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(54) Door track mounting device

(57) A track mounting device for installing an upper track of a folding or sliding door assembly onto a ceiling surface, comprises a height reducing member (58) having end portions a first bracket (10) and a second bracket (10). The first bracket (10) has a track mounting portion (18) on which the upper track can be fixedly mounted and first mounting structure (30) for mounting said first bracket (10) to one of said end portions of said height reducing member. The second bracket (10) has a ceiling mounting portion (18) for fixing to a ceiling surface, and a second mounting structure (30) for movably mounting said second bracket to the other of said end portions of said height reducing member (58) in such a manner as to allow said ceiling mounting portion (18) to be positioned at a selected angle with respect to said height reducing member (58).

The track mounting device may have an orientation indicating device (100) for indicating when said track mounting portion (18) of said first bracket (10) is oriented generally horizontally.

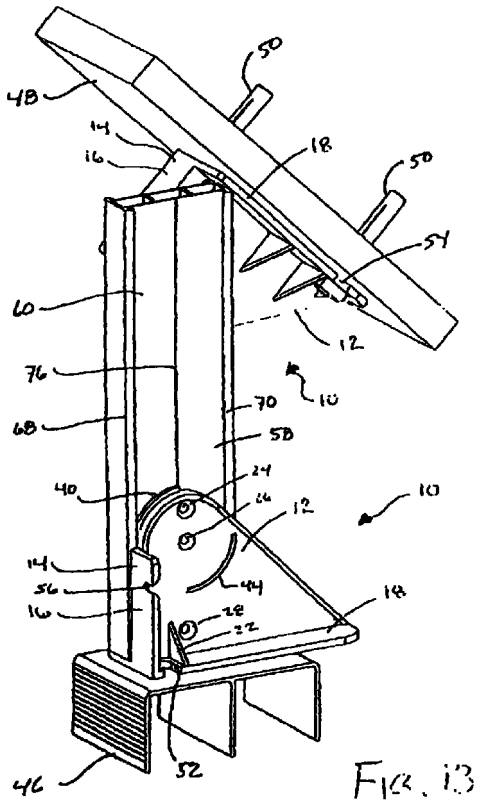

FIG. 13

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Description

[0001] The present invention relates to a track mounting device for mounting an upper door track to generally horizontal or sloped ceiling surfaces of varying heights.

[0002] Kits for sliding or folding doors usually include upper and lower tracks and a plurality of doors or door portions of a standard height. The lower track is mounted to the floor and the upper track is mounted at a fixed height above the lower track corresponding to the standard door height. The doors or door portions are slidingly or rollingly mounted between the upper and lower tracks for movement between open and closed positions. Because homes and other buildings have varying ceiling heights and doors are typically available in predetermined standard heights, the upper track often cannot be fixed directly to the ceiling at a desired location and still function to accommodate doors of standard height. Specifically, the device must be installed at a position on the sloped ceiling where the upper track will be positioned to accommodate the doors or door portions or else a door of non-standard height must be custom made. To overcome this problem, height reducing devices have been provided.

[0003] One such known height reducing device comprises a pair of brackets each with flat mounting surfaces, and a tubular metal pipe. The brackets are mounted to opposing end portions of the pipe with both flat mounting surfaces extending perpendicularly to the longitudinal extent of the pipe. The upper track is attached to the flat mounting surface of one of the brackets and the flat mounting surface of the other bracket is mounted to the ceiling. The distance at which the upper track is spaced below the ceiling is determined by cutting the pipe to a desired length.

[0004] The problem with this arrangement is that the pipe can only be used when installing the track on a horizontal ceiling surface and cannot be used on a sloped ceiling surface. Specifically, the pipe will extend perpendicularly to the ceiling surface and the mounting surface with the upper track thereon will extend parallel to the sloped ceiling surface as a result of the flat mounting surface of the brackets being fixed generally perpendicularly to the longitudinal extent of the pipe.

[0005] Another known device exists which can be used to install the upper track to either a sloped or a horizontal ceiling surface. This device comprises a pair of brackets with flat mounting surfaces. The brackets are attached directly to one another with no intervening member therebetween, such as the rubular pipe of the previously described device. The brackets can be secured to one another at a desired angle so that, when the upper track is installed to one bracket and the other bracket is installed to a sloped ceiling, the upper track will be fixed in a proper position to accommodate and guide the doors or door portions. The problem with this type of device is that there is no way to alter the vertical position of the track with respect to the ceiling portion on which it is mounted.

[0006] Thus, there exists a need for a device which combines the advantages of both the devices described above without the disadvantages associated with each. Specifically, there is a need for a device which can both have the angles of its brackets adjusted to accommodate for sloped ceilings and have its overall length adjusted to position the upper track at a vertical height suitable to receive folding or sliding doors.

[0007] Another problem with this the latter type of device described above is that it provides no way to quickly and easily verify when the track mounting portion of the lower bracket is oriented generally horizontally to enable the upper track to be mounted thereto in its proper operating position. With this type of device, the installer must either estimate the lower bracket's orientation by vision alone or use a separate level or the like to determine when the proper horizontal orientation has been achieved.

[0008] Thus, there exists a need in the art for a track mounting device that provides a mechanism that enables a user to determine when the track mounting portion of the lower bracket is generally horizontal, thereby obviating the need for inaccurate visual determinations or the use of a separate level.

[0009] To meet the above-described needs, one aspect of the present invention provides a track mounting device for mounting an upper track of a folding or sliding door assembly onto a generally horizontal or sloped downwardly facing ceiling surface, the door assembly comprising the upper track and at least one door panel having an upper guiding portion constructed and arranged to be mounted to the upper track. The track mounting device comprises an elongated height reducing member having opposing end portions. A first bracket has a track mounting portion on which the upper track can be fixedly mounted and first mounting structure constructed and arranged to enable the first bracket to be fixedly mounted to one of the opposing end portions of the height reducing member. A second bracket has a ceiling mounting portion constructed and arranged to be fixedly mounted to the ceiling surface. The second bracket also has second mounting structure constructed and arranged to enable the second bracket to be movably mounted to the other of the opposing end portions of the height reducing member so as to allow the second bracket to be moved relative to the height reducing member to selectively position the ceiling mounting portion at a selected angle with respect to a longitudinal extent of the height reducing member. The second mounting structure is constructed and arranged to enable the second bracket to be fixed against further relative movement with respect to the height reducing member after selectively positioning the ceiling mounting portion at the selected angle so as to fix the ceiling mounting portion at the selected angle. The height reducing member has a length selected

such that, when the ceiling mounting portion of the second bracket is positioned at the selected angle and mounted to the ceiling surface and the upper track is mounted to the track mounting portion, the upper track is spaced below the ceiling surface at a height suitable to allow the upper and lower guide portions of the at least one door panel to be mounted to the upper and lower tracks, respectively, for guided opening and closing movements.

[0010] Thus, the device of the present invention can be used to install the upper track on a sloped ceiling surface and at a selected height below the ceiling surface suitable to accommodate one or more sliding or folding door portions. Preferably, the first and second brackets can be used together without the height reducing member by connecting the mounting structures thereof directly together. Further, the brackets may be substantially identical so that either one may serve as the first bracket with the track mounted thereto or the second bracket mountable to the ceiling. Making the brackets identical only requires one mold cavity and results in only one part having to be inventoried instead of two different parts, and hence reduces manufacturing costs in comparison to molding two different brackets.

[0011] A related aspect of the present invention relates to a method for mounting an upper crack of a folding or sliding door assembly to a sloped ceiling surface. The method comprises providing a first bracket having a ceiling mounting portion constructed and arranged to be mounted to the sloped ceiling surface; providing a second bracket having a track mounting portion constructed and arranged to have the upper track mounted thereto; providing an elongated height reducing member having a pair of opposing end portions and a length extending along a longitudinal extent thereof; mounting the first bracket to the one opposing end portion of the height reducing member; mounting the second bracket to the other opposing end portion of the height reducing member with the ceiling mounting portion oriented at an angle selected such that when the second bracket is mounted to the sloped ceiling surface the track mounting portion of the second bracket is oriented generally horizontally; mounting the upper track to the track mounting portion of the first bracket; mounting the ceiling mounting portion of the second bracket to the sloped ceiling surface with the ceiling mounting portion oriented at the selected angle with respect to the longitudinal extent of the reducing member such that the track mounting portion of the second bracket is oriented generally horizontally; and selecting the length of the height reducing member such that after each of the aforesaid mounting operations have been performed the upper track is spaced below the ceiling surface at a height suitable to allow an upper portion of at least one door panel to be mounted to the upper track for guided opening and closing movements.

[0012] The acts involved with the above-described method may be performed in any particular order and this aspect of the invention should not be limited to the specific order in which the acts are listed.

[0013] In addition, to meet the above-described needs, another aspect of the present invention provides a track mounting device for mounting an upper track of a folding or sliding door assembly to a sloped downwardly facing ceiling surface. The door assembly comprises the upper track and at least one door panel having an upper guiding portion constructed and arranged to be mounted to the upper track. The track mounting device comprises a first bracket having a track mounting portion on which the upper track can be fixedly mounted. a second bracket has a ceiling mounting portion constructed and arranged to be fixedly mounted to the sloped ceiling surface. The first and second brackets are constructed and arranged to be coupled to one another such that when the ceiling mounting portion of the second bracket is mounted to the sloped ceiling surface the first bracket can be moved relative to the second bracket until the track mounting portion of the first bracket is oriented generally horizontally at a position whereat the upper track when mounted to the track mounting portion can support the at least one door panel for guided opening and closing movements. The first and second brackets are constructed and arranged such that when the first bracket is oriented generally horizontally as aforesaid the first and second brackets can be fixed against relative movement with respect to one another. An orientation indicating device is constructed and arranged such that as the first bracket is being moved relative to the second bracket as aforesaid the indicating device indicates when the track mounting portion of the first bracket is oriented generally horizontally.

