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3,180,458

CURTAINWALL MULLION AND METHOD OF INSTALLING CURTAINWALLS

Filed Oct. 7, 1960

2 Sheets-Sheet 1

FIG. 1.

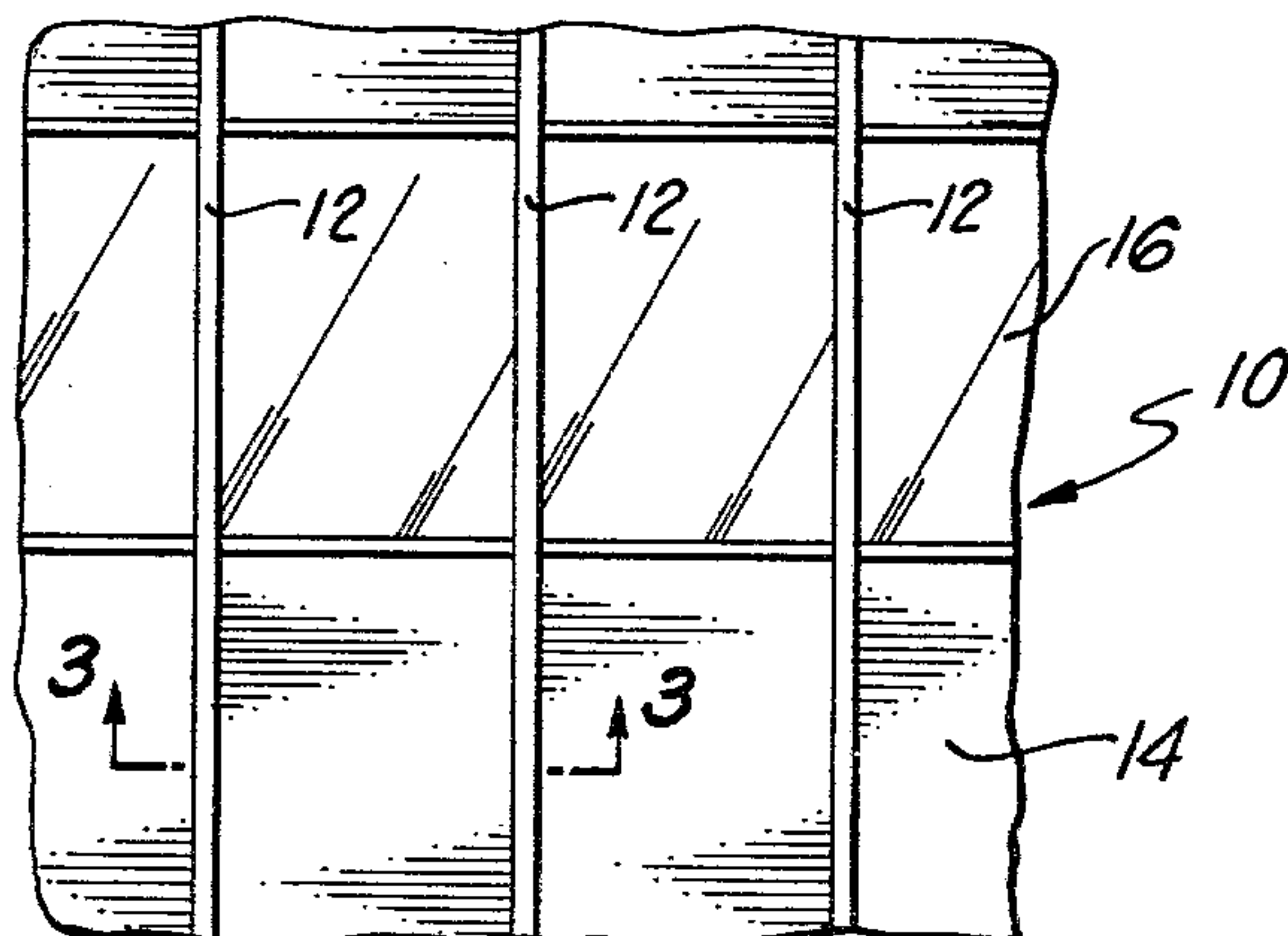


FIG. 2.

