Nov. 21, 1950 K. H. MILLER 2,531,075

METAL DOOR FRAME CONSTRUCTION

Filed Dec. 8, 1945 2 Sheets-Sheet 1

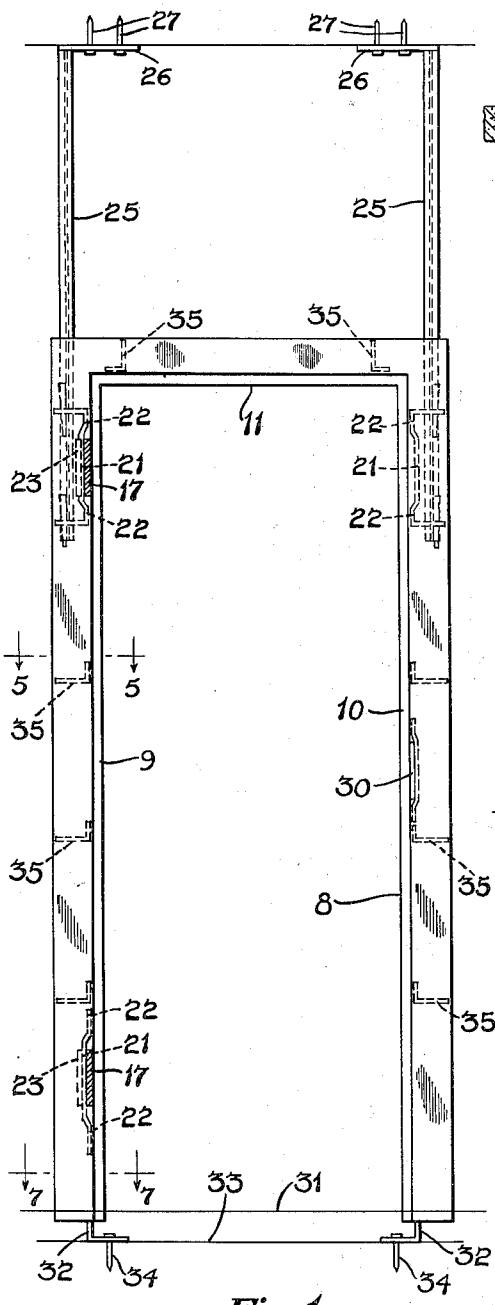


Fig. 1

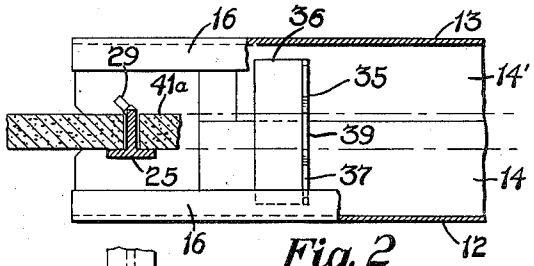


Fig. 2

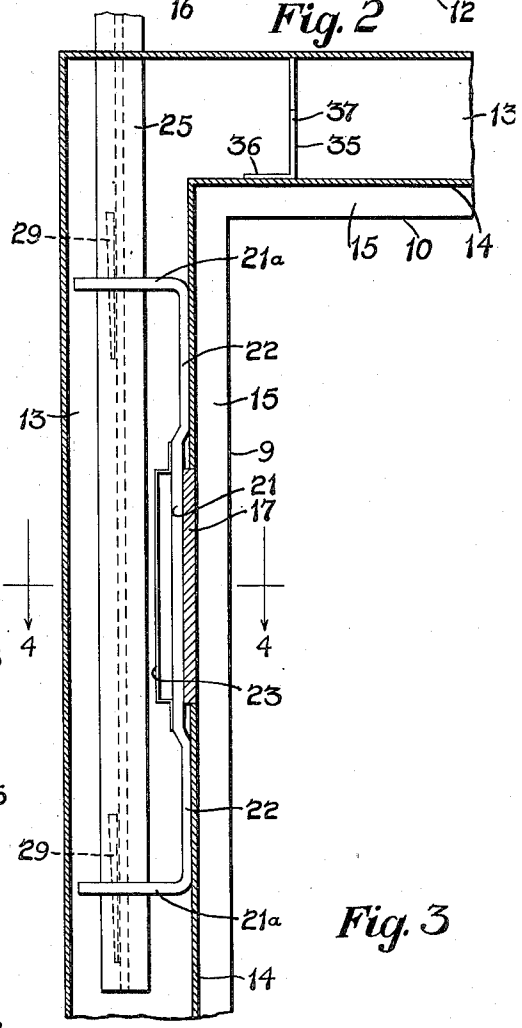


Fig. 3

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METAL DOOR FRAME CONSTRUCTION