[0014] Other objects, features, and advantages of the present invention will become apparent from the following detailed description, the accompanying drawings, and the appended claims.

Fig. 1 is a side profile view of one side of a bracket of a device constructed in accordance with the principles of the present invention;

Fig. 2 is a side profile view of the other side of the bracket of Fig. 1;

Fig. 3 is a front view of the bracket of Fig. 1;

Fig. 4 is a top view of the bracket of Fig. 1;

Fig. 5 is a cross-sectional view taken through line 5-5 of Fig. 1;

Fig. 6 is a cross-sectional view taken through line 6-6 of Fig. 1;

Fig. 7 is a perspective view of two of the brackets of Fig. 1 fixed together at an angle to one another, with an upper door track attached to one bracket and the other bracket mounted to the ceiling;

Fig. 8 is a profile view of the two brackets of Fig. 5;

Fig. 9 is a perspective view of a height reducing member of the device;

Fig. 10 is an end view of the height reducing mem-

ber of Fig. 9;

Fig. 11 is a perspective view of the device installed on a horizontal ceiling surface with the brackets attached to opposing end portions of the height reducing member, an upper door track mounted to one of the brackets, and the other bracket mounted to the horizontal ceiling surface;

Fig. 12 is a side profile view of the device a s shown in Fig. 11;

Fig. 13 is a perspective view similar to Fig. 11, but installed on a sloped ceiling surface;

Fig. 14 is a side profile view of the device as shown in Fig. 12;

Fig. 15 is perspective view of a second embodiment of the present invention mounted to a sloped ceiling surface; and

Fig. 16 is a perspective view of the angle indicating device utilized in the embodiment of Fig. 15.

[0015] Figs. 1-6 show various views of a bracket, generally indicated at 10, which constitutes a component of the device of the present invention. The bracket 10 is injection molded from plastic and has a generally triangular body 12. The body 12 has an integrally molded fascia mounting flange 14 providing a fascia mounting surface 16 and an integrally molded ceiling or track mounting portion in the form of flange 18 with a ceiling or track mounting surface 20. The flanges 14, 18 and the surfaces thereof 16, 20 are arranged generally perpendicularly to one another. A set of generally triangular ribs 22 extend between the body 12 and the ceiling or track mounting flange 18 to provide increased structural strength.

[0016] The body 12 has three fastener receiving bares 24, 26, 28 formed therethrough and arranged along an imaginary line extending generally perpendicularly to the mounting surface 20 of flange 18. Each of the bores 24, 26, 28 is countersunk on the side on which the fascia mounting flange 14 is located. The bores 24, 26, 28 each receive a fastener in the form of a threaded screw (not shown). The countersunk portions of each bore 24, 26, 28 allow the heads of the screws to be positioned flush with the surface of the body 12.

[0017] The body 12 defines an integrally molded angularly adjustable mounting structure, generally indicated at 30, opposite the ceiling or track mounting flange 18. The mounting structure 30 protrudes outwardly from the side of body 12 opposite the fascia mounting flange 14 (Fig. 2). The mounting structure 30 comprises an integrally molded central shaft portion 32 with bore 26 formed therethrough and a generally circular outer ring portion 34 with bore 24 formed therethrough. Bore 26 is formed at the general center of the mounting structure 30. A generally circular recess 36 spaces the shaft portion 32 from the ring portion 34. A generally circular groove 38 generally concentric with bore 26 is formed in the outer ring portion 34. As can be best appreciated from the cross-sectional views of Figs. 5 and 6, the sides of the groove 38 taper inwardly toward one another.

[0018] The mounting structure 30 also has a pair of arcuate flanges 40, 42. The flanges 40, 42 extend generally radially outwardly front the structure 30 and are both generally concentric with the bore 26 and the groove 38. Flange 42 can be seen from the side of the body with the fascia mounting flange 14 through an arcuate groove 44 formed through the body 12. This groove 44 is a result of the bracket 10 being injection molded and plays no functional role in the invention. The role of these flanges 40, 42 will become apparent later in the application.

[0019] Figs. 7 and 8 show how two of the above-described brackets 10 are used to install an upper track 46 of a sliding or folding door assembly to a generally downwardly facing sloped ceiling surface 48. The term ceiling surface is intended to encompass both the interior surface which is visible to persons inside a room and the surfaces of structural beams which are usually concealed from persons inside the room. The brackets 10 may be considered as first and second brackets with respective first and second mounting structures. These brackets 10, however, are substantially identical and can be used interchangeably for mounting the track or mounting to the ceiling. Thus, hereinafter the brackets 10 and the mounting structures 30 thereof will not be described as being "first" and "second" so as to avoid the impression that the disclosed brackets 10 differ in any significant way. However, the principles of the present invention may practiced with first and second different brackets.

[0020] The upper track 46 is mounted to the ceiling or track mounting surface 20 of one of the brackets 10 by fasteners such as threaded screws (not shown). The screws are inserted through the track wall from the interior thereof and threaded into the material of the ceiling or track mounting flange 18. The two substantially identical brackets 10 are engaged with one another and a screw (not shown) is inserted through the bores 26 of both brackets 10 to pivotally connect them directly together. When the screw is inserted through the bores 26 of both brackets 10, the bore 24 of each bracket 10 will be radially aligned with the groove 38 of the other bracket 10. This radial alignment can be best appreciated from Fig. 8 wherein the groove 38 of the ceiling mounted bracket 10 as visible through the bore 24 of the track mounting bracket.

[0021] The ceiling or track mounting surface 20 of the other bracket 10 is engaged with the sloped ceiling surface 48. Fasteners in the form of cavity a drywall fixings 50 are inserted through the notches 52, 54 formed through the ceiling or track mounting flange 18 and driven into the structure defining the sloped ceiling surface 48. The bracket 10 with the track 46 mounted thereto can then be pivoted around the screw inserted through bores 26 until the track 46 is disposed in a proper operating position with the track interior opening

downwardly towards the lower track. It should be noted that in this position the track mounting portion 18, in particular, the surface 20 thereof, of the lower bracket 10 is oriented generally horizontally and generally parallel to the floor surface on which the lower track is mounted. Another screw (also not shown) can be inserted through bore 24 of one or both brackets 10 to fix the brackets 10 in this proper operating position so that the sliding doors or folding door portions of the door assembly can be slidably or rollingly mounted inside the upper and lower track interiors for movement between open and closed positions. When the screw is inserted through bore 24 of one bracket 10, the groove 38 of the other bracket 10 provides an initial bite point for the screw. The screw can then be tightened further and embedded into the plastic material of the ring portion 34. Alternatively, the angle between the two brackets 10 may be fixed before mounting the brackets 10 to the ceiling surface 48.

[0022] In a broad sense, the screws inserted through bores 26 may be considered to be a pivotal mounting structure and the screw or screws inserted through bore(s) 24 may be considered fixing structure. Specifically, the pivotal mounting structure pivotally mounts the brackets 10 for angular adjustment and the fixing structure fixes the brackets at a selected angle. The screws inserted through bores 24 and 26, however, are not shown in the Figures to clearly illustrate the radial alignment between the bore 24 of the bracket 10 with the track 46 mounted thereto and the groove 38 of the bracket mounted to the ceiling surface 48.

[0023] To securely fix the track in its proper operating position as shown a plurality of such paired brackets 10 will be utilized. When positioned as shown, the fascia mounting surface 16 of each track mounting bracket 10 extends vertically and perpendicular to the ceiling or track mounting surface 20 thereof. A fascia board (not shown) can then be engaged with the fascia mounting surfaces 16 and secured thereto. Specifically, headed fasteners such as headed screws (not shown) will be pre-mounted to the fascia board. The fascia board is removably secured to the track mounting brackets 10 by sliding the shafts of the headed screws into the notches 56 on the fascia mounting flanges 14. The fascia board conceals the brackets 10 from view for an enhanced aesthetic appearance.

[0024] Fig. 9 and 10 show a height reducing member in the form of an elongated beam 58. The beam 58 is extruded from plastic and has a pair of generally rectangular longitudinally extending walls 60, 62 and a hollow interior with two longitudinally extending interior ribs 64, 66 between the walls 60, 62 providing structural strength. Each longitudinal side of the beam 58 has a pair of flanges 68, 70 projecting generally perpendicularly outwardly from the respective walls 60, 62. Each flange 68, 70 cooperates with an associated wall 60, 62 to define a pair of longitudinally extending channels 72, 74 facing generally inwardly towards one another. Each wall 60, 62 also has a groove 76 extending longitudinally along the center thereof. The sides of each groove 76 taper inwardly towards one another. As can be appreciated from the Figures, the beam 58 is substantially symmetrical with respect to a centerline taken parallel to the walls 60, 62.

[0025] Figs. 11 and 12 show the beam 58 being utilized in conjunction with two of the above-described brackets 10 to install the upper track 46 in a proper operating position spaced a predetermined distance below a substantially horizontal ceiling surface 78. The distance at which the track 46 is spaced below the ceiling surface 78 corresponds to the height of the door or door portions which are to be slidingly or rollingly received within the track interior. This distance is determined by the length of the beam 58 which is preferably selected by cutting the beam 58 with a saw or the like.