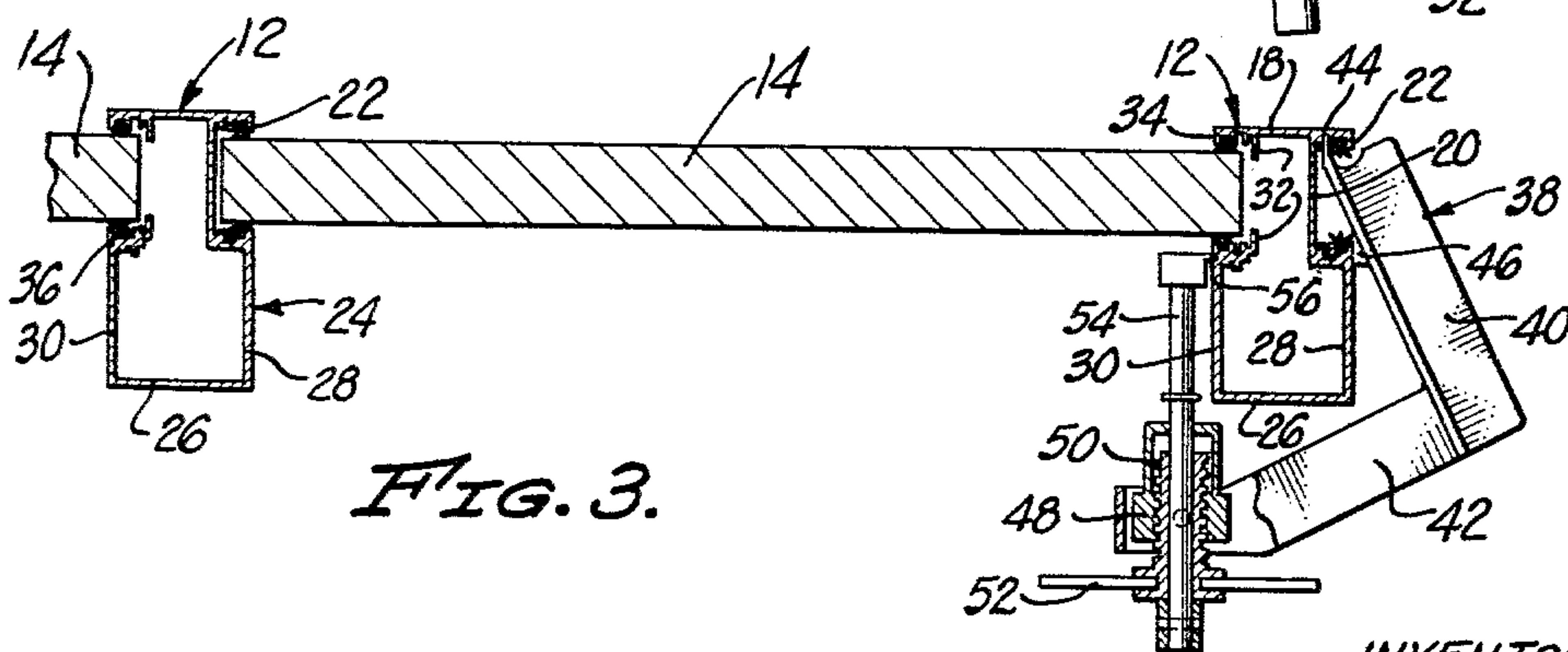
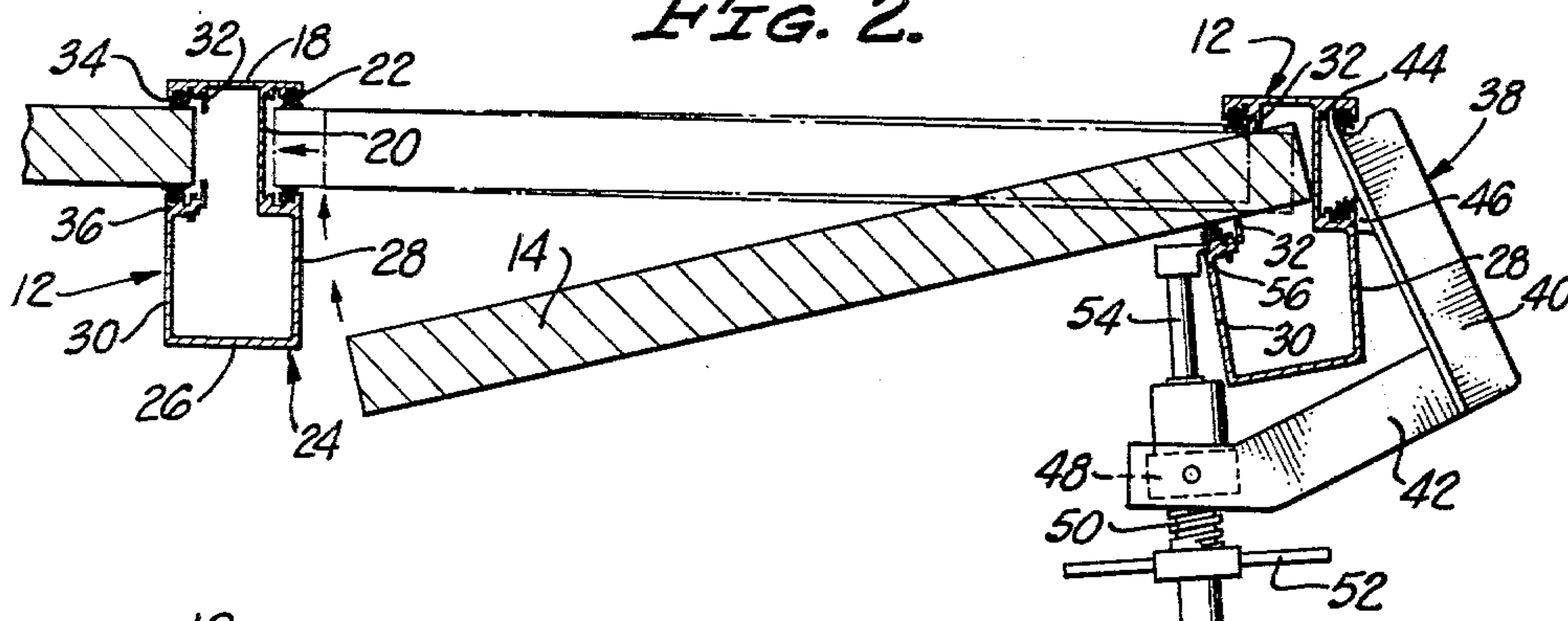


