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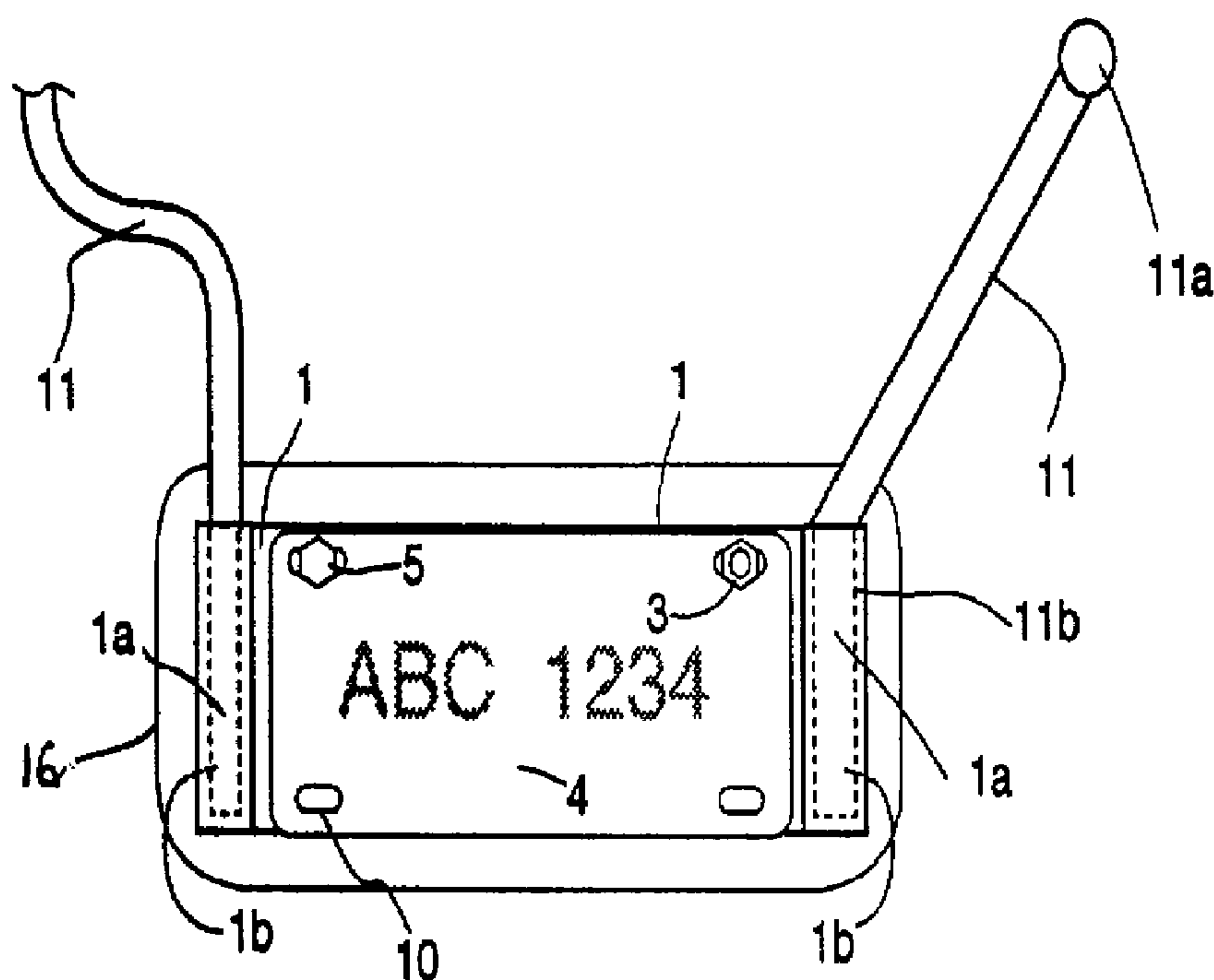
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(54) Titre : SUPPORT POUR PORTE-BAGAGES D'AUTOMOBILE

(54) Title: BRACKET FOR SUPPORTING A CAR RACK



(57) Abrégé/Abstract:

The present invention is a carrier bracket and rack assembly for external cargo carrying by vehicles. The carrier bracket is permanently attached to the vehicle behind the license plate using common fasteners through the existing license plate mounting holes. The license plate then re-attaches to this carrier bracket. The carrier bracket is channel-shaped with the rearward-extending channel sides being wide enough apart to accept a standard-length license plate therebetween and extending rearward enough to clear the vehicle's bodywork. The outboard ends of the channel sides terminate with fittings suitable for the separate rack assembly to solidly connect to the carrier bracket. The rack assembly is adapted to the particular cargo to be carried. A variety of racks for bicycles, skis, sports equipment and the like, or for hauling small trailers, wagons and the like, may be quickly attached and detached from the carrier bracket. In particular a bicycle carrier rack having supporting members that engage the bicycle wheel at a point behind the front fork is disclosed.

ABSTRACT

The present invention is a carrier bracket and rack assembly for external cargo carrying by vehicles. The carrier bracket is permanently attached to the vehicle behind the license plate using common fasteners through the existing license plate mounting holes. The license plate then re-attaches to this carrier bracket. The carrier bracket is channel-shaped with the rearward-extending channel sides being wide enough apart to accept a standard-length license plate therebetween and extending rearward enough to clear the vehicle's bodywork. The outboard ends of the channel sides terminate with fittings suitable for the separate rack assembly to solidly connect to the carrier bracket. The rack assembly is adapted to the particular cargo to be carried. A variety of racks for bicycles, skis, sports equipment and the like, or for hauling small trailers, wagons and the like, may be quickly attached and detached from the carrier bracket. In particular a bicycle carrier rack having supporting members that engage the bicycle wheel at a point behind the front fork is disclosed.

FIELD OF THE INVENTION

The present invention is for enabling the ordinary car or van to carry cargo. It comprises an exterior carrier bracket with rack assemblies that attaches thereto, and where the racks are adapted for carrying specific cargo. The cargo may be bicycles, skis and the like. The adapter remains on the vehicle while the rack may be quickly attached or detached. Cargo is held off the vehicle bodywork to prevent damage thereto.

BACKGROUND OF THE INVENTION

Carriers for vehicles are designed to allow cargo to be conveniently carried by ordinary automobiles and to keep the cargo off the vehicle's bodywork for obvious esthetic reasons. Such carriers take many forms including roof racks, ball hitch extensions, and strapped-on trunk shuttles. The carriers have fittings designed to securely hold specific cargo such as bicycles, skis, sports boards, luggage, and construction materials, to name some. These existing carriers are relatively complex in their design because they must fit a wide range of vehicles and attach to the vehicle very securely yet with no attachment points that are common in all vehicles. Because of the lack of a common attachment means on vehicles, the existing carriers are expensive, complex, bulky, hard to install, and inconvenient to use.

For example, the common ball hitch carrier is made of thick, heavy steel components and they require expensive professional chassis attachment. Hitch carriers also obstruct the license plate readability. Roof racks are difficult to load and unload, especially for women, because of their height off the ground. Roof racks also add considerable air resistance (and noise) resulting in reduced fuel economy. Less expensive rear deck carriers, commonly known as shuttles, rely on an awkward arrangement of bent tubing, pads and straps that must be hooked on, buckled up, and tightened. Moreover most carriers are not quickly detachable to/from the vehicle and are too bulky to be easily carried in the "A. As a result they add an ugliness when they are left unused on the car, or discourage frequent use if removed due to the complex assembly required for re-attachment

The present carrier invention solves these problems by use of a two-piece system comprising a first piece being a carrier bracket of low-cost construction that attaches permanently to the car behind the license plate, and a second piece being a rack also of low-cost construction that attaches quickly to the bracket and quickly removed from the bracket to be compactly stored in the trunk. The rack may in fact be made of more than one piece to reduce bulk even further.

Because the license plate is re-attached over the installed carrier bracket, it covers most of the bracket returning the vehicle to near-stock appearance. Furthermore the reading of the license plate is not in any way obstructed as required by law.

A variety of cargo-specific racks can then be quickly fitted to the bracket, and, just as quickly, detached and stored in the vehicle's trunk. This makes the use of the present carrier both inexpensive and convenient to use.

SUMMARY OF THE INVENTION

The present cargo carrier bracket invention is a sturdy, channel-shaped bracket that attaches to a vehicle behind the license plate preferably using the same holes that secure the license plate to the vehicle. The attachment can be most easily effected with threaded fasteners (nuts and bolts).

5 The present invention is a generally flat rectangular piece of steel having each end bent at a right angle to form a channel wide enough for a license plate to fit within the created channel, that is, in between the bent sides. The flat center portion has license plate pattern holes to allow attachment to the vehicle. These hole may be in the same standard pattern of all license plates (in a country). The channel sides terminate with means of attachment, such as bolted on, or
10 welded-on tube sections, into which can be slid properly dimensioned racks or carriers for the cargo to be attached. Any variety of tubes, clips, clamps, hinges, locks, pins or other fastener means can be used to terminate the channel sides. These attachment fittings may also be adjustable as to for-and-aft position to accommodate different bumper-to-license dimensions, and the attachment fittings may also be rotationally positionable to allow for the rack's lower
15 end to be properly positioned over the bumper when the license plate is angularly mounted on the vehicle. This will be made clearer as the disclosure proceeds.

License plates have two principle locations: below the top of the bumper, or, above the top of the bumper.

The first embodiment of the present invention is for the first location—below top of bumper
20 location. For this location the carrier bracket can be very solidly attached to the car by drilling through the thick bumper metal as necessary, and bolting the carrier bracket to the bumper. With this embodiment, the entire cargo weight can easily be carried by the bracket due to it's strong connection to a strong vehicle element (the bumper).

In the second embodiment of the present invention for the second license plate location—
25 above top of bumper, the carrier bracket is bolted to the sheet metal bodywork in the license plate recess. With this embodiment the cargo weight is carried on the upper surface of the bumper, leaving the carrier bracket to restrain the much lighter sway loads in the side-to-side and fore-and-aft directions. For this second embodiment, a reinforcing plate can be positioned in the trunk directly behind the license plate area and the center portion of the carrier bracket
30 bolted through the bodywork and through an internal (inside trunk) reinforcing plate which adds considerable strength to the installation.

In both embodiments, sway loads may also be taken-up by auxiliary internal/external straps which connect to an edge(s) of the trunk lid, and/or, by rubber pads, attached to the rack, that bear against a vertical portion of the bodywork.

35 The present carrier invention also can be at least partially incorporated into newly designed vehicles by engineering into the license plate area purposeful attachment means including, but not limited to: welded nuts; threaded studs; bolts; reinforcing plates; load spreaders; brackets; trunk hinge extensions; all for the express purposes of strengthening the license plate area, and making easier the attachment of the present carrier bracket invention to a vehicle.

The carrier bracket may be made of one piece of several pieces as required as will be seen later in the drawings. In one embodiment the bracket begins as a flat strip of sheet steel between 1/8" to 1/4" thick and measuring 6" wide by 20" long. A 90° bend 4" from each end is then made to form the sides of the channel. Square steel tubing of 1 1/4" outside measure by 6" long is welded to the ends of the channel sides to make the fittings into which a rack may be telescopically inserted. Holes of 3/8" diameter are drilled through the flat portion in the pattern of license plates. Offered up to the car, 3/8" holes are drilled through the bumper or bodywork and internal reinforcing plate. Installation with 3/8" threaded rods cut to length and with washers and nuts on each end. At the license plate end sufficient rod is left to allow refitting of the license plate with washers and nuts to secure it.

A typical bicycle rack may be made of 1" square steel tubing that is a telescopic fit in the above fittings. For both the right and left rack members, from one end a notch is cut out to allow bending the upper portion of the member to one side such that the outward end is in a location suitable to line up with the bicycle's wheel rim.

In the first embodiment, (below bumper top), the lower portion of the rack member may be left as long as the bracket fitting.

In the second embodiment (above bumper top) The lower portion of the rack member is left long enough to pass through the carrier bracket's end fitting (square tube) and to reach the bumper top surface.