[0026] To install the upper track 46, the track 46 is secured to a track mounting one of the brackets 10 and the beam 58 is cut down to a desired length. Each bracket 10 is mounted to the opposing end portions of the beam 58. Specifically, the flanges 40, 42 of each bracket 10 are slidably positioned inside the channels 72, 74 defined by the flanges 68, 70. The center bore 26 of each bracket 10 is aligned with the beam groove 76 with the flanges 40, 42 being positioned inside the channels 72, 74. Screws (not shown) are inserted into the center bores 26 and engaged with the groove 76. The screws are then tightened and embedded into the plastic of wall 60. Similarly to the groove 38, groove 76 provides an initial bite point for the screws. The channels 72, 74 and the flanges 40, 42 cooperate to restrict relative movement of the bracket 10 with respect to the beam 58 to pivotal movement after the insertion and tightening of the screw in bore 26.

[0027] The brackets 10 are then pivoted around the respective screws until the bores 24 and 28 of each are both radially aligned with the groove 76. Screws are then inserted into one or both of these bores 24, 28 on each bracket 10 and tightened until embedded in the material of wall 60. In this position, the ceiling or mounting surfaces 20 of each bracket 10 will be aligned generally perpendicularly with respect to longitudinal extent of the beam 58. The installer then engages the ceiling or track mounting surface 20 of the ceiling mounting bracket 10 opposite the track mounting bracket 10 with the horizontal ceiling surface 78 and secures the ceiling mounting bracket 10 thereto by cavity or drywall fixings 50. In this position, the upper track 46 is spaced a desired distance below the substantially horizontal ceiling surface 78 and ready to receive a sliding or folding door. Also, the longitudinal extent of the beam 58 extends generally vertically. As with the arrangement wherein the two brackets 10 are attached directly to one another, a plurality of these devices are used to install the upper track 46 and a fascia board may be attached to the fascia mounting flanges 14 of the track mounting brackets 10.

[0028] The screws inserted through bores 24, 26,

and 28 are not shown in the Figures to clearly illustrate the alignment between the bores 24, 26, 28 and the groove 76.

[0029] Figs. 13 and 14 show the device of the present invention installing the upper door track 46 onto a sloped ceiling surface 48. The track mounting bracket 10 has the track 46 secured to the ceiling or track mounting surface thereof 20 and the beam 58 is cut to a desired length. The installer secures the track mounting bracket 10 to one opposing end portion of the beam 58 in the manner described above with the ceiling or track mounting surface 20 thereof extending generally perpendicularly to the longitudinal extent of the beam 58. The installer secures the ceiling mounting bracket 10 to the other opposing end portion of the beam 58 by positioning the flanges 40, 42 inside the channels 72, 74, inserting a screw (not shown) into center bore 26 and tightening the screw until embedded in the material of the wall 60.

[0030] The ceiling or track mounting surface 20 of the ceiling mounting bracket 10 is then engaged with the sloped ceiling surface 48 and the cavity or drywall fixings 50 are inserted through notches 52, 54 to secure the ceiling mounting bracket 10 to the sloped ceiling surface 48. The installer then pivots the beam 58 about the screw of the ceiling mounting bracket 10 until the beam 58 extends vertically downwardly and the upper track 46 is in its proper operating position parallel to its lower track. Another screw is then inserted into bore 24 of the ceiling mounting bracket 10 and tightened until embedded into the material of wall 62, thereby fixing the beam 50 and the ceiling mounting bracket 10 with respect to one another. The installer can then slidably or rollingly mount the door of a sliding or folding door assembly inside the upper track 46.

[0031] Thus, the device of the present invention not only allows an installer to accommodate for either a sloped ceiling or ceilings of varying heights, it also allows the installer to accommodate for combinations of the two. Many variations on the device disclosed herein may be used and the present invention is not limited only to the subject matter disclosed. For example, the brackets 10 do not have to be identical; however substantial identity is preferred so that only one mold is needed during manufacturing. Another variation is to have apertures formed at predetermined increments around the outer ring portion 34 and to have an aperture or bore formed through or in the wall 60, 62 of the beam. A peg could be fixedly inserted into an aperture on the bracket and the aperture on the beam to fix the bracket at a desired angle. However, this variation is not preferred because sloped ceilings come in such a wide variety of angles that the apertured arrangement may not adequately accommodate angles which would fall between the apertures.

[0032] Figure 15 shows a second embodiment incorporating another aspect of the invention. With the exception of the components associated with the orientation indicating device, generally indicated at 100, the brackets 10' are identical to the brackets 10 discussed hereinabove and thus corresponding components have been marked with the same reference numbers with a ` being added to the components of the bracket 10' of Figure 15. The brackets 10' of Figure 15 are couple directly together in the same manner as the brackets 10 and also may be used with height reducing member 58 in the same manner as the brackets 10. However, the orientation indicating device 100 may be used in arrangements that are not designed to be used with the height reducing member 58.

[0033] The orientation indicating device 100 comprises a laterally extending pivot pin 102 integrally molded with the body 12' of the bracket 10' and a pointer member 104 pivotally mounted to the pivot pin 102. The pin 102 illustrated is generally triangular in shape, but may also be cylindrical. The pointer 104 has a pivot pin receiving aperture 106 that receives the pin 102. The aperture 106 is defined by an arcuate surface and a pair of flat surfaces. The pointer 104 also has an end opposite the aperture 106 that terminates at a point 108. In addition, the device 100 has an alignment marking 110 provided on the track mounting portion 18' thereof. The alignment marking 110 is a raised protrusion, but alternatively may be a groove or recess. Further, the alignment marking 110 may be a label or the like.

[0034] During mounting, when the ceiling mounting portion 18' of the upper bracket 10' is mounted to the sloped ceiling surface 48, the lower bracket can be moved relative to the upper bracket until the track mounting portion 18' of the lower bracket 10' is oriented generally horizontally (or absolutely horizontally) at a position whereat the upper track 46 when mounted to the track mounting portion 18' can support one or more door panels (not shown) for guided opening and closing movements. More specifically, the internal surfaces of the track 46 that support the door panel(s) are oriented generally horizontally and parallel to the floor surface on which the lower track is mounted to ensure that the guided opening and closing movements are smooth. The brackets 10' are constructed and arranged such that when the lower or track mounting bracket 10' is oriented generally horizontally as aforesaid the upper and lower brackets can be fixed against relative movement with respect to one another. More specifically, a screw can be inserted through each bore 24' and embedded into the material of the other bracket 10' (or the height reducing member 58 is being used) to fix the brackets 10' against such further relative movement.

[0035] The orientation indicating device 100 is constructed and arranged such that as the lower bracket 10' is being moved relative to the upper bracket 10', the indicating device 100 indicates when the track mounting portion 18' of the bracket 10' is oriented generally horizontally. In particular, the indicating device 100 is constructed and arranged such that gravity acts on the pointer 104 to maintain the pointer 104 in a generally

vertical orientation. As a result, when the track mounting portion 18' of the lower bracket 10' is oriented generally horizontally, the end 108 of the pointer 104 is aligned with the alignment marking 110, thereby enabling the generally horizontal orientation of said track mounting portion 18' to be visually verified. The pointer 104 basically pivots about the pin 102 as the lower bracket 10' is adjusted or moved until the pointer end 108 points to the marking 110. The apex of the triangular pin 102 and the intersection between the flat surfaces partially defining the aperture 106 provide for such pivotal movement with minimal friction generated by surface to surface contact.

[0036] In the illustrated second embodiment, the pointer 104 is removably mounted on the pin 102 so that it can be removed therefrom after installation has been completed. Although it is contemplated that each bracket pair will have its own pointer 104, the same pointer 104 may be used with a plurality of bracket pairs. Alternatively, the pointer 104 may mounted on the pin 102 by staking or deforming the end of the pin 102 or the like to prevent the pointer 104 from being removed from the pin 102.

[0037] It can thus be seen that the object of the present invention has been fully and effectively accomplished. It will be understood that the foregoing preferred embodiment has been provided to illustrate the structural and functional principles of the present invention and is not intended to be limiting. To the contrary, the present invention is intended to encompass all modifications, alterations, and substitutions within the spirit and scope of the appended claims.

Claims

1. A track mounting device for installing an upper track of a folding or sliding door assembly onto a generally horizontal or sloped downwardly facing ceiling surface, the door assembly comprising the upper track and at least one door panel having an upper guiding portion constructed and arranged to be mounted to the upper track, said track mounting device comprising:

an elongated height reducing member having opposing end portions;

a first bracket having a track mounting portion on which the upper track can be fixedly mounted, said first bracket having first mounting structure constructed and arranged to enable said first bracket to be fixedly mounted to one of said opposing end portions of said height reducing member; and

a second bracket having a ceiling mounting portion constructed and arranged to be fixedly mounted to the ceiling surface, said second bracket having second mounting structure constructed and arranged to enable said second bracket to be movably mounted to the other of said opposing end portions of said height reducing member so as to allow said second bracket to be moved relative to said height reducing member to selectively position said ceiling mounting portion at a selected angle with respect to a longitudinal extent of said height reducing member, said second mounting structure being constructed and arranged to enable said second bracket to be fixed against further relative movement with respect to said height reducing member after selectively positioning said ceiling mounting portion at the selected angle so as to fix the ceiling mounting portion at the selected angle;

said height reducing member being constructed and arranged to enable a length thereof to be selected such that, when said ceiling mounting portion of said second bracket is positioned at said selected angle and mounted to the ceiling surface and the upper track is mounted to said track mounting portion, the upper track is spaced below the ceiling surface at a height suitable to allow the upper and lower guide portions of the at least one door panel to be mounted to the upper track for guided opening and closing movements.

