how the ceiling sheets may be rigidly and securely fastened to the rafters or beams.

In carrying out my invention as herein embodied 50 represents supports such as studs, furring bars, joists or beams, and these may be po-

sitioned any suitable distance apart so long as they will support the applied load.

Across the supports **50** are disposed at random sheets of stiff material **51** in the form of plaster board or blocks of desirable thickness, length and width. Since the sheets of material can be disposed at random and since the supports **50** may be spaced at random, a person erecting a wall, partition, ceiling or the like does not have to make accurate measurements except for the outside boundaries or to line up a wall to see that the same is perpendicular, horizontal or whatever angle might be desired.

Where a wall or partition is started from a floor which is already laid, I prefer to first install a boundary rail **52**, that may be used as a base rail, or inverted and used as a top or finishing rail.

With a section of the boundary rail installed as a base rail the sheets of material **51** are set in the channel thereof and a clip **58**, Fig. 1, has its head **59** engaged around a support **50** and then moved into engagement with the upper edge of the sheet of material **51** and the leg **60** attached in any convenient manner to the boundary rail.

As the lower end of the leg **60** of a clip is attached to the boundary rail the head of the clip will be drawn firmly against the upper edge of the material sheet **51** and where the latter is of fragile material the clip head will be embedded into the edge of the material sheet.

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 the clips then placed in position so that the heads engage the supports with the legs projecting over faces of the sheets opposite the supports and with the ends of the clip legs projected through the eyes of the clips holding the first course of material sheets and then bent up, and the bending of the end of the clip leg will bind the material sheet in place, the same as before described.

The above operations continue until a wall or partition is completed, or practically so, and on the last course of erected material sheets a boundary rail may be installed in an inverted position relative to the first mentioned boundary rail for use as a top rail and this may be fastened to a support **50** by suitable fastening means, and the last assembled clips are attached to said top rail and the leg of each of said last assembled clips passed through the eye of a preceding clip and the end bent over. When this is done all of the courses will be securely bound together and to their supports.

In order to hold the meeting ends of the material sheets together at corners whether or not a support **50** is located at such corner small sections of the boundary rail **52** may be utilized as shown in Fig. 1, in which case the longer leg of the boundary rail overlies what may be termed the outer face of the sheet while the shorter leg lies between the opposite face and the contiguous edge of the abutting sheet and then by driving a nail or equivalent fastening means through openings in the long and short legs across the heel of the boundary rail the nail will then be disposed over the outer face of said abutting sheet and will assist in holding the latter in place.

The several sheets 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 clamps **70** herein called a fish plate and illustrated in detail in Figs. 1 to 4 inclusive. Each fish plate includes a base member **71** having a number of sections partially cut therefrom and bent or fashioned to provide oppositely projecting hooks **72** and **73** the shanks of which are all on the same line, said shanks being indicated by the numeral **74**.

In a screw threaded hole **75** in the base **71**, which hole is in the same line as the shanks of the hooks, is mounted a screw **76** over which may be passed the clamping plate **77** having a key hole **78** therein so that the larger part will register with the screw head and then the whole clamping member moved sidewise for positioning the same and then the screw **76** screwed into its hole **75** until the clamping member **77** is drawn tightly against the sheets between the two members of the fish plate. The clamping member **77** is provided with openings **79** to register with certain of the hooks, as **73**, and also has fangs **80** along the edges of its body and along the edges of the opening **79** therein and said fangs may be co-extensive with the edges from which they are formed or they may be serrations.

In both the base **71** and the clamping member **77** are formed other screw threaded holes **81** to either temporarily or permanently receive screws **82** of various lengths. These last named screws are 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 and the recesses formed may then be filled up.

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 material sheets and likewise may be used in connection with the erection of short pieces of sheets known as fillers, 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.

In lieu of the fish plate other fastening devices may be used which will herein be referred to as spiders one of which is shown in Figs. 1 and 5, and numbered **83**. The spider **83** is fashioned from a piece of wire of suitable strength and stiffness to provide an axle **85** from each end of which projects a spoke **86**, preferably parallel, and with each spoke is formed one of the rings **87** and **88** which are bent or turned in opposite directions relative to each other so that the end of one ring terminates on the side of its spoke opposite to the termination of the other ring relative to its spoke.

A spider may be used between the joints of two material sheets or between the joints of three of such sheets and where it is desirable that the ring portions of said spiders be braced or strengthened to prevent any possibility of the rings separating or moving apart the ring portions may be tied together by wires **92** which pass through the spaces of adjoining material sheets as shown in Fig. 5.

Often while a building is under construction, the plumber, electrician, steam fitter or other mechanic may require that a space be left open or an opening provided temporarily so that wires, pipes and the like may be installed at a later time. This opening will be subsequently closed or partially closed by a piece of sheet material generally known as a dutchman. In building up the base or core of the wall or partition or ceiling the sheets of material **51** are placed against the supports **50** and fastened thereto by clips. When the location for the desired opening is reached the stock or material sheets are merely arranged so that the opening is formed and a U-shaped clip head **95**, Fig. 10, having an eye **96** at each end is placed around each support **50** within the confines of the opening beneath the lower edge or edges of the stock or material sheets in the course above the opening and the legs of the clips fastening the course of stock above the opening, in the region thereof, are projected through one of the eyes of each U-shaped head so that said upper course is properly secured in place.

