June 21, 1932. L. L. LEVENE 1,863,722

PANEL FRAME CONSTRUCTION

Filed Aug. 29, 1930

Fig. 1.

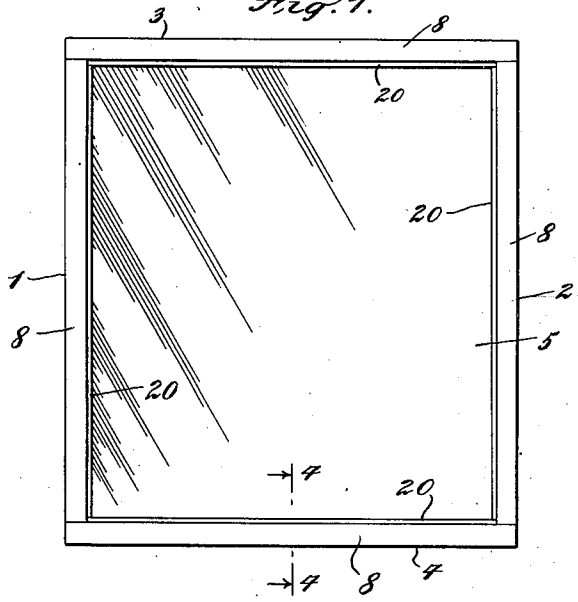


Fig. 2.

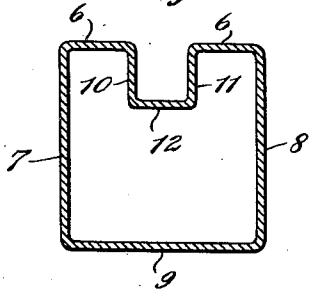


Fig. 3.

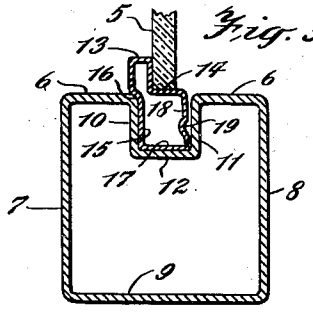


Fig. 4.

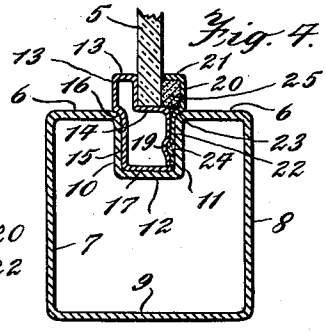


Fig. 5.

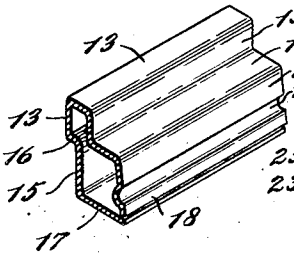
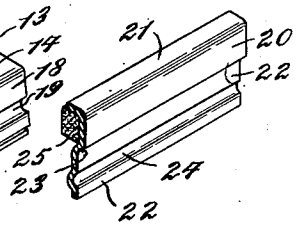


Fig. 6.



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UNITED STATES PATENT OFFICE

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PANEL FRAME CONSTRUCTION

Application filed August 29, 1930. Serial No. 478,674.

This invention relates to the construction of frames for supporting and holding panels, more particularly glass panels, although panels of various other kinds may be similarly held in place in their frames by means of this invention. The invention relates more particularly to a molding device for removably mounting a panel in an assembled frame which is provided with a panel-holding channel or groove.

This invention is applicable to the construction of doors, windows, partition wall sections, or to any part of a building construction or the like where panel-holding frames are used. For example, in my copending application for patent, Serial No. 478,673, filed on even date herewith, for means for stiffening partition walls, the glass panels there shown may be considered as being mounted in the frames of the wall sections by means of this present invention. Also, my copending application for patent, Serial No. 478,675, filed on even date herewith, for a partition wall construction, discloses this invention as there utilized for mounting glass panels in the frames of the partition wall sections. In the accompanying drawings there is shown a simple conventional form of panel frame which could be a window sash, substantially as indicated, or it could be used in a partition wall construction or the like, features of construction not relating to this invention having been omitted from the drawings for simplicity of illustration and disclosure.

