May 5, 1964 W. M. LEESER 3,131,440

EXTENSIBLE SECTIONAL SASH ASSEMBLY

Filed July 14, 1961 2 Sheets-Sheet 1

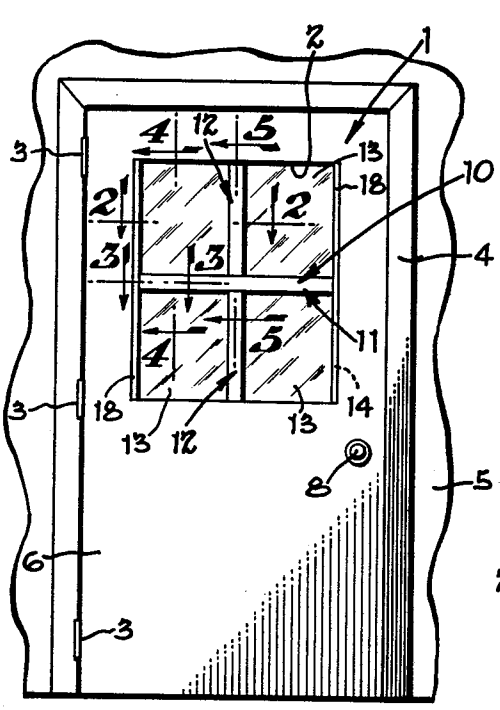


Fig. 1

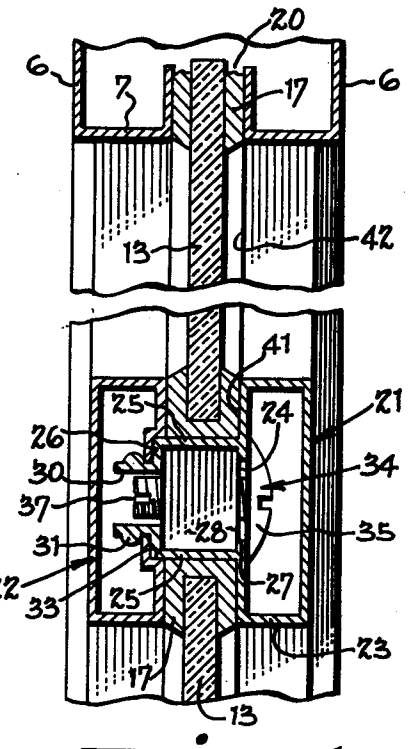


Fig. 4

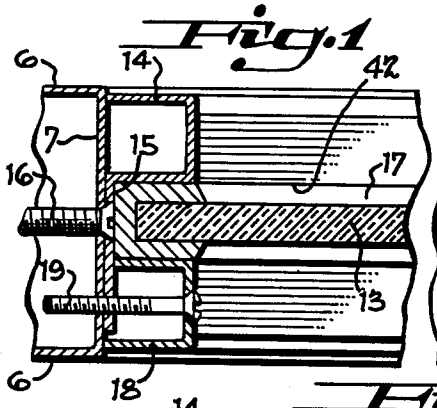


Fig. 2

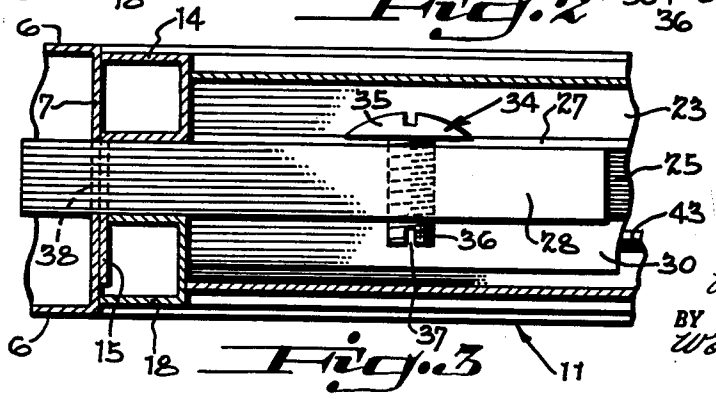


Fig. 3

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May 5, 1964 W. M. LEESER 3,131,440