In both embodiments, the notch is welded closed. The notch prevents the rack from sliding through the fitting on the below bumper top installation. On the above bumper location the notch may be at any convenient place. A second rack support member that extends rearwards to engage the bicycle wheel is welded or bolted to the outboard end of this first member to form the support extension. preferably the right to left distance between the two bicycle support members should allow for the engagement of the bicycle behind the front fork to prevent front wheel movement and to prevent bicycle rocking on the support member.

The present carrier bracket invention can also be fitted with a traditional ball hitch for light towing; a cross-rest for one end of large sheets of construction materials to be secured thereto; a camera rest for rolling shots; a seat for spectator events.

The present invention may also be fitted to the front of the vehicle and both rear and front brackets may co-operatively carry load with the help of connecting rack members.

As well, where necessary, the extending channel side of the bracket may have openings incorporated in the design to allow the side mounted license plate lamps to illuminate the license plate. A new light may be incorporated into the carrier bracket to replace the car-mounted one where this is necessary.

Additional fittings may be included in the bracket design such as corner stiffening brackets, thick vehicle attachment washers and the like.

It is understood that many different shapes and designs of brackets may be used to attach behind a vehicle's license plate, and that designs other than those herein described fall within the scope of the present invention.

BRIEF EXPLANATION OF THE DRAWINGS

Figure 1 Face-on view of license plate and carrier bracket with each side showing a different design of cargo rack fitted thereto.

Figure 2 Top view of same embodiment with only one cargo rack.

Figure 3 Face-on view of same embodiment showing vehicle rear bumper and bicycle installed on cargo rack

Figure 4 Face-on view of same embodiment as Figure 1 with ball hitch attached.

Figure 5 Side view showing vehicle bumper with carrier bracket's attachment studs passing therethrough.

Figure 6 Rear view of vehicle with carrier invention showing cargo load-on rack being carried on rear bumper.

Figure 7 Perspective view of one embodiment of the carrier bracket formed from two pieces.

Figure 8 Perspective of one piece bracket with several holes to which separate rack attachment fittings are bolted to accommodate a wider range of vehicle designs..

Figure 9 Rear view of vehicle showing carrier bracket and rubber bumpers against bodywork.

Figure 10 Side view of same embodiment.

Figure 11 A side view of the embodiments shown in Figures 8,9 and 10.

Figure 12 A side view of the same embodiment

Figure 13 A side view of another embodiment incorporating a locator plate which is clamped in place by the vehicle's trunk lid.

Figure 14 A detail view of the location plate of Figure 13.

Figure 15 A face-on view of another embodiment made of separate bracket combinations.

Figure 16 A top view of the same embodiment.

Figure 17 Another embodiment of the bracket where it is made from four identical brackets.

Figure 18 A side view of an adapter to increase the effective length of the carrier bracket's sides by a piggy-back device.

Figure 19 A pictorial view of the same adapter.

Figure 20 View inside of vehicle trunk showing adjustable support strut to hinge.

Figure 21 View inside vehicle trunk showing adjustable support strap to trunk lid lip.

Figure 22 Side view showing external strap to trunk lid lip.

Figure 23 is a perspective of a carrier bracket and rack attachment fittings that allow both fore-and-aft and rotational adjustment.

Figure 24 shows a two piece bracket where the upper and lower halves are identical pieces to save manufacturing cost.

DETAILED DESCRIPTION OF THE INVENTION

In Fig 1 is a face-on view of the rear of a vehicle with license plate area recess 9 has license plate 4 attached via four holes 10 the upper two of which are shown with bolt 5 and stud with nut 3. Carrier bracket has flat portion 1 and side portions 1b which terminate in fittings 1a. On the left side is shown rack 11 engaged in left side fitting 1a, and on the right a different design of rack 11 engaged in the right side fitting 1a. Rack 11 has bicycle support extension 11a which engages the wheel rim of the bicycle.

In Fig 2 a view from the top of the same subject matter as in Figure 1 is shown. In Fig two the left attachment fitting is shown having round tubing while the right attachment fitting is square tubing. Support 7 has bolt 6 and stud and nuts 8 passing through bodywork 9 and carrier bracket 1. License plate adapter 2 may be used to provide reception for license plate mounting bolts 5 if necessary. Otherwise the stud/nut 8 may extend and have separate nut 3 to hold plate.

Fig 3 has a bicycle 12 in partial fragmented view resting on rack 11 extensions 11a.

Fig 4 shows a ball fitting 15 attached to a rack 11 inserted in the attachment fitting 1a.

In Fig 5 is shown in cross section how threaded fasteners 20 pass through the vehicle's hidden bumper 22 and extend through extending piece 21, if needed, that serves to allow attachment to a solid surface where the bumper 22 may not be as wide vertically as the required hole spacing of the license plate 4. Extending piece 21 accepts bolts from the lower holes in license plate 4 and bolts to bumper 22.

In Fig 6 the vehicle 17 has trunk lid 13, license recess 16, and bumper 9. In this embodiment the vertical load or weight of the cargo is carried by the bumper 9 because rack 11 extends through the attachment fittings 1a and may have rubber pad 11a shown on left side or rubber pad 11a sitting on support strip 11b which, in turn, rests on rubber strip 11c attached to bumper 9.

Fig 7 shows how the carrier bracket may be made of two pieces. The pieces may have different length of sides 1b to enable easier fitting.

Fig 8 is another embodiment where the sides 1a are perforated to receive a range of bolt-on attachment fittings 1g and allow some adjustment to better fit a wider range of vehicles.

Figures 9 and 10 show a more sophisticated embodiment with rubber bumpers 18a on bushing 18c which ride on threaded rod 18b tightened by hand knob 18d. to tension rack 11. The weight is carried by foot 14c with rubber sole 17a. The foot 14c removably engages rack extension 11a via socket 14b.

Figure 12 is a side view of the carrier bracket embodiment shown in Figure 8 with adjustment holes 1c formed in carrier side 1b.

Figure 11 is the same embodiment as Figure 12 with the rack 11 engaging adjustable attachment fitting 1g and the rack extension 11a connected to adjustable foot comprising parts 14b, 14c, and 14d detailed in Figure 10.

In Figures 13 and 14 an accessory fitting is shown that provides an additional means of fore-and-aft support for cargo where the bumper may be at an unwanted angle, the support strip 30 may be attached to the vehicle by closing trunk lid 13 into groove 31 thereby leaving second groove 32 to receive rack extension 11a. The surface 33 rests on bumper 9 in Figure 13.

Figure 15 shows two different carrier bracket embodiments the left one being single ended and the right one being double ended. Both have flat portion 1 with holes 10 and fittings 1a at the end of channel sides 1b. These embodiments are formed by double bending bar stock as can be further seen from the top view in Figure 16.

Figure 17 is a single bracket with flat portion 1 having hole 10, side 1b and attachment fitting 1a. Four such brackets, all identical, may be the lowest cost method of implementing the present invention.

Figures 18 and 19 are two views of an adapter to extend the rack further from the vehicle where this is necessary. Smaller stub 1k engages the attachment fitting of any of the bracket designs and leaves extended attachment fitting 1f available for rack insertion. Bridge 1m is welded between to give extension strength.

In Figures 20, 21, and 22 are shown side views of the rear of vehicles with trunk lids C and bumper 9. In these views are shown means of stabilizing in the fore-and-aft direction. In Figure 20 the interior of the trunk conceals strut 32 which solidly bolts to the carrier bracket via bolts 6. The other end of strut 32 clips to trunk hinge A, hinged at B, with clip 33 and is tightened thereto with turnbuckle 35.

The same concept is revealed in Figure 21 except that the strut clips to trunk lip with clip 34 and strut 32 may be flexible strap.