One of the objects of this invention is to provide for firmly and securely holding panels which may vary in thickness. For example, glass panels which are supposed and intended to be of the same thickness, commonly vary considerably in that respect. In this connection, an object of the invention is to provide for holding panels of different thickness in a frame, without the use of special holding devices, such as putty, nails, screws, or the like. Another object of the invention is convenience of use, by which a panel may be quickly and easily either mounted in or removed from its frame, while the frame remains in its assembled condition. Other objects of the invention are security, simplicity, and convenience as well as economy of manufacture. Other objects and advantages of the invention will hereinafter appear.

In carrying out the invention, the bars of the panel frame, such as the stiles and cross rails thereof, are each provided on its inner or panel side with a longitudinal groove or channel into which there fit together alongside of one another a pair of panel-holding molding strips, one of which at the outside of this channel forms a backing molding for the panel with a shoulder against which the edge of the panel may abut at the outside of such channel, while the other molding strip is removable and replaceable with the panel in place against the backing strip and comprises a molding portion which engages with the panel at the outside of the channel in the frame bar, and a portion frictionally held in the channel between one of the walls thereof and the adjacent portion of the strip which forms the backing molding. More particularly, the abutment strip which forms the backing molding is of hollow sheet metal construction with a resilient wall or flange portion for frictionally engaging with the portion of the removable holding strip or clamping molding which is inserted alongside thereof in the channel of the frame bar.

A further feature of the invention is the provision of means for resiliently interlocking the holding strip for the panel with the above noted abutment strip. Another feature of the invention is the combining with this holding strip of a resiliently yieldable gasket which is carried by the molding portion of this strip to be pressed thereby against the panel. The invention further includes various other features of construction and combinations of parts, as will appear from the following description.

One embodiment of the invention, which is shown in the accompanying drawing, will now be particularly described, and thereafter the invention will be pointed out in claims, reference now being had to the drawing, in which:

Fig. 1 is a reduced side elevation of a sim-

ple conventional form of a panel frame construction in which this invention is embodied;

Fig. 2 is a cross section of one of the frame bars, with the molding strips and panel omitted;

Fig. 3 is a similar view with the panel in place against the abutment strip, which forms a backing molding therefor;

Fig. 4 is another similar view, which may be considered as a vertical section on the line 4—4 of Fig. 1, showing the panel as held in place in the frame bar by means of both of the molding strips, which fit together into the panel-holding groove or channel in the frame bar;

Fig. 5 is a perspective view of a portion of the abutment strip which forms a backing molding for the panel; and

Fig. 6 is a similar perspective view of the separately or independently insertable and removable holding strip which forms a clamping molding for the panel.

In Fig. 1 there is shown conventionally a simple form of panel frame having only four frame bars, for the mounting therein of a single panel. This frame comprises stiles 1 and 2, an upper cross rail 3 and a lower cross rail 4. These four frame bars are of course firmly connected together at the corners of the frame, which may be done by any suitable means, with which the invention claimed herein is not directly concerned. A glass panel 5, mounted in this frame, is held in place by means involving the present invention.

For the purposes of the present invention, each of these frame bars 1, 2, 3 and 4 may be considered as being substantially of the construction shown more particularly in Figs. 2, 3 and 4. In the drawing, Figs. 2, 3, 4, such a frame bar is shown as a metal tube of substantially square outline and having its walls of sufficient thickness to provide adequate strength. Each of the four side walls of this frame bar are shown as flat, although they might be of a more or less different contour so far as this invention is concerned. These side walls of the frame bar shown in the drawing comprise a divided or two-part flat inner wall 6 on the panel side of the frame bar, parallel lateral or side walls 7 and 8, and a flat outer wall 9. Between the two aligned parts of the inner flat wall 6 and substantially at the middle between the side walls 7 and 8 there is a rather large substantially rectangular panel-holding groove or channel shown as having parallel side walls 10 and 11 and a flat inner or bottom wall 12.

Obviously, the outer wall 9 of a panel frame bar such as shown in Figs. 2, 3 and 4 could likewise be provided with a similar panel-holding groove or channel if so desired, thereby producing an otherwise similar frame bar having two opposite panel-holding grooves, one of which would be as shown in the wall 6 and the other of which would then be in the wall 9. Thus there would be produced an intermediate frame bar or mullion, as is well understood in the art, but embodying therein the present invention. Also it should be understood that, without affecting the present invention as shown in the drawing, the outer wall 9 might be omitted, the side walls 7 and 8 then forming flanges of any desirable more or less width, thereby producing a frame bar which would be substantially or in general of channel shape as a whole in cross section. It might be noted that both of these above noted different forms of frame bars are incidentally disclosed in my above noted copending application, Serial No. 478,675.