FIG. 3.

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2 Sheets-Sheet 2

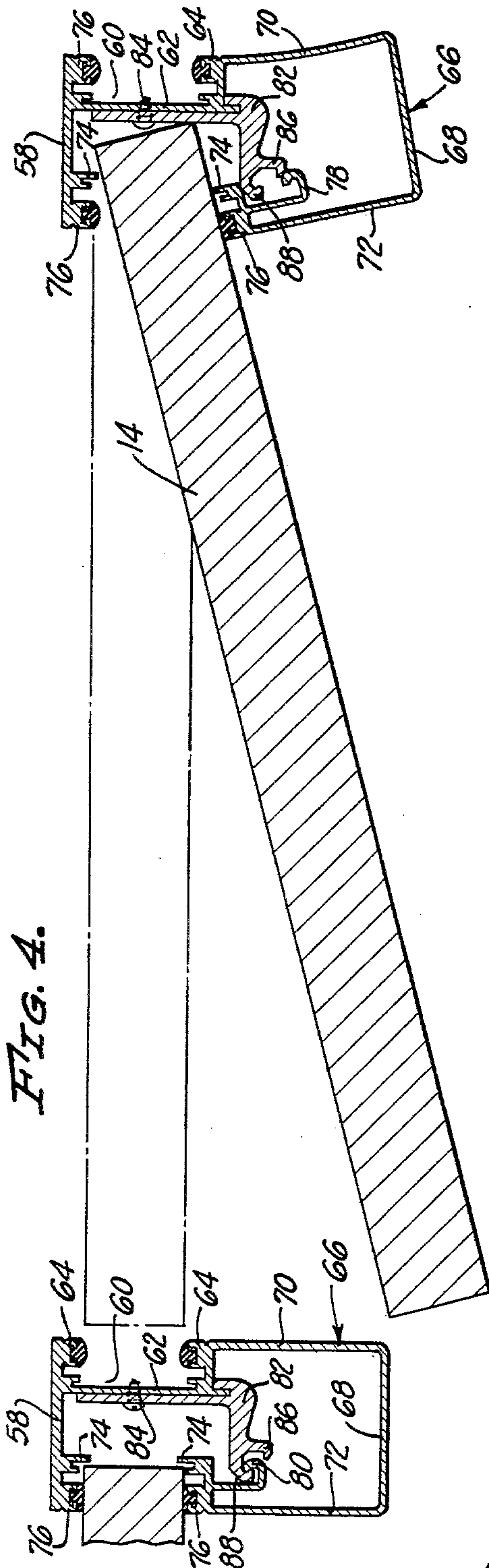
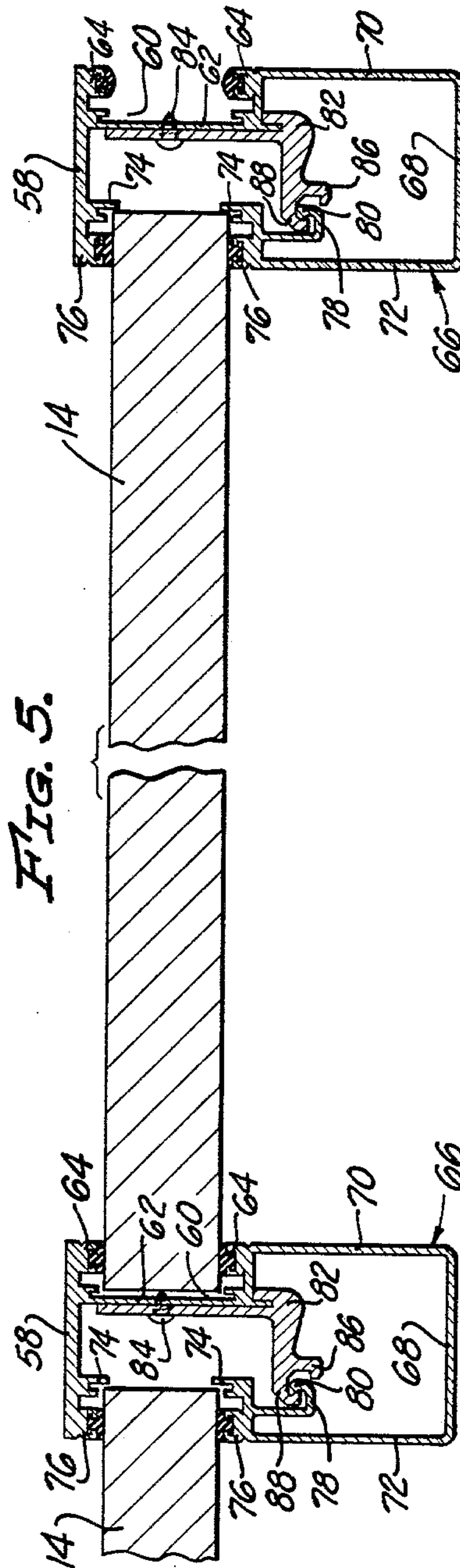


FIG. 5.



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CURTAINWALL MULLION AND METHOD OF INSTALLING CURTAINWALLS

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11 Claims. (Cl. 189—34)

The present invention relates generally to the construction art and more particularly to a novel curtainwall mullion and a method of installing curtainwalls employing the same.

Briefly stated, the invention comprises a mullion of unitary construction which includes a channel-like portion with spaced leg members and opposed stop elements spaced inwardly of the ends of the leg members. The mullion is made from a resilient material such as aluminum so that one leg member and its associated stop element can be sprung away from the other leg member and stop element so as to increase the distance between the inner ends of said stop elements. The springing apart or spreading of the leg members can be accomplished with either a special jack or by means of a supporting member mounted on the mullion during the fabrication of the unit. In use, one edge of an in-fill panel is inserted between the sprung-apart stop elements and the other edge of the panel is swung into position in an opposed channel-like mullion, and, when the panel is moved toward the second channel-like mullion until said one edge clears the stop elements, the first mullion is released to cause the legs thereof to return to the normal position and thereby lock the panel between the two mullions.

Although the present invention is shown and described as embodied in an exterior curtainwall for buildings, it is to be understood that the same teachings can be applied to interior curtainwall constructions and to supporting means for panels and the like as used in the shipbuilding, aircraft, packaging and similar industries where it is desired to provide a skin or wall which is self-supporting.

At the present time curtainwall constructions employ a vertical mullion section which is comprised of two major components or parts which are divided either along a line perpendicular to the resultant wall or along a line parallel with the wall. In those installations where the mullions are divided along a perpendicular line as defined above, the rectangular frame can be prefabricated in the shop and the in-fill material placed in position in advance of installation, but the parts of the mullions must be fastened together on the job site. In the other type of construction either the rear or the front part of the mullion is installed on the job, the in-fill materials are placed in position, and the second part of the mullion is then locked in place as with bolts or other locking means.

