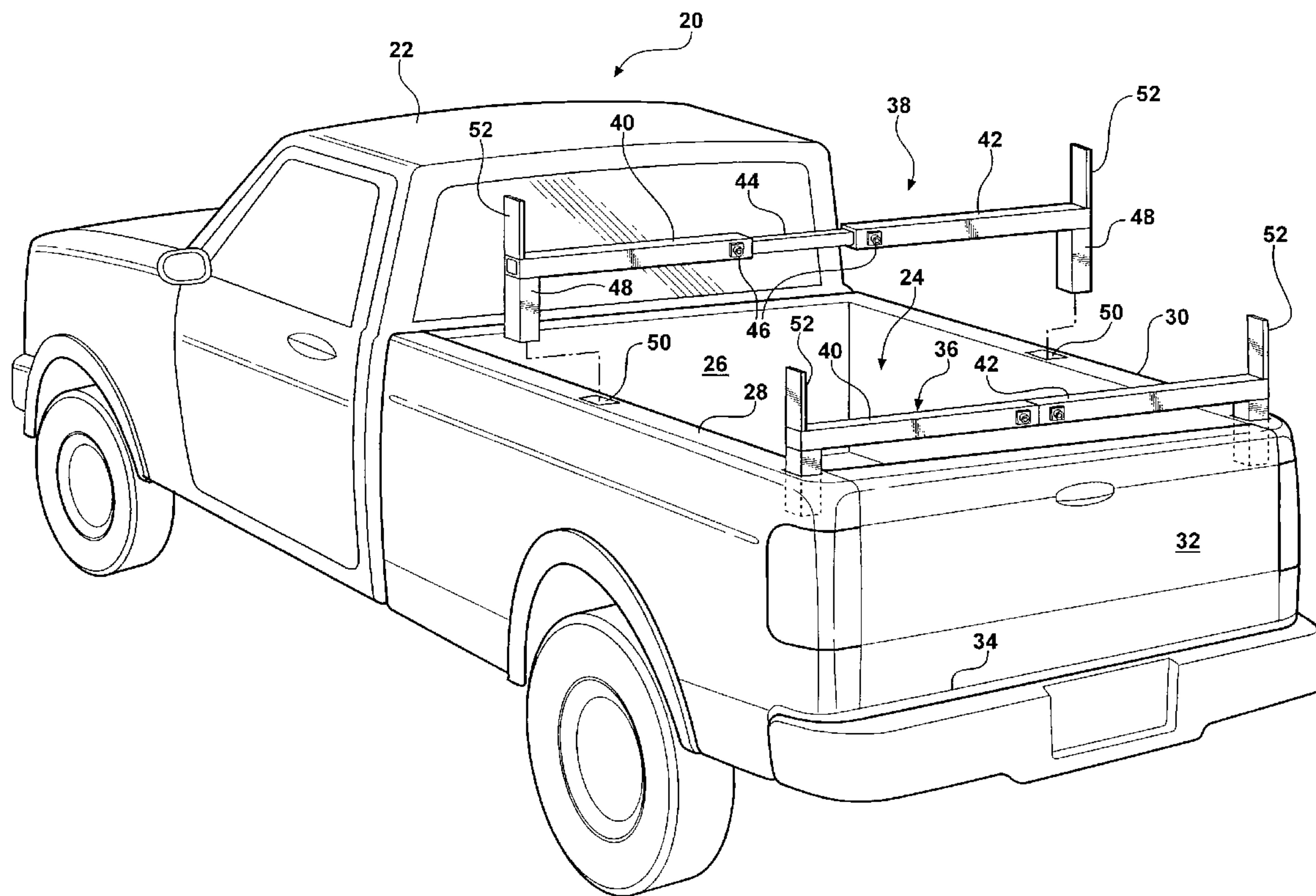




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(57) Abrégé/Abstract:

A load support for the attachment to the box of a pickup truck to assist in retaining loads carried by the truck employs cross members of adjustable length to accommodate pickup truck beds of varying widths. The ends of the cross member include structures for securing the ends to the top edges of the opposed side rails of the truck. The transversely extending load support includes upright members on its two ends for limiting sliding motion of loads supported on top of the cross bar. Various attachments for securing particular loads, such as bicycles or the like, to the cross bar may be fixed to the cross bar or removably attached to the cross bar through sleeves which surround the cross bar and may be fixed to it by set screws.

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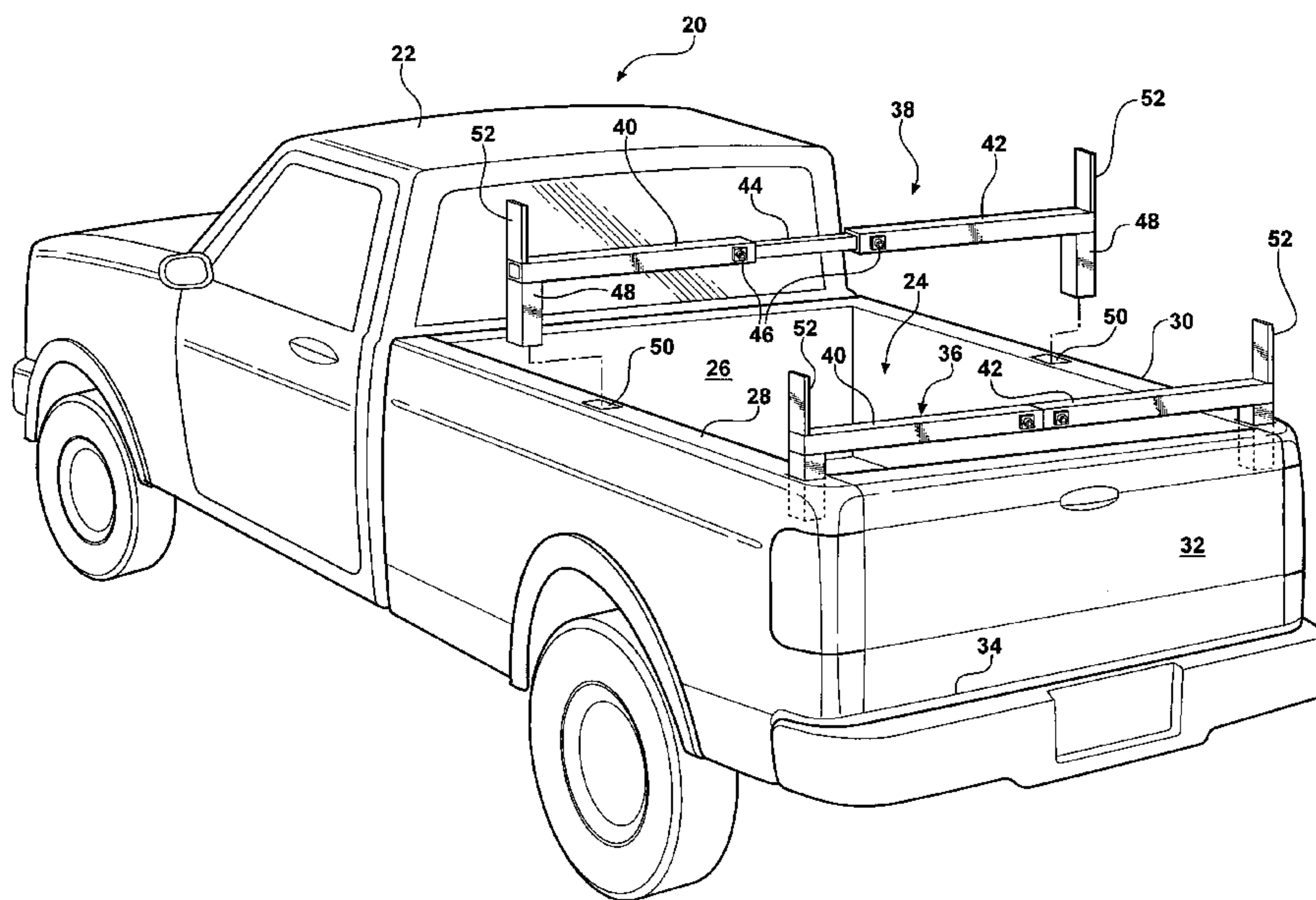
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(54) Title: LOAD SUPPORT FOR PICKUP TRUCKS



(57) Abstract: A load support for the attachment to the box of a pickup truck to assist in retaining loads carried by the truck employs cross members of adjustable length to accommodate pickup truck beds of varying widths. The ends of the cross member include structures for securing the ends to the top edges of the opposed side rails of the truck. The transversely extending load support includes upright members on its two ends for limiting sliding motion of loads supported on top of the cross bar. Various attachments for securing particular loads, such as bicycles or the like, to the cross bar may be fixed to the cross bar or removably attached to the cross bar through sleeves which surround the cross bar and may be fixed to it by set screws.

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## LOAD SUPPORT FOR PICKUP TRUCKS

### RELATED APPLICATION

This application claims priority of United States Provisional Patent Application Serial No. 60/618,831 filed October 14, 2005, which is incorporated herein by reference.

### 5 FIELD OF THE INVENTION

This invention generally relates to apparatus for use with pickup trucks and the like to support loads with respect to the pickup truck box, and more particularly to devices adapted to extend laterally across the width of a pickup truck box at the height of the sidewall and to variations on such devices for supporting particular types of loads.

### 10 BACKGROUND OF THE INVENTION

Pickup trucks constitute light trucks with an open-top cargo area with fairly short rigid sides and a rear end defined by a tailgate that is pivotably supported at its lower end at the rear of the cargo area. The relatively small size of the truck box makes it difficult to support a variety of loads which might otherwise be desirable to carry in the pickup truck, such as loads that have a length in excess of the linear dimension of the box, including ladders, lengths of lumber and the like. These long loads are typically positioned in pickup truck boxes so that one end is supported on the floor of the box, a midpoint of the load is supported on the top of the closed tailgate, and the rear end of the load projects upwardly over the tailgate. In this position a major portion of the load is supported on the top of the tailgate, and inevitable vibration and bouncing of the load during motion of the vehicle tends to mar or deform the tailgate.

Other forms of loads are also difficult to carry in a conventional pickup truck such as bicycles, long construction tools such as shovels and rakes, and the like. It is often desirable to transport all terrain vehicles (ATVs) which do not conveniently fit in the box of the pickup truck.

### 25 SUMMARY OF THE INVENTION

The present invention is accordingly directed toward a device which may be easily attached to pickup truck boxes and may be used, along with accessories specially designed to cooperate with the device, to support a wide variety of loads that are difficult or

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inconvenient to transport in a conventional pickup truck and particularly to transport them so they do not rest on the top of the tailgate of the pickup truck.

The devices of the present invention preferably take the form of elongated beams of adjustable length, to fit pickup truck boxes of a variety of widths, having fittings on their  
5 opposed ends which allow them to be secured to the tops of the opposed sidewalls of the pickup truck box, so that the beam extends across the width of the box, forward of the tailgate, at a height approximating the height of the sidewalls. After this device is attached to the pickup truck box, loads which are longer than the length of the box may be supported with one end on the floor of the box, with their midsection supported on the cross rail, and  
10 their end projecting beyond the box, over the closed tailgate.

The adjustment of the length of the load support device of the present invention to fit boxes of differing width may involve a telescopic arrangement in which the primary load support constitutes an elongated tubular section and sections of smaller dimensions, complementary to the internal dimensions of the primary tube, telescope within the primary  
15 tube. The position of the smaller section within the primary section may be locked through use of one or more locking screws which fit in threaded holes in the outer section and bear against the outer surface of the inner section. These telescoping sections may be incorporated on both ends of the primary tube, on one end, or a primary tube may be divided into two sections with a telescoping section joining them. Alternatively, the  
20 smaller telescoping section may have a series of holes formed through its width, at spaced points along its length, and a pin may be inserted into the holes and through a hole in the larger telescoping section, to lock the two sections at a chosen length.

