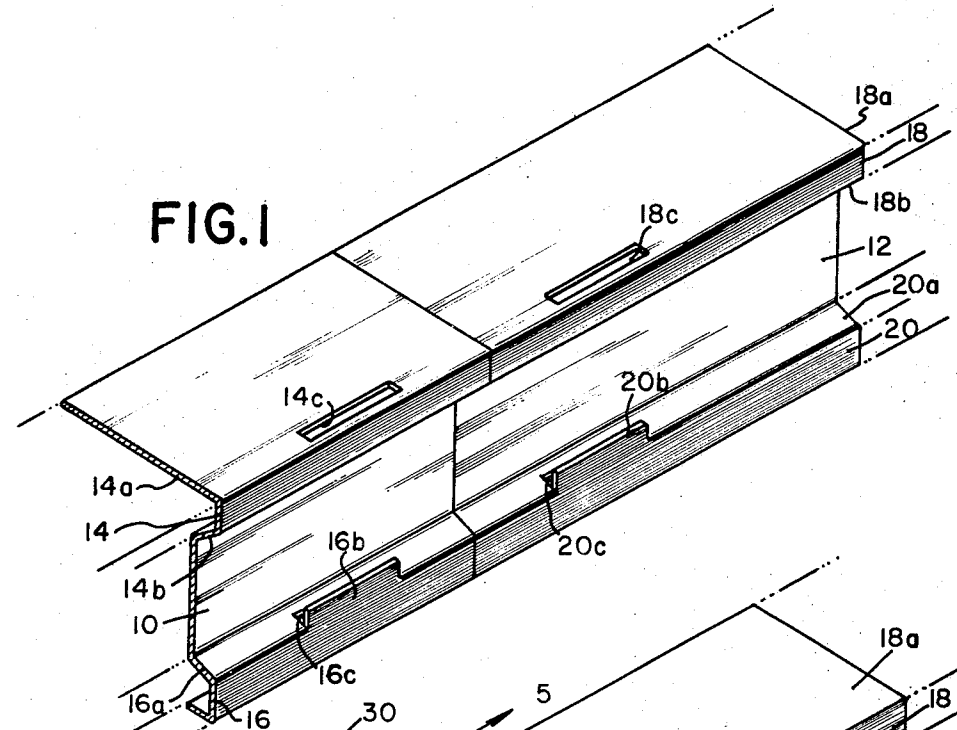
Oct. 24, 1967 J. DALTON, JR 3,348,865

PLASTER FRAME

Filed Dec. 23, 1964 2 Sheets-Sheet 1

FIG. 1



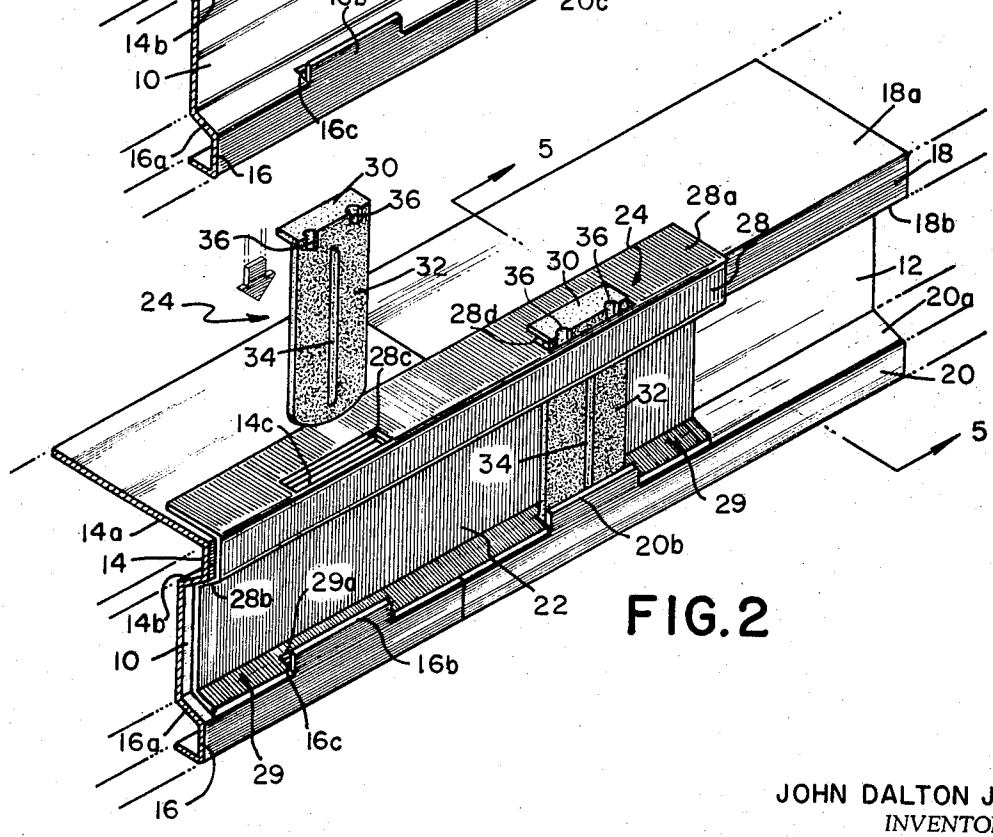


FIG. 2

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PLASTER FRAME

Filed Dec. 23, 1964 2 Sheets-Sheet 2

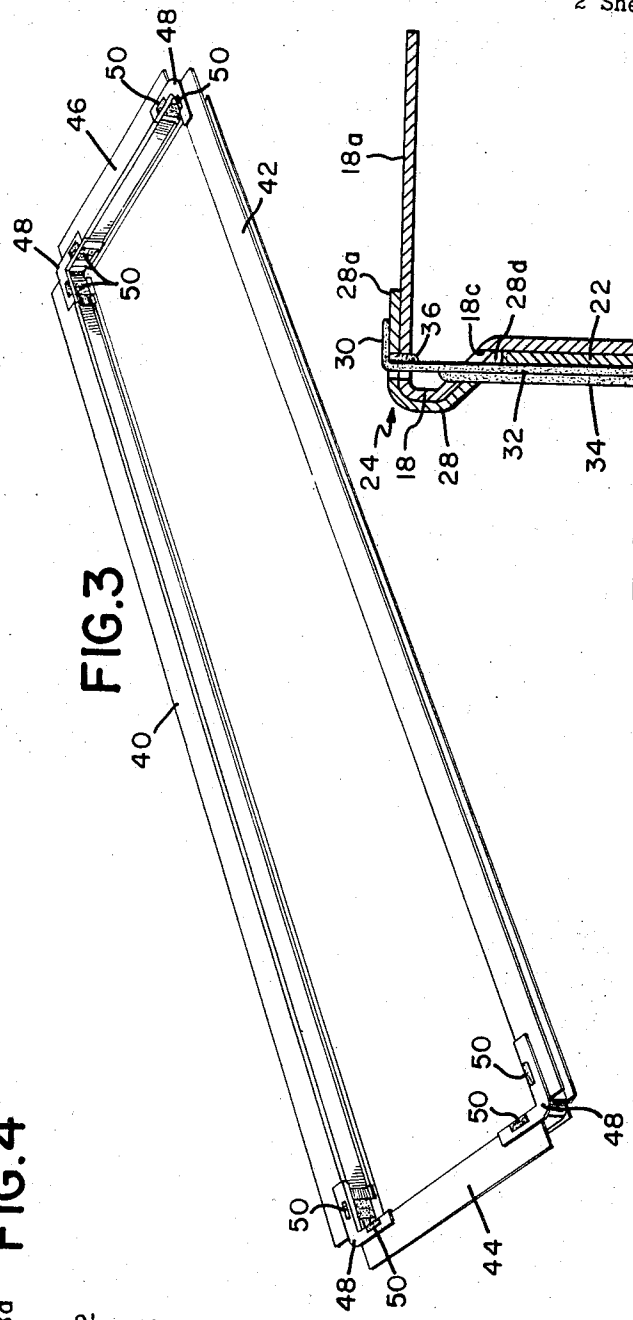


FIG.3

FIG.5

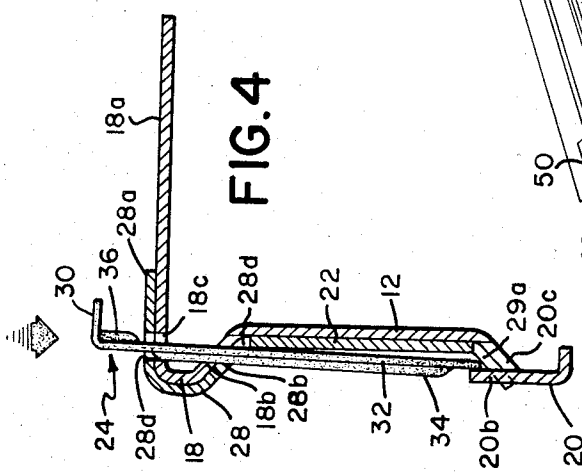


FIG.4

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PLASTER FRAME

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2 Claims. (Cl. 287—189.36)

This invention relates generally to recessed lighting fixtures and more particularly to a plaster frame designed to define an opening of predetermined dimensions therefor. The term "plaster frame," as used in this context, is a metal border for providing a rectangular opening in a plastered wall or ceiling for the installation and mounting of a recessed lighting fixture or row of fixtures. Because of the variations in the size of recessed fixtures and the desire to group fixtures quite often in a single opening, the plaster frame is usually made up of a series of pieces of either different lengths or the same length to provide an opening for the desired fixture or series of fixtures.