It is an object of the present invention, therefore, to provide a novel, vertical curtainwall mullion which has only one major component and which permits the installation of in-fill materials at the job site. More particularly, it is an object to provide such a unitary mullion which can be installed at the job site, and the in-fill material then placed in the mullion and locked in position without the use of external bolts or the like which detract from the appearance of the installation.

Further objects and advantages of the present invention will be apparent from the following detailed description, reference being had to the accompanying drawings wherein preferred embodiments of the present invention are shown.

In the drawings:

FIG. 1 is a fragmentary front elevational view of a curtainwall constructed in accordance with the teachings of the present invention;

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FIG. 2 is an enlarged horizontal sectional view taken through the curtainwall in FIG. 1 showing one form of mullion in the open or sprung-apart position with an in-fill panel being inserted therein;

FIG. 3 is an enlarged horizontal sectional view taken on the line 3—3 in FIG. 1 showing the mullion in the normal or closed position with the panel supported between the two mullions;

FIG. 4 is a horizontal sectional view similar to FIG. 2 showing a modified form of mullion construction in the open or sprung-apart position; and

FIG. 5 is a horizontal sectional view similar to FIG. 3 showing the modified construction in the closed or panel-supporting position.

Referring to the drawings more particularly by reference numerals, 10 indicates a curtainwall containing vertical mullions 12 embodying the teachings of the present invention, which support in-fill panels 14 and/or glass panels 16.

As shown in FIGS. 2 and 3, each mullion is of unitary construction and has the over-all appearance of two channel-like portions in back-to-back arrangement. Specifically, each mullion includes a rear portion 18, a channel portion 20 which contains seal-supporting projections 22, a U-shaped front element 24 having a transverse portion 26, a right leg portion 28 and a left leg portion 30, and opposed stop elements 32 and opposed seal-supporting projections 34. It will be noted that the seal-supporting projections 34 define a throat or passageway and that the opposed stop elements 32 are positioned inwardly thereof for a reason to appear. The left leg portion 30 contains a groove or shoulder 36 adjacent the inner end thereof for use in moving the left leg portion to an open or sprung-apart position as will be described more fully hereinafter.

On the job, two mullions 12, for example, are mounted in vertically extending spaced-apart position with the channel portion 20 of one in opposed aligned relationship with the aforementioned throat of the other mullion as defined by the seal-supporting projections 34. A jack 38 is then used to move the left leg portion 30 from the normal aligned position to the sprung-apart position as shown at the right-hand side in FIG. 2.

The jack 38 contains an L-shaped frame having a side leg 40 and a front leg 42, the side leg containing a wedge-like tip 44 at the free end thereof and a shoulder 46 inwardly of the tip. Mounted on the free end of the front leg 42 is a nut 48 which receives a threaded shaft 50 which has a handle 52 at the outer end thereof and a rotatably mounted hook member 54 at the inner end, the hook member containing a lip 56.

When the jack 38 is used to open a mullion to the sprung-apart position (FIG. 2), the tip 44 is inserted alongside of the seal-supporting projection 22 and the shoulder 46 is placed in engagement with the inner end of the right leg portion 28. The lip 56 of the hook member 54 is then placed in the groove 36 and the handle 52 rotated so as to move the left leg portion 30 and the U-shaped front element 24 to the sprung open position. The right-hand edge of the panel 14 is inserted between the stop elements 32 which have been moved apart by the action of the jack 38, and the left-hand edge of the panel is then swung inwardly to a position in alignment with the channel portion 20 of the mullion on the left-hand side. The panel 14 is then moved to the left toward the channel portion 20 until the right-hand edge is moved to the left of the stop elements 32. The jack 38 is then released so as to permit the U-shaped front element 24 and the left leg portion 30 with its associated stop element 32 to spring back to the normal or closed position, thereby locking the panel in place. Although the mullions 12 are preferably extruded from

aluminum, other materials which have the necessary resilient characteristics can be used in place of the aluminum.

It will be noted that, when the mullion 12 is in the closed or normal position (FIG. 3), the distance between the inner ends of the stop elements 32 is less than the thickness of the panel 14 and the width of the panel is greater than the distance between opposed leg portions of the U-shaped front element 24. Consequently, the panel 14 is securely locked in position and can only be removed by opening the mullion with the jack 38 as previously described.