The ends of the load support preferably incorporate sections which extend at right angles to the primary load support, at its ends, and that fit into load support holes that are  
25 formed at the top of most pickup truck side rails. In a typical truck there may be three holes in the top of each side rail, one immediately behind the cab, one immediately adjacent the tailgate, and one in the middle. The right angle sections at the two opposed ends of the cross bar of the present invention are formed complementary to these holes, which are usually square, and fit into those holes so that the bar extends across the width of the bed.  
30 In an alternative embodiment of the invention, C clamps are secured to the two ends of the bar and incorporate set screws which allow them to grip the top and the bottom of side rail ledges to secure the bar across the width of the truck box. This C clamp arrangement may be designed to elevate the cross bar with respect to the side rails.

The preferred embodiment of the invention is made of rectangular aluminum tubing with the inserts for the side rail holes welded to the bars. The devices also preferably incorporate right angle extensions at the two ends of the bar which project in an opposite direction from these inserts so as to extend above the tops of the side rails and prevent an elongated load supported on the cross bar from shifting over the edge of the device.

In certain supporting arrangements more than one cross bar may be employed, with the cross bars secured to different holes in the side rails.

A variety of supports for specific devices may be incorporated on the cross bars either by permanent attachment, as by welding, releasably securing the supports to the cross bar as with bolts fitting into threaded holes in the cross bar, or by incorporating the attachments on sleeves that may be slid over the cross bars.

Bicycles are often carried in pickup trucks and while they may fit within the bed of the truck, a conventional truck lacks means for supporting the bikes in a fixed position so that they are not damaged during transport. The cross bar of the present invention may be equipped with a bike carrier to solve this problem. One form of carrier, which will be subsequently described in detail, constitutes a speed release lock for the front fork of the bike, of the type used to secure the front wheel. This speed release lock may be permanently affixed to a side rail, releasably joined to the side rail, or incorporated in a sleeve that fits over the side rail and may be locked in position on the side rail. Racks may be provided for more than one bike. The bike support could also be in the form of a rack which accepts the tire of the bike and incorporates straps for extending through the wheel or the frame to support the bike on the cross bar. A pair of these racks could be employed on forward and rear cross bars to retain both of the tires. Alternatively, one tire rack and one speed release fork rack could be provided on separate cross bars or on laterally spaced points on the same cross bar. Again, these fixtures could be permanently attached or formed on sleeves which fit over the cross bars.

Similar support fixtures could be provided for other frequently carried items such as kayaks, boats or the like.

A series of spring-like garden tool holders may be fixed to a rack either permanently or removably, to secure items such as shovels, brooms, rakes and the like.

Another attachment for the cross bar, which will be subsequently disclosed in detail, is a support for items such as are desirable to retain on the outer sides of the sidewalls. In a preferred embodiment of the invention these supports take the form of a vertical member

and a right angle support stand formed at the bottom of the vertical member. The top of the vertical member includes a right angle section that telescopes within the exposed end of the cross bar.

5 Other implements that could be fixed to or attached to the cross bar include vertically extending post holders which can support straps for retaining articles, cargo anchors for receiving straps for extending above the rack, and the like.

Another embodiment of the invention which will be subsequently disclosed in detail constitutes an elevated cross bar extending upwardly from C clamps affixed to guide rails on opposite sides of the truck bed. The upper ends of the vertical members support end sections which telescope within a tubular cross member to provide an elevated support.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, advantages and applications of the present invention will be made apparent from the following detailed description of preferred embodiments of the invention. The description makes reference to the accompanying drawings in which:

15 Figure 1 is a perspective view of a pickup truck equipped with a cross bar formed in accordance with the present invention and illustrating another version of the same cross bar, in exploded view, adapted to be inserted into the cargo holders of the pickup truck;

Figure 2 is a rear view of the cross bar of Figure 1 installed on a pickup truck, with the pickup truck box illustrated in phantom;

20 Figure 3 is a view, similar to Figure 2, of a second version of the cross bar of the present invention, which attaches to the rail of a pickup truck box by C clamp;

Figure 4 is a detailed, partially broken away perspective view of one end of the cross bar of Figure 3, ready for attachment to a pickup truck;

25 Figure 5 is a rear view, similar to Figures 2 and 3, of a third embodiment of the cross bar of the present invention;

Figure 6 is a view, similar to Figures 2, 3 and 5, of a fourth embodiment of the cross bar of the present invention, including a structure for elevating it above the side rails;

Figure 7 is a perspective view of the cross bar of Figure 6 equipped with garden tool holders, showing the portions of the pickup truck and the garden tool holders in phantom;

30 Figure 8 is a perspective view of a pickup truck and components necessary for converting the pickup truck to allow the support of an all terrain vehicle on the truck, with the accessory components illustrated in exploded form;

Figure 9 is a perspective view of the pickup truck of Figure 8 with the equipment installed and an all terrain vehicle supported on top of the platform and shown in phantom;

Figure 10 is a detailed perspective view of a cross bar equipped with a quick release clamp for securing the front forks of a bicycle, with the forks, shown broken away, attached to the clamp;

Figure 11 is a perspective view of an attachment for the cross member, with the cross member illustrated in phantom, incorporating a quick release clamp for bicycle forks;

Figure 12 is a perspective view of an attachment for a cross rail which supports a cargo holder loop;

Figure 13 is a perspective view of an attachment for the cross bars which supports a stand for the front wheels of bicycles;

Figure 14 is a perspective view of another form of clamp for use with the cross bars, having a cargo holder hook affixed to it;

Figure 15 is a perspective view of a sleeve for surrounding a cross bar and having a bicycle wheel support affixed thereto;

Figure 16 is a perspective view of a sleeve for a cross rail adapted to support a kayak or the like; and

Figure 17 is an illustration of an attachment for the cross members for securing a platform at the outer side of one of the side rails.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, Figure 1 illustrates a conventional pickup truck, generally indicated at 20. The pickup truck has a cab 22 and a box, generally indicated at 24. The box is defined by a rear wall 26 of the cab, a pair of opposed side rails 28 and 30, and a rear tailgate 32. The tailgate is hingedly supported at its bottom edge 34 with respect to the rear end of the pickup truck box. It is shown in its closed, elevated position, but may be moved to an inclined open position.

A pair of cross members, generally indicated at 36 and 38, representing a first preferred embodiment of the invention, are illustrated in association with the pickup truck 20. The member 36 is installed with respect to the bed 24 by virtue of sections which insert into the cargo holder holes in the opposed sidewalls. The cross member 38 is shown in exploded form, ready to be installed in another pair of cargo holder holes.



Each of the bars 36 and 38 are formed of a pair of rectangular cross-section tubular aluminum sections 40 and 42, joined by an intermediate bridging section 44, visible in the exploded section 38. The section 44 is a rectangular aluminum section having outer dimensions complementary to the inner dimensions of the larger diameter tubes 40 and 42 so that it may slide within the tubes in a telescoping manner. A pair of set screws 46 formed in threaded holes adjacent to the opposing ends of the sections 40 and 42 may be used to lock the bridging section 44 in a desired position, so as to adjust the overall length of the cross members 36 and 38. The cross member 36 is illustrated at a minimum extension.

Each of the cross members 36 and 38 includes a pair of rectangular sections 48 welded to the outer ends of the tubes 40 and 42 so as to project at right angles with respect to the central axis of the tubes 40 and 42. The sections 48 have dimensions complementary to cargo holder holes 50 formed at spaced points along the length of the side rails 28 and 30 of the truck bed. When the cross rail is adjusted to an appropriate length and its end sections 48 are inserted into the cargo holder holes 50 in the opposed sidewalls, the cross member extends transversely across the width of the bed, in the manner of the cross member 36. The cross members also include upward extending sections 52, formed at their ends, and projecting in a direction opposite to the sections 48, but also at right angles to the length of the main tube section. These sections prevent loads supported on the cross members 36 or 38 from sliding off the edge.

From Figure 1 it is clear that a load which is too long to be supported within the truck box 24 may be supported so that its forward end rests against the base of the box and a point along its length bears against the cross member 36 so that its rear end projects freely above the tailgate 32. In this manner the load may be carried without marring the tailgate.

The cross member 36 is illustrated from the rear end in Figure 2 to show how the members 48 fit within the cargo holder holes formed in the top of the tailgates 28 and 30.

Figure 3 illustrates an alternative embodiment of the cross member of the present invention, as supported on tailgates 28 and 30, having ledges 60 and 62 formed inwardly at their top sides. The cross member comprises a single elongated rectangular tubular section 64 having a pair of smaller cross section end members 66 and 68 telescopically projecting within its opposed ends. The length of the cross member is adjusted by locking the sections 66 and 68 within the section 64 by means of upward extending locking screws 70 and 72 which are supported in threaded holes in the cross bar 64, and horizontally projecting

locking screws 74 and 76. Each of the end sections 66 and 68 carries a C clamp, generally indicated at 80 and 82. The C clamp 80 is illustrated in detail in the perspective view of Figure 4. It comprises upper and lower clamp sections 82 and 84, respectively, joined by an upright connecting section 86 which is welded to the end of member 66. A set screw 88 projects through a threaded hole in the lower locking member 84 and may be used to lock against the lower side of the cross rail ledge 60, while the inner side of the upper clamp section 82 bears against the top of the ledge.

In Figure 5 a third version of the cross member of the present invention, generally indicated at 90, is illustrated in position with respect to the side rails 28 and 30 of the pickup truck. Its central tubular section 92 is substantially identical to the section 64 of the embodiment of Figures 3 and 4 and includes vertical locking screws 94 and 96 at its opposed ends and associated horizontal locking screws 98 and 100. The end members 102 and 104, which telescopically extend into the opposed ends of the member 92, are welded to the top members of C clamps generally indicated at 104 and 108, so as to elevate the cross member above the tops of the side rails 28 and 30. Otherwise, the embodiment of Figure 5 is substantially similar to the embodiments of Figures 3 and 4.

Still another embodiment of the cross member is illustrated in Figure 6. The cross bar 110, with its end locking screws, is telescopically joined to end members 112 and 114. These horizontal members have their outer ends welded to points below the top of upwardly inclined bars 116 and 118 which are welded to the top members of C clamps generally indicated at 120 and 122. The free upper ends of the bars 116 and 118 project above the bar 110 and act as work stops. Thus the cross member 110 is substantially elevated above the tops of the side rails 28 and 30 which are illustrated in phantom.

Figure 7 illustrates an embodiment of the cross member, in substantially the same form as Figure 6, having a bar 130 welded or otherwise joined to one surface, which incorporates a plurality of spring-like holders 132. The holders 132 are of the spring type conventionally used to support brooms, garden tools and the like. Figure 7 shows a plurality of tubular handles 134 in phantom form supported in the holders 32. They may be the handles of shovels, rakes, tubes or pipes or the like.

Figure 8 illustrates cross members and accessories for creating a platform above the pickup truck box for supporting a large load. A pair of cross members, generally indicated at 142 and 144, of the type illustrated in Figure 5, are used in the system. The cross member 142 is illustrated as being clamped to the top ledges 146 and 148 of the side rails

of the pickup truck 20. The cross member 142 is shown installed and the cross member 144 in exploded form before installing on the side rails. Once the cross members are installed, a planar platform member 150, which may be a sheet of plywood or the like, is supported on the tops of the cross members 142 and 144, above the sides of the pickup truck. When not in use the ramps 152 and 154 may be collapsed in a telescoping manner and easily stored in the truck bed.