Plaster frames are usually offered by the lighting fixture manufacturer as an accessory for the fixture when an installation in a plastered ceiling is to be used. Over the years, these plaster frames have usually comprised a plurality of metal members joined to one another by screws, nuts and bolts, and the like. More recently, some manufacturers have introduced plaster frames which may be assembled without screws, nuts and bolts and the like, i.e., snap-on or interlocking parts are employed.

In view of the foregoing, a principal object of this invention is to provide an improved plaster frame.

In accordance with the principles of my invention, a plaster frame comprises a plurality of side rails, end rails and corner plates (and/or joining plates for assembling additional side rails as the size of the opening indicates) joined to one another in a rigid manner by specially designed pins. The principle of this joining system is very similar functionally to that of joining together two overlapping pieces of fabric with a common pin, wherein the pin is first pushed through the top and bottom pieces, the fabric is arched back into the path of the pin and the pin is then pushed through the two pieces of fabric again.

In the specific embodiment of my invention illustrated in the accompanying drawings, FIGURE 1 is a fragmentary detail of the abutting ends of two side rails of a plaster frame.

FIGURE 2 is a fragmentary detail of the abutting ends of two side rails of a plaster frame with a joining plate overlying them and with one pin in interlocking position with respect thereto and the other pin in register therewith prior to insertion.

FIGURE 3 is a perspective view from above, on a small scale, of a complete plaster frame.

FIGURE 4 is a transverse sectional view through a side rail-joining plate assembly with a pin in interlocking engagement therewith and in position to be driven home.

FIGURE 5 is a transverse sectional view of a side rail-joining plate-pin assembly taken along the line 5—5 of FIGURE 2.

A fragmentary detail of a pair of abutting rails **10** and **12** is illustrated in FIG. 1. The upper longitudinal portion of side rail **10** is shaped to define an upper reverse bend **14** and the lower longitudinal portion of side rail **10** is shaped to define a lower reverse bend **16**. Similarly, the upper longitudinal portion of side rail **12** is shaped to define an upper reverse bend **18** and the lower longi-

tudinal portion of side rail **12** is shaped to define a lower reverse bend **20**. The opposite spaced legs **14***a* and **14***b* of the upper reverse bend **14** of side rail **10** are provided with a pair of elongated slots **14***c*, one of which is shown in FIG. 1, in vertical register with one another. On the other hand, the upper leg **16***a* of the lower reverse bend **16** has a vertical tab **16***b* struck therefrom, thus leaving an elongated slot **16***c* therein. Similarly, the opposite spaced legs **18***a* and **18***b* of the upper reverse bend **18** of side rail **12** are provided with a pair of elongated slots **18***c*, one of which is shown in FIG. 1, in vertical register with one another. On the other hand, the upper leg **20***a* of the lower reverse bend **20** has a vertical tab **20***b* struck therefrom, thus leaving an elongated slot **20***c* therein. Thus the side rail **10** has three elongated slots **14***c*, **14***c* and **16***c* in register with and aligned with one another. Similarly, the side rail **12** has three elongated slots **18***c*, **18***c* and **20***c* in register with and aligned with one another.

In FIGURE 2, the side rails **10** and **12** are shown in abutting relationship with respect to one another as in FIG. 1 but with the addition thereto of a joining plate **22** and a pair of pins **24**. The upper longitudinal portion of joining plate **22** is shaped to define an upper reverse bend **28** similar in contour to the upper reverse bends **14** and **18** in side rails **10** and **12** respectively. The opposite spaced legs **28***a* and **28***b* of the upper reverse bend **28** are provided with two pairs of elongated slots **28***c* and **28***d*, one of each pair being shown in FIG. 2. The pair of slots **28***c* are in register with the slots **14***c*, **14***c* and **16***c* in side rail **10**; and the pair of slots **28***d* are in register with the slots **18***c*, **18***c*, and **20***c* in side rail **12**. The lower longitudinal edge of the joining plate **22** is characterized by a laterally extending flange **29** which overlies the upper legs **16***a* and **20***a* of the lower reverse bends **16** and **20** respectively and terminates flush with the vertical surface of reverse bends **16** and **20**. The flange **29** has a pair of elongated notches **29***a* formed therein, said notches being aligned with the slots **16***c* and **20***c* in the upper legs of the reverse bends **16** and **20** respectively.