In the modified construction shown in FIGS. 4 and 5, the mullion is somewhat similar in construction to the one previously described in that there are, in effect, two channel-like portions in back-to-back relationship and the mullion includes a rear portion 58, a channel portion 60 with a base 62, seal-supporting projections 64, a U-shaped front element 66 with a transverse portion 68, a right leg portion 70 and a left leg portion 72, opposed stop elements 74 and seal-supporting projections 76 adjacent thereto which define a throat or passageway as previously described. The modified mullion construction differs from the one previously described in that it contains an L-shaped flange 78 adjacent the left leg portion 72, the flange 78 including a curved lip 80 for a purpose to appear. Another difference is that a supporting member 82 is fastened to the base 62 by metal screws 84 or the like during the fabrication of the mullion assembly. The supporting member 82 can extend the length of the mullion so as to provide additional strength, or it can be made in short lengths which are fastened to the base 62 in vertical spaced relationship. In the preferred form, the supporting member 82 is made from a material such as aluminum and includes a U-shaped end portion which contains an open leg 86 and a lock leg 88, both of which contain an intumed lip portion at the free end thereof. When the mullion assembly is fabricated in the shop, the left leg portion 72 and the U-shaped front element 66 are moved to the sprung-apart position (FIG. 4) by any suitable means and the supporting members 82 installed so that the lip 80 of the flange 78 bears on the open leg 86. After the mullions are installed at the job site in vertical spaced relationship with the channel-like portion 60 of the one mullion in opposed aligned relationship with the throat or passageway defined by the seal-supporting projection 76 of the other mullion, the in-fill panels 14 are inserted in the same manner as previously described. Thus, the right-hand edge of a panel is inserted between the opposed stop elements 74 which are in a sprung-apart relationship and the left-hand edge of the panel is pivoted inwardly until it is in alignment with the channel-like portion 60 as shown in broken lines in FIG. 4. The panel is then moved to the left until the right-hand edge thereof clears the stop elements 74. Thereafter, the left leg 72 of the front element 66 is caused to move inwardly as by striking the transverse portion 68 with a mallet or the like so as to dislodge the lip 80 from the open leg 86 and to cause it to snap into overlapping engagement with the lip portion of the lock leg 88 (FIG. 5), thereby locking the mullion in the closed or normal position. As previously described, and as shown in FIG. 5, the width of the panel 14 is greater than the distance between the front elements 66 but less than the distance between the stop elements 74 and the base 62, and the thickness of the panel is greater than the distance between the inner ends of the stop elements 74 so that when the mullion is in the closed or normal position the panel 14 cannot be removed therefrom.

Although it is preferable to include the lock leg 88 in the supporting member construction so that the mullion is positively maintained in the closed or locked position due to the overlapping of the lips, the lock leg can be omitted and the mullion held in the closed or normal position by the inherent rigidity of the front element 66.

As a further alternative, the supporting member 82 can be made of simple L-shaped cross section from fran-

gible material such as plastic, ceramic, wood or the like, whereby it will shatter or break away when the transverse portion 68 is struck with a mallet or the like, thereby permitting the front elements 66 and the left leg portion 72 to return to the closed or normal position.

Thus, it is apparent that there have been provided several related curtainwall mullion constructions and methods of installing curtainwalls which fulfill all of the objects and advantages sought therefor. The mullions are of unitary construction and contain only one major component, yet they permit the installation of in-fill panels at the job site by unskilled workmen using conventional tools. The in-fill panels can be easily and quickly placed in position between the mullions and the latter moved to the closed or normal position either by striking the mullion with a mallet as when the supporting member 82 is used, or by releasing the jack member 38 if that method of installation is preferred.

It is to be understood that the foregoing description and the accompanying drawings have been given only by way of illustration and example and that changes and alterations in the present disclosure which will be readily apparent to one skilled in the art are contemplated as within the scope of the present invention.

We claim:

1. The method of erecting a curtainwall from infill panels having opposed side edges and from mullions made from resilient material and containing a portion of normally U-shaped cross section with a base portion and spaced-apart leg portions, which includes the steps of: positioning two mullions in parallel opposed spaced relationship with one leg portion of one mullion sprung outwardly out of normal spaced relationship with the other leg portion of said one mullion; positioning one side edge of an in-fill panel between the leg portions of one of said mullions; positioning the other side edge of the panel between the leg portions of the other of said mullions; and causing said sprung leg portion to be returned to the normal relationship with the leg portion adjacent thereto, whereby the panel is maintained in position between the two mullions.