Figure 10 illustrates a quick release locking mechanism, generally indicated at 160, of the type used to secure the front forks 162 of a bicycle from which the front wheel has been removed. The quick release lock 160 is illustrated as welded to a cross member tube 92, shown broken away. In this manner, a bicycle can be easily secured and carried in the pickup truck.

The quick release lock mechanism 160 may also be formed as part of a sleeve 164, illustrated in Figure 11, which is designed to surround the cross member tube 92. The member 164 has a quick release locking element 160 welded or otherwise secured to its top, its lower edge 166 is convex, and it carries a locking screw 168 which moves in a threaded hole in the bottom 166 to firmly lock the member 164 along the length of the cross bar 92. In this manner a conventional cross bar may be used and various attachments may be secured to the cross bar to carry particular types of loads.

Figure 12 shows a similar sleeve member 170 which has an upright 172 with a central hole 174 secured to its top side. Again, a locking screw 176 may be used to secure the sleeve on the cross member tube 92 or one of the tubes of the alternative forms of the cross member. The upright 172 and its hole 174 may be used to retain one end of a rope or bungee cord or the like which is used to secure cargo.

Figure 13 illustrates a similar sleeve 180 which carries a bike tire rack 182 fixed to its top edge to allow one or more bikes to be carried on the pickup truck in a secure manner. The rack 182 may be used to retain the rear tire of a vehicle alone or in combination with another quick lock fastener of the type illustrated in Figure 10 or 11 to secure the front fork of the vehicle. Various forms of holders may be provided for boats or kayaks, such as the saddle shaped high density foam saddle 210 illustrated in Figure 16 as being retained on a cross member tube 92.

Figure 17 illustrates an attachment for the cross members for supporting a platform 200 on the outer side of the side rails. This platform might be used for a wide variety of purposes such as supporting supplies for a "tailgate" party. The platform 200 is attached to

the lower end of a bar 202 adapted to extend vertically along an outer side of a side rail 30 which supports one end of a cross member, generally indicated at support bar 204. The top of the bar 202 carries a right-angular tubular member 206 adapted to telescope within the tubular end of the cross member to support the bar over the outer side of the side rail 30 with the platform 200 extending horizontally away from the side rail. The platform may be used to support any of a variety of items.

One of ordinary skill in the art will recognize that a wide variety of specialized fixtures might be secured to or attached to the cross members of the present invention to secure particular loads in a pickup truck vehicle.

Having thus described my invention, I claim:

**AMENDED CLAIMS**

[received by the International Bureau on 05 June 2006 (05.06.2006);  
original claims 1-19 canceled, claims 20, 21 amended and claims 22, 23 added]  
+ Statement

**CLAIMS**

20. The load support of claim 22 where the ramp for elevating a load onto the platform comprises an elongated ramp adapted to have one end secured to at least one of the support rails and the other end supported at a lower elevation on which the truck rests whereby a load may be moved up the ramp onto the platform.

21. The apparatus of claim 23 wherein the ramp comprises a plurality of telescoping sections so that it may be disposed in a compressed form wherein the sections telescope within one another or an extended form in which the sections extend from one another.

22. A load support for use with the bed of a pickup truck of the type having a box bounded on opposed sides with fixed side rails terminating at their top edges with ledges extending in the direction of the opposite side rail and at its rear with a tailgate pivotably supported at the rear of the box so as to be movable between an upright position in which opposed edges of the side rail bear against the rear edges of the side rails, closing the box, and an open position wherein the tailgate is pivoted downwardly relative to the side rails, comprising:

a first elongated bar of rectangular tubing;

a first clamp fixed to one end of the first rectangular bar;

a second bar of rectangular tubing having outer dimensions complementary to the inner dimensions of the first bar so that the second bar may telescope within the first bar;

a second clamp fixed to one end of the second bar;

the first and second clamps each comprising a first section adapted to overlay a ledge of a side rail and a screw member threaded in a hole in the clamp and adapted to urge the first section into pressured engagement with its associated ledge when threaded into the hole;

a locking screw threaded in a hole in one side of the first tube for engaging a section on the outer surface of the second tube telescoping within

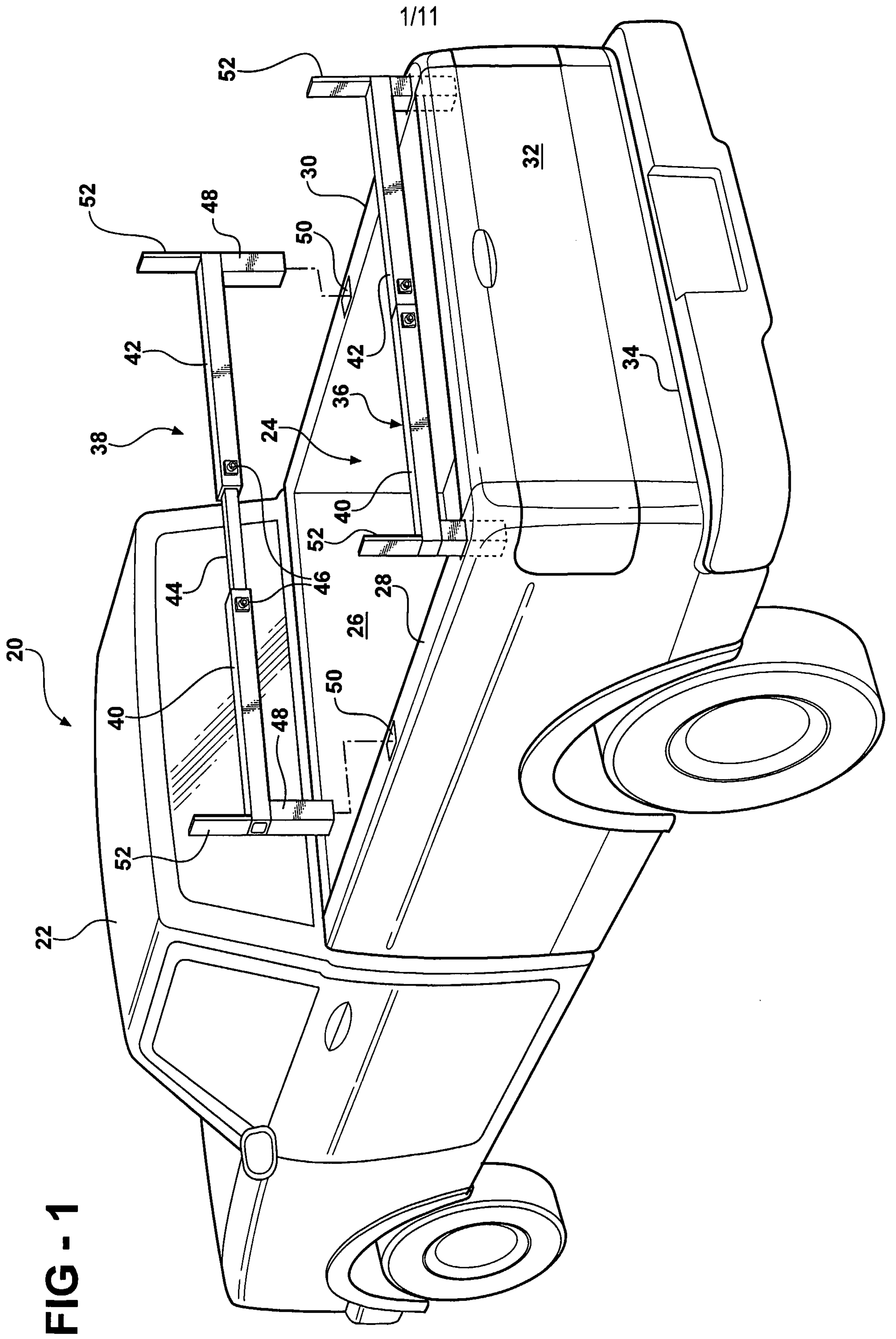
the first tube to lock the first and second tubes at a fixed length and present an unencumbered top surface of the first tube to support an elongated load with a first end of the load on the floor of the box and a midsection of the load supported on the top of the second tube, and a second end of the load extending above the top of the closed tailgate.

23. The load support of claim 22, further including:

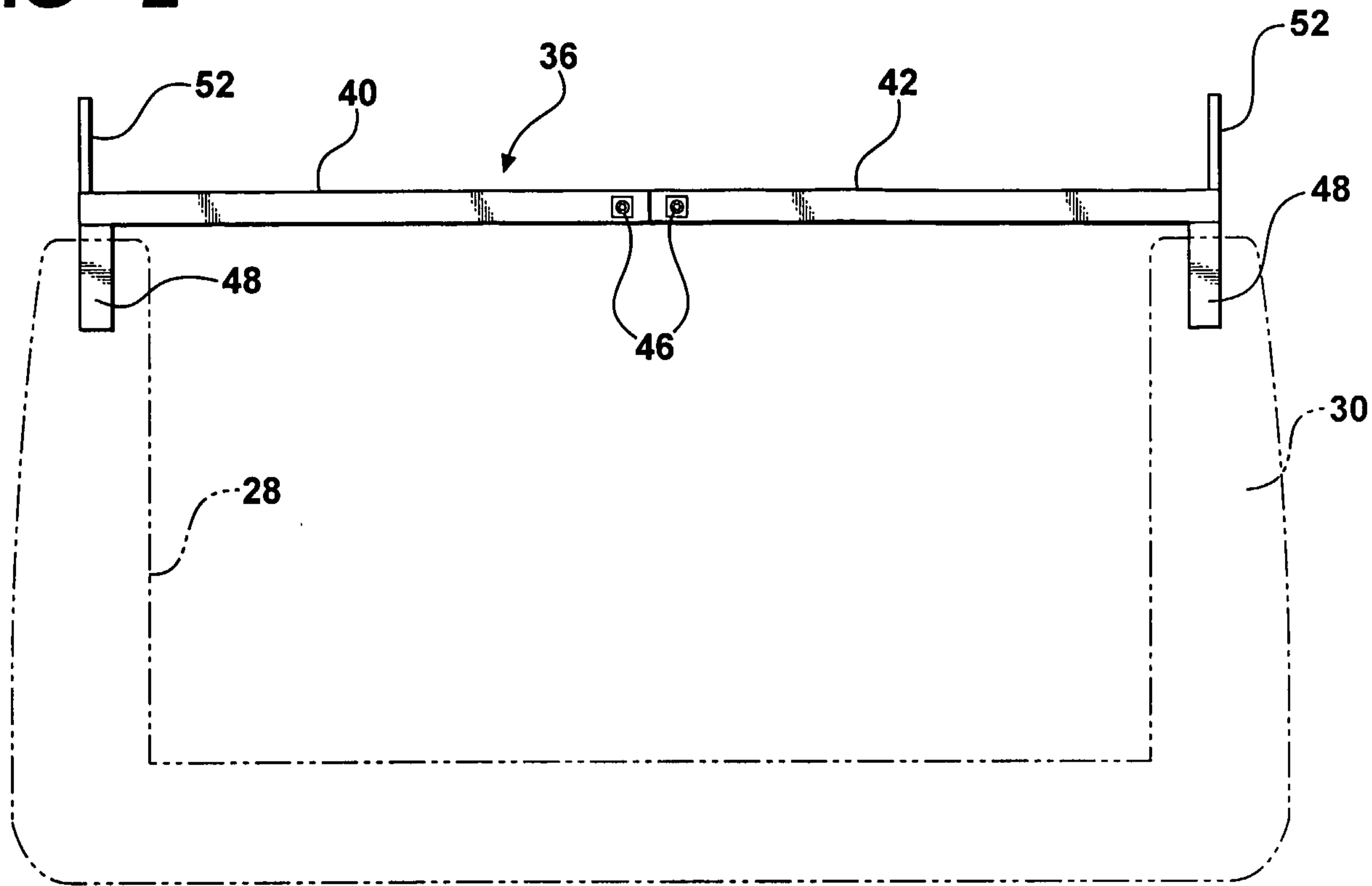
a third elongated bar adapted to be supported between the side rails at a spaced distance from said first bar;

a planar platform adapted to be supported between the first and third elongated bars; and