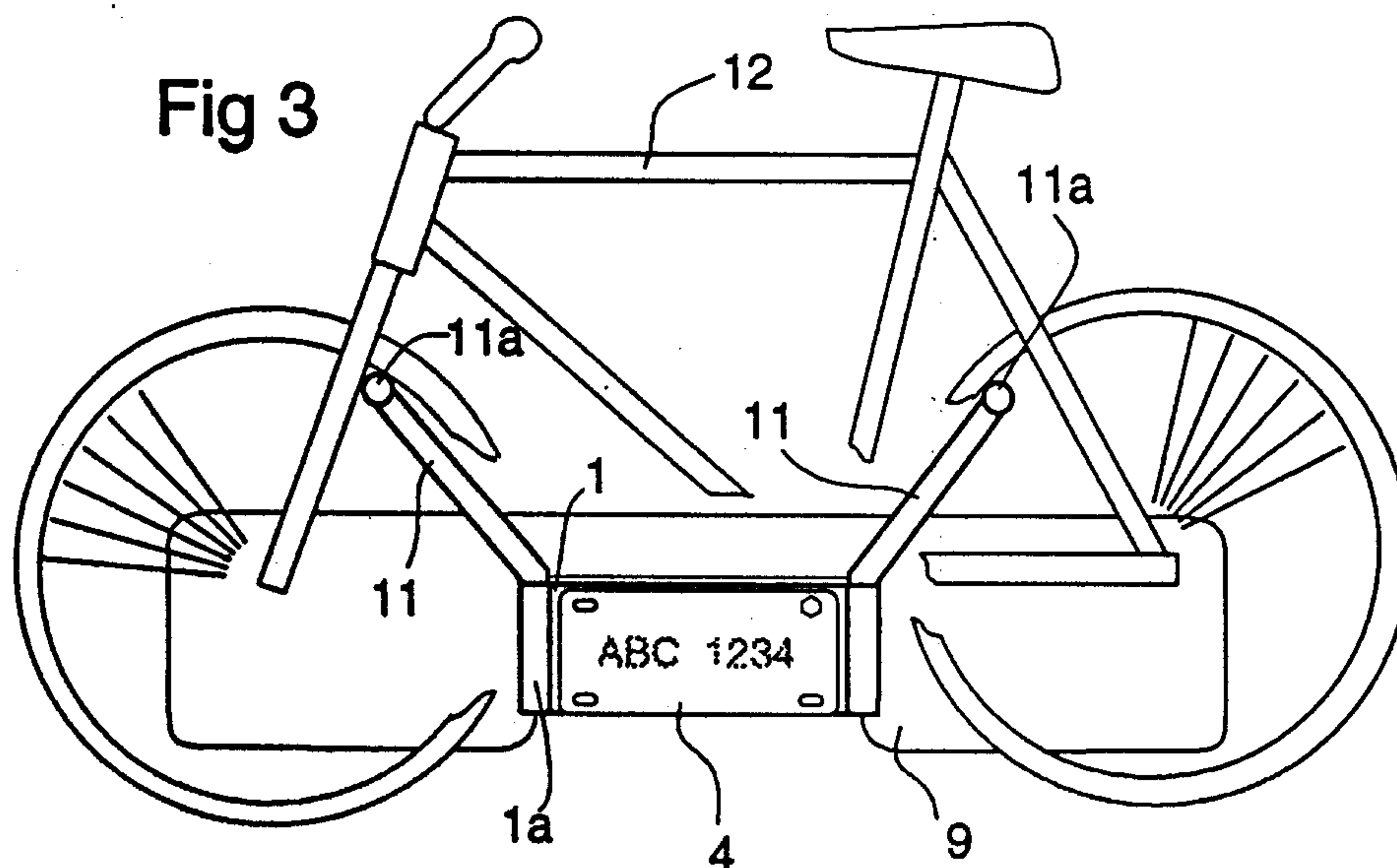
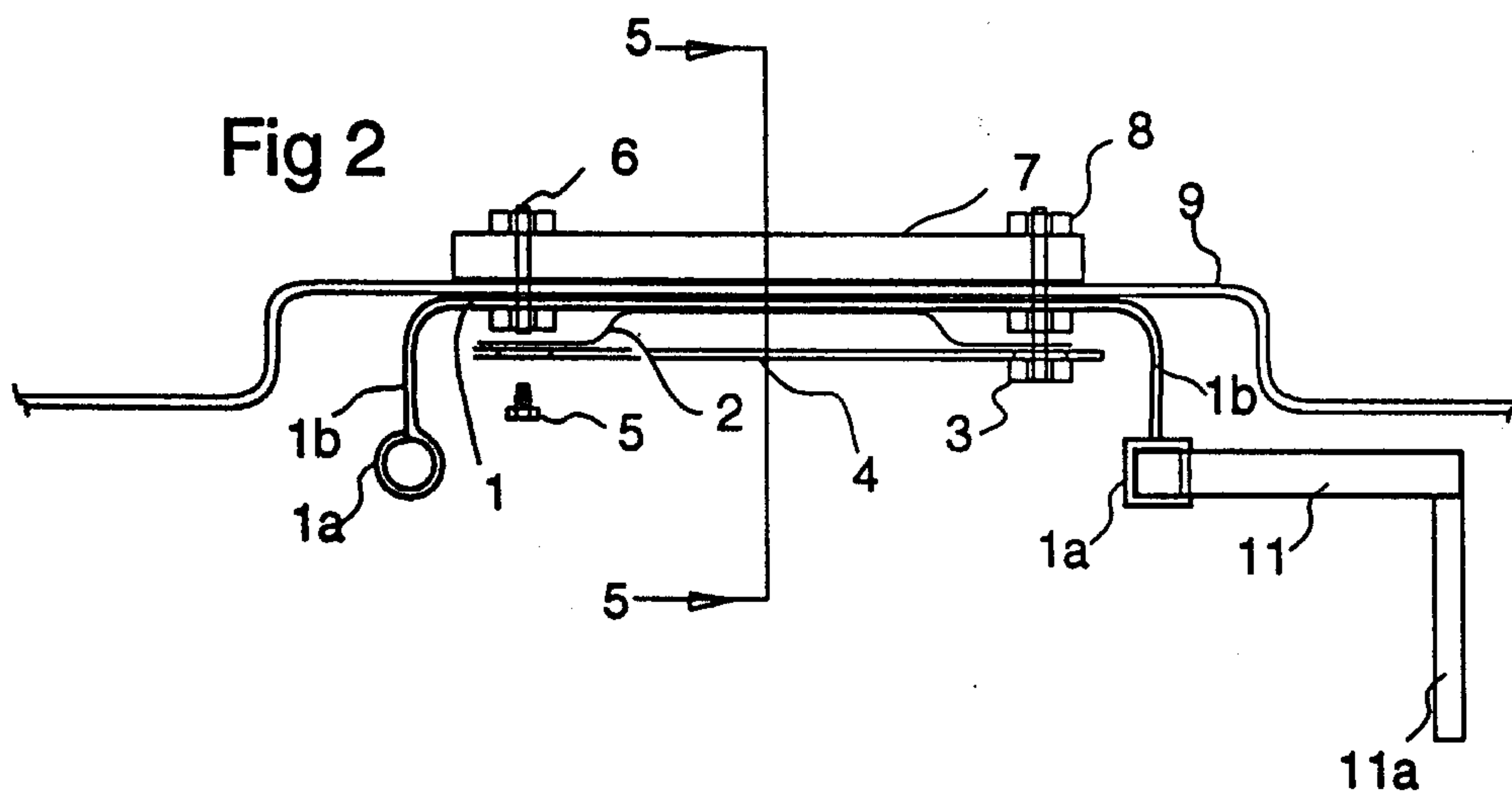
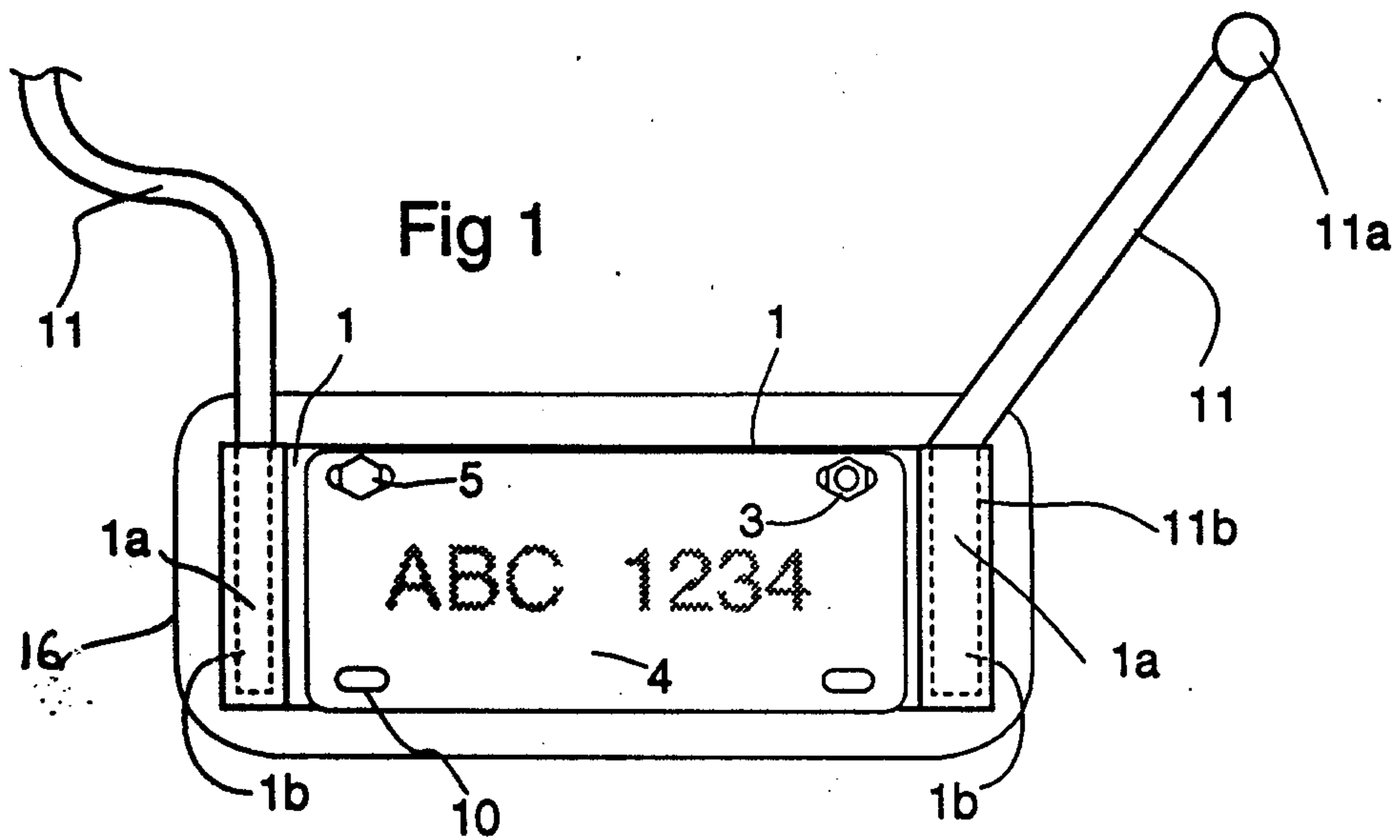
In Figure 22 the support is external to the trunk where strap 36 and clip 34 on trunk lid's C forward lip to stabilize cargo.

Figure 23 shows the carrier bracket where the side portions 1b are slotted. The ends may also be radiused as shown. The near side portion 1b has an open slot 60a while the far side portion 1b has a closed slot 60 which adds strength but also cost. Attachment fittings 1g have side members 1h drilled to accommodate fastener 63 that clamps attachment fitting 1g to side portion 1b. By choosing either hole to bolt to the slot 60 or 60a, the for-and-aft position can be optimized. The rotation of attachment fittings 1g can also be effected, the radiused ends providing maximum movement potential to enable use of carrier bracket and rack on the widest range of vehicles.

CLAIMS

1. A carrier to be mounted on a vehicle for an object to be transported therewith, where said carrier is mounted to said vehicle using said vehicle's license plate connector receiving means, said carrier comprising a channel-shaped bracket where the flat portion between the channel's legs has apertures in registry with said vehicle's license plate connector receiving means, and where each of the outwardly extending ends of said channel legs are adapted to receive removable rack members designed to support said object, the arrangement being such that when said rack members are engaged in said bracket, said license plate remains fully readable.
2. The carrier of Claim 1 wherein said outer ends of the channel legs have sockets into which said rack members removably fit.
3. The carrier of Claim 1 wherein said outer ends of the channel legs are adapted to receive fittings having sockets into which said rack members removably fit.
4. The carrier of Claim 3 wherein said fittings are adjustable such that each socket may be varied with respect to the vertical to adjust the position of said rack members.
5. In a vehicle having a license plate mounted to the vehicle by a plurality of spaced connectors and which connectors pass through respective spaced connector receiving means on a portion of the vehicle, the improvement comprising a bracket having a plurality of spaced apertures in registry with said connector receiving means, said bracket being secured to said vehicle through said apertures, said license plate being mounted on an exteriorly facing surface of said bracket, and means on said bracket for receiving and retaining at least one rack member for supporting an object to be carried without any obstruction of the license plate.
6. The improvement of Claim 5 further including first and second bracket members having means for receiving and retaining said at least one rack member.
7. The improvement of Claim 6 wherein each of said means for receiving and retaining a rack member comprises a fitting having a channel to receive said rack member, said channel extending in a generally vertical direction.
8. The improvement of claim 7 wherein each of said fittings is adjustable to change the relative location of said channel with respect to the vertical.

9. The improvement of Claim 8 wherein each of said rack members has a vertical component sized to fit within said channel and to rest on a bumper of a vehicle, and a horizontal portion extending outwardly to support said object to be carried without said vertical component obstructing the readability of said license plate.