In FIG. 2, one of the pins **24** is located above and in register with slots **28***c* in joining plate **22**, whereas the other pin **24** is completely and firmly seated in interlocking engagement with joining plate **22** and side rail **12**. As shown in FIGS. 2, 4, and 5, each pin **24** has a head **30** and a shank **32**. The shank **32** is provided with a central longitudinal ridge **34** on one face thereof and a pair of nubs **36** on the other face thereof immediately beneath the head **30**. These structural characteristics, in combination with the structural characteristics noted above with respect to the joining plate **22** and the side rails **10** and **12**, provide the means whereby the several members are loosely joined together as illustrated in FIG. 4 and securely joined to one another as illustrated particularly in FIG. 5.

One form of plaster frame is shown completely assembled in FIG. 3. It comprises a pair of side rails **40** and **42**, a pair of end rails **44** and **46**, and four corner plates **48**, the side rails and the end rails being secured to one another at their adjoining ends by the overlying corner plates and pins **50** which extend therethrough. The side rails **40** and **42**, and the end rails **44** and **46** are similar structurally to the side rails **10** and **12** described in detail above and illustrated in detail in FIGS. 1 and 2. The corner plates **48** are similar structurally to the joining plate **22** described in detail above and illustrated in

detail in FIG. 2, except that they are provided with a right angle bend intermediate their ends. The pins **50** are the same as the pins **24** in FIG. 2.

FIGS. 4 and 5 are transverse sectional details through a side rail-joining plate assembly of the type shown in FIG. 2. In assembling a plaster frame, if at least two side rails are to define one side of the frame as illustrated in FIGS. 1 and 2, the side rails **10** and **12** are placed end-to-end and a joining plate **22** is placed over-lapping thereon with the joining plate bridging the two side rails. When so positioned, the upper reverse bend **28** of the joining plate **22** nests with the upper reverse bend **14** of side rail **10** and the upper reverse bend of the side rail **12**. Similarly, the laterally extending flange **29**, which defines the lower longitudinal edge of the joining plate **22**, overlies the upper legs **16***a* and **20***a* of the lower reverse bends **16** and **20** respectively of the side rails. In addition, the sides of the notches **29***a* straddle the tabs **16***b* and **20***b*, thus pre-aligning side rails **10** and **12** and their joining plate **22** with respect to one another in their final assembled position before the insertion of the pins **24**. Thus the pair of slots **14***c* in the legs of the upper reverse bend **14** of the side rail **10**, and the pair of slots **28***c* in the legs of the upper reverse bend **28** of the joining plate **22** are aligned and in register with one another as well as with the notch **29***a* in the flange 29 of the joining plate **22** and the slot **16***c* in the upper leg of the lower reverse bend **16** of side rail **10**. The several slots in the reverse bends of the side rail **12** and the portion of the joining plate associated therewith are aligned similarly.

With the side rails **10** and **12** and the joining plate **22** so assembled, the pins **24** are inserted loosely through the several aligned slots as shown in FIG. 4 and driven home as shown in FIG. 5 to secure the several components to one another and thereby define a rigid unitary framework. The vertical surfaces of the side rails **10** and **12** and the joining plate **22** (and end rails and corner plates as well) are formed to pass back and forth through the path taken by the pins **24**, and the slots and notches formed therein are aligned in a vertical plane to receive the pins. Thus, as shown in FIG. 5, the pin **24** extends through the nested components three times, first through the upper legs of the upper reverse bends, then through the lower legs of the upper reverse bends and finally through the flange of the joining plate and the upper leg of the lower reverse bend of the side rails.