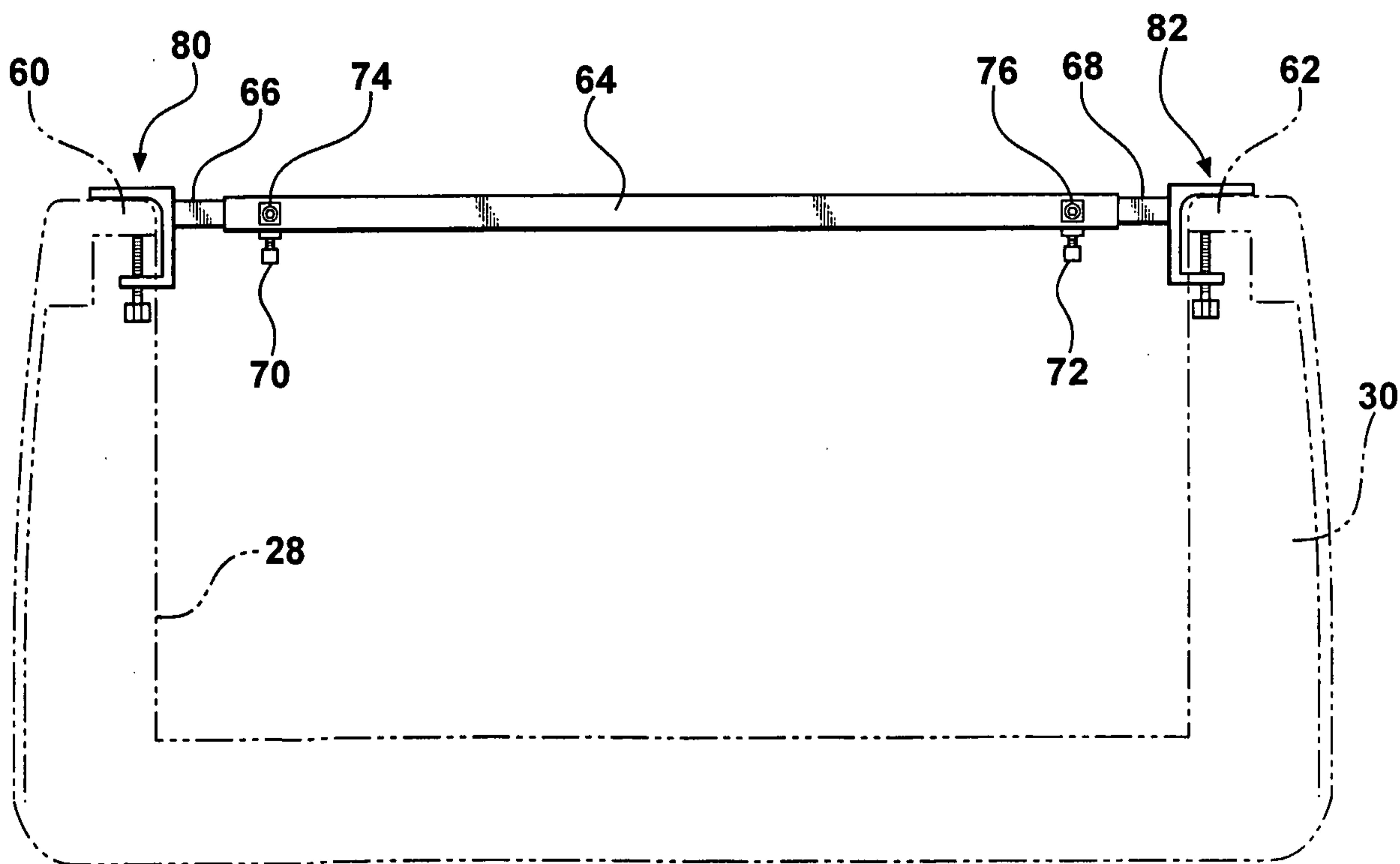
a ramp for elevating a load onto said platform.