2. The method of erecting a curtainwall from in-fill panels having opposed side edges and from mullions made from resilient material and containing a portion of normally U-shaped cross section with a base portion and spaced-apart leg portions, which includes the steps of: positioning two mullions in parallel opposed spaced relationship with one leg portion of one mullion sprung outwardly out of normal spaced relationship with the other leg portion of said one mullion; positioning one side edge of an in-fill panel between the sprung leg portion and the leg portion adjacent thereto; positioning the other side edge of the panel between the spaced-apart leg portions of the other mullion; and causing said sprung leg portion to be returned to the normal relationship with the leg portion adjacent thereto, whereby the panel is maintained in position between the two mullions.

3. The method of erecting a curtainwall from in-fill panels having opposed side edges and from mullions made from resilient material and containing a portion of normally U-shaped cross section with a base portion and spaced-apart leg portions, which includes the steps of: positioning two mullions in parallel spaced relationship with the leg portions of the two mullions in aligned opposed position; springing the leg portion of one mullion away from the leg portion adjacent thereto so as to increase the opening therebetween; positioning one side edge of an in-fill panel between the sprung leg portion and the leg portion adjacent thereto; positioning the other side edge of the panel between the leg portions of the other mullion; and causing said sprung leg portion to be returned to a normal spaced relationship with the leg portion adjacent thereto, whereby the panel is maintained in position between the two mullions.

4. The method of erecting a curtainwall containing panels with opposed side edges which includes the steps

of: providing two similar mullions made from resilient material and having first and second channel-like portions in back-to-back arrangement, each of said portions including spaced leg members; positioning the two mullions in spaced-apart parallel relationship with the second channel-like portion of one mullion in opposed alignment with the first channel-like portion of the other mullion; providing a jack with a stationary leg member and an actuating leg member movable relative thereto; engaging the stationary leg member in the second channel-like portion of said other mullion and the actuating leg member with one of the leg members of the first channel-like portion of said other mullion; causing the actuating leg member of the jack to move relative to the stationary leg thereof so as to spring said one leg member away from the leg member adjacent thereto so as to enlarge the opening of the first channel-like portion of said other mullion; inserting one side edge of a panel in the first channel-like portion of said other mullion; inserting the other side edge of the panel in the second channel-like portion of said one mullion; and releasing the jack to cause the sprung leg member to return to its normal position, whereby the panel is held in position between the two spaced mullions.

5. The method of erecting a curtainwall containing panels with opposed side edges which includes the steps of: providing two similar mullions made from resilient material and having first and second channel-like portions in back-to-back arrangement, each of said portions including spaced leg members, one leg member of each first-channel-like portion being sprung outwardly and supported in the sprung position by supporting means fastened to the mullion adjacent said leg member; positioning the two mullions in spaced-apart parallel relationship with the second channel-like portion of one mullion in opposed alignment with the first channel-like portion of the other mullion; inserting one side edge of a panel in the first channel-like portion of said other mullion adjacent the sprung leg member; inserting the other side edge of the panel in the second channel-like portion of said one mullion; and dislodging the sprung leg member of said other mullions from the supporting means to cause it to return to its normal position, whereby the panel is held in position between the two spaced mullions.

6. A mullion made from resilient material for use with a panel of predetermined thickness, comprising: a channel-like portion with opposed leg members which form a passageway having an entrance opening and which can be moved from a normal position to a sprung-apart position; and opposed stop elements with inner ends extending into the passageway inwardly of the entrance opening, the distance between the inner ends of the stop elements in the normal position being less than the thickness of the panel, and the distance between said inner ends in the sprung-apart position being greater than the thickness of the panel.

7. A mullion made from resilient material for use with a panel of predetermined thickness, comprising: a channel-like portion with opposed leg members which form a passageway having an entrance opening and which can be moved from a normal position to a sprung-apart position; opposed stop elements with inner ends extending into the passageway inwardly of the entrance opening; and means associated with the channel-like portion for supporting a jack for use in releasably supporting one leg member in the sprung-apart position away from the other leg member adjacent thereto, the distance between the inner ends of the stop elements in the normal position being less than the thickness of the panel, and the distance between said inner ends in the sprung-apart position being greater than the thickness of the panel.