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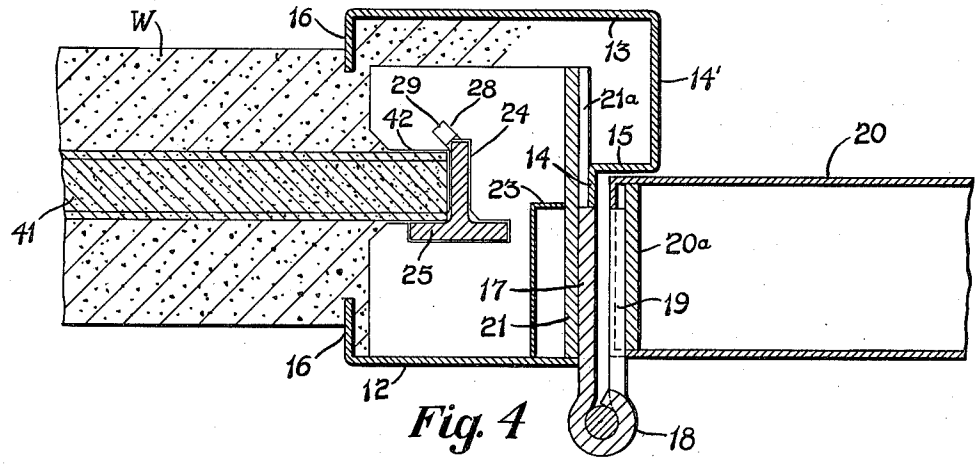


Fig. 4

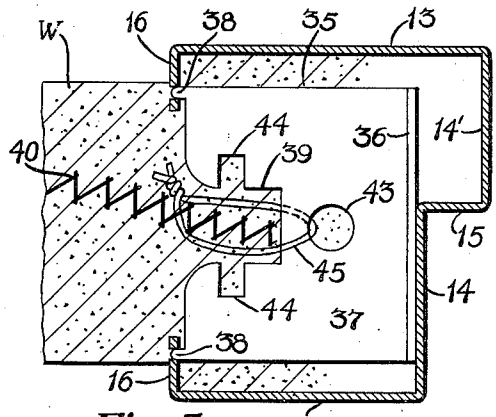


Fig. 5

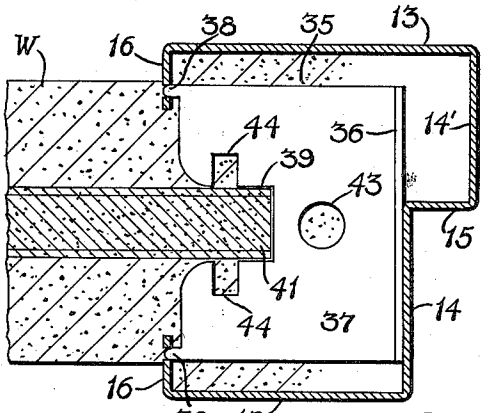


Fig. 6

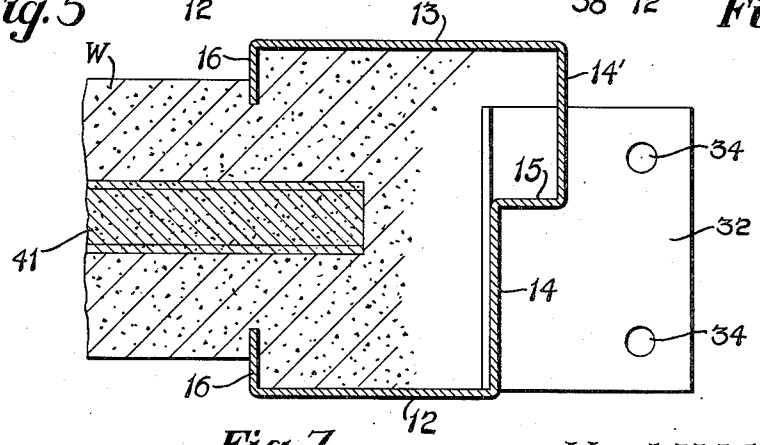


Fig. 7

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METAL DOOR FRAME CONSTRUCTION

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Application December 8, 1945, Serial No. 633,802

7 Claims. (Cl. 189—46)

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The invention relates generally to prefabricated metal door frames, and more particularly to a sheet metal door frame adapted for connection to ceilings of various heights.