2. A track mounting device according to claim 1, wherein said first mounting structure and said second mounting structure are each constructed and arranged to enable said second bracket to be movably mounted directly to said first bracket without said height reducing member therebetween so as to allow said second bracket to be moved relative to said first bracket to selectively position said ceiling mounting portion at a selected angle with respect to said track mounting portion;

said second mounting structure being constructed and arranged to enable said second bracket to be fixed with respect to said first bracket after movably mounting said second bracket directly to said first bracket so as to fix the ceiling mounting portion at the selected angle with respect to said track mounting portion so that, when said ceiling mounting portion is mounted to the ceiling surface and the upper track is mounted to said track mounting portion, the upper track will be disposed in the operating position in generally parallel relation with respect to a lower track at a height suitable to allow the at least one door portion to be mounted to both the upper and lower tracks for guided opening and closing movements.

3. A track mounting device according to claim 2, wherein said first bracket and said second bracket are substantially identical such that either of said

first and second brackets can be mounted to the ceiling or have the upper track mounted thereto.

4. A track mounting device according to claim 1, wherein said second mounting structure comprises a pivotal mounting structure and a fixing structure, said pivotal mounting structure being constructed and arranged to enable said second bracket to be pivotally mounted to the other opposing end portion of said height reducing member so as to allow said second bracket to be moved relative to said height reducing member to selectively position said ceiling mounting portion at the aforesaid selected angle, said fixing structure being engageable with the other opposing end portion of the height reducing member to fix the ceiling mounting portion of said second bracket at the aforesaid selected angle with respect to the longitudinal extent of said height reducing member.

5. A track mounting device according to claim 4, wherein said second bracket has a pair of bores, said pivotal mounting structure and said fixing structure being threaded fasteners which are respectively received through said bores and engageable with the other of said opposing end portions of said height determining member.

6. A track mounting device according to claim 1, wherein said height reducing member is generally rectangular and wherein a length of said height reducing member is determined by cutting said reducing member to said length.

7. A track mounting device according to claim 1, wherein said first and second brackets are substantially identical such that either of said first and second brackets can be mounted to the ceiling or have the upper track mourned thereto.

8. A track mounting device according to claim 7, wherein said first mounting structure and said second mounting structure each comprise a pivotal mounting structure and a fixing structure, said pivotal mounting structures being constructed and arranged to enable said first and second brackets to be pivotally mounted to the opposing end portions of said height reducing member so as to enable said first bracket to be moved relative to said height reducing member to selectively position said track mounting portion generally perpendicularly to the longitudinal extent of said height reducing member and so as to enable said second mounting bracket to be moved relative to said height reducing member to selectively position said ceiling mounting portion at said selected angle with respect to the longitudinal extent of said height reducing member.

9. A track mounting device according to claim 8, wherein each of said first and second brackets has a pair of arcuate flanges concentric with said pivotal mounting structures thereof and wherein said height reducing member has a pair of opposing channels;

said arcuate flanges being constructed and arranged to be received within said opposing channels of said height reducing member so as to restrict relative movement between said brackets and said height reducing member prior to engaging said fixing structures to relative pivotal movement.

10. A track mounting device according to claim 9, wherein said channels face inwardly toward one another.

11. A method for mounting an upper track of a folding or sliding door assembly to a sloped ceiling surface, said method comprising:

providing a first bracket having a ceiling mounting portion constructed and arranged to be mounted to the sloped ceiling surface;
providing a second bracket having a track mounting portion constructed and arranged to have the upper track mounted thereto;
providing an elongated height reducing member having a pair of opposing end portions and a length extending along a longitudinal extent thereof;
mounting said first bracket to said one opposing end portion of said height reducing member;
mounting said second bracket to the other opposing end portion of said height reducing member with said ceiling mounting portion thereof oriented at an angle selected such that when said second bracket is mounted to said sloped ceiling surface the track mounting portion of said first bracket extends generally horizontally;
mounting said upper track to said track mounting portion of said first bracket;
mounting said ceiling mounting portion of said second bracket to said sloped ceiling surface with said ceiling mounting portion oriented at said selected angle with respect to the longitudinal extent of said reducing member such that the track mounting portion of said first bracket extends generally horizontally; and
selecting the length of said height reducing member such that after each of the aforesaid mounting operations have been performed said upper track is spaced below the ceiling surface at a height suitable to allow an upper portion of

at least one door panel to be mounted to the upper track for guided opening and closing movements.

12. A method according to claim 11, wherein said mourning said first bracket to said one opposing end portion of said height reducing member comprises mounting said first bracket to said one opposing end portion of said height reducing member with said track mounting portion oriented generally perpendicular to the longitudinal extent of said height reducing member;
wherein said mounting said second bracket to the other opposing end portion of said height reducing member comprises mounting said second bracket to the other opposing end portion of said height reducing member with said ceiling mounting portion thereof oriented at an angle selected such that when said second bracket is mounted to said sloped ceiling surface the longitudinal extent of said height reducing member extends generally vertically; and
wherein said mounting said ceiling mounting portion of said second bracket to said sloped ceiling surface comprises mounting said ceiling mounting portion of said second bracket to said sloped ceiling surface with said ceiling mounting portion oriented at said selected angle with respect to the longitudinal extent of said reducing member such that longitudinal extent of said height reducing member extends generally vertically.

13. A method according to claim 12, wherein said selecting the length of said height reducing member is performed prior to the aforesaid mourning operations.

14. A method according to claim 13, wherein said mounting upper track to said first bracket is performed prior to mounting said first bracket to said one of said opposing end portions of said height reducing member.

15. A method according to claim 13, wherein said mounting said second bracket to the other opposing end portion of said height reducing member is performed prior to mounting the ceiling mounting portion of said second bracket to said sloped ceiling surface.

16. A method according to claim 13, wherein said selecting the length of said height reducing member is performed by cutting said height reducing member.

17. A track mounting device for mounting an upper track of a folding or sliding door assembly to a sloped downwardly facing ceiling surface, the door assembly comprising the upper track and at least one door panel having an upper guiding portion constructed and arranged to be mounted to the upper track, said track mounting device comprising:

a first bracket having a track mounting portion on which the upper track can be fixedly mounted;
a second bracket having a ceiling mounting portion constructed and arranged to be fixedly mounted to the sloped ceiling surface;
said first and second brackets being constructed and arranged to be coupled to one another such that when said ceiling mounting portion of said second bracket is mounted to said sloped ceiling surface said first bracket can be moved relative to said second bracket until the track mounting portion of said first bracket is oriented generally horizontally at a position whereat the upper track when mounted to said track mounting portion can support the at least one door panel for guided opening and closing movements, said first and second brackets being constructed and arranged such that when the track mounting portion of said first bracket is oriented generally horizontally as aforesaid said first and second brackets can be fixed against relative movement with respect to one another; and
an orientation indicating device constructed and arranged such that as said first bracket is being moved relative to said second bracket as aforesaid said indicating device indicates when said track mounting portion of said first bracket is oriented generally horizontally.

18. A track mounting device according to claim 17, wherein said orientation indicating device comprises an elongated pointer pivotally mounted to said first bracket and an alignment marking provided on said bracket, said indicating device being constructed and arranged such that gravity acts on said pointer to maintain said pointer in a generally vertical orientation and such that when said track mounting portion of said first bracket is oriented generally horizontally said pointer is aligned with said alignment marking, thereby enabling the generally horizontal orientation of said track mounting portion to be visually verified.

19. A track mounting device according to claim 18, wherein said alignment marking is a raised protrusion provided on a track mounting portion.

20. A track mounting device according to claim 18, wherein said first and second brackets are constructed and arranged to be coupled directly to one another.

21. A track mounting device according to claim 18, further comprising a an elongated height reducing member having opposing end portions;

said first bracket having first mounting structure constructed and arranged to enable said first bracket to be fixedly mounted to one of said opposing end portions of said height reducing member;
said second bracket having second mounting structure constructed and arranged to enable said second bracket to be movably mounted to the other of said opposing end portions of said height reducing member such that said brackets are coupled indirectly to one another via said height reducing member and such that when said ceiling mounting portion of said second bracket is mounted to said sloped ceiling surface said height reducing member can be moved relative to said second bracket until track mounting portion said first bracket is oriented generally horizontally as aforesaid, said second mounting structure being constructed and arranged such that said height reducing member can be thereafter fixed against further relative movement with respect to said second bracket.

22. A track mounting device for installing an upper track of a folding or sliding door assembly onto a ceiling surface, said track mounting device comprising:

a height reducing member (58) having end portions;

a first bracket (10) having a track mounting portion (18) on which the upper track can be fixedly mounted and first mounting structure (30) for mounting said first bracket (10) to one of said end portions of said height reducing member; and

a second bracket (10) having a ceiling mounting portion (18) for fixing to a ceiling surface, and a second mounting structure (30) for movably mounting said second bracket to the other of said end portions of said height reducing member (58) in such a manner as to allow said ceiling mounting portion (18) to be positioned at a selected angle with respect to said height reducing member (58).

23. A method of mounting an upper track of a folding or sliding door assembly to a sloped ceiling surface, said method comprising:

mounting a first bracket (10) to one end portion of a height reducing member (58);

mounting a second bracket (10) to an opposite end portion of said height reducing member (58) with a ceiling mounting portion (18) of said second bracket movable to be oriented at a selected angle relative to the height reducing member (58);

mounting said upper track to a track mounting portion (18) of said first bracket (10);

mounting said ceiling mounting portion (18) of said second bracket (10) to said sloped ceiling surface in such a manner that the track mounting portion (18) of said second bracket (10) extends generally horizontally.

24. A track mounting device for mounting an upper track of a folding or sliding door assembly to a sloped downwardly facing ceiling surface, said track mounting device comprising:

a first bracket (10) having a track mounting portion (18) on which the upper track can be mounted;

a second bracket (10) having a ceiling mounting portion (18) for mounting to a sloped ceiling surface;

said ceiling mounting portion (18) of said second bracket (10) being movable relative to said track mounting portion (18) of said first bracket (10) such that when said ceiling mounting portion (18) is mounted on said sloped ceiling surface said track mounting portion (18) can be oriented generally horizontally; and

an orientation indicating device (100) for indicating when said track mounting portion (18) of said first bracket (10) is oriented generally horizontally.