8. The method of erecting a curtainwall from in-fill panels having opposed side edges and from mullions made from resilient material and containing a channel-like portion with opposed leg portions which form a passageway having an entrance opening and which can be moved from

a normal position to a sprung-apart position, and opposed stop elements with inner ends extending into the passageway inwardly of the entrance opening, the distance between the inner ends of the stop elements in the normal position being less than the thickness of the panel and the distance between said inner ends in the sprung-apart position being greater than the thickness of the panel, which includes the steps of: positioning two mullions in parallel opposed spaced relationship with one leg portion of one mullion sprung outwardly out of normal spaced relationship with the other leg portion of said one mullion; positioning one side edge of an in-fill panel between the sprung leg portion and the leg portion adjacent thereto; positioning the other side edge of the panel between the spaced-apart leg portions of the other mullion; positioning the side edges of the panel between the stop elements of the opposed mullions; and causing said sprung leg portion to be returned to the normal relationship with the leg portion adjacent thereto, whereby the panel is maintained in position between the two mullions.

9. The method of erecting a curtainwall from in-fill panels having opposed side edges and from mullions made from resilient material and containing a channel-like portion with opposed leg portions which form a passageway having an entrance opening and which can be moved from a normal position to a sprung-apart position, and opposed stop elements with inner ends extending into the passageway inwardly of the entrance opening, the distance between the inner ends of the stop elements in the normal position being less than the thickness of the panel and the distance between said inner ends in the sprung-apart position being greater than the thickness of the panel, which includes the steps of: positioning two mullions in parallel spaced relationship with the leg portions of the two mullions in aligned opposed position; springing the leg portion of one mullion away from the leg portion adjacent thereto so as to increase the opening therebetween; positioning one side edge of an in-fill panel between the sprung leg portion and the leg portion adjacent thereto; positioning the other side edge of the panel between the leg portions of the other mullion; positioning the side edges of the panel between the stop elements of the opposed mullions; and causing said sprung leg portion to be returned to a normal spaced relationship with the leg portion adjacent thereto, whereby the panel is maintained in position between the two mullions.

10. The method of erecting a curtainwall containing panels with opposed side edges which includes the steps of: providing two similar mullions made from resilient material and having first and second channel-like portions in back-to-back arrangement, each of said portions including spaced leg members which form a passageway having an entrance opening and which can be moved from a normal position to a sprung-apart position, and opposed stop elements with inner ends extending into the passageway inwardly of the entrance opening, the distance between the inner ends of the stop elements in the normal position being less than the thickness of the panel and the distance between said inner ends in the sprung-apart position being greater than the thickness of the panel; positioning the two mullions in spaced-apart parallel relationship with the second channel-like portion of one mullion in opposed alignment with the first channel-like portion of the other mullion; providing a jack with a stationary leg member and an actuating leg member movable relative thereto; engaging the stationary leg member in the second channel-like portion of said other mullion and the actuating leg member with one of the leg members of the first channel-like portion of said other mullion; causing the actuating leg member of the jack to move relative to the stationary leg thereof so as to spring said one leg member away from the leg member adjacent thereto so as to enlarge the opening of the first channel-like portion of said other mullion; inserting one side edge of a panel in the first channel-like portion of said other mullion; inserting the other side edge of the panel in the second channel-like portion of said one

mullion; positioning the side edges of the panel between the stop elements of the opposed mullions; and releasing the jack to cause the sprung leg member to return to its normal position, whereby the panel is held in position between the two spaced mullions.

11. The method of erecting a curtainwall containing panels with opposed side edges which includes the steps of: providing two similar mullions made from resilient material and having first and second channel-like portions in back-to-back arrangement, each of said portions including spaced leg members which form a passageway having an entrance opening and which can be moved from a normal position to a sprung-apart position, and opposed stop elements with inner ends extending into the passageway inwardly of the entrance opening, the distance between the inner ends of the stop elements in the normal position being less than the thickness of the panel and the distance between said inner ends in the sprung-apart position being greater than the thickness of the panel, one leg member of each first-channel-like portion being sprung outwardly and supported in the sprung position by supporting means fastened to the mullion adjacent said leg member; positioning the two mullions in spaced-apart parallel relationship with the second channel-like portion of one mullion in opposed alignment with the first channel-like portion of the other

mullion; inserting one side edge of a panel in the first channel-like portion of said other mullion adjacent the sprung leg member; inserting the other side edge of the panel in the second channel-like portion of said one mullion; positioning the side edges of the panel between the stop elements of the opposed mullions; and dislodging the sprung leg member of said other mullions from the supporting means to cause it to return to its normal position, whereby the panel is held in position between the two spaced mullions.

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