In the copending application of Ronald R. Magaw and myself, Serial No. 554,442, now Patent No. 2,450,673, Patented October 5, 1948, entitled Door Frame, we disclose a knock-down frame construction utilizing struts of flat bar or angle cross section for making adjustable connection between the door frame and ceilings of various heights. Such construction includes substantially circular clips at intervals between the front and rear faces of the frame for stiffening the same, and the struts are connected to certain of said clips by means of socket cups telescoped therein into which the struts are wedgably engaged.

Such construction has many advantages over the prior art, but is adapted primarily for use with expanded metal lath which can be tied to the clips and to holes in the struts, and does not lend itself readily for use with gypsum lath panels, commonly called rock lath; because where such lath panels abut a flat bar strut, or the closed side of an angle strut, or the outer surfaces of said circular clips, there are joint openings which tend subsequently to produce cracks in the plaster applied to the lath.

Moreover, in order to make a good joint between such lath panels and a flat strut or the closed side of an angle strut, it would ordinarily require cutting or trimming the panels on the job, thus necessitating additional time and expense during erection.

In certain other prior constructions the lath panels have not been centered between the front and rear faces of the frame, and the clips receiving the lath panels present surfaces of substantial area parallel with the outer edges of the frame. Both of these conditions make it difficult to force plaster into the frame around the inner edges of the lath.

It is an object of the present invention to provide a novel metal door frame construction which overcomes the foregoing disadvantages and which is adapted for use with rock lath without requiring any through joints around the door frame.

Another object is to provide an improved metal door frame construction which embodies novel struts for making adjustable connection with ceilings of various heights.

Another object is to provide a novel metal door frame construction which embodies improved spacer clips permanently attached to the

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frame for stiffening the same, said clips being adapted for receiving either rock lath panels or metal lath within the frame.

A further object is to provide an improved metal door frame construction embodying novel struts which are adapted to be used with rock lath panels without requiring trimming or fitting of the panels to the struts during installation of the door frame.

Another object is to provide an improved metal door frame construction which embodies extremely simple adjustable connections between the ceiling struts and the frame, with a minimum number of parts.

A further object is to provide an improved metal door frame construction which is adapted to receive the edges of lath panels within the frame in a position substantially centered between the front and rear frame faces.

Another object is to provide improved spacer clips which are easily and quickly attached to the door frame with but one welding operation for providing a three point cross bracing connection between the web and front and rear channel faces of the frame.

Another object is to provide novel clips within the door frame having lath receiving flanges extending transversely of the frame so as to present their outer edges at the frame outer edges, thus facilitating forcing plaster into the frame.

A still further object is to provide a novel metal door frame construction which is adapted for use in a knock-down or finished door frame.

Finally, it is an object of the present invention to provide an improved metal door frame construction having simple strut and associated clip means which are easily and cheaply manufactured, and which provides for quick and easy attachment of the door frame to ceilings of various heights by the use of only a hammer and nails.

These and other objects and advantages apparent to those skilled in the art from the following description and claims may be obtained, the stated results achieved, and the described difficulties overcome, by the devices, constructions, arrangements, combinations, sub-combinations, parts and elements which comprise the present invention, the nature of which is set forth in the following general statement, preferred embodiments of which—illustrative of the best modes in which applicant has contemplated applying the principles—are set forth in the following description and shown in the drawings, and which are particularly and distinctly pointed out and

set forth in the appended claims forming part hereof.

The nature of the improvements of the present invention may be stated in general terms as preferably including in a sheet metal door frame construction, side and top jamb members of substantially channel shape, said side jamb members having flanged brackets provided with T-shaped slots, T-shaped struts passing through said slots and secured at their upper ends to a ceiling, wedge nails securing said T struts in said slots in adjusted position, and angular clips within said top and side jamb members, spacing the front and rear faces thereof, said clips having notches for receiving the edges of lath panels within said jamb members.