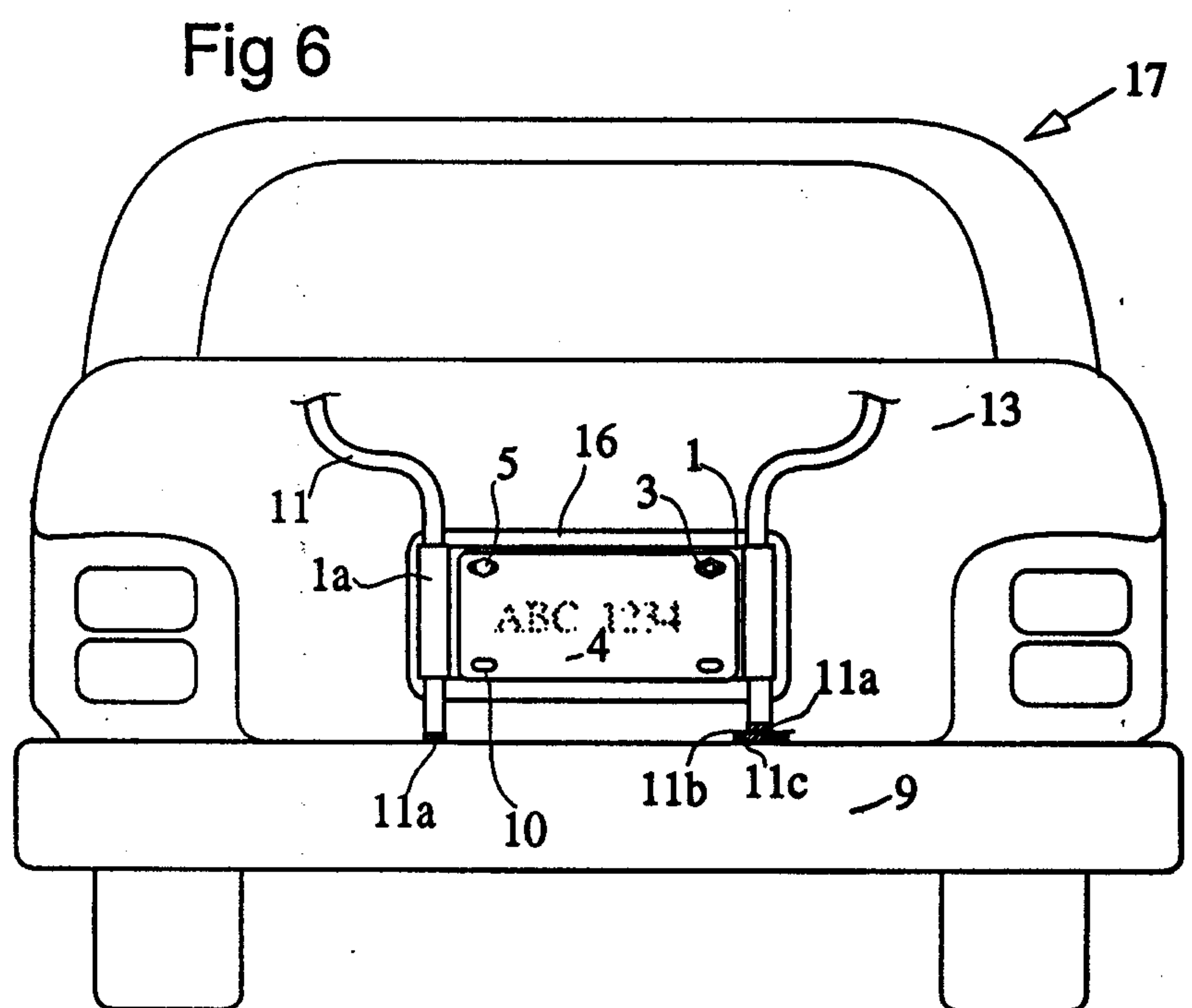
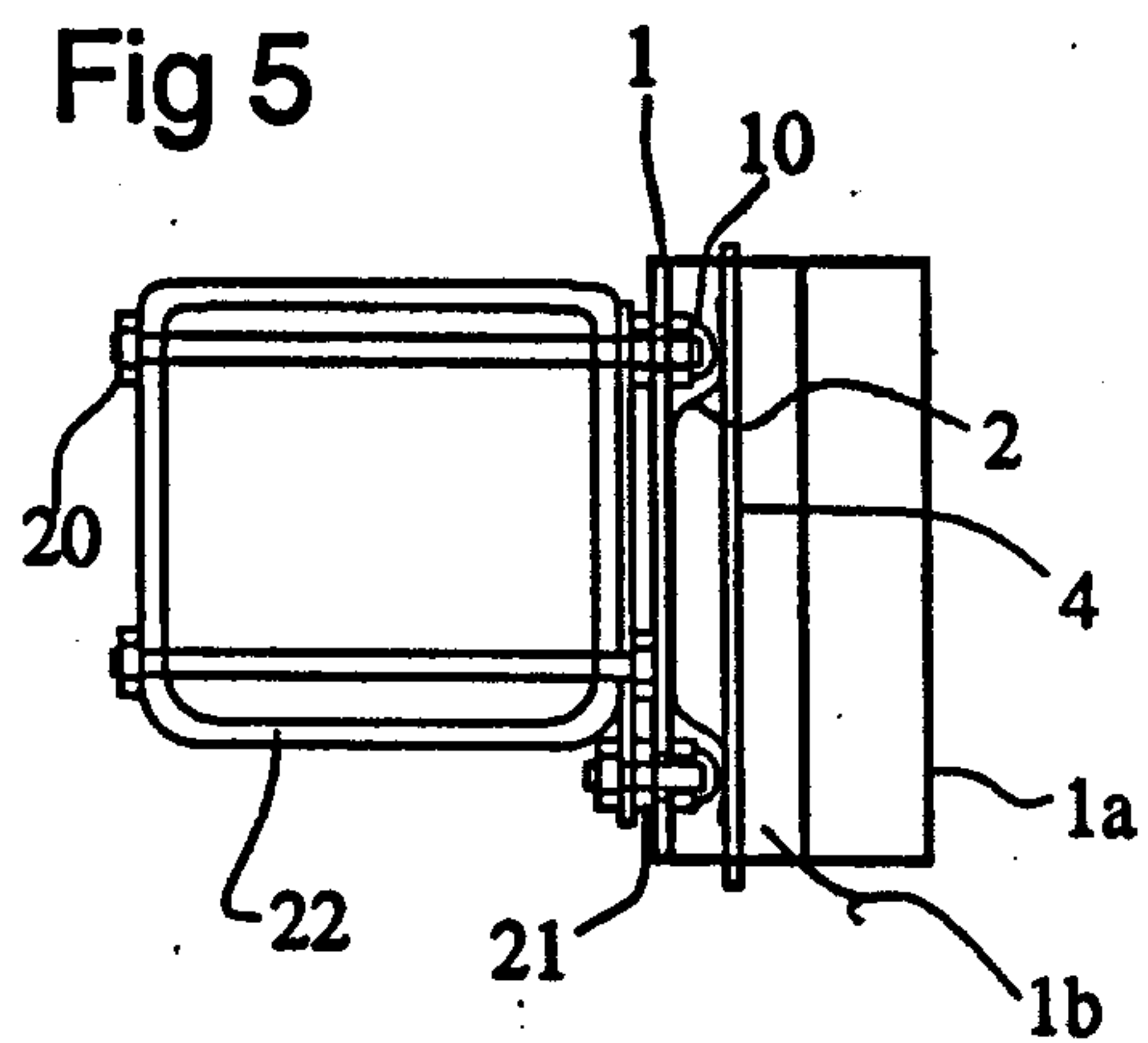
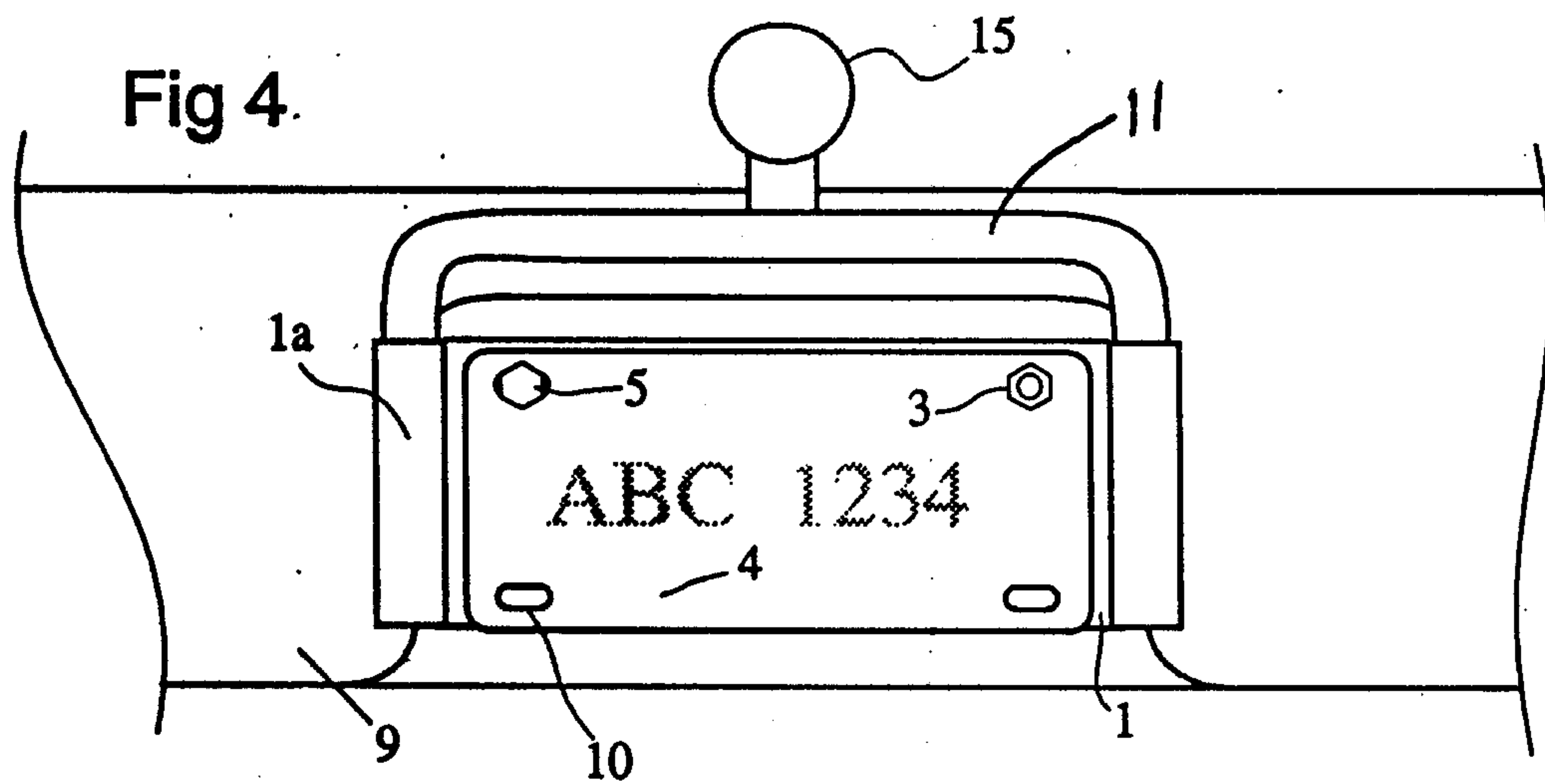