**FIG - 2**

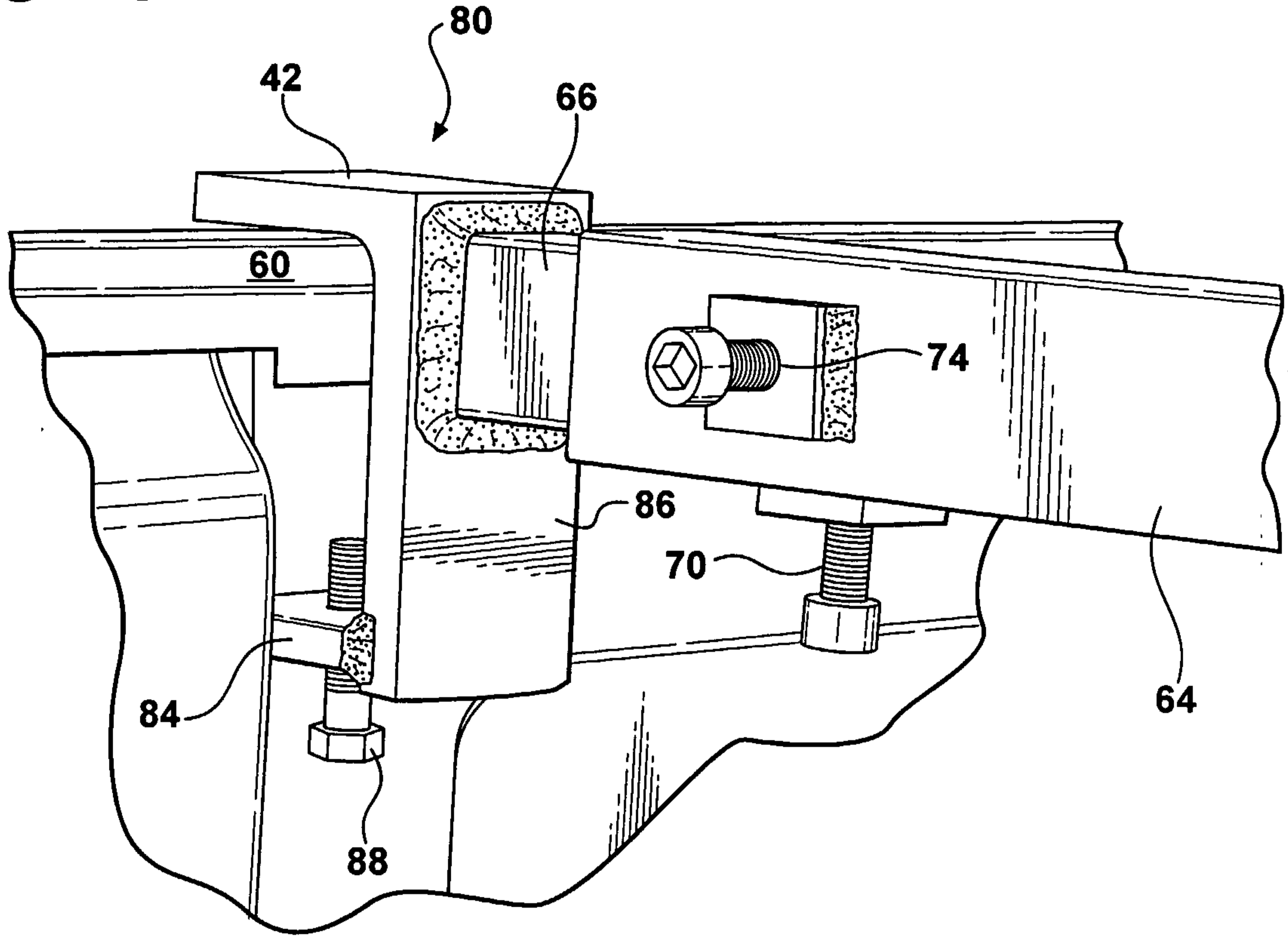


**FIG - 3**

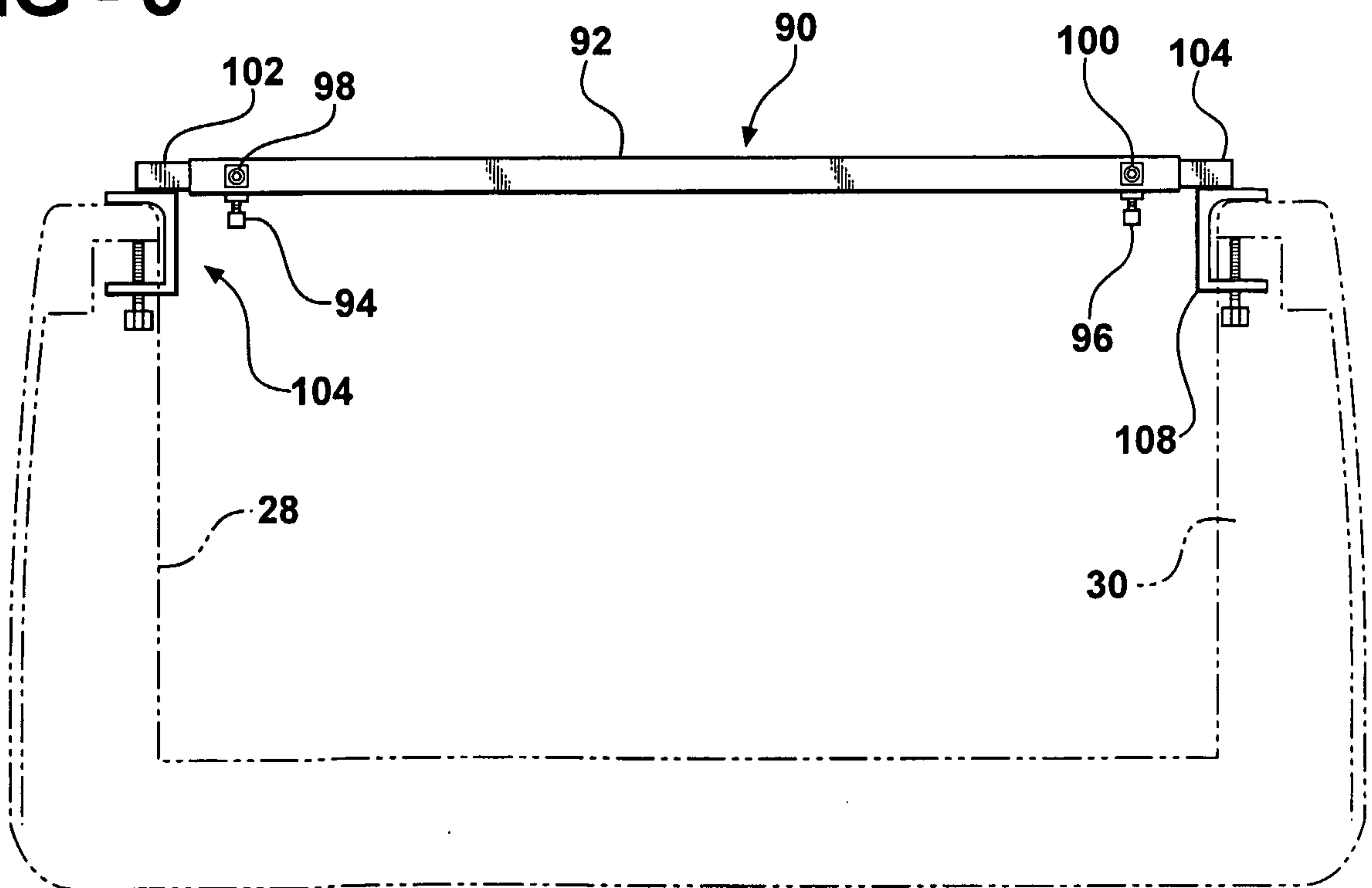




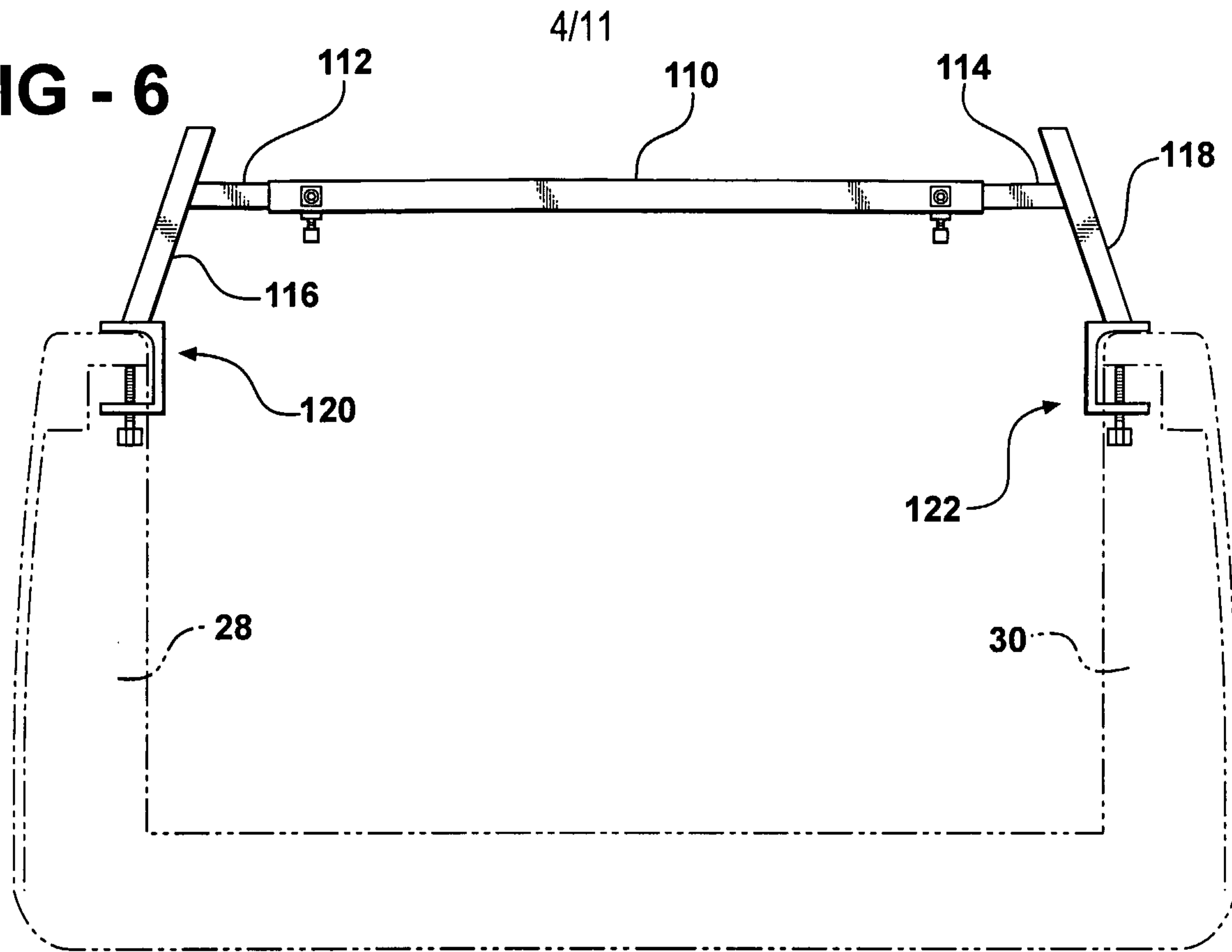