Referring to the drawings in which a preferred embodiment of the improved metal door frame construction is shown by way of example:

Figure 1 is a front elevation of the improved door frame construction erected in position between a floor and ceiling;

Fig. 2 is an enlarged fragmentary plan of one corner of the improved frame, showing one of the improved strut bars and adjoining lath panels in cross section;

Fig. 3 is a vertical sectional view of the corner construction shown in Fig. 2, with the lath panels removed;

Fig. 4 is an enlarged fragmentary cross sectional view as on line 4—4, Fig. 3;

Fig. 5 is an enlarged fragmentary cross sectional view as on line 5—5, Fig. 1, showing an adjoining plaster wall of metal lath construction;

Fig. 6 is a similar view showing a plaster wall of rock lath construction; and

Fig. 7 is an enlarged cross sectional view as on line 7—7, Fig. 1.

Similar numerals refer to similar parts throughout the various figures of the drawings.

The improved door frame, indicated generally at 8 in Fig. 1, includes side jamb members 9 and 10 and a top jamb member 11. Each of the jamb members 9, 10 and 11 has a uniform, substantially channel-shaped cross section as best shown in Figs. 4 to 7 inclusive, and may be fabricated from rolled or pressed sheet metal channel. Each channel preferably includes a front face portion 12, a rear face portion 13, offset web or frame opening portions 14 and 14' between the face portions, said offset portions being connected by a door stop wall 15, and inturned flange portions 16 at the outer edges of the faces 12 and 13.

As shown in the drawings, the door frame may be of finished shop welded construction, in which case it is assembled in finished form in the shop and shipped to the job where it may be erected and fastened to the floor and ceiling in the manner shown in Fig. 1.

It is to be understood that the improved strut and clip construction may be embodied in a knock-down metal door frame, such as is disclosed in my copending application, now abandoned, Serial No. 633,803, filed Dec. 8, 1945, without departing from the scope of the present invention as defined in the claims.

As shown in the drawings the jamb member 9 is a hinge side jamb member, and the jamb member 10 is a lock side jamb member. The hinge side jamb member preferably has its offset portion 14 cut out at two places to receive one leaf or strap 17 of a door hinge 18, as best shown in Figs. 3 and 4, the other strap 19 of the hinge being secured flush with the inner edge of a sheet

metal door indicated at 20, preferably by screwing the strap 19 to a plate 20a inside the inner edge of the door. The hinge strap 17 is preferably secured as by welding or screwing to the central portion of a hinge bracket 21 which has its upper and lower portions 22 welded to the inside of the offset portion 14. Cover plates 23 are preferably spot welded to the hinge brackets 21 so as to enclose the cut out portions of the offset 14 in which the hinge straps 17 are received.

The upper hinge bracket 21 has angular flange extensions 21a on the portions 22 which give the bracket a U shape, and said extensions are provided with vertically aligned T-shaped slots 24 through which a ceiling strut 25 of T cross section is slidably inserted. The top ends of the struts 25 have angular flanges 26 which are attached to the ceiling by nails 27 or the like. The T slots 24 preferably have angular notches 28 at the base of the T for receiving wedge nails 29 to rigidly connect the strut 25 to the flanges 21a, and both the notches 28 and the nails 29 may be rectangular in cross section as shown.

As indicated in Fig. 1, the lock side jamb member 10 is provided with one of the U-shaped brackets 21 at a position opposite to the U-shaped bracket 21 on the hinge side, even though there is no hinge strap inserted on the lock side, for connection to another ceiling strut 25 on the lock side of the door. The lock side jamb member 10 is provided intermediate its ends with a lock strike plate indicated at 30 which is provided with a lock-receiving opening in a usual manner.

The side jamb members 9 and 10 preferably extend slightly below the level of the finished floor, which is indicated at 31, and are provided with angle feet 32 which rest on the rough floor level 33 and are secured thereto by nails or the like 34.

The novel spacer clips indicated generally at 35 are located at intervals along the top and side jamb members and between the front and rear faces 12 and 13 thereof. Preferably, the clips 35 are angle clips and have a securing flange 36 and spacer flange 37 at right angles thereto. The securing flange 36 is preferably spot welded in a usual manner to the offset web portion 14 of the jamb member, and the width of the clip is such that the outer edges of the spacer flange 37 are overlapped by the inturned flange portions 16 of the jamb member channel.

As best shown in Figs. 5 and 6, the outer edge portions of the spacer flange 37 of each clip are provided with tangs or projections 38 which are received in holes in the flange portions 16 of the jamb channels, so that the projections 38 of the spacer clips rigidly hold the front and rear faces 12 and 13 of the jamb channels in proper spaced relation and prevent twisting or distortion thereof.