EXTENSIBLE SECTIONAL SASH ASSEMBLY

Filed July 14, 1961 2 Sheets-Sheet 2

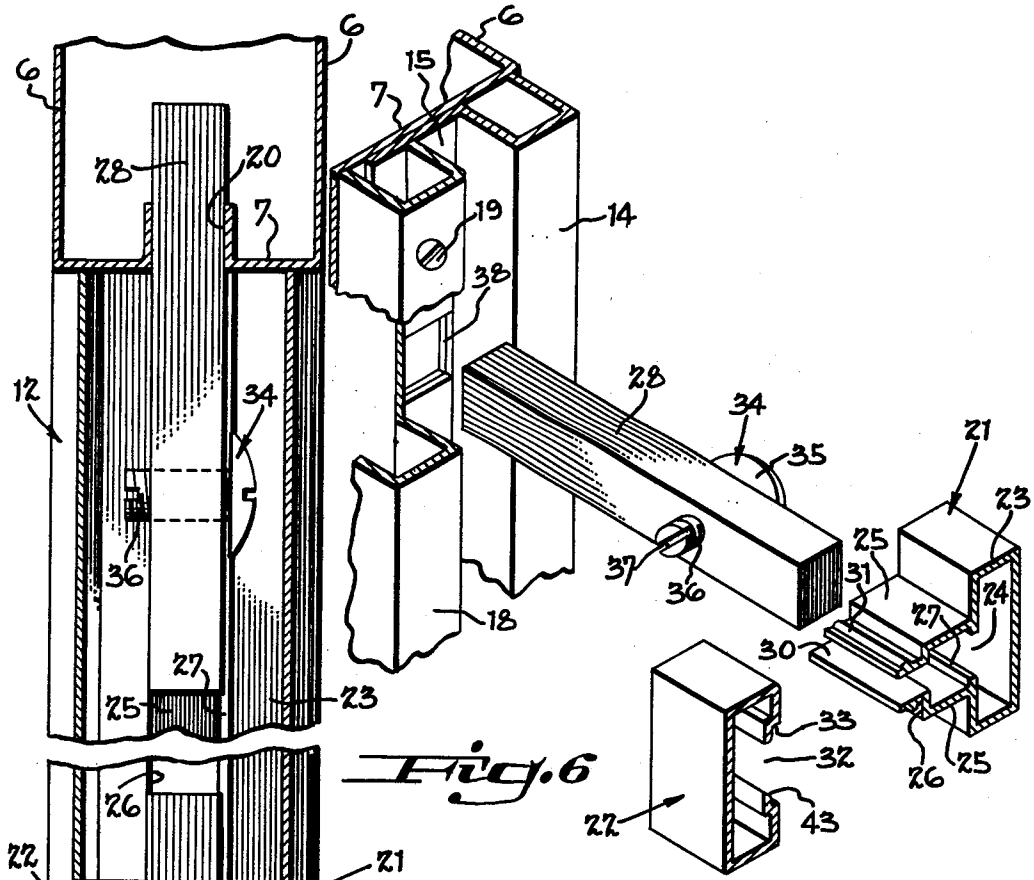


Fig. 6

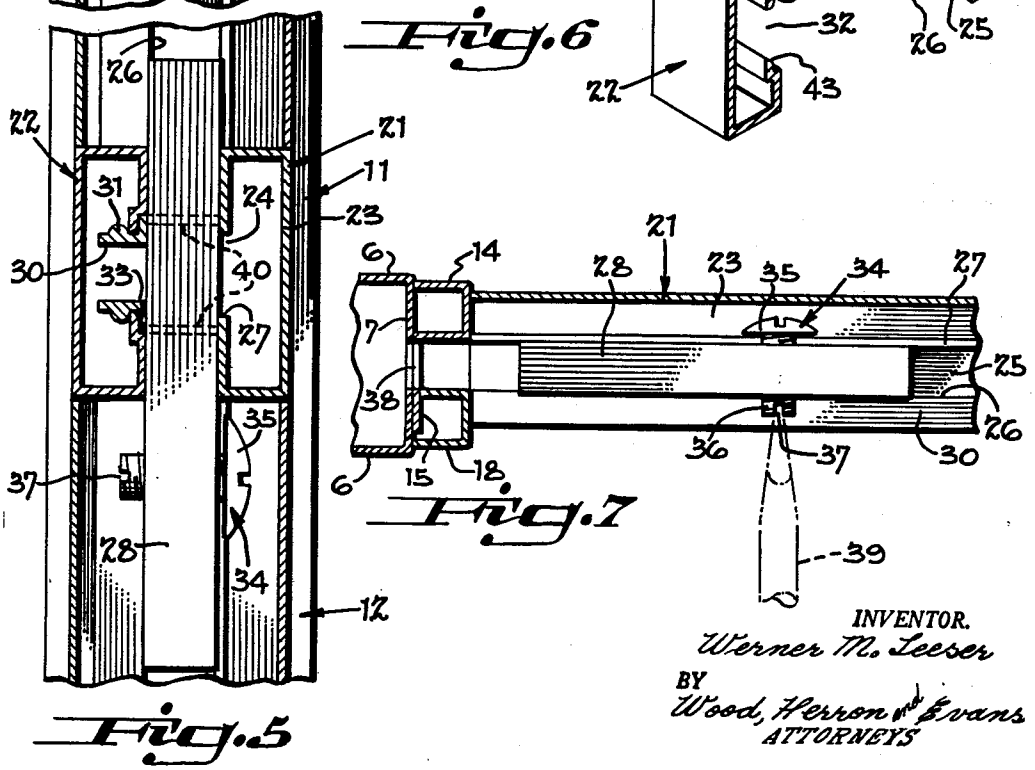


Fig. 7



Fig. 5

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# EXTENSIBLE SECTIONAL SASH ASSEMBLY

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This invention relates to the glazed window openings of doors or the like and is directed in particular to an extensible mullion or sash assembly for such openings, formed of metal sections which preferably are extruded.

One of the primary objectives of the invention has been to provide a sectional mullion or sash assembly for mounting the glass panes, the assembly adapted to be mounted in the opening of a door, wall structure or the like in a rapid convenient manner with simple tools.

In order to provide convenient installation of the sash assembly, the structure comprises individual sash bars or muntins which are hollow in cross section, each having respective tenons or anchor bars slidably confined in its opposite end portions. The opening of the door, in which the sash assembly is to be installed, is delineated by a framing member having mounting apertures adapted to receive the end portions of the extensible tenons, whereby the sash bar may be placed in position spanning the opening and anchored in place simply by shifting the tenons outwardly through the mounting apertures. The anchor bars each include a locking screw engageable with the sash bar, the locking screws being tightened with a screw driver, thereby to lock the tenon permanently in its extended position.

The present sash assembly is intended particularly for doors of sheet metal construction, although, by virtue of the extensible tenons it may be installed with equal facility in doors of other conventional construction by providing mounting apertures in the framing structure which delineates the opening. Moreover, the sash assembly may be installed in existing plain doors in a simple manner by cutting an opening therein and providng the necessary mounting