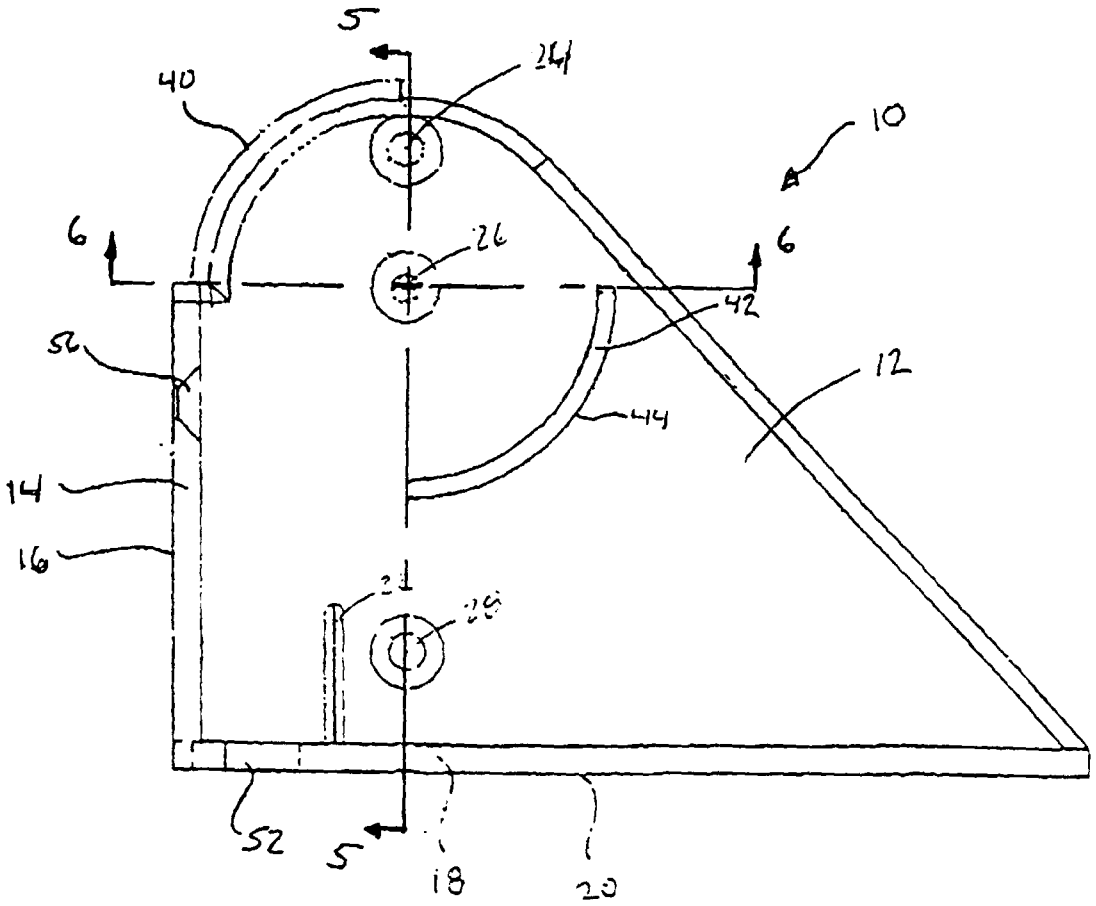

FIG. 1

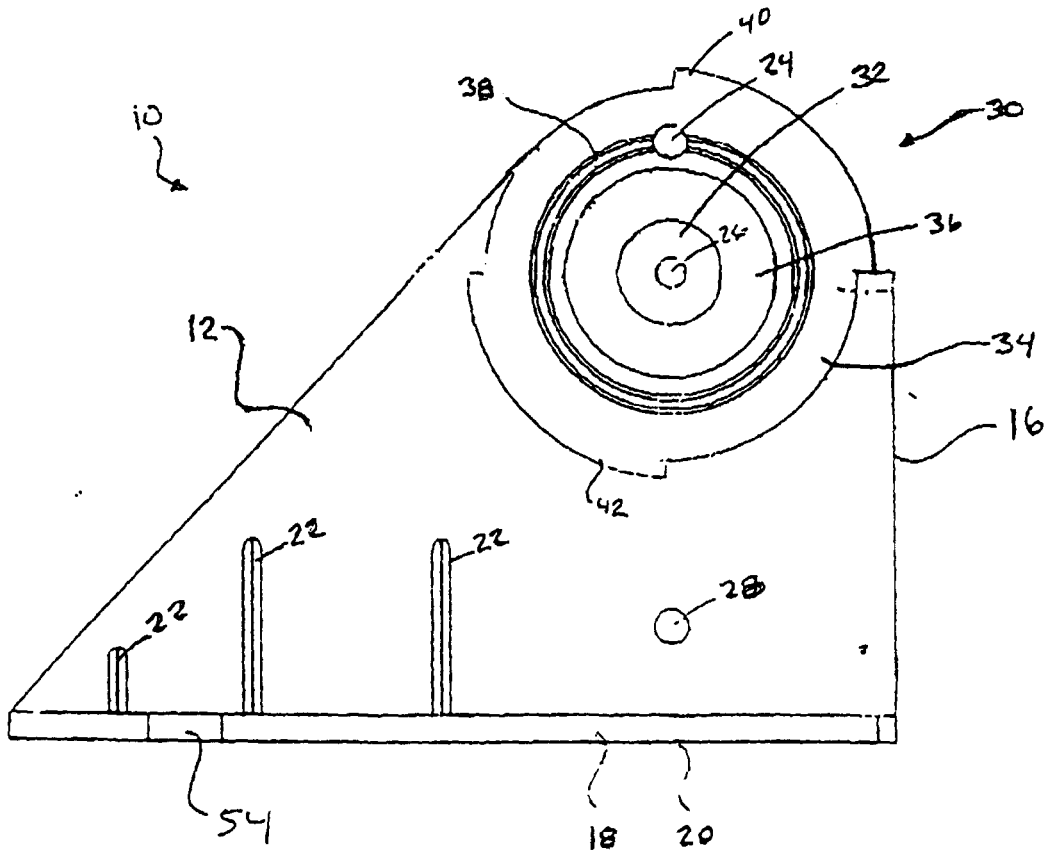

FIG. 2

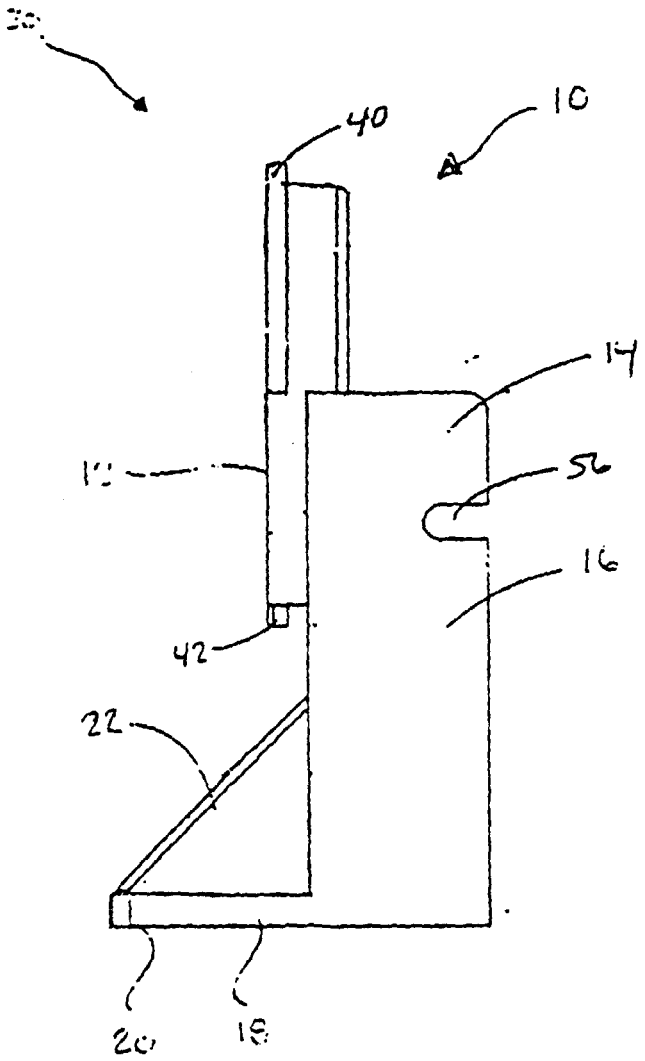

FIG. 3

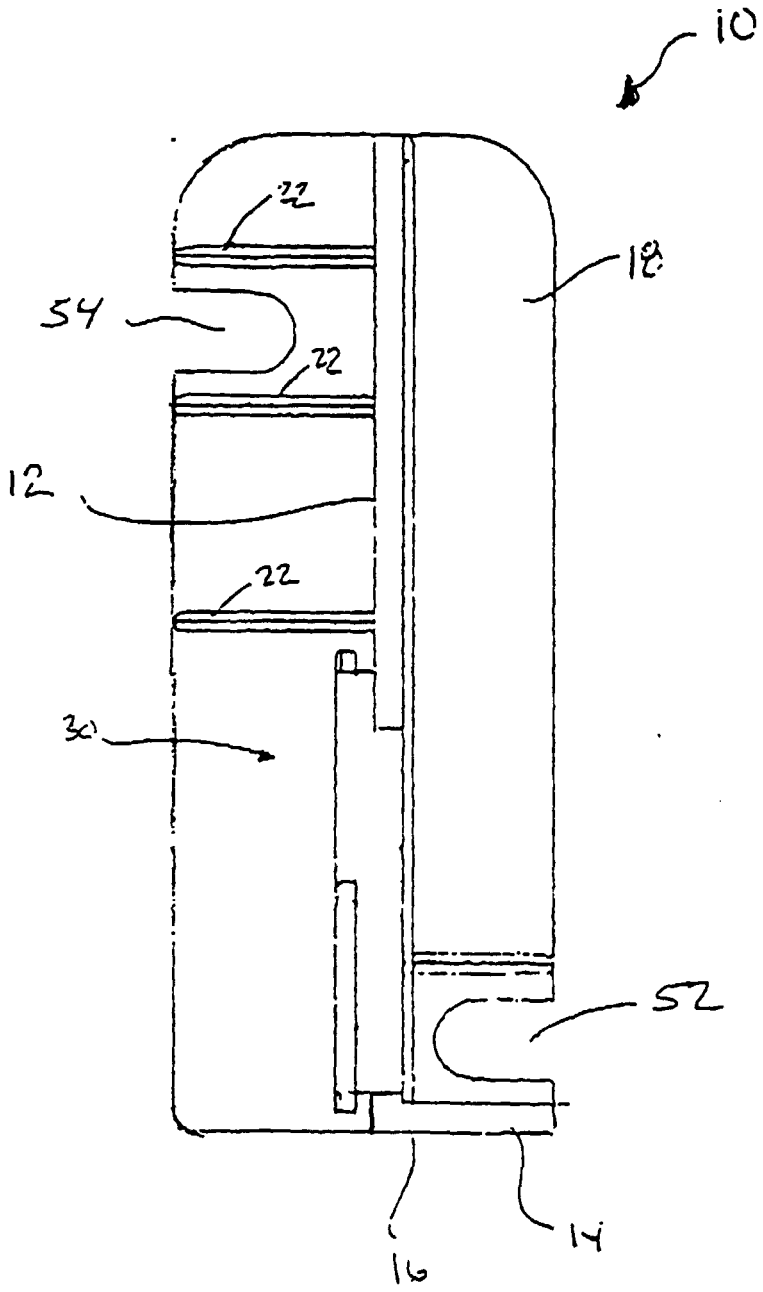

FIG. 4

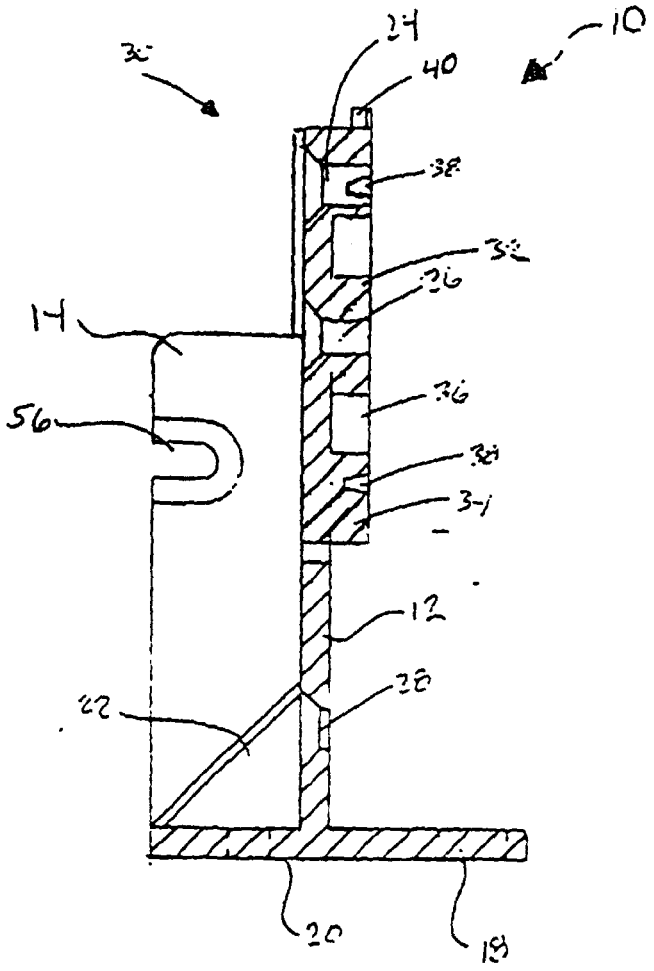