Thus, the clips are quickly and easily attached to the jamb members by inserting the tangs 38 in the holes in the flange portions 16, and then welding the securing flange 36 to the offset portion 14. This requires only a single welding operation to provide an improved clip which makes a three point cross bracing connection between the flanges 16 of the front and rear faces 12 and 13, and the web 14 of the channel.

The outer edge of each spacer flange 37 is provided intermediate the projections 38 with an exterior or side opening U-shaped notch 39 which is adaped for receiving the edge of expanded metal lath indicated diagrammatically at 40, or the edge of a rock lath panel 41, so that the edge

of the lath extends well within the jamb channels and eliminates any through joints in or between the lath outside of the door frame. The spacer flanges 37 are all disposed transversely of the jamb members between their inner and outer edges, so as to present an edge rather than a surface at the outer edges of the door frame, and thus facilitate forcing plaster into the frame around the inner edges of the lath panels therein. Moreover, the notches 39 are substantially centered between the front and rear faces 12 and 13 which further enables and insures the entrance of plaster on both sides of the lath panels, to tie the wall and frame together.

As shown in Fig. 4, the flange extensions 21*a* of the hinge brackets 21 have lath notches 42 which communicate with the T-shaped slots 24, so that the inner edge of the lath panel 41 may be received within the angle of the T strut 25, and the inner edges of the notches 39 in the clips 35 are substantially in alignment with the outer surface of the stem of the T strut 25, and so that a vertically extending lath panel can fit in the notches 39 of the clips 35 and in the notches 42 of the bracket 21 while being overlapped by the cross bar portion of the T strut above the door frame.

Between the struts 25 at opposite sides of the door frame 8 a lath panel 41*a* may extend to the ceiling, its lower edge being received in notches 39 of clips 35 in the top jamb member 11, and its side edges being received within the angles of the T struts 25 and overlapped by the cross bar portions of the T struts. Thus, the T struts 25 provide means for overlapping the joints between lath panels extending into the side and top jamb members, so that there is no through joint opening between lath panels which would subsequently produce cracks in the plaster applied to the lath. Obviously, the T struts may be reversed, that is, rotated 180° from their positions shown in Figs. 2 and 4, and still function to overlap the joints between adjoining lath panels.

The clips 35 are preferably each provided with a hole 43 in the spacer flange 37 adjacent the notch 39, for use in tying expanded metal lath to the clips when expanded metal lath is used as indicated in Fig. 5. Also, the sides of the notches 39 in the spacer flanges 37 of the clips are provided with transversely extending notches 44 which are of such width as to fit loosely around the stem portion of a T strut 25. The purpose of these notches is to permit the two T struts 25 of a door frame 8 to be slid down and housed entirely within the side jamb members 9 and 10 for shipping, by springing the struts below top hinge bracket 21 so that the cross bar portion of the T strut is located in the notch 39 and the stem portion is located in either notch 44.

In erecting the improved metal door frame at a desired location in a building wall, the door frame is set up on the floor, as indicated in Fig. 1, and the T struts 25 are then slid upwardly through the T slots 24 of the hinge brackets 21, and the angular flanges 26 at the top ends of the struts are attached to the ceiling by means of the nails 27. The wedge nails 29 are then driven into the notches 28 in the flanges 21*a* for wedgeably engaging the T struts and rigidly connecting them to the door frame.

After the door frame is thus erected, rock lath panels 41 and 41*a* are then positioned around the door frame with their marginal edges extending within the jamb members and received in the notches 39 of the clips 35. The adjoining edges of the rock lath panels 41 and 41*a* are inserted into the adjacent angles formed by each T strut, and the cross bar portion of the T strut overlaps the joint between the panels.

If expanded metal lath is used, after the doors are erected the metal lath may be extended into the jam members of the door frame and tied to the clips 35 by passing fastening means 45 through the holes 43.

The plaster wall W is then formed on the lath in a usual fashion to a thickness such as indicated in Figs. 4 to 7 inclusive, or if desired, the wall surface may be made flush with the outer faces 12 and 13 of the jamb members. Due to the fact that the T struts are centered within the wall W and the cross sectional dimensions of the struts are relatively small, if expanded metal lath is used it can be extended across the front or back of the struts if desired and still provide ample space for plaster on both sides.