Fig 7

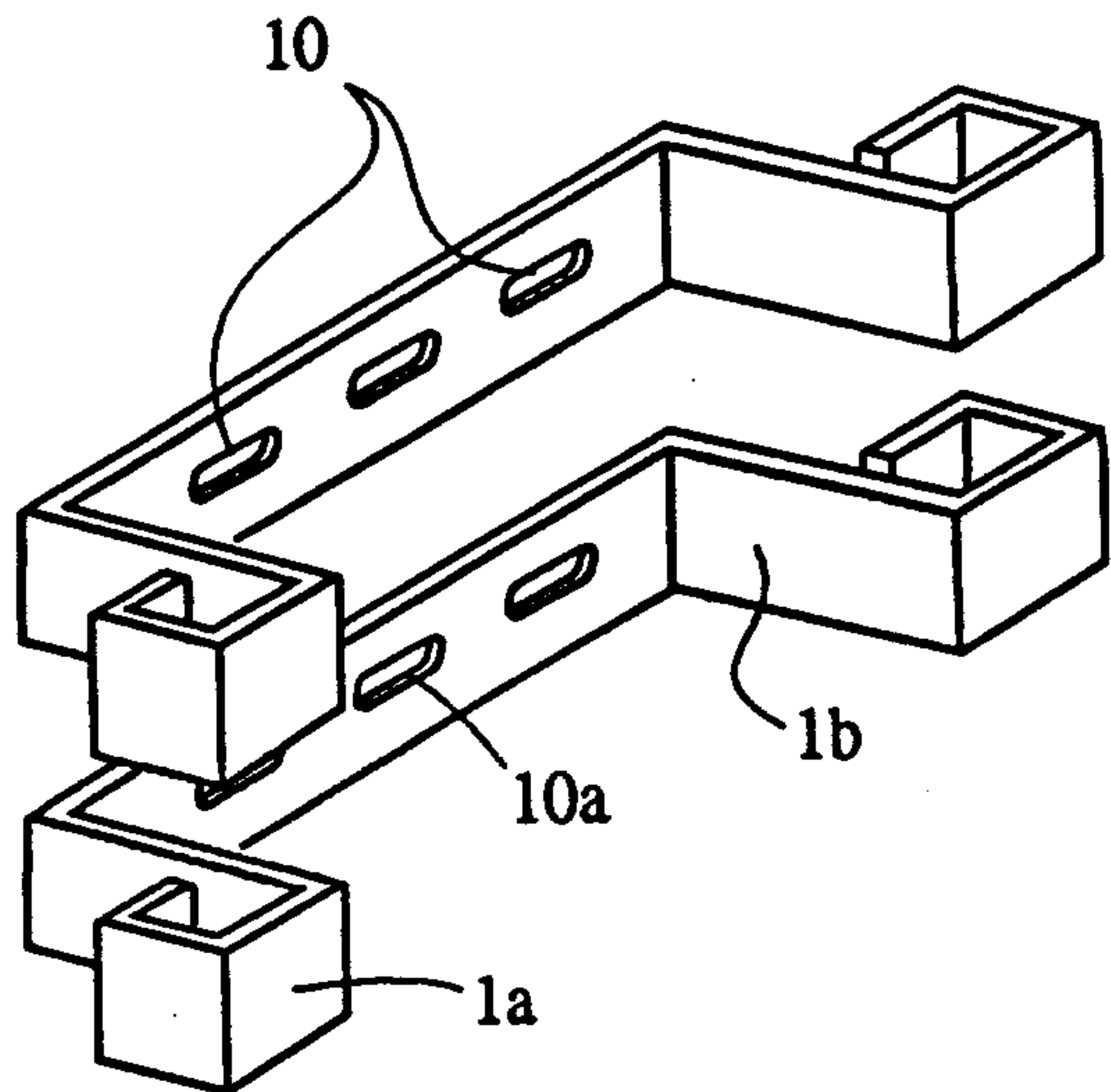


Fig 8

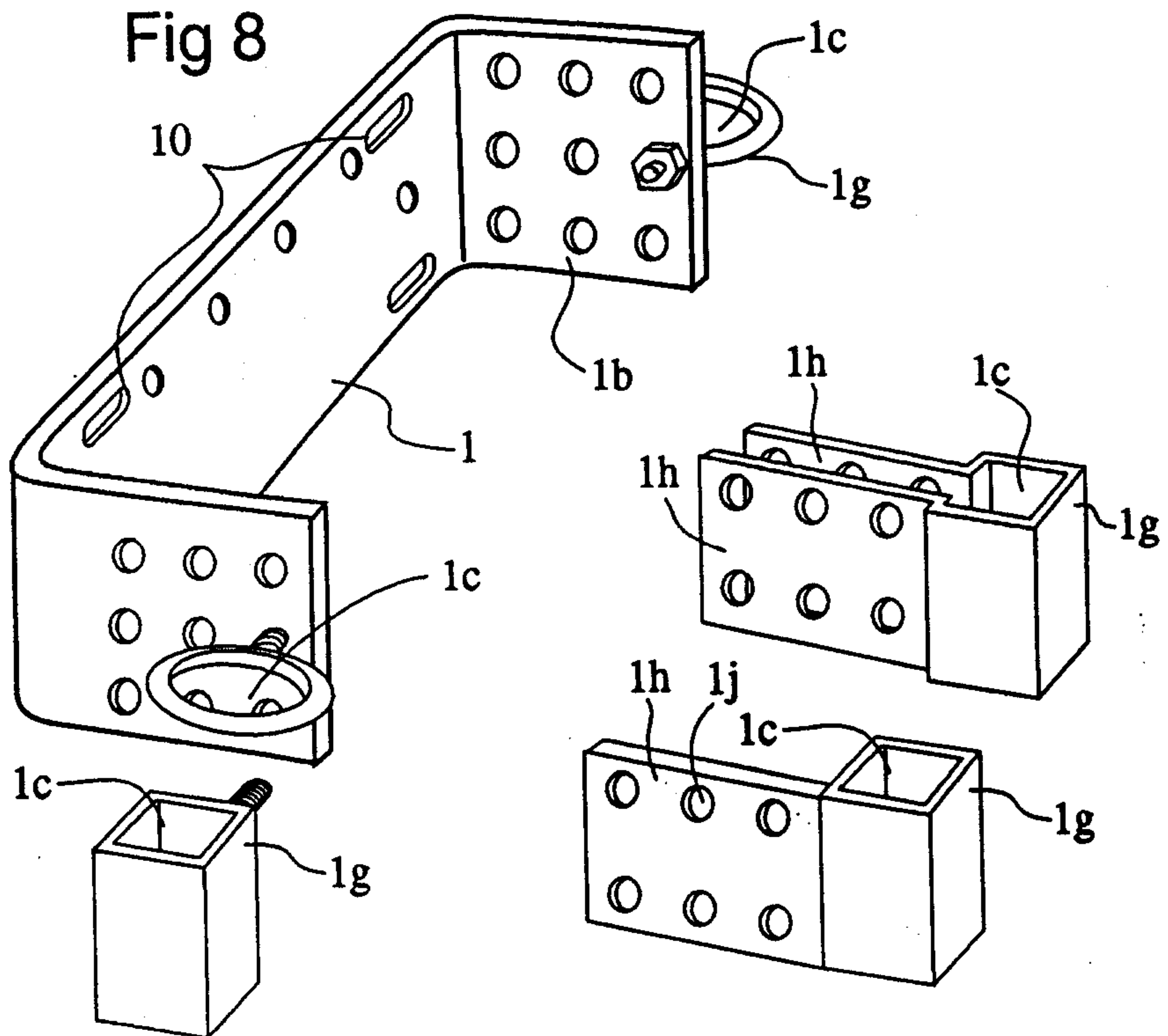


Fig 9

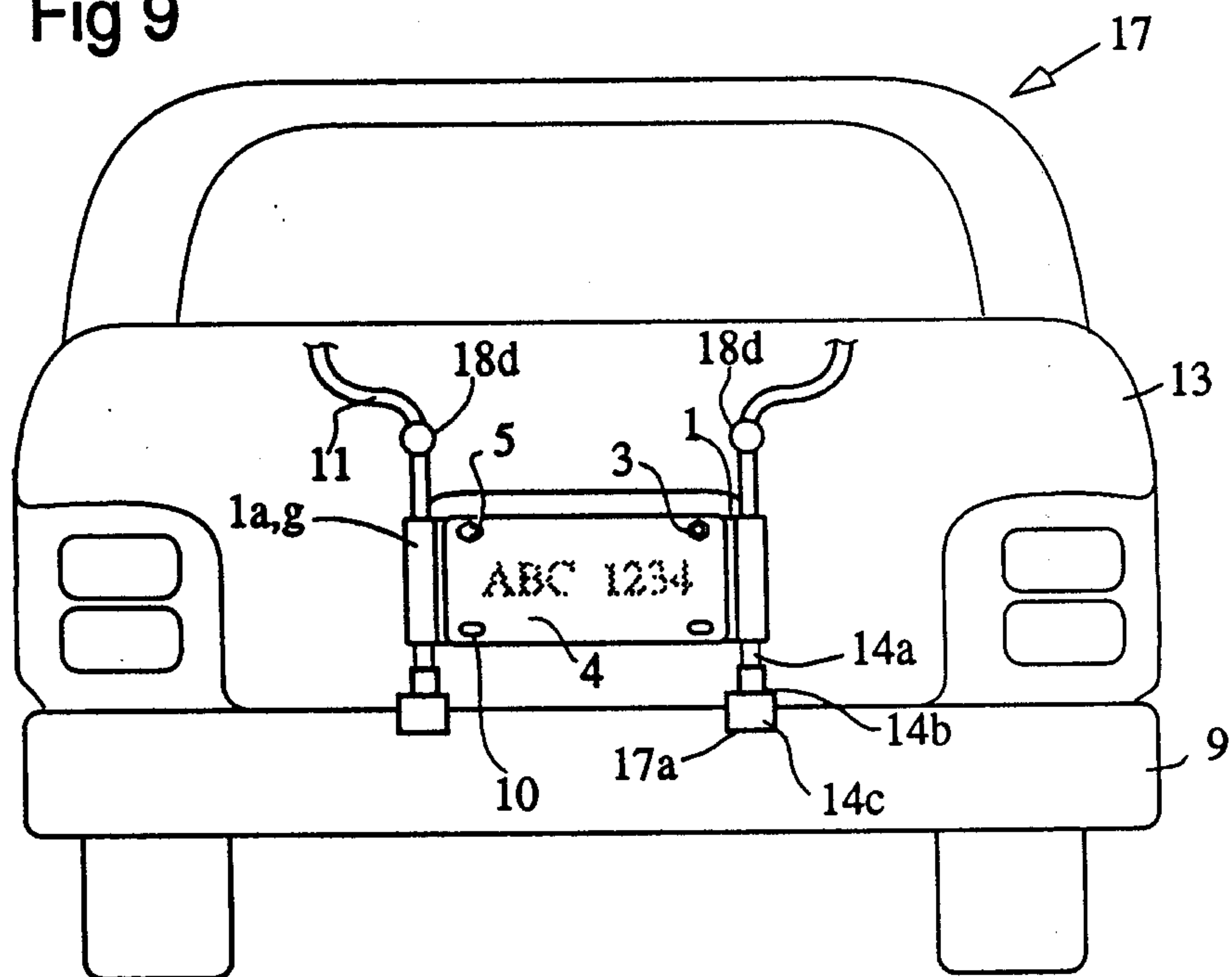


Fig 10

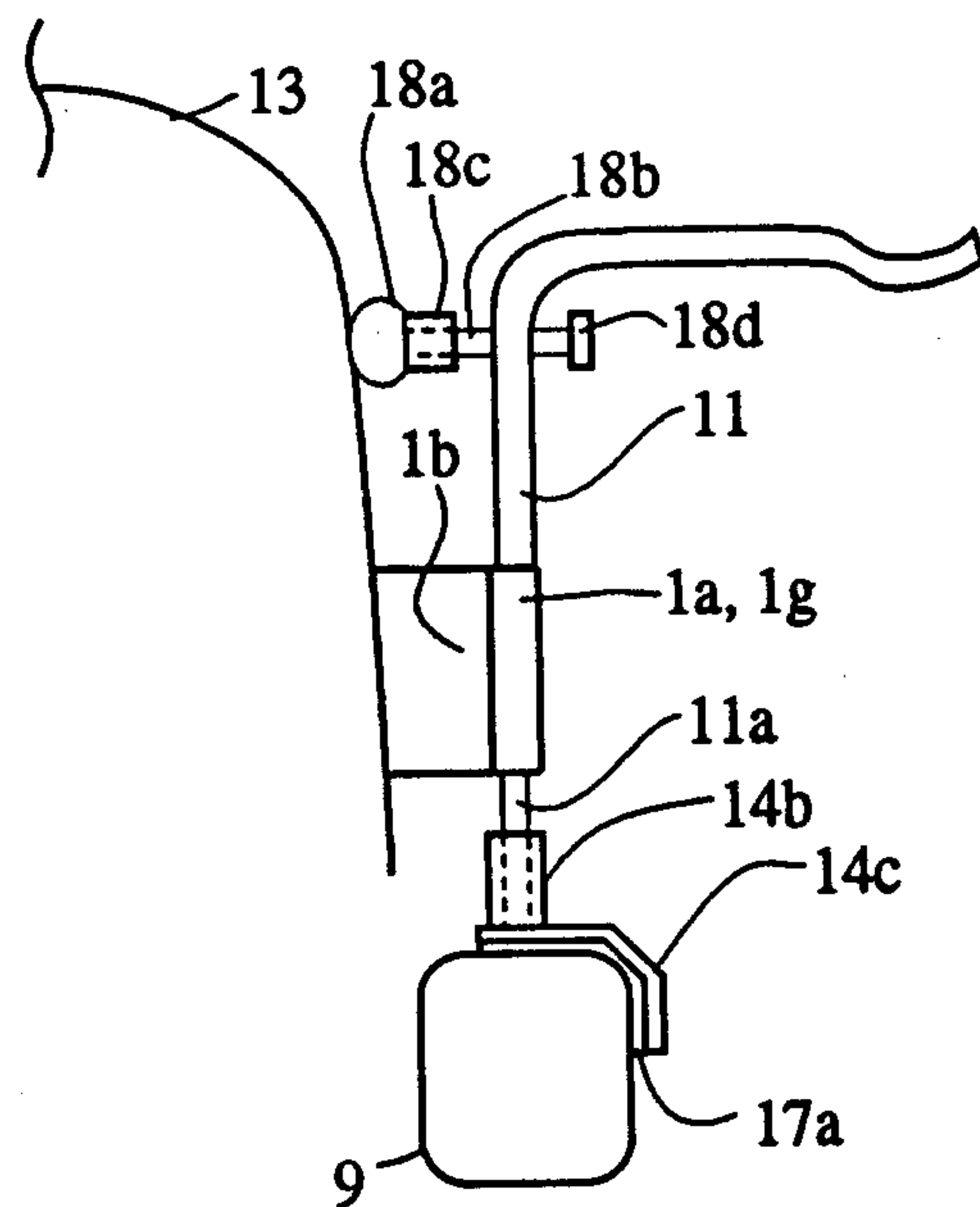