apertures to receive the extensible tenons. It will be understood that the sash bars may be mounted either horizontally or vertically, or they may be mounted as a combination of horizontal and vertical bars intersecting one another in accordance with the size of the opening and number or pattern of glass panes desired.

A further objective of the invention has been to provide a mullion or sash assembly which provides a neat and trim appearance and which provides for the convenient mounting of the glass panes or lights within the sash assembly.

According to this aspect of the invention, each muntin or sash bar is of composite design, comprising a base rail and a cover or trim strip which provides a snap-on engagement with the base rail, and which acts as the retainer or glazing bead adapted to embrace the marginal portion of the glass pane. The base rail, as noted above, is hollow and comprises a body portion which is generally rectangular in cross section, having a longitudinal slot along one side which is delineated by a pair of spaced, yieldable limbs arranged to provide the snap-on engagement with the cover or trim strip. The body portion of the base rail forms a pair of shoulders on opposite sides of the yieldable limbs, the shoulders providing glass stops when the glass panes are installed.

The extensible tenons are mounted between the yieldable limbs, which include opposed ledges to confine the tenons between the limbs. The locking screw of each extensible tenon includes an enlarged head engageable with the anchor rail, and a shank passing outwardly through the tenon, the outer end portion being slotted for a screw driver engagement, so that the screw may be



tightened to frictionally engage the head with the base rail, thereby to lock the tenon in its extended position. The outer end portion of each yieldable limb includes an outwardly projecting bead adapted to provide engagement with the trim strip. The yieldable limbs thus serve the double function of mounting the extensible tenons and of providing for the snap-on engagement of the trim strip.