A hollow sheet metal virtually tubular resilient abutment strip is received into the above described channel in the frame bar and has a hollow projecting portion 13 at the outside of this channel forming a backing molding for the marginal edge portion of the panel 5 and having at the panel side of this molding portion 13 a flat wall 14 forming an abutment shoulder for the edge of this panel 5 at the outside of the channel in the frame bar. In the embodiment of the invention shown in the drawing, this abutment shoulder 14 is shown as of slightly greater width than the thickness of the glass panel 5 and is shown as projecting slightly beyond or as a little more than flush with the adjacent inner wall 6 of the frame bar, whereby the panel 5 may be seated against the backing molding 13 by transverse movement of its edge past the adjacent face of this wall 6, as will be most clear from Fig. 3.

The abutment strip which forms the backing molding 13 with its shoulder 14 further comprises, outward from this molding portion 13 and abutment shoulder 14, a hollow substantially rectangular portion which is received into and substantially fills the above described rectangular channel in the inner wall 6 of the frame bar. This outer portion of the abutment strip which extends into the channel has a flat wall 15 which lies against one of the flat side walls of the channel, shown in the drawing, Figs. 2 and 3, as the left hand side wall 10. This wall 15 of the abutment strip is shown as slightly offset from the adjacent wall of the molding portion 13 of which it forms a continuation, to form an intervening concave shoulder 16 which seats against the slightly rounded corner formed by the side wall 10 of the channel with the adjacent wall 6 of the frame bar, thereby providing a reinforcement for the molding portion 13. This side wall 15 of the abutment strip is provided with a right-angular flange 17 which fits against the bottom wall 12 of the channel, across which it is shown as extending substantially to the right hand side wall 11 of this channel. This an-

gular flange 17 stiffens and strengthens the side wall 15, as well as the abutment strip as a whole.

This abutment strip which forms the backing molding 13 and abutment shoulder 14 further includes a resilient side wall 18 in the form of a flange which extends outward substantially at right angles from the free edge of this shoulder 14 and substantially parallel with, but shown in the drawing as slightly flaring away from, the other side wall 15, the edge of this side wall 18 terminating adjacent to but in slightly spaced relation from the marginal edge portion of the bottom wall or flange 17, so that thereby this free disconnected or separated edge of the resilient side wall 18 may move freely over the bottom wall 17 to provide for the springing or resilient yielding of this wall 18. This resilient wall 18 is adjacent to the side wall 11 of the channel and has a tendency to spring laterally towards this channel wall 11, and is thus shown in Fig. 3 as assuming a slightly flaring relation to this channel wall 11. On its side adjacent to the channel wall 11 and adjacent to its free edge this yieldable wall 18 is provided with a longitudinal indentation which forms a locking groove 19 in its side adjacent to the channel wall 11.

An independently attachable and removable sheet metal holding strip for the panel 5 is provided having, at the outer side of the above described panel-holding channel in the frame bar, a molding portion 20 which includes a flange 21 turned towards the panel 5. This panel-holding strip has an outer edge portion 22 in the form of a flange of substantially the same width as the resilient wall 18 of the abutment strip and which, as is clearly shown in Fig. 4, is received into the channel in frictional engagement between this resilient wall 18 and the adjacent side wall 11 of the channel. This edge portion 22 of the holding strip is shown as joined with the outer molding portion 20 thereof in offset relation to form a concavely rounded shoulder 23 which snugly engages with the slightly rounded corner formed by the channel wall 11 with the adjacent wall 6 of the frame bar, thereby both strengthening and forming a reinforcement for the outer molding portion 20. This otherwise flat edge portion 22 of the panel-holding strip is provided with a longitudinal locking bead or ridge 24 which is indented therein towards the resilient wall or flange 18 of the above described abutment strip, so as to have resilient interlocking engagement in the locking groove 19 of this resiliently yieldable wall 18, as is shown in Fig. 4.