Fig 11

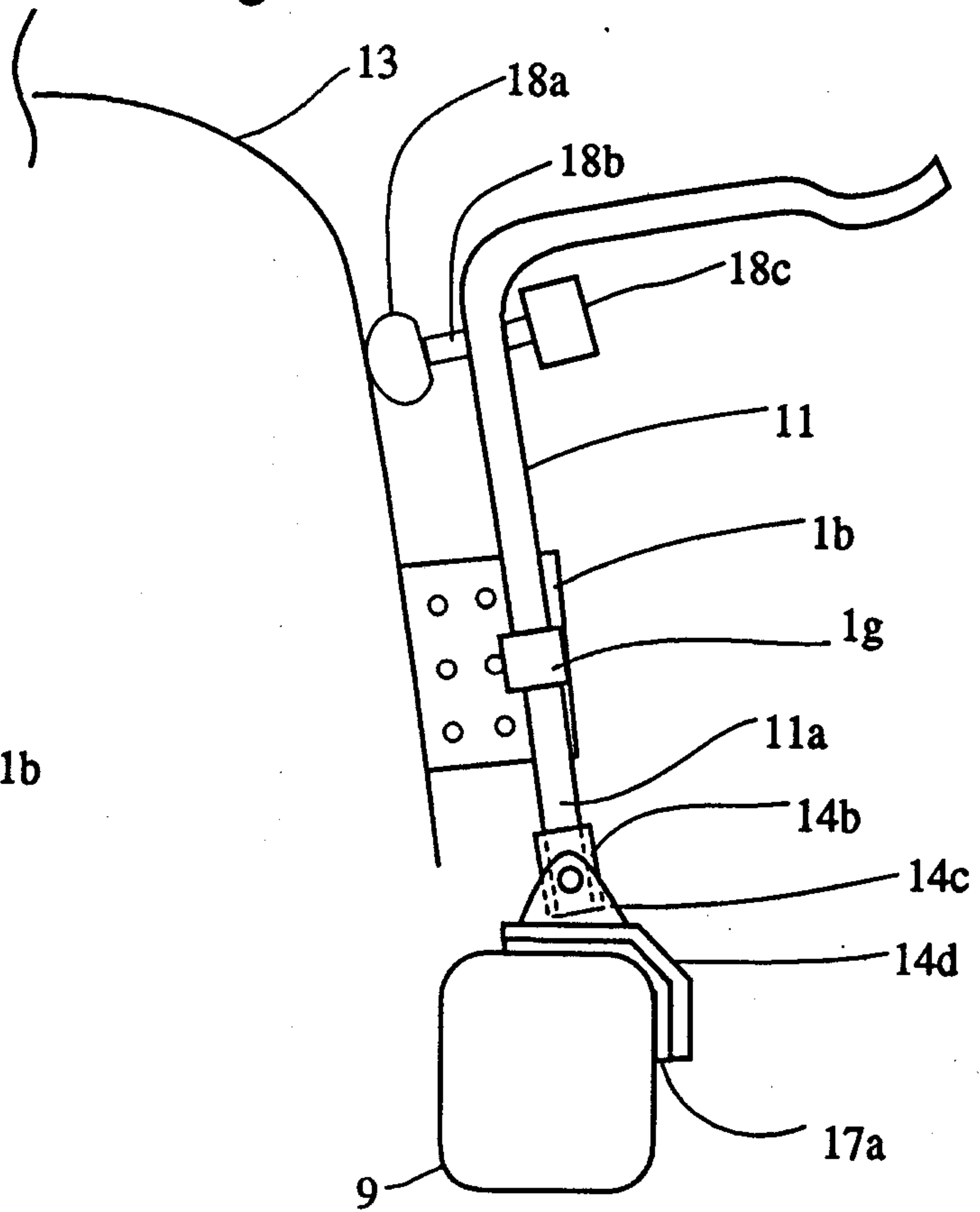


Fig 12

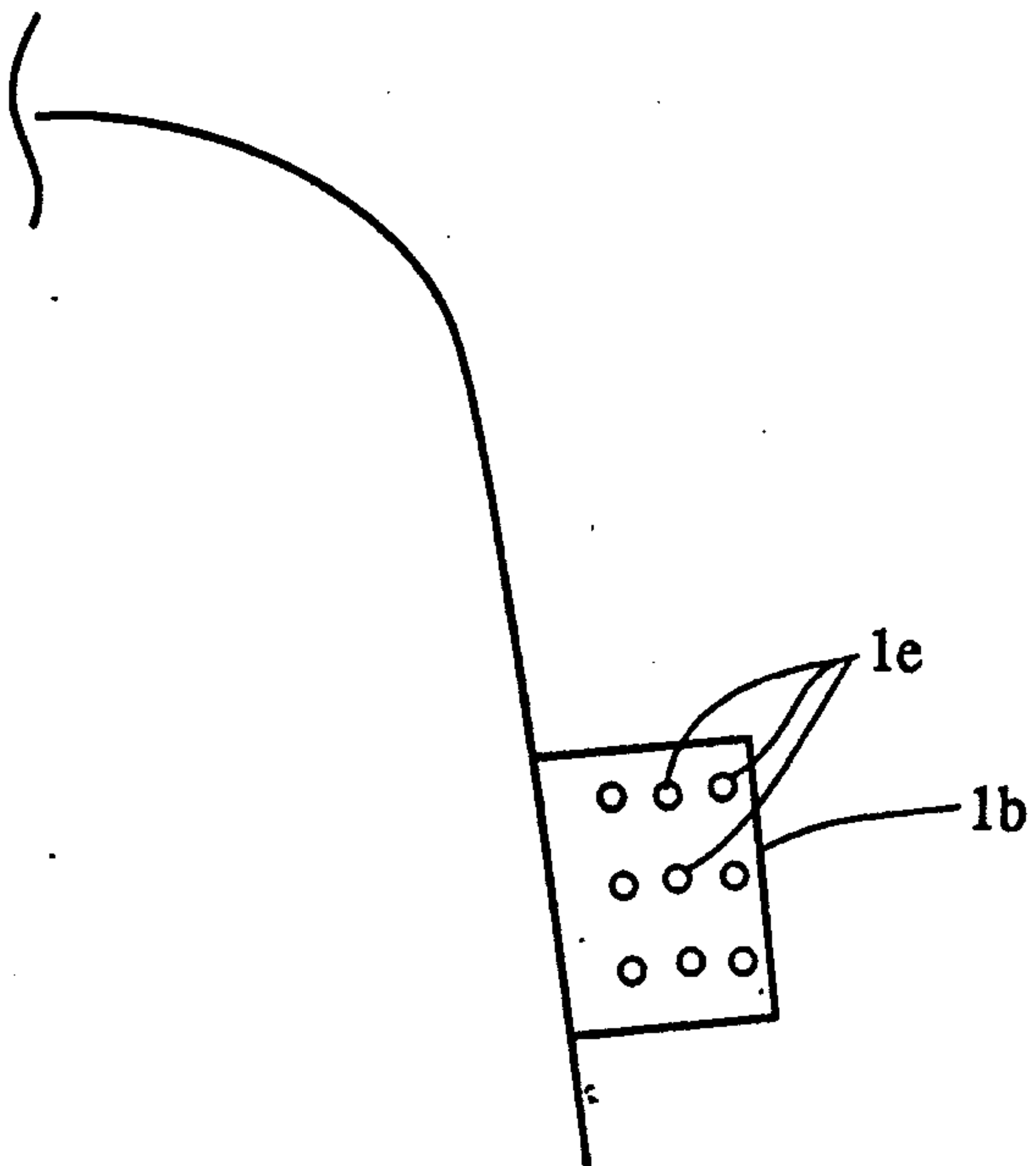


Fig 13

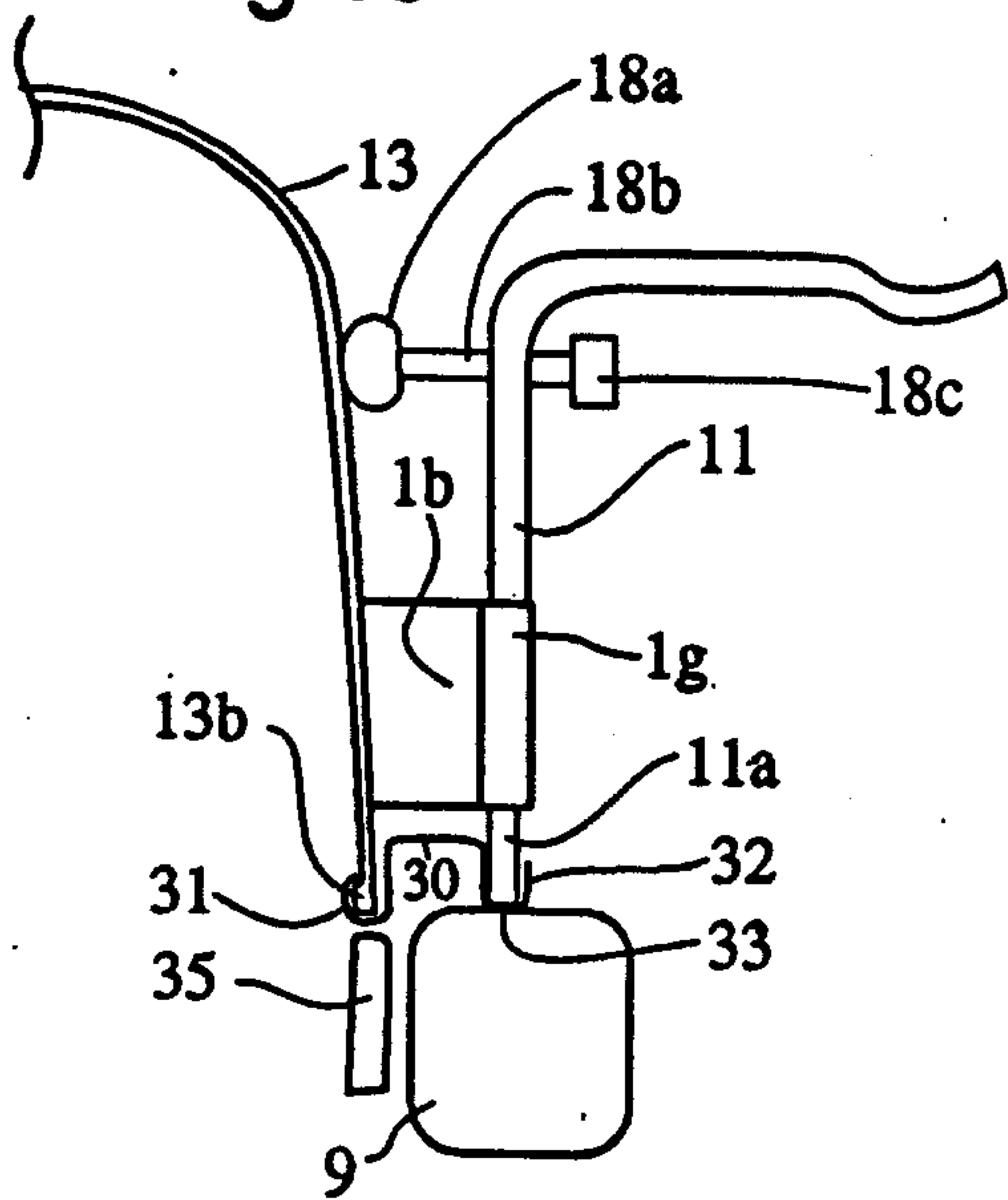


Fig 14