When the time arrives to fill in or partially close the opening a dutchman or filler of proper shape and size is fitted into the opening and independent clip legs **97** are projected through the remaining eyes of the U-shape clip heads **95** and the eyes of the heads of the clips which are holding the lower course of the stock in place in the region of the opening. The independent clip leg **97** is produced from a section of wire having a stop eye or loop **99** formed at or near one end whereby said independent clip leg will be properly positioned relative to one of its cooperating elements while the end of said independent leg opposite the stop loop can be bent over the other co-acting element after being properly inserted in the eye thereof. Where the independent leg **97** is used in vertical work it will be obvious the same may be threaded upwardly or downwardly through the co-acting elements.

The independent clip leg may be merely a section of wire having both ends bent after it has been threaded through the elements or one end may be bent over prior to the leg being threaded through the co-acting elements.

In Fig. 9, I have illustrated a modified form of independent or substitute clip head **100** which is fashioned U-shaped with two eyes **101** and a pigtail **102** projecting from each eye both of said pigtails projecting in the same direction whereas in Fig. 11, I have shown a further modification of independent or substitute clip head **103** which like the others is fashioned U-shaped and provided with two eyes **104** but the pigtails **105** project in opposite directions from the eyes **104**. These pigtails engage the stock or material sheets forming the base or core of the wall or ceiling and prevent the independent or substitute clip heads from moving lengthwise and becoming accidentally displaced from the supports during assembly or erection.

In Figs. 5 and 6 I have illustrated a slightly different form of clip **106** which like the other clips is produced from a section of suitable wire fashioned to provide a leg **107** and a head **108**, the latter including a section **109** at right angles to the leg **107**, a connecting piece **110** at right angles to the section **109**, another section **111** at right angles to the connecting piece **110** and also at right angles to the leg **107** and parallel to the section **109** and the end of the section **111** is coiled to provide an eye **112** from which projects a pigtail **113** parallel with the leg **107**.

The clip illustrated in Fig. 7, is identical in every detail in that shown in Fig. 6, with the exception that the section carrying the eye and pigtail is on the opposite side of the leg and therefore the same reference numerals have been used. It might be said that the clip in Fig. 6, is a right handed one while the clip in Fig. 7, is a left handed one as this would be the most simple explanation of the differences between the two.

When the core or base of a ceiling is erected in accordance with this invention such ceiling will have considerable strength and can properly withstand any ordinary load of applied plaster and since all holding means including the clips, are embedded in the plastic material they will remain intact for the full life of the building.

It is to be particularly noted that in the structure herein set forth that the clips, and sometimes the fish plates and other holding appliances act as guides for the application of the first coat of plaster thereby gaging the thickness of said plaster making it possible to apply an even first coat of plaster of uniform thickness which will set at an equal speed throughout. The advantage of this condition is that the entire area will become hard at the same time and be ready for the next coat of plaster.

Where the fish plates are used either by themselves or in conjunction with the spiders or other means of fastening the edges of the sheets together, the screed screws **82** may be used as gages for subsequent coats of plaster eliminating the necessity of driving nails or other equivalent means into the core of base or forming screed settings in the form of small mounds of plaster.

While I have used the word block in some places throughout the above description, it is to be understood that the use of the word sheet or its derivatives or equivalents is to include blocks of material, especially such blocks as are used in present day construction. In other words, there are pieces of material used in present day building construction which are considerably thicker than the usual building sheets of gypsum and equivalent materials which are known as blocks.

I desire to call attention to the arrangement of the joints between the sheets or blocks and especially those joints which are parallel with the furring bars or supports wherein all of such joints are a considerable distance from the supports and at no time is there a joint running parallel or in alignment with said supports. This makes it possible that the supports and the sheets or blocks may be erected at random and the supports will not be exposed from the face or working side of the construction with the possible exception that where a number of the sheets or blocks cross a support, if said blocks or sheets are not forced into absolute contact throughout the joint, there may be a noting that there is something behind the blocks or sheets.

Of course, I do not wish to be limited to the exact details of construction as herein shown, as these may be varied within 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 wall core consisting of supporting means, material sheets disposed at random across said supporting means, attaching means disposed across the material sheets and having portions engaging the

supporting means and other portions engaging coacting contiguous attaching means and fastening means engaging the edges of contiguous material sheets whereby they will be held in alignment during plastering operations, and said attaching and fastening means functioning as gages for workingmen during the plastering operations.

2. In a building construction, the combination of supporting means, material sheets disposed at random across said supporting means, attaching means disposed across the material sheets and having portions engaging the supporting means, and means positively engaging adjacent material sheets near the contiguous edges for securing said adjacent material sheets to each other.

3. In a device of the character described, a wall core consisting of supporting means, material sheets disposed at random across said supporting means, clips disposed across the material sheets and having portions engaging the supporting means and other portions engaging coacting contiguous clips, and means engaging adjacent material sheets along contiguous edges to hold said sheets together in edgewise alignment.

4. In combination, spaced supports, a channeled rail for securement to said supports, material sheets disposed at random across said supports with the edges of those sheets adjacent the rail in contact therewith, clips disposed across the material sheets and having portions engaging the supports and other portions engaging contiguous clips for fastening the material sheets to the supports and holding some of them in engagement with the rail, and means to fasten adjacent material sheets together whereby all of the sheets become a unitary structure.

5. In a building construction, the method of forming a wall core, consisting in erecting supports in spaced relation, then disposing sections of material at random across said supports whereby the joints between the sections of one run of sections are in staggered relation relative to similar joints of adjacent runs of sections and so that all of said joints will fall between the supports, then fastening the sections of material together along abutting edges, and then fastening the sections to the supports.

6. In a building construction, spaced supports, rectangular material sheets disposed across said supports in random fashion so that the joints between said sheets are not regularly spaced relative to the supports, means to attach said sheets to the supports, and means engaging directly opposite surfaces of the sheets in the region of the joints for rigidly attaching adjacent edges of said sheets together.

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