FIG. 5

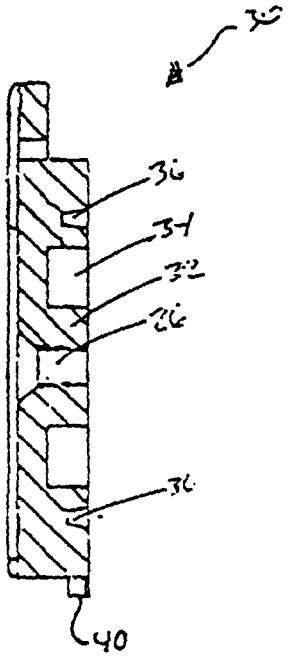

Fig. 6

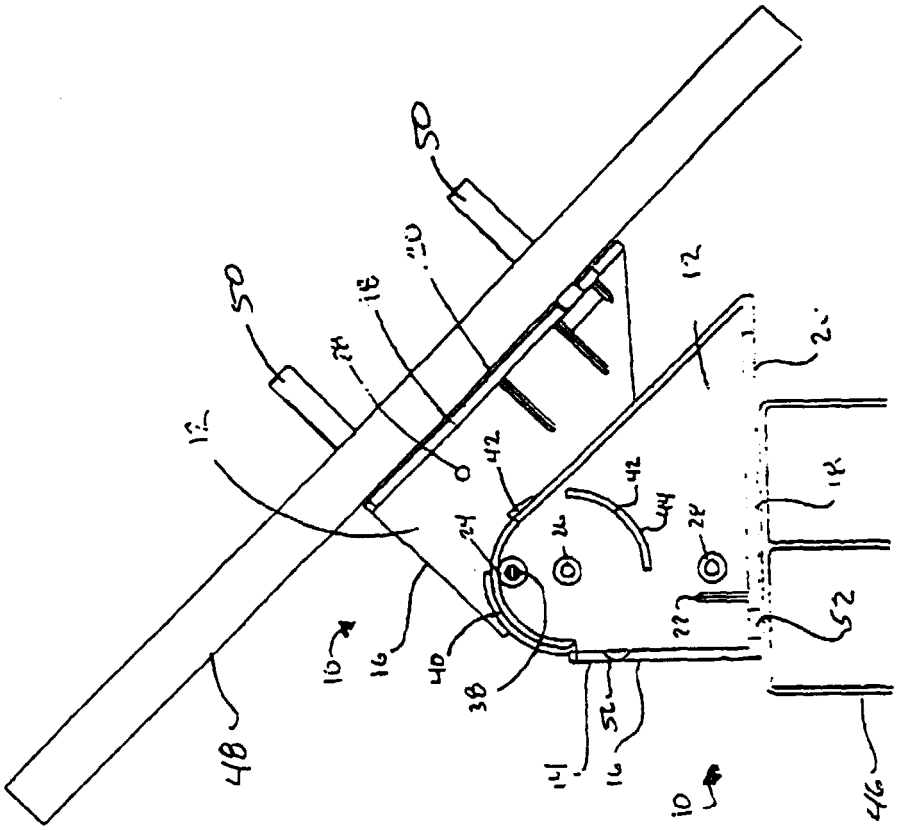

FIG. 8

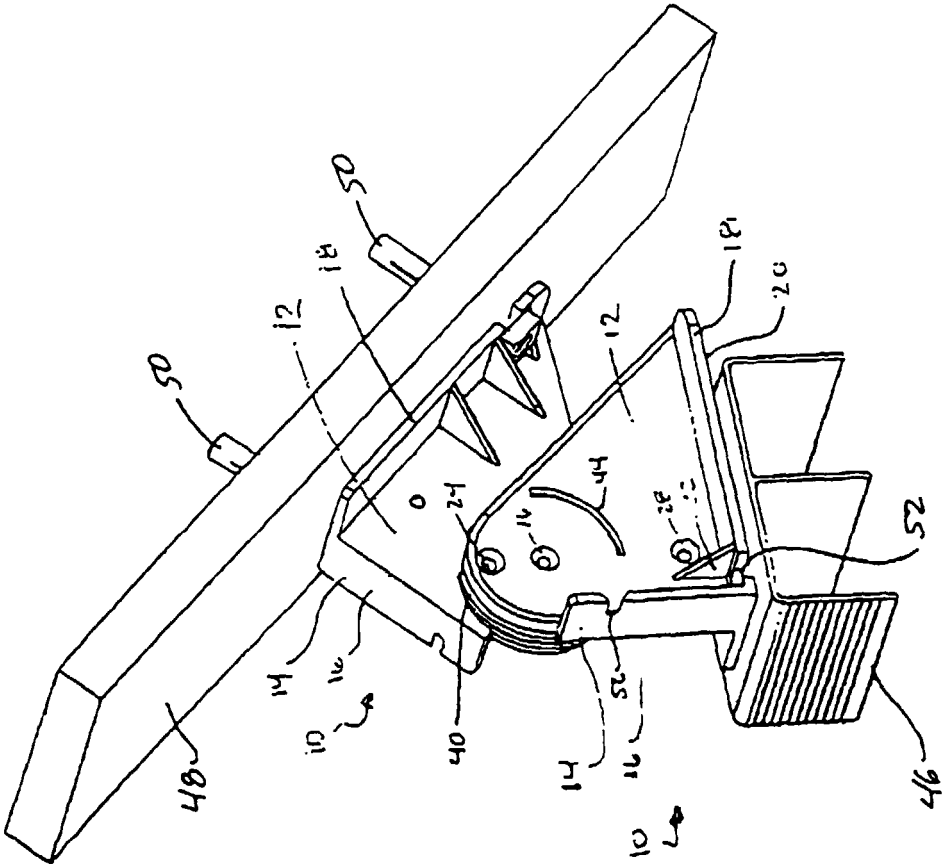

FIG. 7

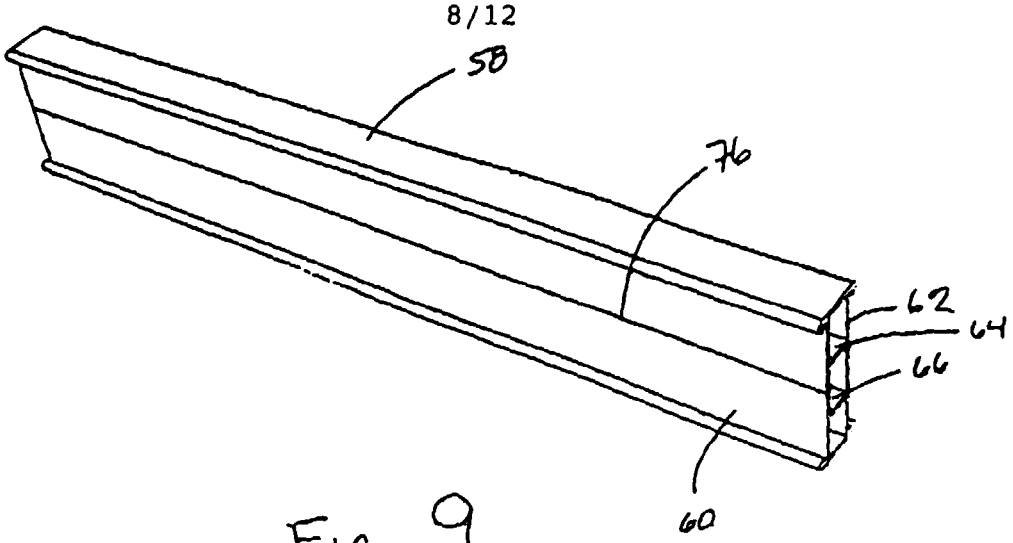

FIG. 9