The trim strip is also hollow in cross section and is generally rectangular, including a longitudinal slot having a width substantailly equal to the spacing of the yieldable limbs of the base rail. After the glass pane is placed in position against the glass stops which are provided by the base rail (with the anchor tenons projecting through the aperture and locked in place by the screws) the cover or trim strip is placed with its slotted side against the outer edges of the yieldable limbs and is then snapped in place over the beads by applying pressure. The rectangular configuration of the trim strip corresponds with the body portion of the base rail and overlies the marginal portion of the glass pane, whereby the pane is embraced between the body portion of the base rail and trim strip. The marginal edge portion of the pane, which is thus engaged, is provided with a pliable mounting strip or calking material in the customary manner. It will be understood that the peripheral surface of the window opening is provided with a glass stop and glazing bead which form counterparts of the base rail and trim strip and lying in the same plane so as to embrace the outer marginal portions of the glass panes.

From the foregoing, it will be understood that the sectional sash assembly is flexible as to assembly and may be fitted in various combinations of horizontal and vertical sash bars to provide a glazed opening of the desired pattern. Where the vertical sash bars intersect the horizontal bars, mounting apertures are formed in the yieldable limbs of the horizontal base rails to receive the extensible tenons of the vertical bars. In the event of glass breakage after the door is in use, a new pane may be installed conveniently by prying off the trim strips, replacing the broken pane, then forcing the trim strips back in place.

The various objects of the invention will be fully apparent to those skilled in the art from the following detailed description in conjunction with the drawings.

In the drawings:

FIGURE 1 is a front elevation showing the sectional mullion or sash assembly installed in the opening of a door.

FIGURE 2 is an enlarged fragmentary sectional view taken along line 2—2 of FIGURE 1 detailing the sash assembly.

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 1, detailing the tenon or anchor bar which is shown in locking position with respect to the sash structure.

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1, detailing the sash assembly in relation to the glass panes of the glazed window.

FIGURE 5 is a sectional view taken along line 5—5 of FIGURE 1, detailing the anchorage of the vertical sash bars with respect to the horizontal bar.

FIGURE 6 is an exploded view illustrating the components of the sash structure.

FIGURE 7 is a sectional view similar to FIGURE 3, showing the mode of installing one of the muntins or sash bars in the window opening.

*Door Structure*

Referring to FIGURE 1, which shows a typical installation of the sectional mullion or sash assembly, a conventional door is shown at 1 having a window opening 2. The door is hingedly mounted as at 3 in a door frame 4,

which is installed in the opening of a wall **5**. The door, which has been selected to illustrate the principles of the invention, is of conventional hollow steel construction, comprising sheet metal face panels **6—6** (FIGURE 2) spaced apart from one another by a honeycomb structure (not shown), the window opening **2** being delineated by a closure strip **7** which is joined to the face panels **6—6**. The outer periphery of the door is delineated by a similar closure strip (not shown), and the door lock is mounted between the face panels and includes the usual knob **8**. It will be understood that the mullion or sash assembly, indicated generally at **10** in FIGURE 1, is intended for installation in doors of various types which are originally constructed with a window opening. The structure is also intended to convert plain doors into the window type simply by cutting a window opening therein, with suitable mounting apertures formed in the margin of the opening for anchoring the mullion structure, as explained later.

The mullion or sash structure, selected to illustrate the invention, is provided with a horizontal muntin or sash bar **11** and a vertical sash bar **12** to provide a mounting for four panes of glass, as indicated at **13** (FIGURE 1). It will be understood, that the sectional sash structure is flexible as to assembly and may comprise either a single horizontal or vertical sash bar to mount two panes of glass, or it may comprise combinations of horizontal and vertical sash bars, other than that illustrated, so as to provide various other arrangements of glass lights.

As shown generally in FIGURE 2, the vertical sides of the door opening are each provided with a glass stop **14** formed of sheet metal and being generally channel-shaped in cross section. The stop **14** includes a mounting strip **15** along one side which is secured in place by screws **16** passing through the mounting strip and threaded into the marginal portion of the door. As shown in FIGURE 2, the glass stop **14** embraces the outer marginal portion of the pane **13**, while the sash bars **11** and **12** provide a corresponding glass stop, as explained later.