Because of the overlapping of the joints between adjoining lath panels by the cross bar portion of the T struts, it is not necessary to perform any trimming or cutting operations on the lath panels during installation of the door frames, and the erection of the door frame, as well as the erection of the lath panels, is made extremely simple and rapid because the connections between the T struts and the door frame and ceiling are quickly done by the use of a hammer and nails.

The improved door frame construction accordingly provides simple and inexpensive spacer clips for stiffening the frame members and receiving the edges of lath panels within the same in cooperation with the aligned T strut means which adjustably connects the frame to the ceiling and makes a closed joint between adjoining lath panels.

The embodiments of the present improvements are illustrated and described herein by way of example, and the scope of the present invention is not limited to the exact details of construction of various parts.

In the foregoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such words are utilized for descriptive purposes herein and not for the purpose of limitation, and are intended to be broadly construed.

Having now described the features of the invention, the construction and erection and use of preferred embodiments thereof, and the advantageous, new and useful results obtained by the improved construction; the new and useful devices, constructions, arrangements, combinations, sub-combinations, parts and elements, and reasonable mechanical equivalents thereof obvious to those skilled in the art, set forth in the appended claims.

I claim:

1. In a sheet metal door frame having channel-shaped side and top jamb members, a flanged bracket secured within each side jamb member and having a T-shaped slot, ceiling struts passing through said slots and each having a cross sectional T shape for receiving the edge of a lath panel against the stem of the T, means wedgeably securing said struts in said slots, and spacer clips secured in said side jamb members and including flanges extending transversely of the jamb member legs having notches in said

flanges aligned with said T-shaped slots for receiving the edges of said lath panels within said side jamb members.

2. In a sheet metal door frame having channel-shaped side and top jamb members, ceiling struts each having a cross sectional T shape for receiving the edges of adjoining lath panels against the stem of the T, means adjustably securing said struts in said side jamb members, and spacer clips in said jamb members including flanges extending transversely of the jamb member legs having notches in said flanges aligned with said struts for receiving the edges of said lath panels within said jamb members.

3. In a sheet metal door frame including channel-shaped side and top jamb members each having front and rear faces with inturned flange portions, a flanged bracket secured within each side jamb member and having a T-shaped slot, ceiling struts passing through said slots and each having a cross sectional T shape for receiving the edge of a lath panel against the stem of the T, means wedgeably securing said struts in said slots, and spacer clips secured in said side jamb members and including flanges extending transversely of the jamb member legs having notches in said flanges aligned with said T-shaped slots for receiving the edges of said lath panels within said side jamb members, each of said clips having projections at each side of said notch extending into said front and rear inturned flange portions.

4. In a sheet metal door frame including channel-shaped side and top jamb members each having front and rear faces with inturned flange portions, ceiling struts each having a cross sectional T shape for receiving the edges of adjoining lath panels against the stem of the T, means adjustably securing said struts in said side jamb members and spacer clips in said jamb members having flanges extending transversely of said jamb member legs with notches in said flanges aligned with said struts for receiving the edges of said lath panels within the jamb members, each of said clips having projections at each side of said notch extending into said front and rear inturned flange portions.

5. In a sheet metal door frame having channel-shaped side and top jamb members, a flanged bracket secured within each side jamb member with a flange transversely of the jamb member legs, ceiling struts extending through said flanged brackets and adapted for abutting the edge of a lath panel, said bracket flanges having notches receiving the edge of said panel, means wedgeably securing said struts in said brackets, and spacer clips secured in said side jamb members and having flanges extending transversely of said jamb member legs with notches in said flanges aligned with said struts for receiving the edges of said lath panels within the side jamb members.

6. In a sheet metal door frame having channel-shaped side and top jamb members, ceiling struts extending into said side jamb members and adapted for abutting the edges of adjoining lath panels, means adjustably securing said struts in said side jamb members, and spacer clips in said jamb members, said clips including flanges extending transversely of the jamb member legs and having notches in said flanges aligned with said struts for receiving the edges of lath panels within the jamb members.

7. In a sheet metal door frame having channel-shaped side and top jamb members, a bracket secured within each side jamb member and having a flange transversely of the jamb member legs, said flange having a T-shaped slot and a lath notch communicating therewith, ceiling struts passing through said slots and each having a cross sectional T shape for receiving the edges of adjoining lath panels against the stem of the T, one of which panels extends into said lath notch, and means wedgeably securing said struts in said slots.

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