**FIG - 4**



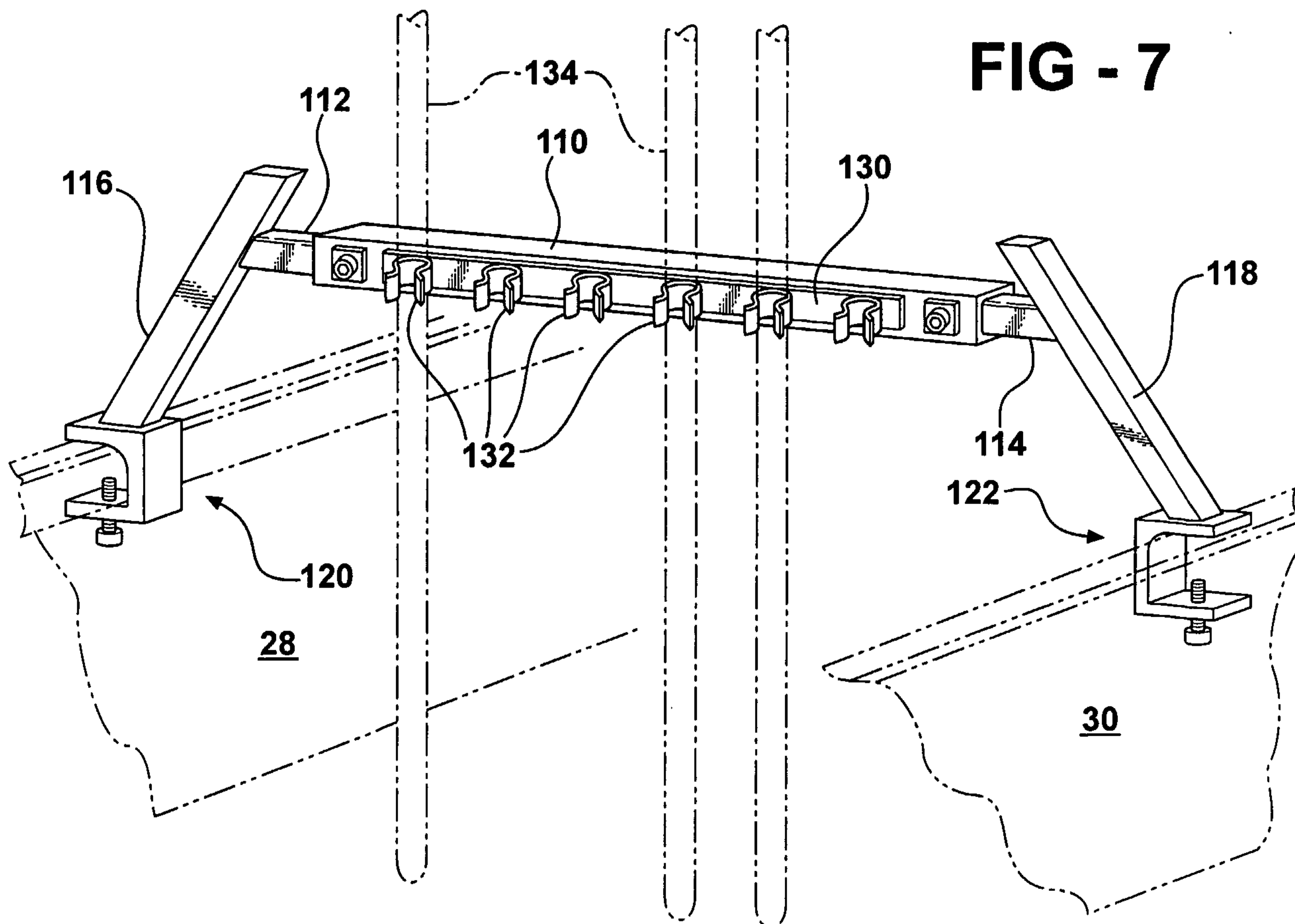
**FIG - 5**

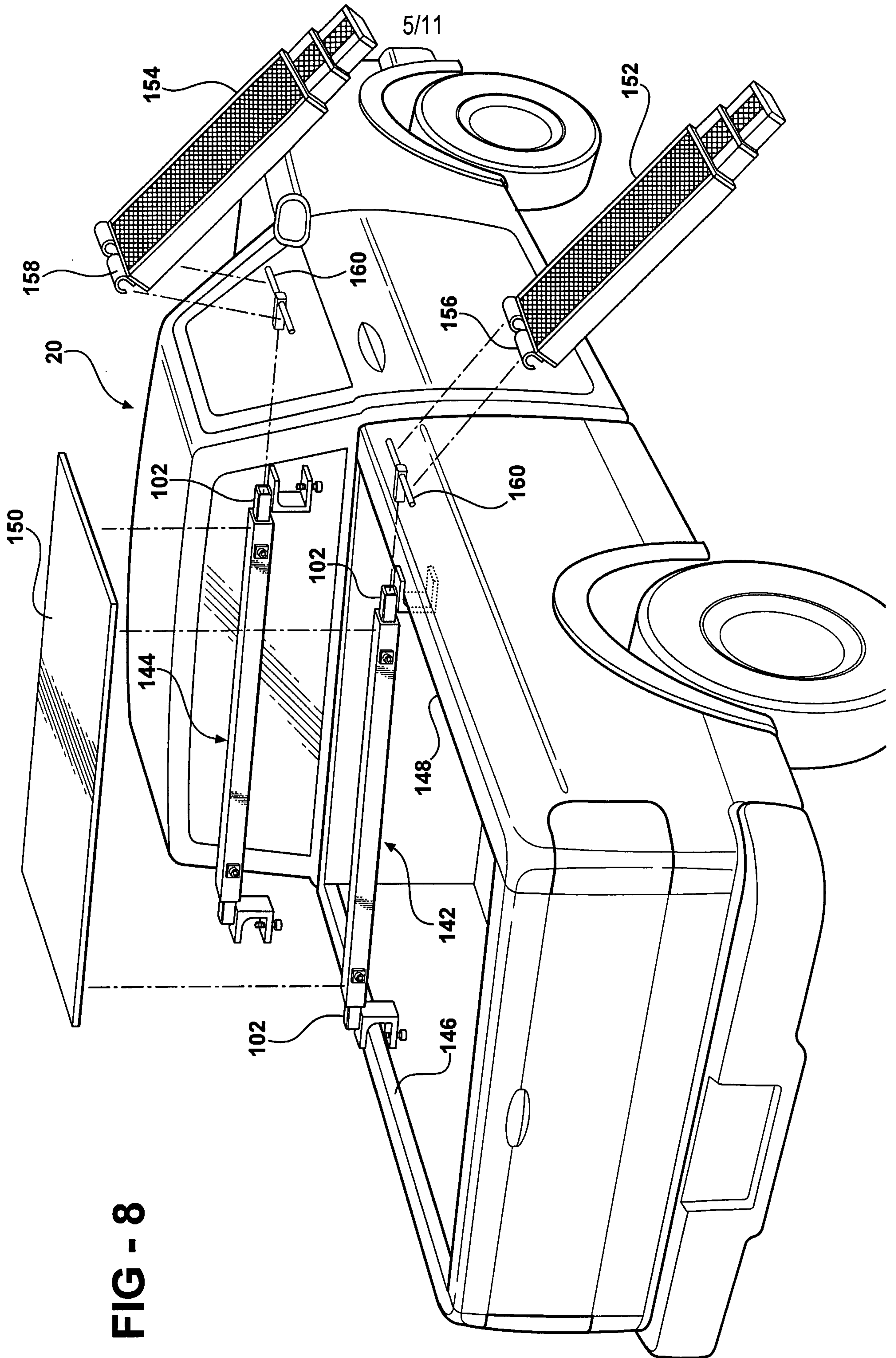


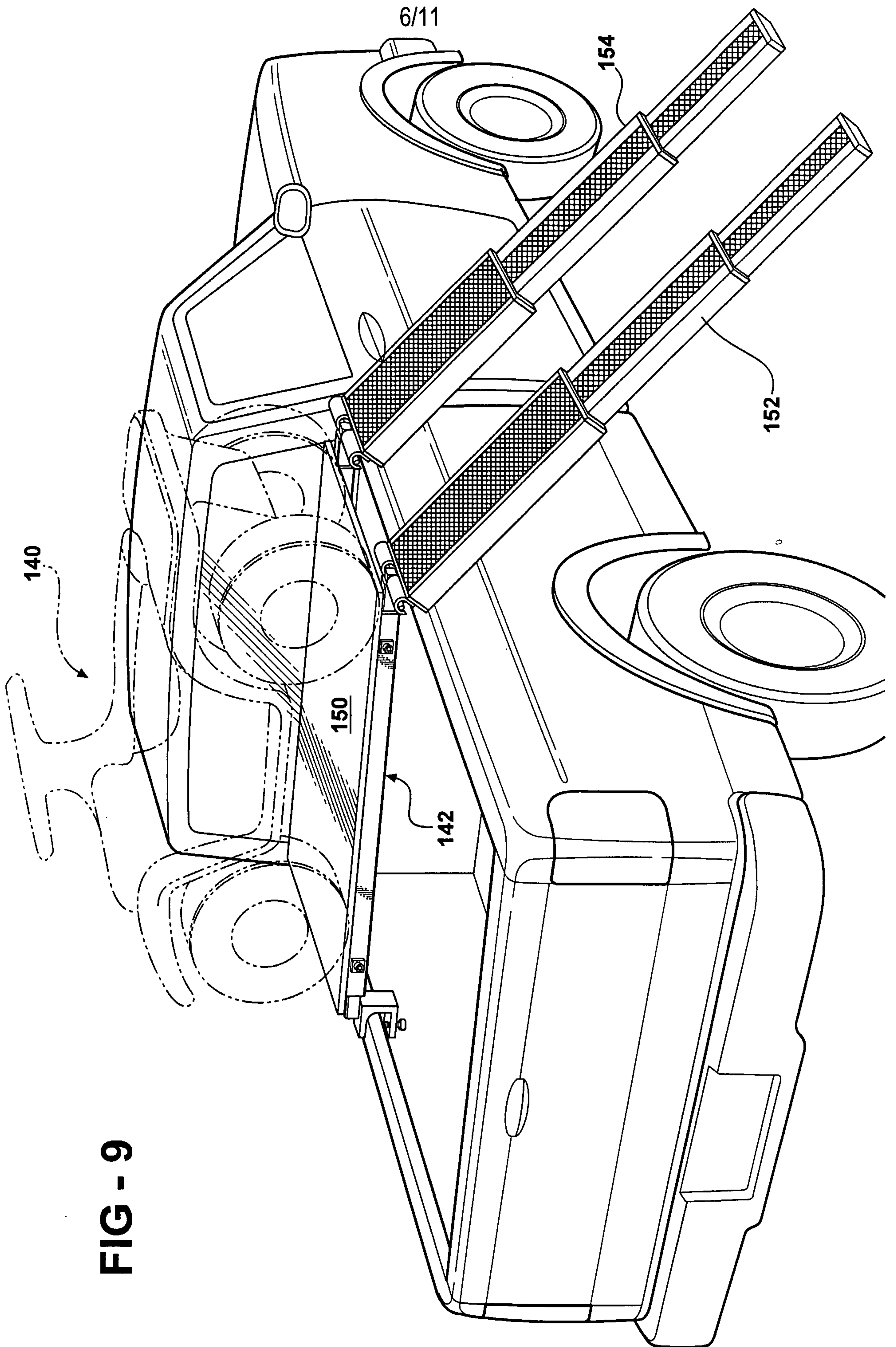
**FIG - 6**



**FIG - 7**

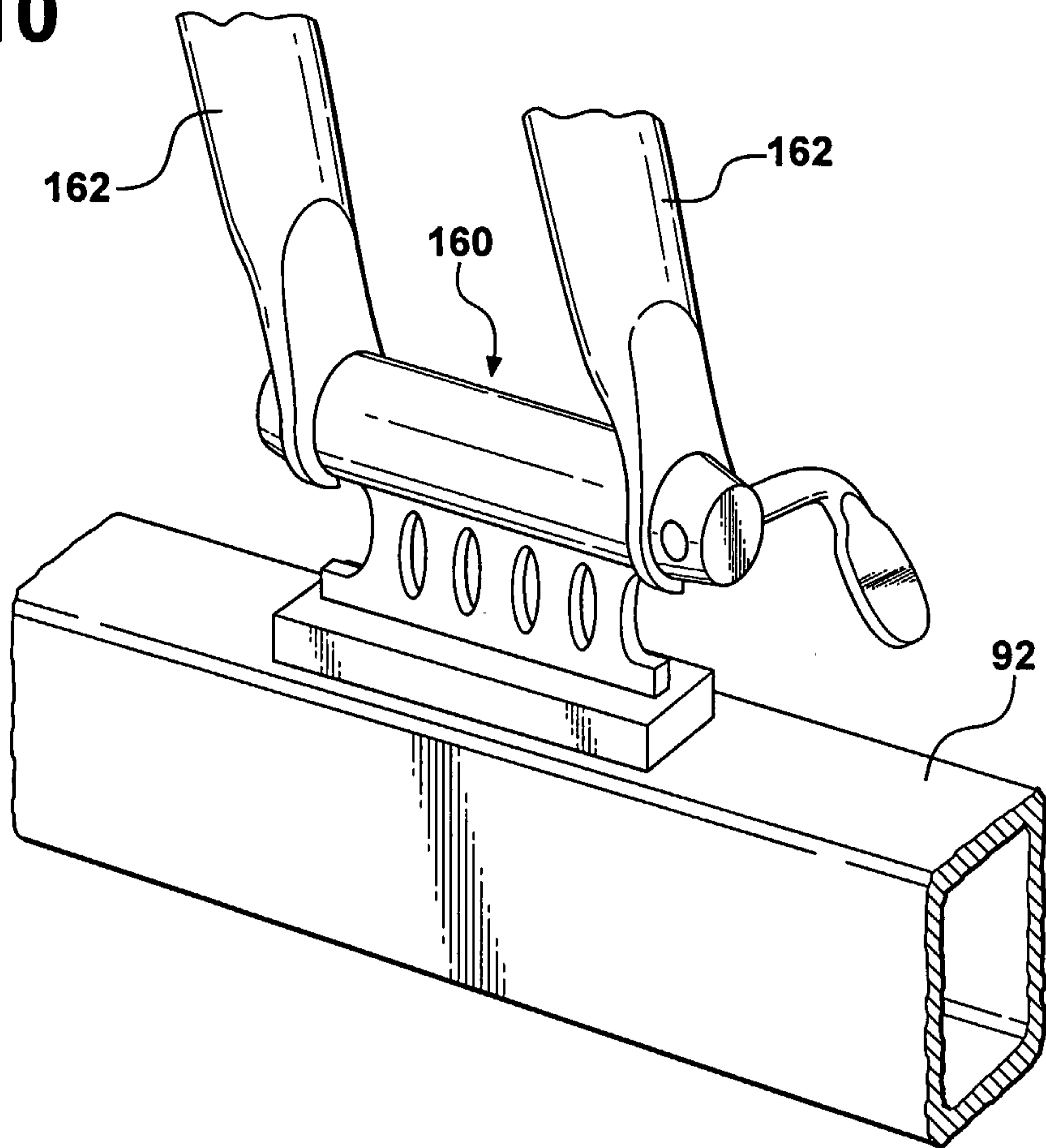