During installation, the glass stops **14** are first mounted within the opening, then the base rails of the mullion structure are installed so as to form corresponding glass stops for engaging the marginal portions of the glass panes **13**. The glass panes are then installed against the glass stops, the edges of the panes being embedded in flexible strips, such as rubber or protected by suitable calking, such as putty, indicated at **17**. Finally, glazing beads **18** are mounted in the opposite side of the opening (FIGURE 2) and secured in place by screws **19**. The closure strips of the mullion structure correspond to the glazing beads and are installed with the glazing beads to complete the assembly, as explained later.

In the present example (FIGURE 4), the upper closure strip **7** of the window opening is slotted as at **20** to accommodate the upper edge of the panes **13**. When installing the panes, their upper portions are first inserted through the slot **20**, then the pane is placed in position against the glass stops and sash rails. The lower closure strip of the opening is similarly slotted (not shown) to receive the lower portion of the panes.

*Mullion or Sash Structure*

Described in detail (FIGURES 2–6) each muntin or sash bar is a composite unit comprising a base rail **21** and a cover or trim strip **22** which is snapped in place over one side of the base rail after the glass panes **13** are installed in the sash assembly. The composite horizontal sash bars **11** and vertical sash bars **12** are identical in cross section and are preferably in the form of extruded aluminum sections.

Each base rail **21** comprises a body portion **23**, which is generally rectangular in cross section and having a longitudinal slot 24 along one side, which provides access to the anchor bars, as explained later. A pair of yieldable parallel limbs **25—25** project outwardly from the body **23**



of the base rail along opposite sides of the slot **24**. The outer ends of the yieldable limbs each include a right angular inturned flange **26**, and the base of the limbs include ledges **27—27** which border the longitudinal slot **24**. The limbs **25** delineate a passageway generally rectangular in cross section arranged to slidably confine the extensible anchor bars or tenons **28** in the opposite end portions of the base rails; the limbs also provide an attachment means for the trim strip, as explained below.

In order to provide a snap-on engagement with the cover or trim strip 22, the flanges **26** of the yieldable limbs **25** are each provided with an outwardly projecting lip **30** parallel with the limbs **25**, and the lips include opposed, outwardly facing beads **31** which present partially cylindrical profiles. These beads, through the yieldability of the opposed limbs **25**, adapt the cover strip **22** to be snapped in place upon the base rail at assembly.

Each cover strip **22** is also generally rectangular in cross section and includes a longitudinal slot **32** (FIGURE 6) having a width substantially equal to the spacing of the lips **30** of the base rail so as to fit over the lips **30** and provide a camming action with respect to the curved surfaces of the beads **31** when the trim strip is forced in place. Opposed portions of the trim strip, adjacent the slot **32**, are inset at **33**, so as to interfit the shoulders or flanges **26** of the base rail, as best shown in FIGURES 2 and 6.

The anchor bars or tenons **28**, (FIGURE 2) are each provided with a locking screw **34** passing through slot **24** and having a head **35** which resides within the hollow body **23** of the base rail **21**, the head being adapted to seat against and frictionally engage the ledges **27** of the base rail on opposite sides of slot **24**. The opposite shank portion **36** of the screw projects through the anchor bar and resides between the lips **30—30** of the base rail. The screw **34** may be conventional; however, the outer end of the shank **36** is provided with a slot **37** for engagement with a screw driver **39** (FIGURE 7), permitting the screw to be rotated to a locking position before the trim strip is applied to the base rail.

As shown in FIGURES 3 and 6, a mortise or mounting aperture **38**, to receive the end portion of the tenon or anchor bar, is formed in the closure strip **7** and mounting strip **15** of the door structure at opposite sides of the opening **2**. The horizontal sash bar **11** is thus anchored at opposite ends by the shiftable tenons or bars **28**, which extend outwardly through the apertures **38**. The ends of the vertical sash bars **12** are similarly anchored by extensible anchor bars **28** which pass through the slot **20** which is formed in the closure strips **7** at upper and lower margins of the window opening, which also receive the edge portions of the window panes, as explained earlier.

In the form of the invention illustrated, the adjacent inner ends of the vertical sash bars **12**, which abut the horizontal bar **11**, are anchored in place by a tenon or bar **28** passing through an aperture **40** which is formed in the horizontal sash bar **11** (FIGURE 5). In this example, the tenon **28** of the lower vertical sash bar **12** passes upwardly through the aperture **40** into the upper vertical sash bar **12** so as to lock both bars in place. Alternatively, however, each vertical bar may include its own anchor bar or tenon **28**, two tenons passing through the aperture of the horizontal sash bar **11** and into endwise abutment with one another.