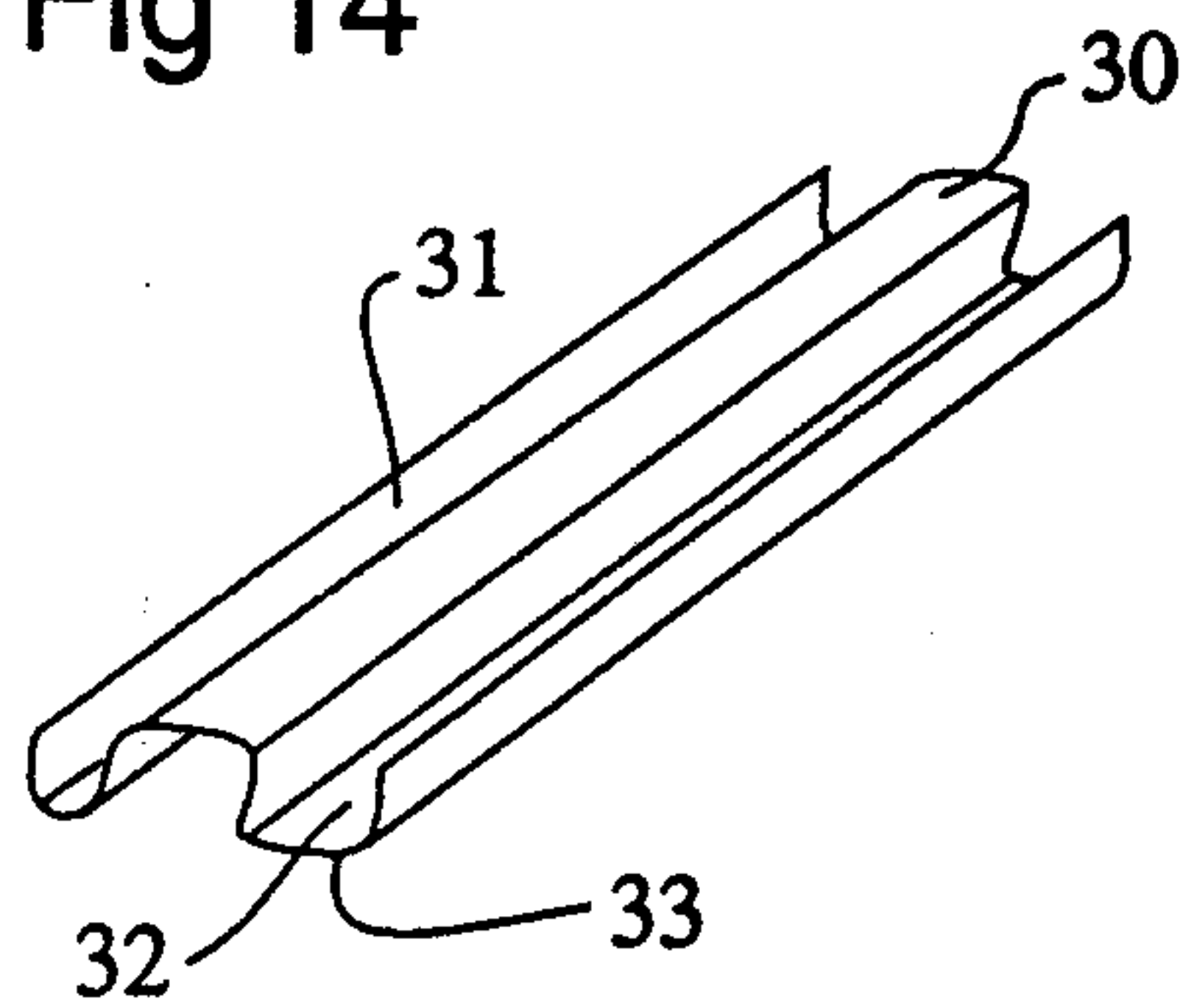


Fig 15

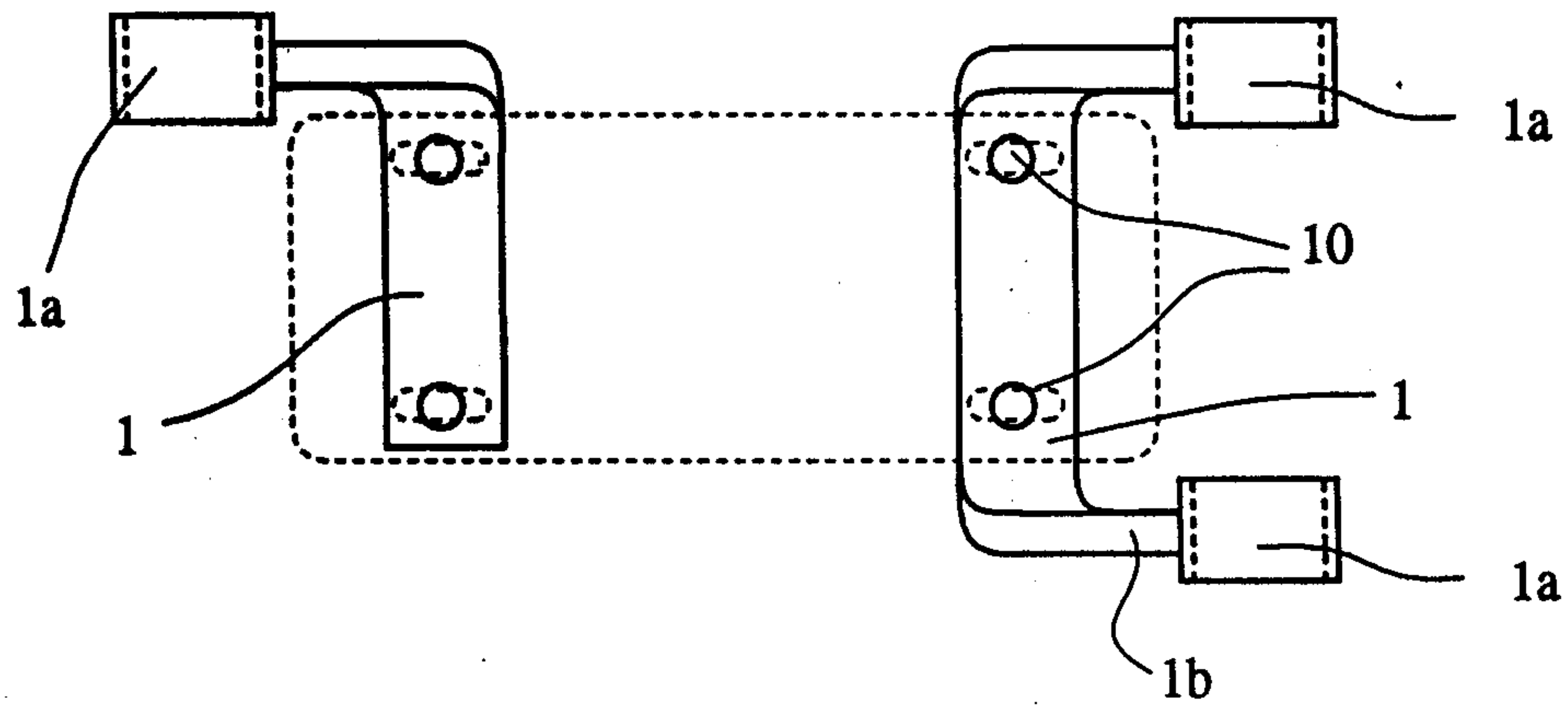


Fig 16

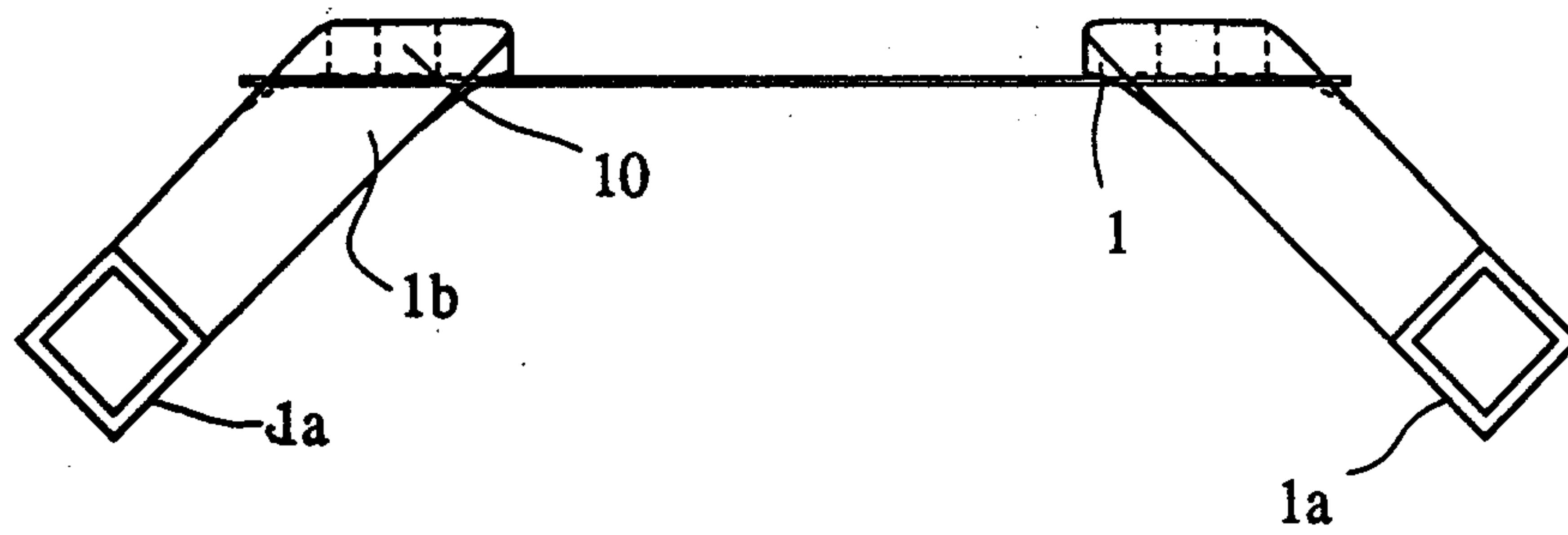


Fig 17

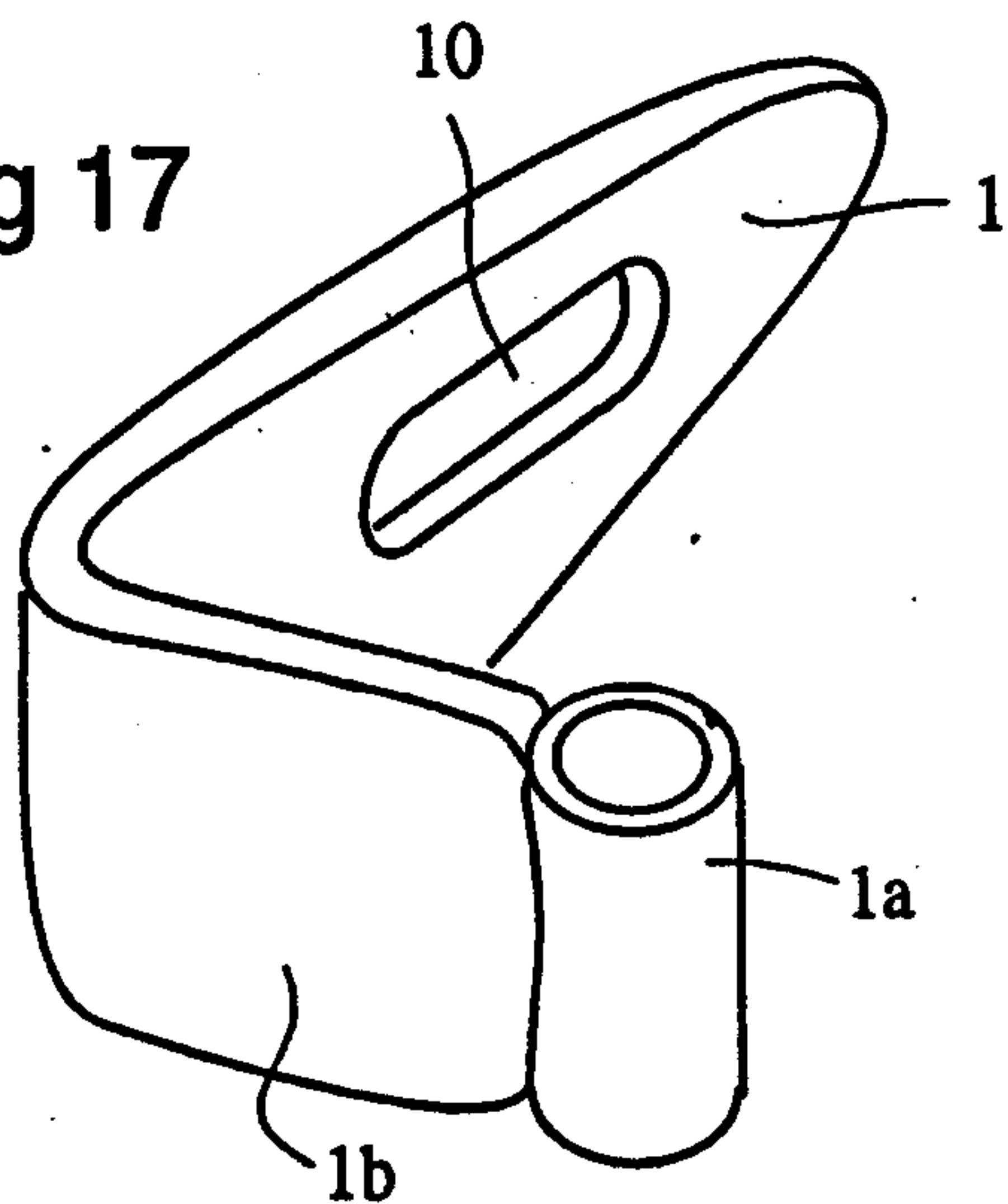