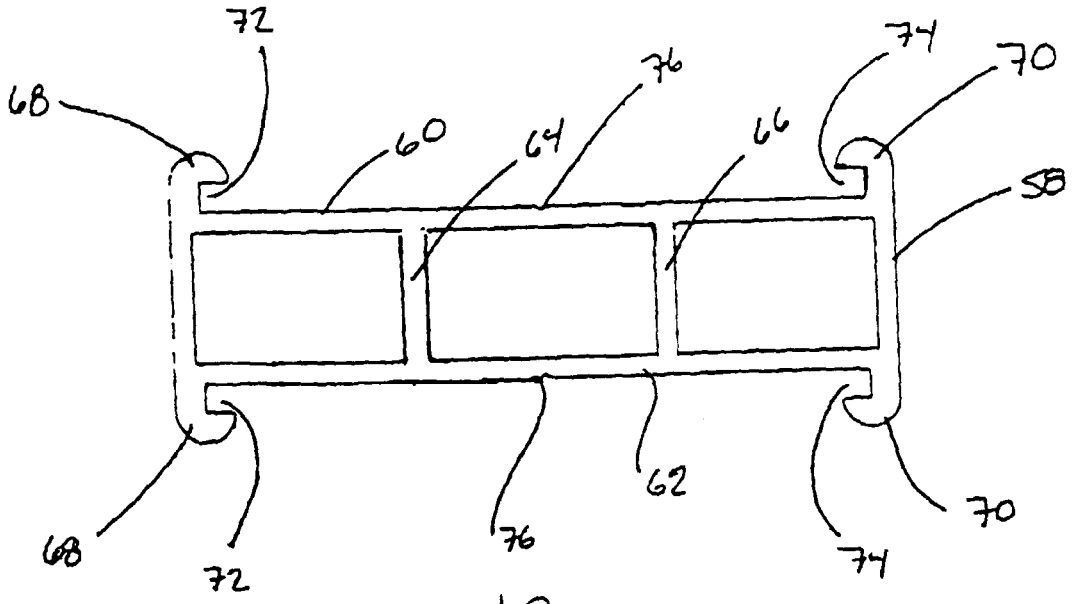

FIG. 10

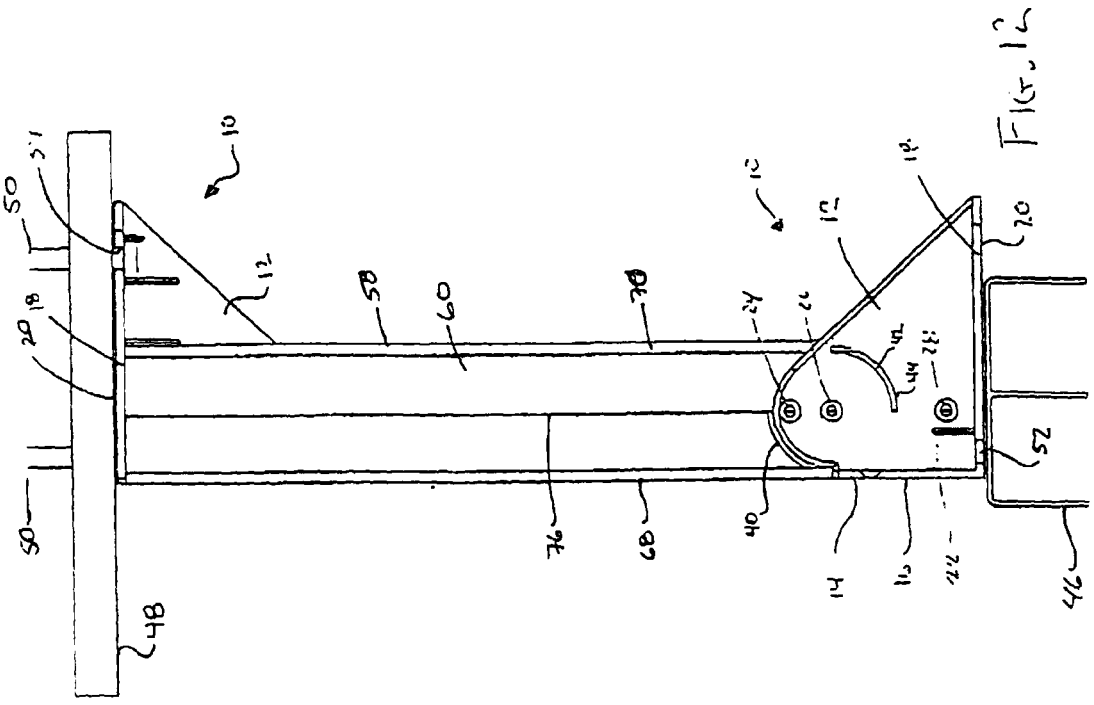

FIG. 12

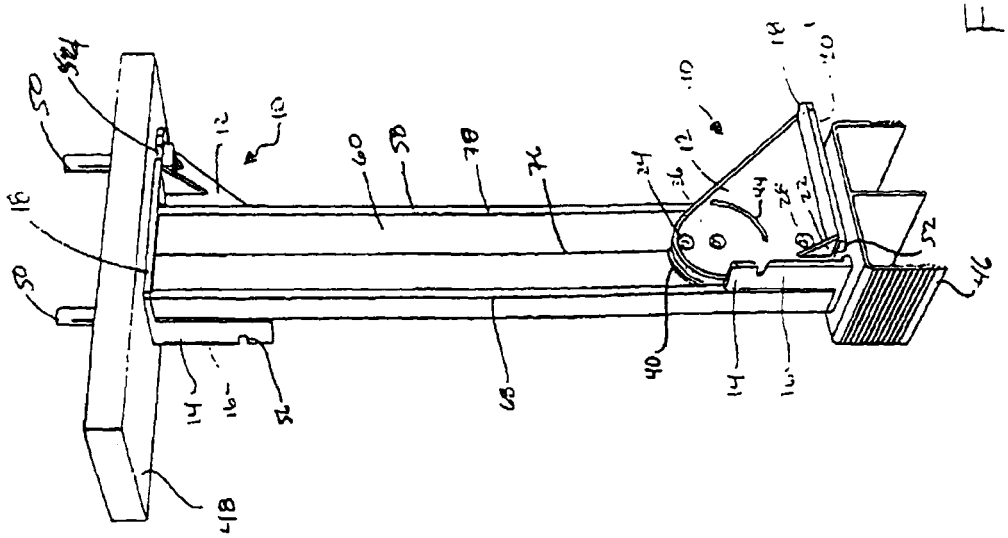

FIG. 11

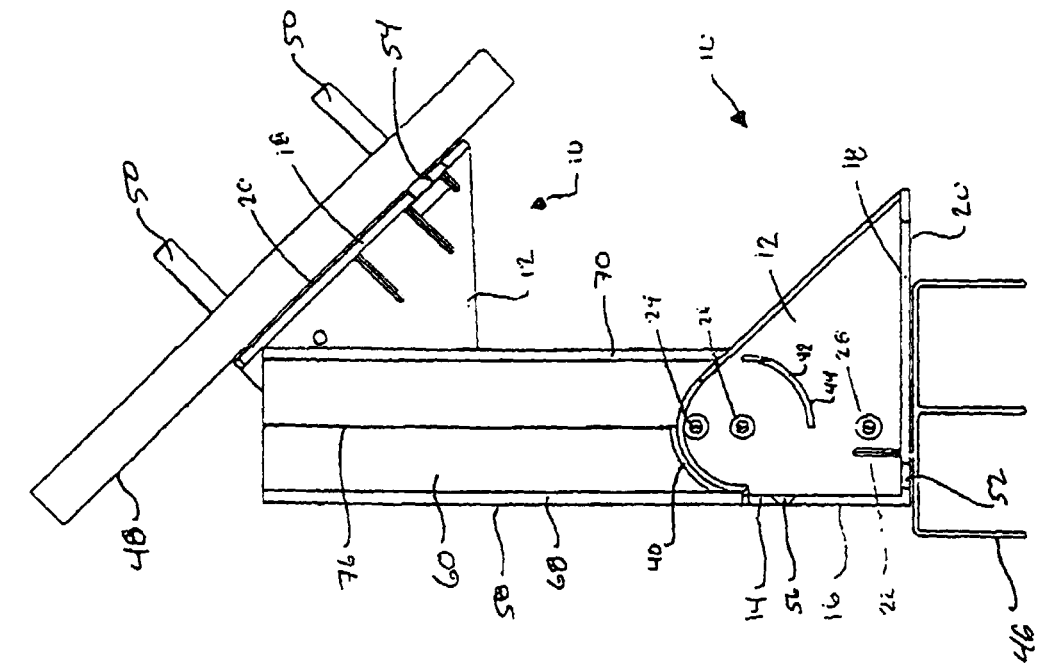

FIG. 14

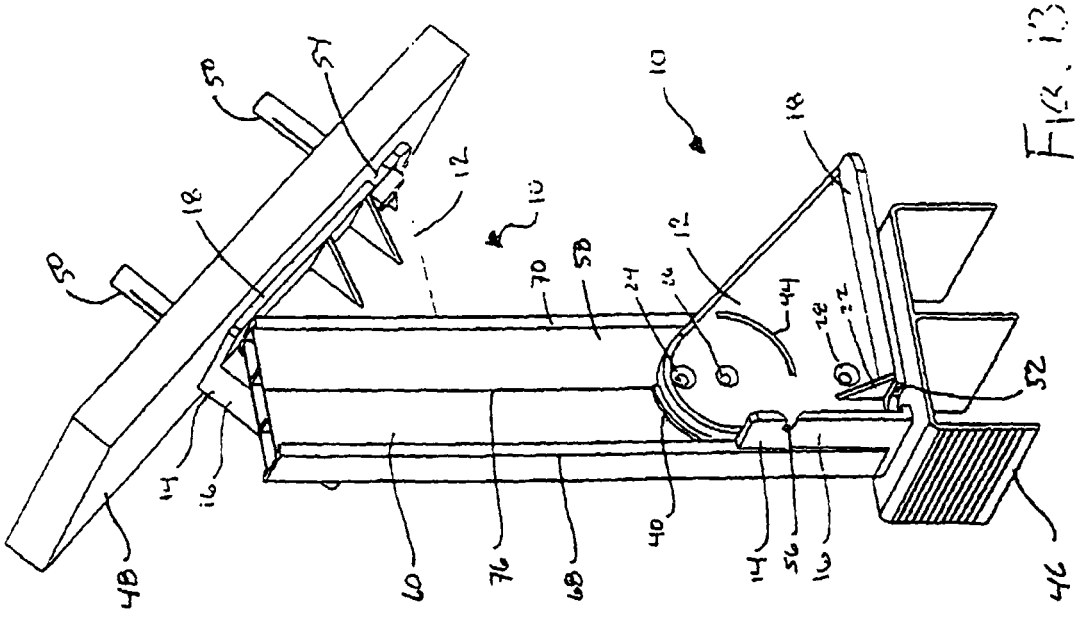