When the mullion or sash assembly is installed, the glass stops **14** are first mounted in the door opening and secured into place by the screws **16**. Thereafter, the base rail **21** of the horizontal sash bar **11** is fitted between the assembled glass stops **14—14** with the trim strip **22** removed (FIGURE 7), the anchor bars **28** being retracted to permit the installation. With the base rail thus located in alignment with the mounting apertures **38**, the anchor bars **28** are shifted outwardly (FIGURE 3) so as to pass through the mounting apertures at opposite sides of the opening **2**. Thereafter the screw driver **39** is engaged in

the slot 37 and the locking screws 34 are rotated in a direction to bring the head 35 into engagement with the ledges 27, thereby to lock the anchor bars in place. The base rails 21 of the vertical sash bars 12 are similarly mounted on opposite sides of the horizontal bar 11 and locked in place.

It will be noted in FIGURE 4 that the glass-engaging surface 41 of the base rail 21 lies in the same plane as the corresponding surface 42 of the glass stop 14, adapting the panes to be mounted within the sash assembly at this stage. After the glass panes are placed in position, either with the flexible strips or with calking, as previously indicated at 17, the trim or cover strips 22 are snapped in place under the opposed beads of the lips 30. As the trim strips are forced in place, its edges produce a camming action with respect to the beads 31 causing the limbs 25 to be sprung toward one another then to snap outwardly to the position shown in FIGURE 4, thus locking the trim strip 22 firmly in place. To facilitate this camming action, the edges (FIGURE 6) which delineate the slot 32 of the trim strip, are rounded as at 43. The closure strip thus conceals the anchor bars 28 and their locking screws 34, providing a neat and trim appearance, and also locking the glass panes 13 in place. The glazing beads 18 are also secured in place at this time, thus completing the installation of the glazed window. It will be understood that the trim strips 22 can be pried off the base rails to replace a broken light of glass if this ever becomes necessary.

Having described my invention, I claim:

1. A sectional sash structure adapted to be installed in an opening of a door or the like to provide a mounting for a glazed window therein, said opening being delineated by a framing member including mounting apertures, said sash structure comprising, a sash bar adapted to be installed in a position spanning said opening, said sash bar being of hollow cross section, a pair of tenons slidably mounted in the end portions of said hollow sash bar, a locking screw threaded through each of said tenons, said sash bar being slotted longitudinally, each locking screw having a shank portion projecting outwardly through said slot and having a head portion residing within the hollow sash bar and adapted to engage the sash bar on opposite sides of said slot, each locking screw having tool-engaging means on the shank portion opposite the head portion providing engagement with a tool for tightening the screw, said tool-engaging means being presented outwardly through said slot, whereby a tool is adapted to be engaged with said tool-engaging means for tightening the screw, thereby to secure the tenon in an adjusted position relative to the sash bar, said sash bar being installed within said opening in alignment with the apertures of said framing member and with said tenons shifted outwardly through said apertures and locked relative to the sash bar by said locking screws, thereby anchoring the sash bar in place within said opening.

2. A composite sash bar for a sectional sash structure adapted to be installed in the opening of a door or the like to provide a mounting for a glazed window therein, said opening being delineated by a framing element including mounting apertures, said composite sash bar comprising, a base rail and a cover strip, said base rail being hollow in cross section and including an internal and an external longitudinal slot, said base rail including a pair of parallel limbs projecting outwardly along opposite sides of said external slot, a respective anchor bar slidably mounted within the endwise portions of said base rail, each of said anchor bars including a locking screw, each locking screw having a head portion disposed within the hollow base rail and engageable therewith on opposite sides of said internal slot, said head portion adapted to lock the anchor bar relative to the base rail, each locking screw having a shank portion projecting outwardly through said external slot, said shank portion including means for engagement with a tool for rotating the screw, said base rail adapted to be installed in a position spanning said opening in alignment with said apertures of the framing element, said anchorage bars adapted to be shifted outwardly through said apertures to anchor the base rail within said opening, said cover strip being tubular in cross section and including a longitudinal slot, said slot adapting the cover strip to be snapped in place upon the limbs of the base rail after the base rail is anchored in place within said opening thereby to cover the external slot of the base rail after the locking screws are tightened to secure the anchor bars in said outwardly shifted position.

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