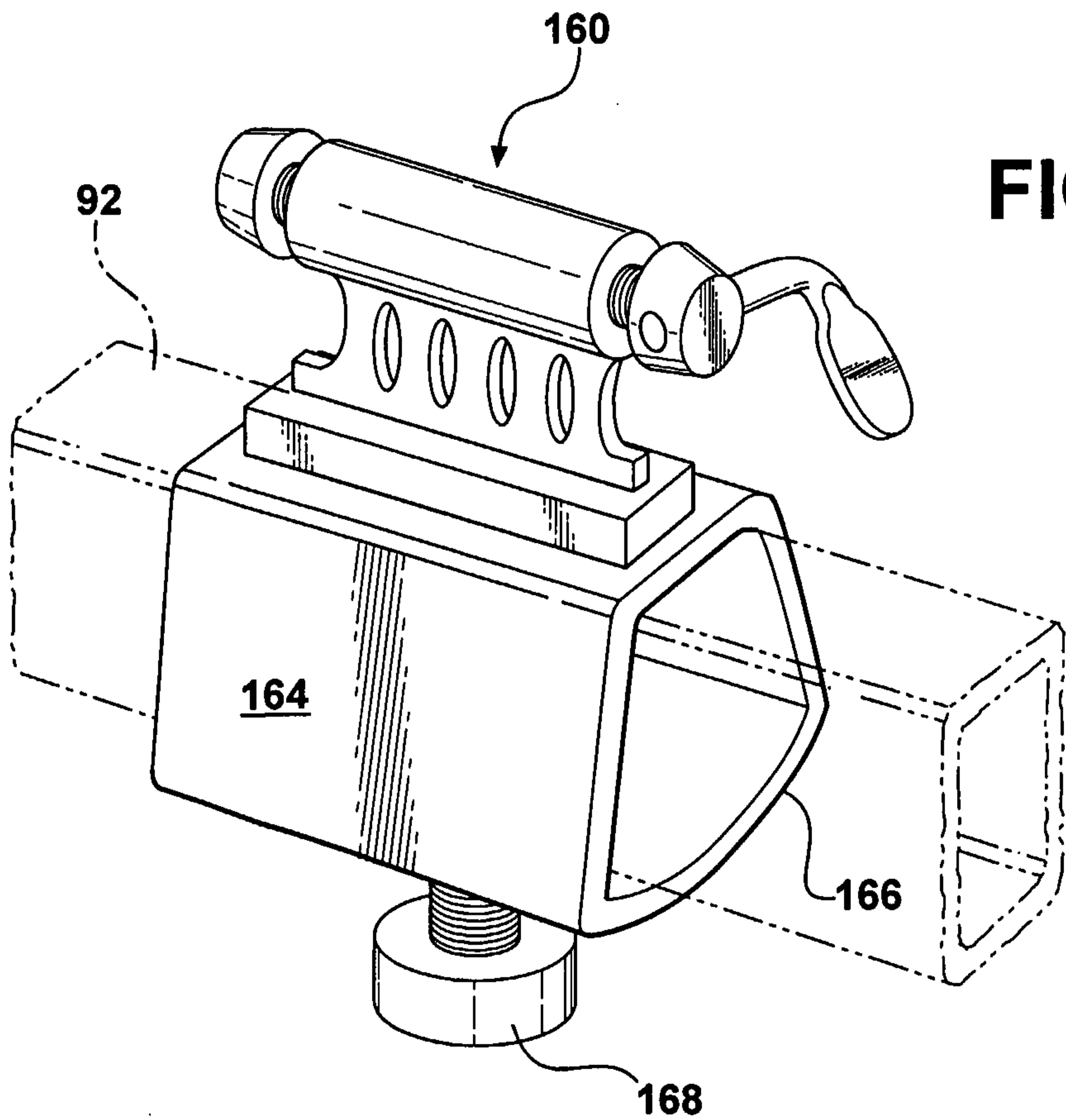


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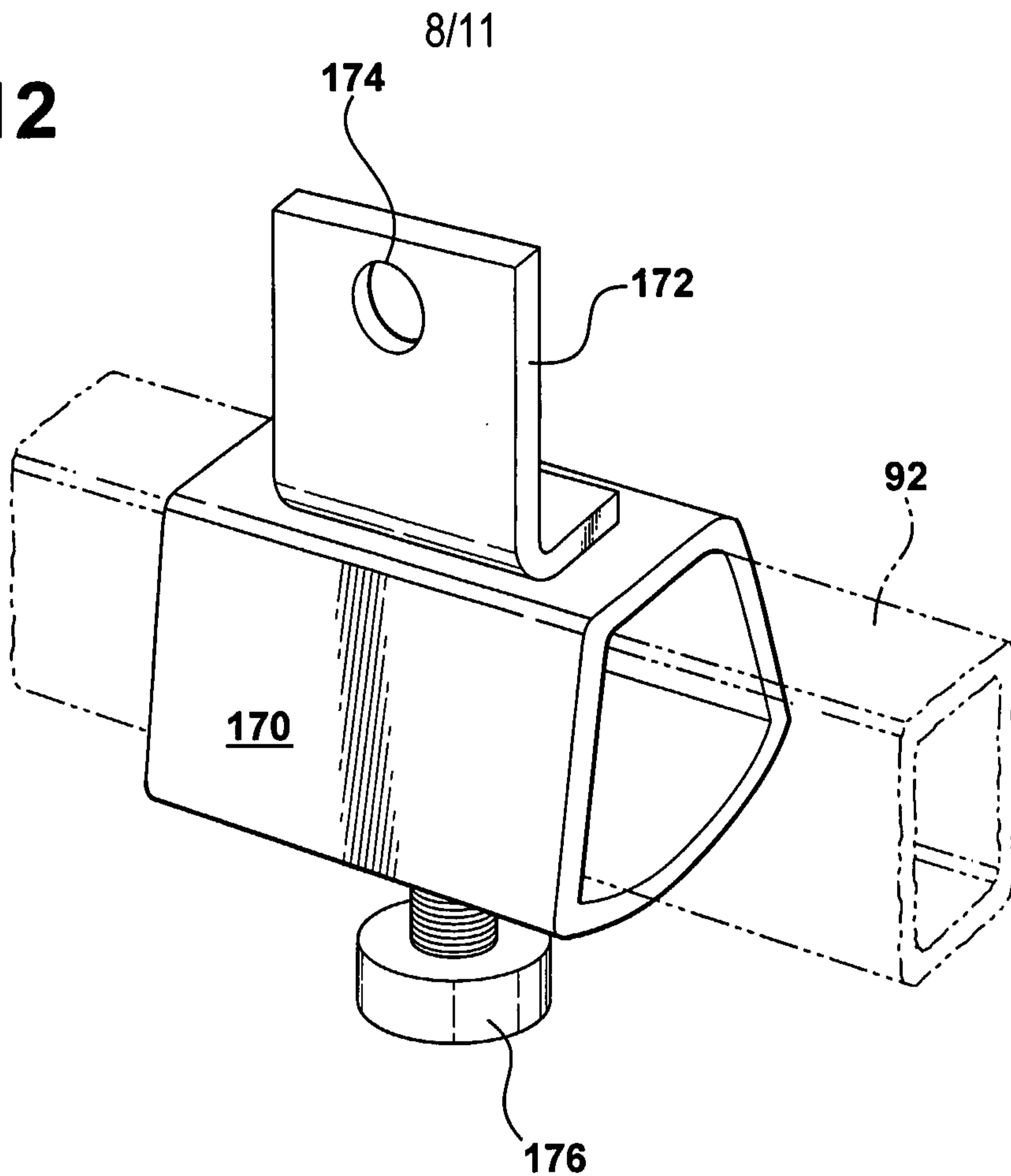
**FIG - 10**