FIG. 13

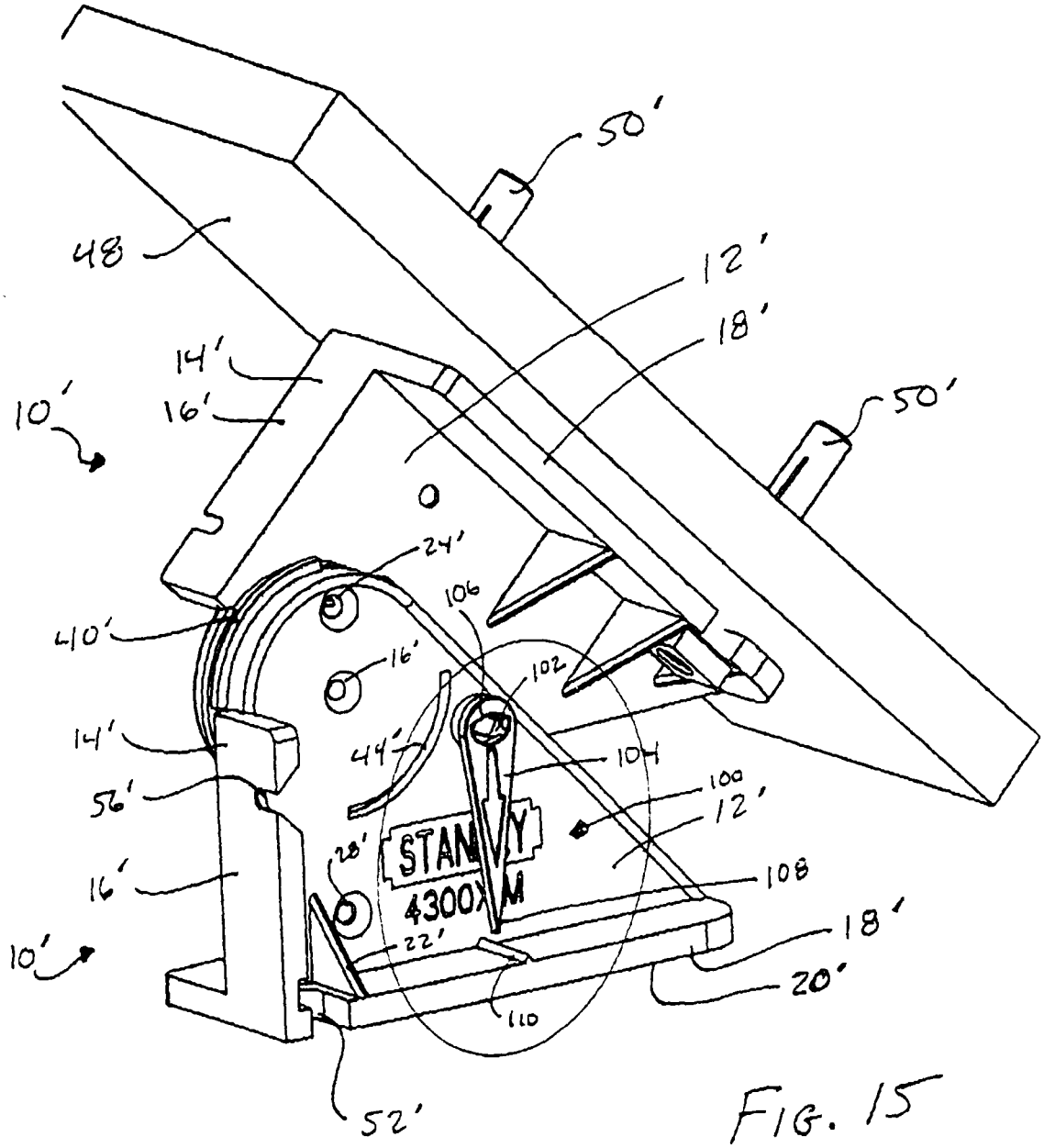
50'
48
12'
18'
14'
16'
10'
50'
24'
106
40'
16'
102
14'
44'
104
56'
100
12'
28'
STANLEY
4300M
16'
108
18'
10'
22'
20'
110
52'

FIG. 15

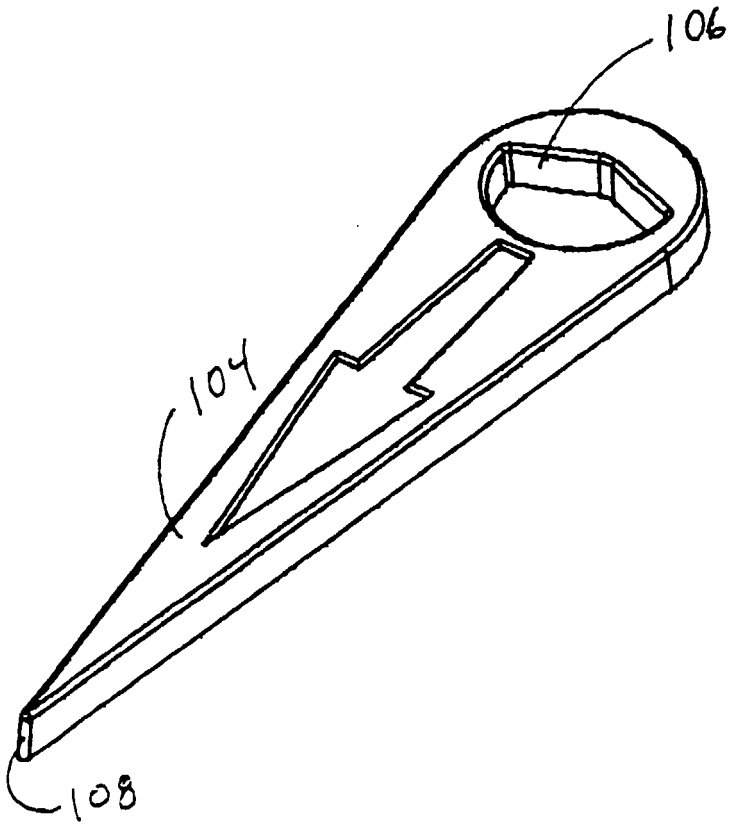

FIG. 16