As shown in FIG. 4, the pin **24** has been inserted into and through both the upper and the lower legs of the upper reverse bends of both the side rail and the joining plate. It has not yet passed through the notch **29***a* in the flange **29** of the joining plate **22** or the slot **20***c* in the upper leg **20***a* of the lower reverse bend **20** of the side rail **12**. However, the toe of the shank **32** is held by the tab **20***b* to pre-align the pin **24** requisite to final insertion through notch **29***a* and slot **20***c*. Up to this point, the clearance is such that the pins can be readily inserted by hand with very little interference and hence with the application of very little force. However, for all intents and purposes the assembly is complete and rigid at this stage. During the remaining portion of the pin-insertion stroke, the pin must be forced to drive it home and thus effect the final interlocking of parts as illustrated in FIG. 5. As shown best in FIG. 4, the nubs **36** constitute an obstruction on one of the vertical faces of the shank **32** of the pin **24** and the long ridge **34** defines another obstruction on the other vertical face of the shank. Thus, when the pin **24** is forced home, the ridge and the nubs provide for a camming action in opposite directions to draw the nested frame components tightly together and they are so held by the force-fitted pin. The components now so joined cannot be disassembled without forcefully removing the pin.

What I claim is:

1. In a plaster frame, the combination of: a pair of rails, the upper and the lower longitudinal edges of each rail being shaped to define a reverse bend, said upper reverse bend of each rail being provided with at least one pair of vertically aligned slots, and said lower reverse bend of each rail having a vertically disposed tab struck from the upper lateral surface thereof and thereby providing a slot in said upper surface of said lower reverse bend, said slot being in vertical register with said pair of vertically aligned slots in said upper reverse bend; a joining plate overlying and nesting with the adjacent ends of said rails, the upper longitudinal edge of said joining plate being provided with a reverse bend which nests with the reverse bend which characterizes the upper longitudinal edge of each of said rails, said reverse bend of said joining plate having a pair of vertically aligned slots formed therein near each end thereof and in register with the corresponding vertically aligned slots formed in the upper longitudinal edge of said rails, and the lower longitudinal edge of said joining plate being a laterally extending flange overlying the upper lateral surface of the lower reverse bend of said rails and terminating flush with the vertical surface thereof, said laterally extending flange of said joining plate being provided with cutouts in register and co-extensive with the slots in the upper lateral surface of the lower reverse bend of said rails whereby an interlocking of the laterally extending flange of the joining plate with the vertically disposed tabs struck from the upper lateral surface of the lower reverse bends of the rails is effected; and a pin extending through each series of vertically aligned slots and cutouts whereby said rails and said joining plate are securely fastened to one another.

2. A plaster frame comprising:

a pair of spaced substantially parallel side rails, the upper and lower longitudinal edges thereof being shaped to define a reverse bend, said upper reverse bend of each side rail being provided with a pair of vertically aligned slots near each end thereof, and said lower reverse bend of each side rail having a vertically disposed tab struck from the upper lateral surface thereof near each end thereof and thereby providing a slot in said upper surface of said lower reverse bend near each end thereof, each of said slots being in vertical register with each said pair of vertically aligned slots in said upper reverse bend near each end thereof;

a pair of spaced substantially parallel end rails, substantially normal to said side rails and disposed therebetween at the ends thereof, the upper and lower longitudinal edges thereof being shaped to define a reverse bend, said upper reverse bend of each end rail being provided with a pair of vertically aligned slots near each end thereof, and said lower reverse bend of each end rail having a vertically disposed tab struck from the upper lateral surface thereof near each end thereof, thereby providing a slot in said upper surface of said lower reverse bend near each end thereof, each of said slots being in vertical register with each said pair of vertically aligned slots in said upper reverse bend near each end thereof;

a corner plate having a pair of legs at right angles to one another bridging and overlying each of the adjacent ends of said side rails and said end rails, the upper longitudinal edge of each leg of said corner plates being shaped to define a reverse bend which nests with the reverse bend which characterizes the upper longitudinal edge of said side rails and said end rails, each leg of each corner plate having a pair of elongated slots formed in the reverse bend thereof, said slots being in vertical alignment with one another, the slots in one leg of each said corner plate being in vertical alignment with the slots at one end of each of said side rails and the slots in the other leg of each said corner plate being in vertical alignment with the slots at one end of each said end rails, and the lower longitudinal edge of each said corner

plate being a laterally extending flange overlying the upper lateral surface of the lower reverse bend of said side rails and said end rails and terminating flush with the vertical surface thereof, said laterally extending flange of each said corner plate being provided with cutouts in register and co-extensive with the slots in the upper lateral surface of the lower reverse bend of said side rails and said end rails whereby an interlocking of the laterally extending flange of each said corner plate with the vertically disposed tabs struck from the upper lateral surface of the lower reverse bends of said side rails and said end rails is effected;

and a pin having a flat shank extending through each of said series of vertically aligned slots and cutouts, the shank of each pin having a camming surface near one end of one face thereof and a camming surface near the other end of the other face thereof whereby, as the pin is driven home, a camming action in opposite directions is obtained to draw the mating components tightly together and securely lock them to one another.

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