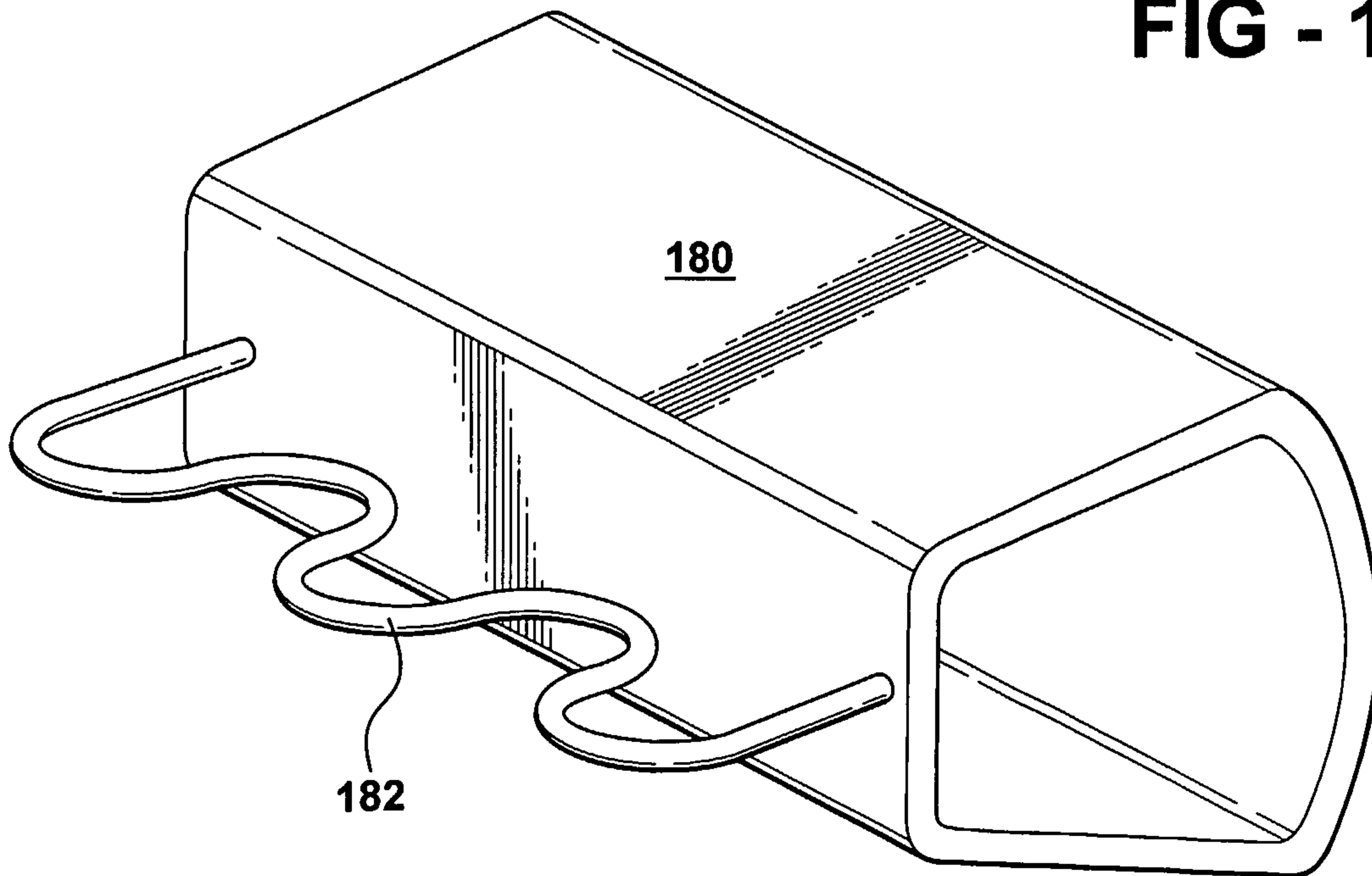
**FIG - 11**



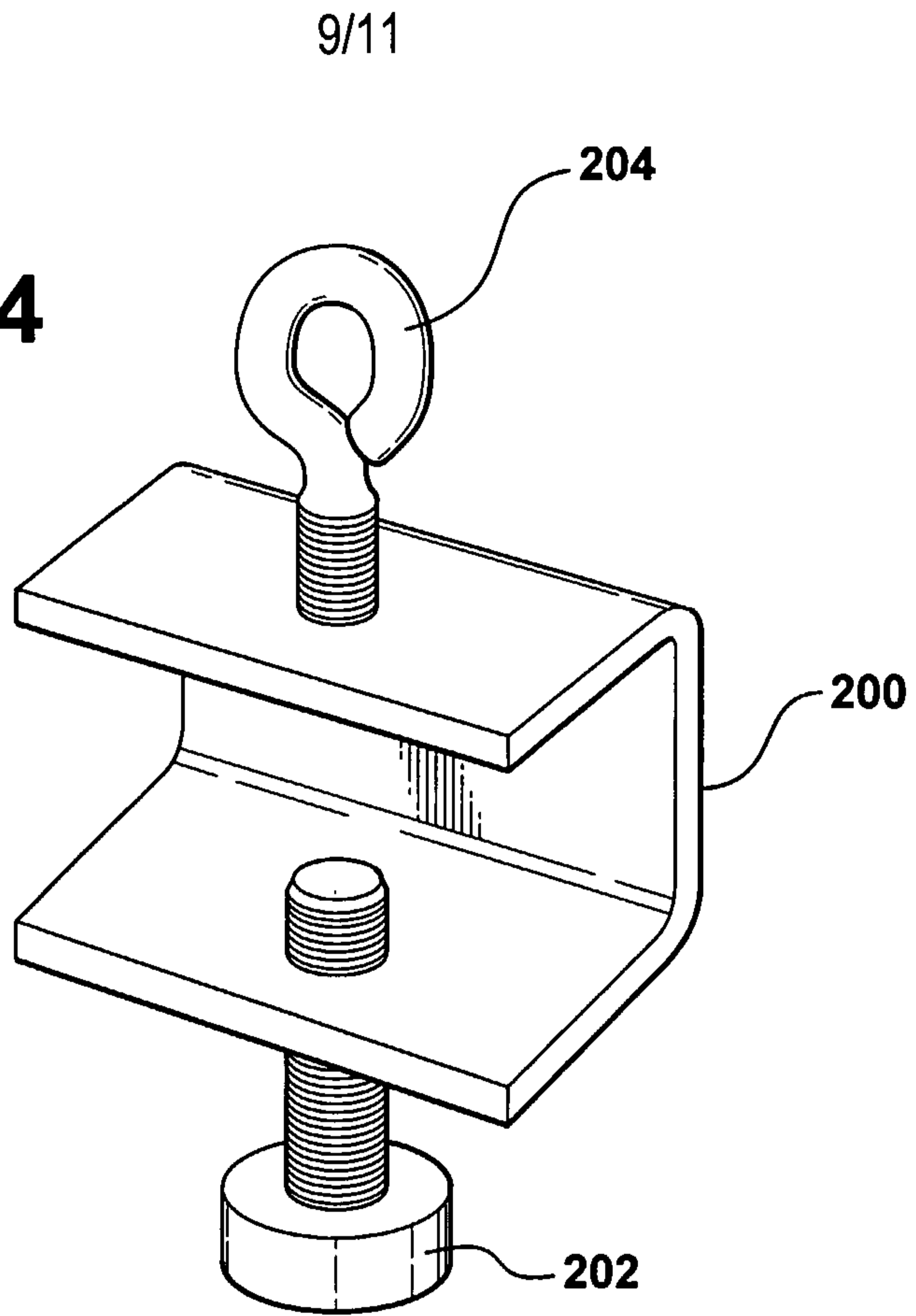
**FIG - 12**



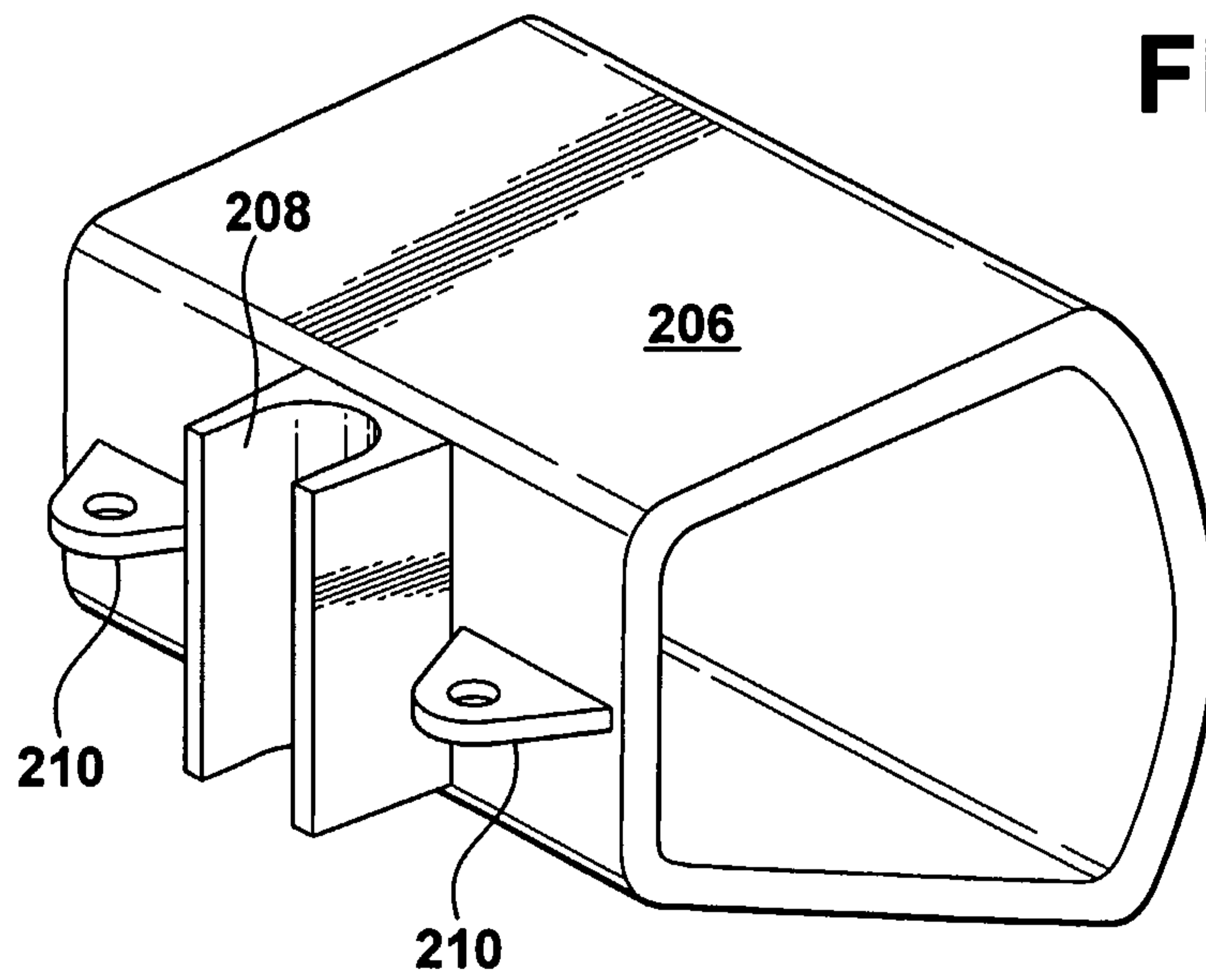
**FIG - 13**



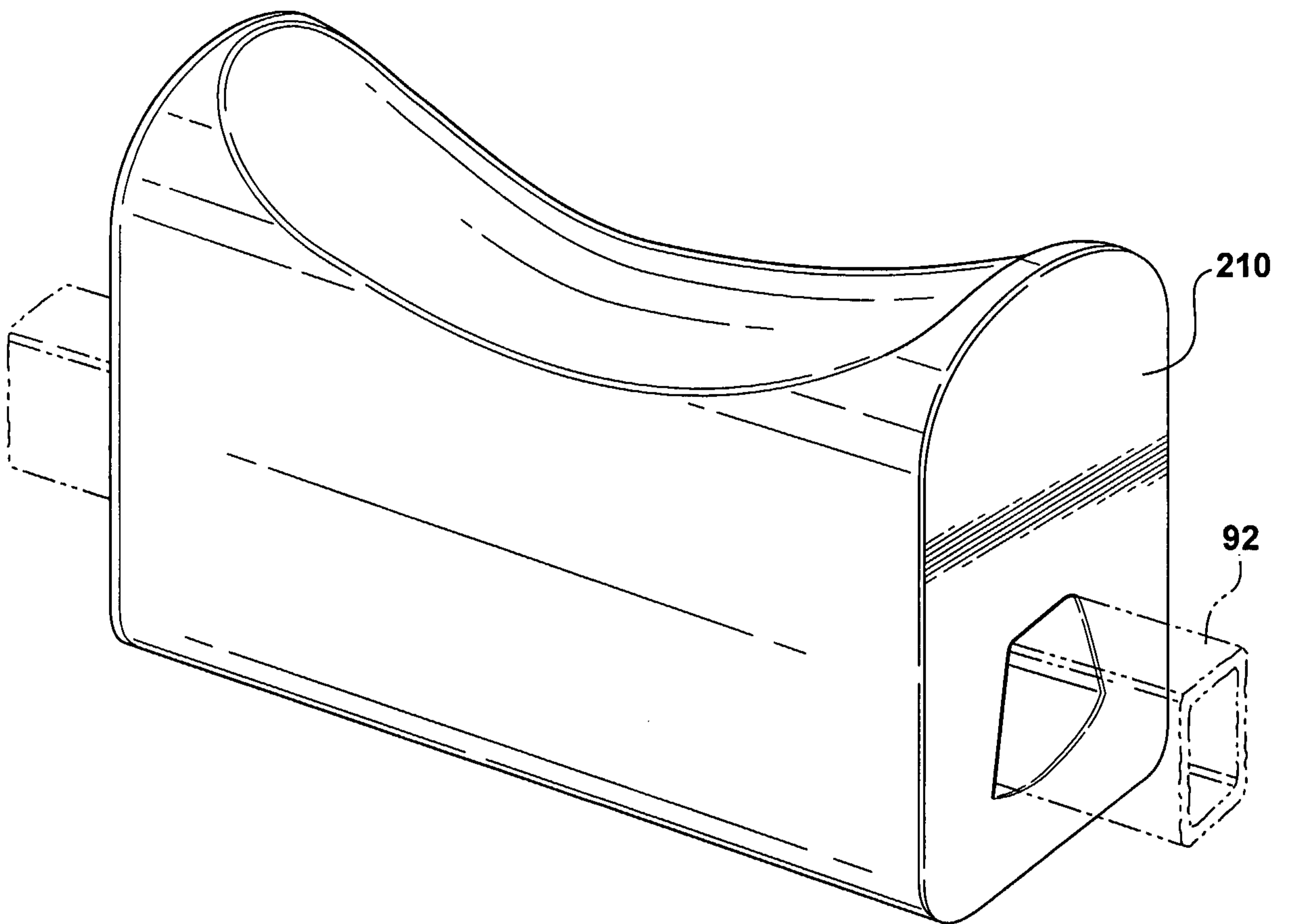
**FIG - 14**



**FIG - 15**



**FIG - 16**





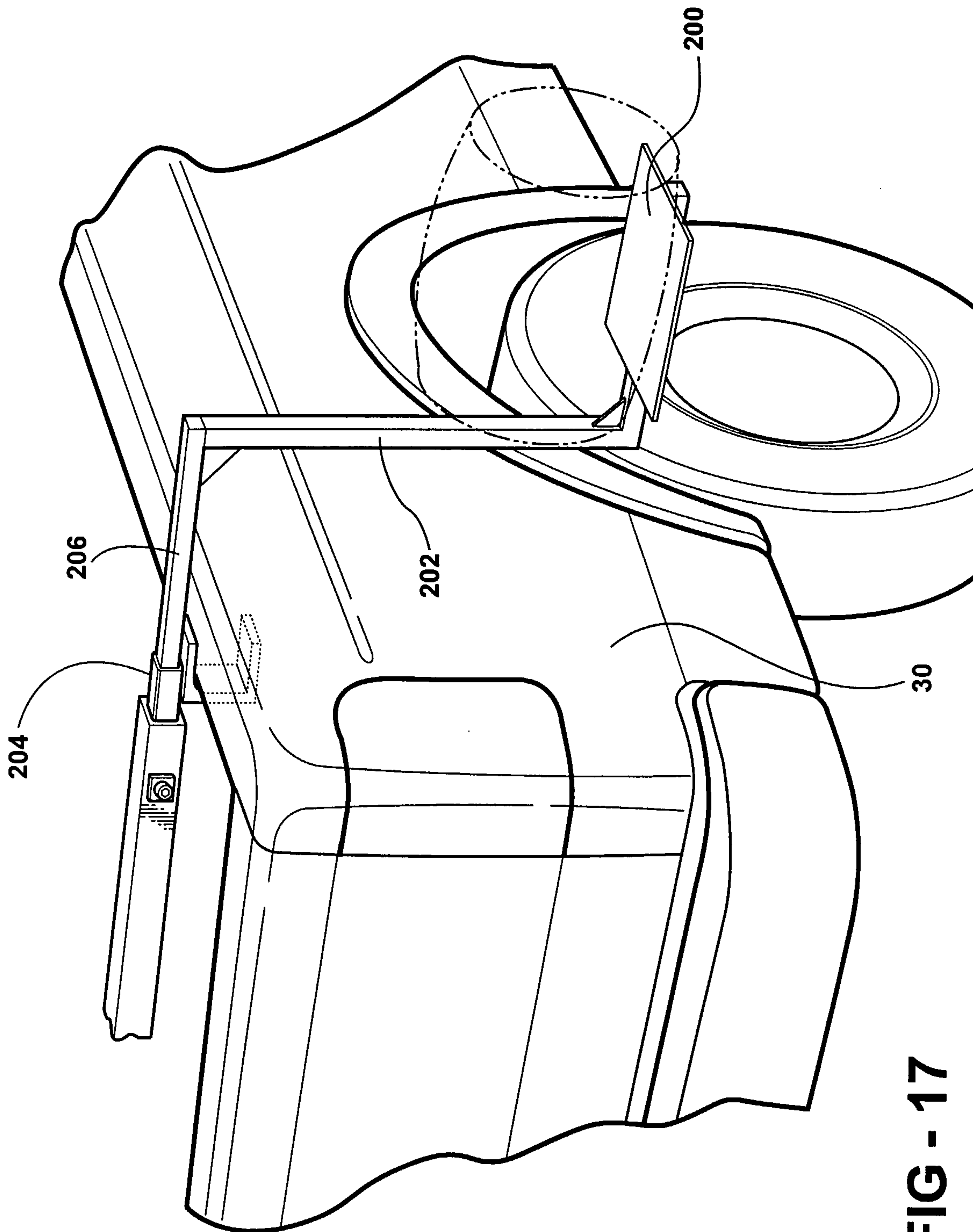


FIG - 17