This panel-holding strip forms a clamping molding for the panel 5. For effectively performing this function, as well as providing for securely holding panels, such as 5, which may vary more or less in thickness, a resiliently yieldable gasket 25 is seated against the molding portion 20 within its flange 21, by which this gasket is held in place and beyond which it projects into clamping engagement with the panel 5, as shown in Fig. 4. This gasket 25 may desirably be of soft rubber and may be conveniently secured to the molding portion 20 and its flange 21 by means of a suitable adhesive. This rubber clamping gasket 25 is desirably of rectangular cross section as shown and is of a width to extend from the molding flange 21 along the molding portion 20 to its offset or shoulder 23, and adjacent to the edge of the panel 5 this gasket fits immediately over the adjacent projecting edge portion of the abutment shoulder 14 of the above described abutment strip, the backing molding 13 of which forms a stop for the panel 5.

It will be noted that the edge of the panel 5 is at the outside of the above described panel-holding channel or groove in the frame bar, substantially in line with and shown as slightly inward from the aligned inner flat surfaces of the frame bar, formed by its two-part wall 6 on its inner or panel side. In effecting the assembly of a panel, such for example as the glass panel 5, in its assembled frame, as shown in Figs. 1 and 4, first the abutment strip, which forms the backing molding or stop 13 for the panel 5, together with the abutment shoulder 14 for the edge of this panel, as shown in Figs. 3 and 4, is inserted into the above described channel in the frame bar, one of these abutment strips being thus placed in position in the channel for each of the four frame bars 1, 2, 3 and 4, shown in Fig. 1. Then the panel 5 may be simply laid in the frame by transverse flatwise movement. As will be clear from Fig. 3, the edges of this panel will readily pass transversely across the adjacent surfaces of the frame bar wall 6, in thus seating the edges of this panel within the shoulders 14 and to rest against the stop molding or backing molding 13, as shown in Fig. 3.

The panel-holding molding strip or clamping molding may now be readily assembled in position as shown in Fig. 4, merely by edgewise movement of this strip parallel to the adjacent surface of the panel 5. The edge of the flange portion 22 of this holding strip may be readily inserted between the resilient flange wall 18 of the abutment strip and the adjacent side wall 11 of the channel, and by relatively gentle pressure on the flange 21, the wall 18 will yield until the locking bead 24 of the wall 22 snaps into and becomes interlocked in the locking groove 19 in the resilient wall 18 of the abutment strip, as shown in Fig. 4, the resilient gasket 25 also yielding, whereby the panel 5 will be securely clamped in place. For removing or replacing the panel 5, the holding strip may be readily removed by means of an ordinary

suitable tool, such for example as by means of a screw driver with a suitably thin end, which may be pushed under the shoulder 23 of the holding strip, for thereby disengaging the bead 24 from the groove 19, after which this holding strip may be readily pulled out by hand. All of the molding strips have square-cut ends, as shown in Fig. 1 for the clamping moldings or holding strips, with the ends of two opposite strips abutting against the frame bars, while the ends of the other two opposite strips abut against the first mentioned strips, thereby facilitating the insertion and removal of all of these molding strips.

It is obvious that various modifications may be made in the construction shown in the drawing and above particularly described, within the principle and scope of the invention as defined in the appended claims.

I claim:

1. In a panel frame, the combination of a frame bar having a longitudinal channel in the panel side thereof opening inwardly from this panel side, and a pair of panel-holding moldings fitting together into the channel alongside of and in engagement with one another, said moldings having portions projecting from the channel and forming between these projecting portions a panel-receiving groove at the outside of the said channel.

2. In a panel frame, the combination of a frame bar having a longitudinal channel in the panel side thereof, an abutment strip entering the channel and projecting therefrom to form a backing molding for the panel and having an abutment shoulder for the edge of the panel at the outside of the said channel, whereby the panel may be seated against the backing molding by transverse movement of the edge of the panel past the adjacent face of the frame bar, and an independently removable clamping molding for the panel having a portion to be snugly frictionally received into the said channel alongside of the portion of the said abutment strip which is in the channel.

3. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls and with the surfaces of the said panel side of the frame bar in alignment with one another at the opposite sides of the mouth of the said channel, a hollow sheet metal resilient abutment strip for the panel forming a backing molding having an abutment shoulder for the edge of the panel at the outside of the said channel and having separated resilient portions extending into the said channel, one of such portions lying against one of the side walls of the channel and the other said portion being adjacent to the other side wall of the channel, and an independently removable sheet metal holding strip for the panel having a molding portion at the outside of the said channel to engage with the panel and having an edge portion removably inserted into the said channel between the side wall of the latter and the adjacent portion of the said abutment strip and resiliently frictionally held in place by the latter against the adjacent side wall of the said channel.

4. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls, a hollow sheet metal resilient abutment strip for the panel forming a backing molding having an abutment shoulder for the edge of the panel at the outside of the said channel and having separated resilient portions extending into the said channel with one of such portions lying against one of the side walls of the channel and the other said portion being adjacent to the other side wall of the channel and on its side adjacent to this wall being provided with a longitudinal indentation forming a locking groove, and an independently removable sheet metal holding strip for the panel having a molding portion at the outside of the said channel to engage with the panel and having an edge portion removably received in the said channel between the side wall of the latter and the adjacent portion of the said abutment strip and provided with an indented bead to have interlocking engagement in the said locking groove of the latter so as thereby to be resiliently removably held in the said channel.

5. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls, an abutment strip entering the said channel and projecting therefrom to form a backing molding having an abutment shoulder for the edge of the panel at the outside of the said channel, an independently removable sheet metal holding strip for the panel snugly frictionally received into the said channel alongside of the said abutment strip and having a molding portion at the outside of the said channel provided with a flange turned towards the panel, and a yieldable gasket held in place by and interposed between the said flanged molding portion and the panel.

6. In a panel frame, the combination of a frame bar having in the panel side thereof a substantially rectangular longitudinal channel, a hollow sheet metal resilient abutment strip having a substantially rectangular resilient portion substantially filling the said channel and at the outside of the said channel forming a backing molding having an abutment shoulder for the edge of the panel, and an independently removable sheet metal holding strip for the panel having a molding portion at the outside of the said channel to engage with the panel and having an edge portion removably received in the said channel alongside of one wall of the said rectangu-

lar portion of the resilient abutment strip so as to be resiliently frictionally held in place by the latter against the adjacent side wall of the said channel.

7. A molding device for securing a panel in a frame comprising a pair of molding strips of which one is a backing molding having a backing portion for the panel, the backing portion being provided with a shoulder for the edge of the panel and this shoulder being provided with a wall portion extending outwardly away from the edge of the shoulder and beyond the edge of the panel, the other said molding strip having a molding portion to engage with and hold the panel and having an outer wall portion beyond the edge of the panel to lie against the said wall portion of the said backing molding outwardly from the said shoulder of the latter.

8. A molding device for securing a panel in a frame comprising a hollow sheet metal resilient abutment strip for the panel forming a backing molding provided with a backing portion having an abutment shoulder for the edge of the panel and having a resilient portion outwardly from the edge of the panel and said shoulder, said resilient portion including opposed spaced side walls of which one is a resilient wall extending outwardly away from the said shoulder, and a sheet metal holding strip for the panel having a molding portion to engage with and hold the panel and having a wall portion extending outwardly from the molding portion to engage with the said resilient wall of the abutment strip outwardly from its said shoulder.

9. A molding device for securing a panel in a frame comprising a hollow sheet metal resilient abutment strip forming a backing molding for the panel having a shoulder to be engaged by the edge of the panel and having a hollow angular portion outwardly from the said shoulder including a resilient wall adjacent thereto provided with an indentation forming a longitudinal groove, a sheet metal holding strip for the panel having a wall portion provided with a longitudinally indented ridge to engage in the said groove in the abutment strip and having a molding portion provided with a flange turned towards the said backing molding of the abutment strip, and a yieldable gasket for the panel seated within the said flange of the holding strip.

10. In a panel frame, the combination of a frame bar having a longitudinal channel in the panel side thereof opening inwardly from this panel side and provided with a projecting backing molding adjacent to one side of the channel, whereby a panel may be seated to abut against the backing molding by transverse movement of the edge of the panel past the adjacent face of the frame bar, and an independently removable sheet metal clamping molding for the panel having a molding portion at the outside of the said channel to engage with and hold the panel and having a flange portion extending outwardly from the molding portion and to be received into the said channel and provided with an indented longitudinal bead so as thereby to be frictionally retained in the said channel.

11. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls, an abutment strip entering the channel in engagement with one of the side walls thereof and projecting therefrom to form a backing molding for the panel and providing for the transverse movement of the edge of the panel past the adjacent face of the frame bar, and an independently removable holding strip for the panel entering the said channel in engagement with the other side wall threof and projecting therefrom to form a removable clamping molding for the panel.

12. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls, a hollow sheet metal resilient abutment strip having a hollow resilient portion substantially filling the said channel and at the outside of the said channel forming a backing molding having an abutment shoulder for the edge of the panel, and an independently removable sheet metal holding strip for the panel having a molding portion at the outside of the said channel to engage with the panel and having an edge portion to be removably received in the said channel alongside of an adjacent wall of the said hollow resilient portion of the resilient abutment strip which is in the channel so as to be resiliently frictionally held in place by the latter portion against the adjacent side wall of the said channel.

13. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls and with the surfaces of the said panel side of the frame bar in alignment with one another at the opposite sides of the mouth of the said channel, a hollow sheet metal resilient abutment strip forming a backing molding for the panel, the said backing molding having at one of its sides an abutment shoulder for the edge of the panel at the outside of the said channel and having at its other side an overhanging reinforcing shoulder to engage with the surface of the frame bar adjacent to the said channel, the said reinforcing shoulder being provided with a resilient wall portion extending into the said channel in engagement with the adjacent side wall of the channel, and the said abutment shoulder being provided with a resilient wall portion extending into the channel adjacent to the other side wall thereof, and an independently removable sheet metal holding strip for the panel having a

molding portion at the outside of the said channel to engage with and hold the panel and having an overhanging reinforcing shoulder to engage with the surface of the frame bar adjacent to the said channel, the said shoulder on the holding strip being provided with a wall portion to be removably inserted into the said channel between a side wall of the latter and the adjacent resilient wall portion of the said abutment strip so as thereby to be resiliently frictionally held in place by the latter against the adjacent side wall of the said channel.

14. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls and with the surfaces of the said panel side of the frame bar in alignment with one another at the opposite sides of the mouth of the said channel, a hollow sheet metal resilient abutment strip forming a backing molding for the panel, the said backing molding having at one of its sides an abutment shoulder for the edge of the panel at the outside of the said channel and having at its other side an overhanging reinforcing shoulder to engage with the surface of the frame bar adjacent to the said channel, the said reinforcing shoulder being provided with a resilient wall portion extending into the said channel in engagement with the adjacent side wall of the channel, and the said abutment shoulder being provided with a resilient wall portion extending into the channel adjacent to the other side wall thereof, and an independently removable sheet metal holding strip for the panel having a molding portion at the outside of the said channel to engage with and hold the panel and having a wall portion to be removably inserted into the said channel between a side wall of the latter and the adjacent resilient wall portion of the said abutment strip so as thereby to be resiliently frictionally held in place by the latter against the adjacent side wall of the said channel.

15. In a panel frame, the combination of a frame bar having in the panel side thereof a longitudinal channel with abrupt side walls and with the surfaces of the said panel side of the frame bar in alignment with one another at the opposite sides of the mouth of the said channel, and a hollow sheet metal resilient abutment strip forming a backing molding for the panel, the said backing molding having at one of its sides an abutment shoulder for the edge of the panel at the outside of the said channel and having at its other side an overhanging reinforcing shoulder to engage with the surface of the frame bar adjacent to the said channel, the said reinforcing shoulder being provided with a resilient wall portion extending into the said channel in engagement with the adjacent side wall of the channel, and the said abutment shoulder being provided with a resilient wall portion extending into the channel adjacent to the other side wall thereof.

16. A molding device for securing a panel in a frame comprising a shaped sheet metal resilient abutment strip forming a backing molding for the panel having a shoulder to be engaged by the edge of the panel and having a resilient portion outwardly from the said shoulder including opposed spaced side walls of which one is a resilient wall adjacent to said shoulder provided with an indentation forming a longitudinal groove, and a sheet metal holding strip for the panel having a wall portion provided with a longitudinally indented ridge to engage in the said groove in the abutment strip and having a molding portion to engage with and hold the panel.

In witness whereof, I hereunto subscribe my signature.

LOUIS L. LEVENE.