Fig 18

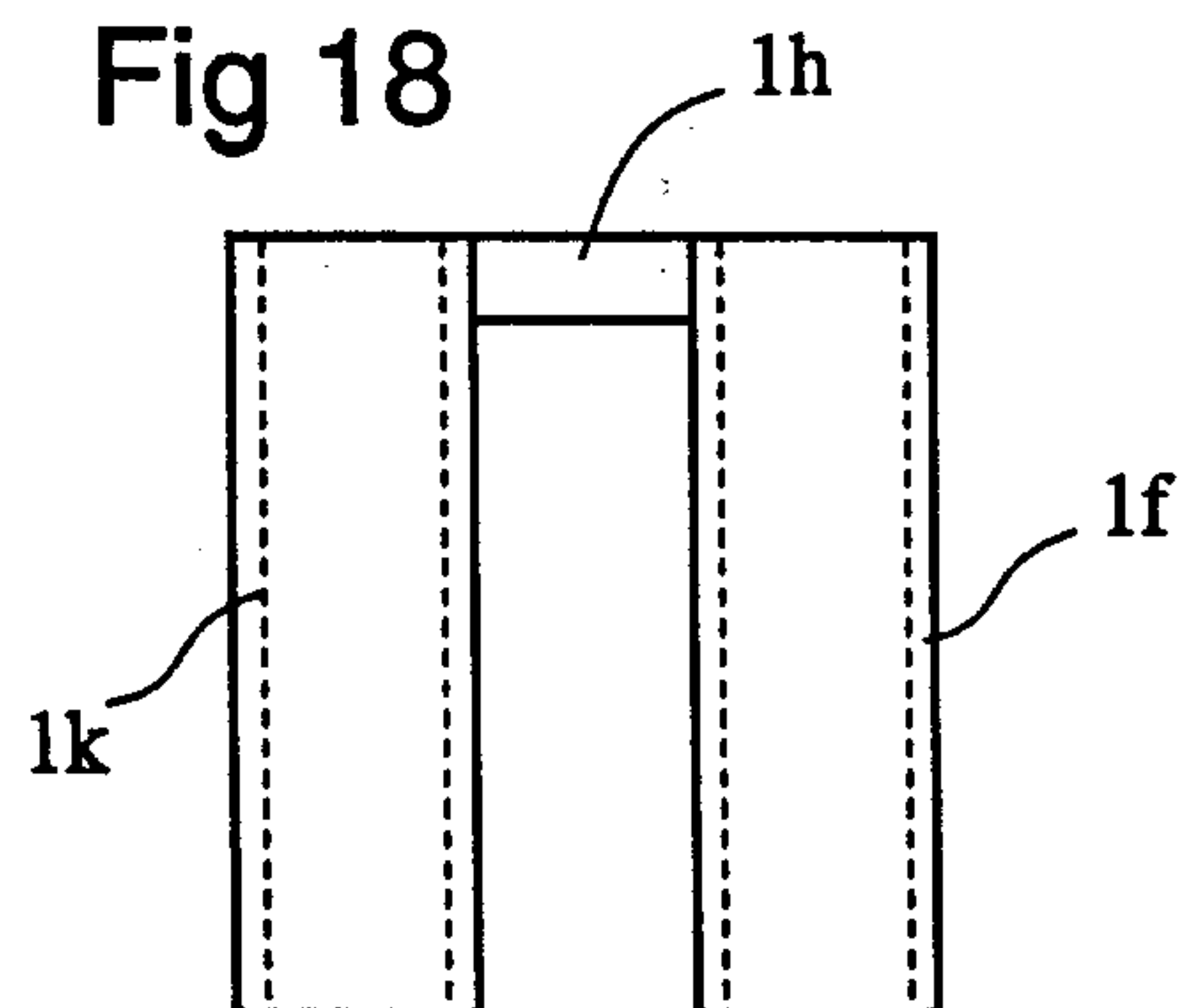


Fig 19

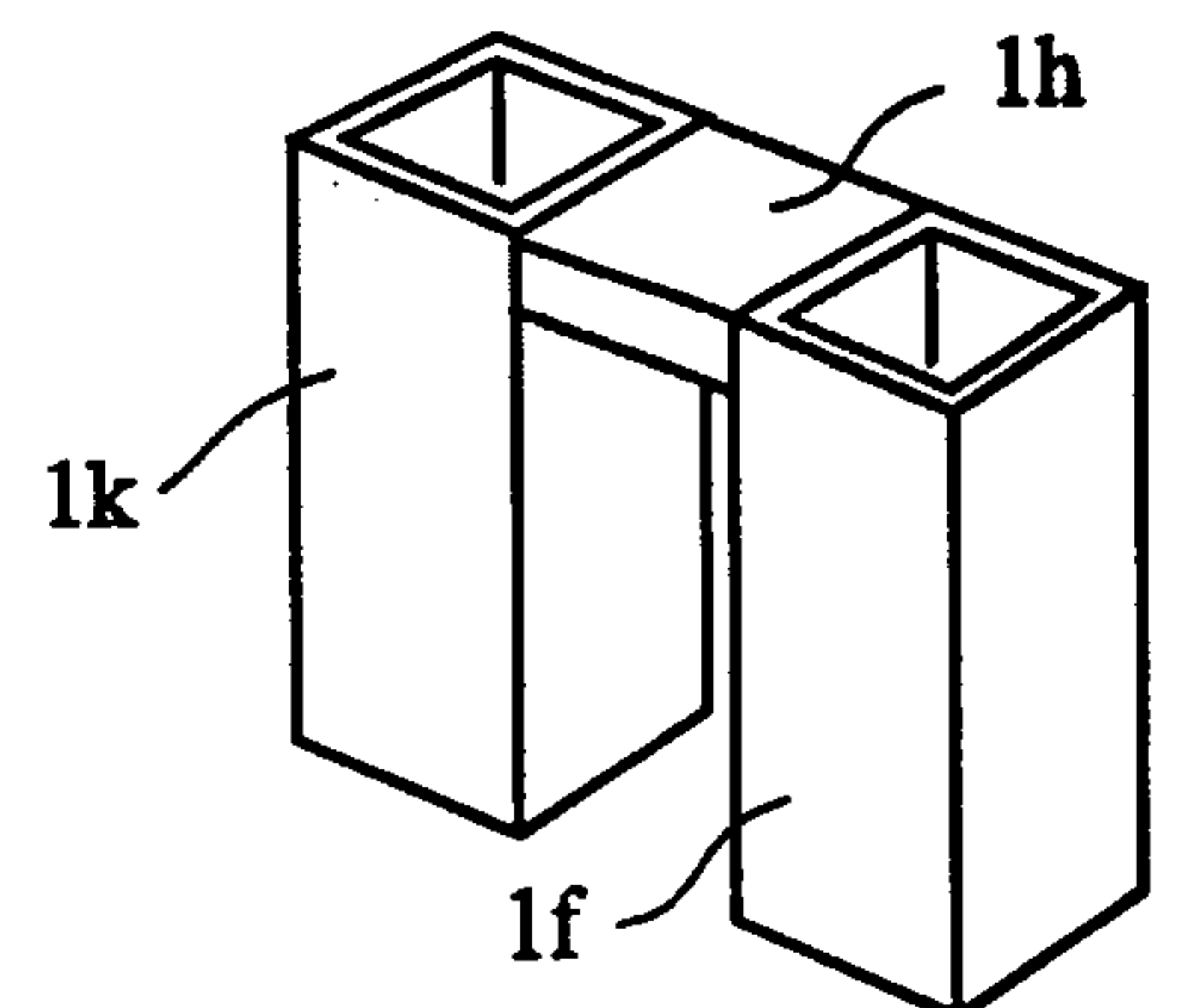


Fig 20

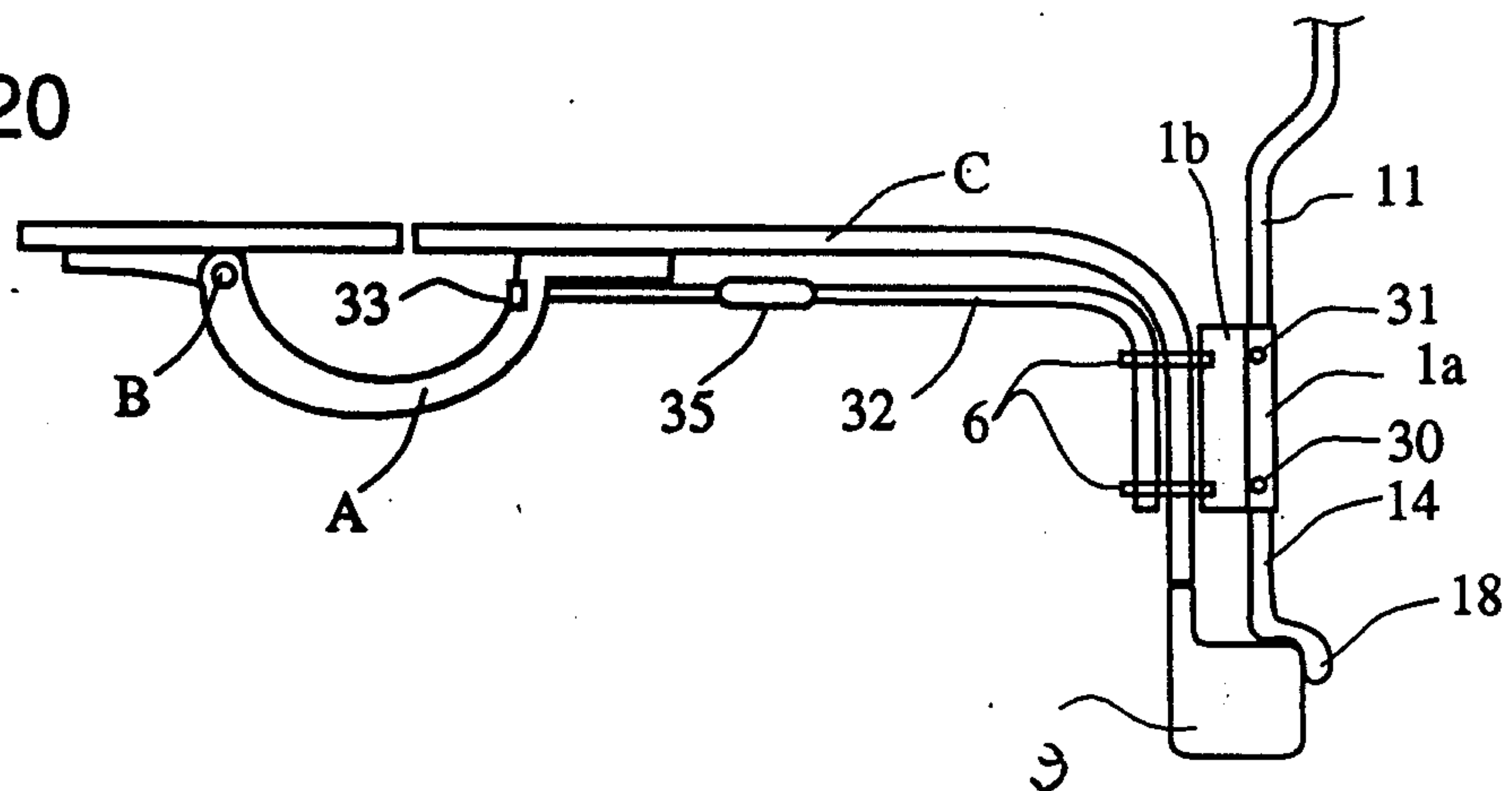


Fig 21

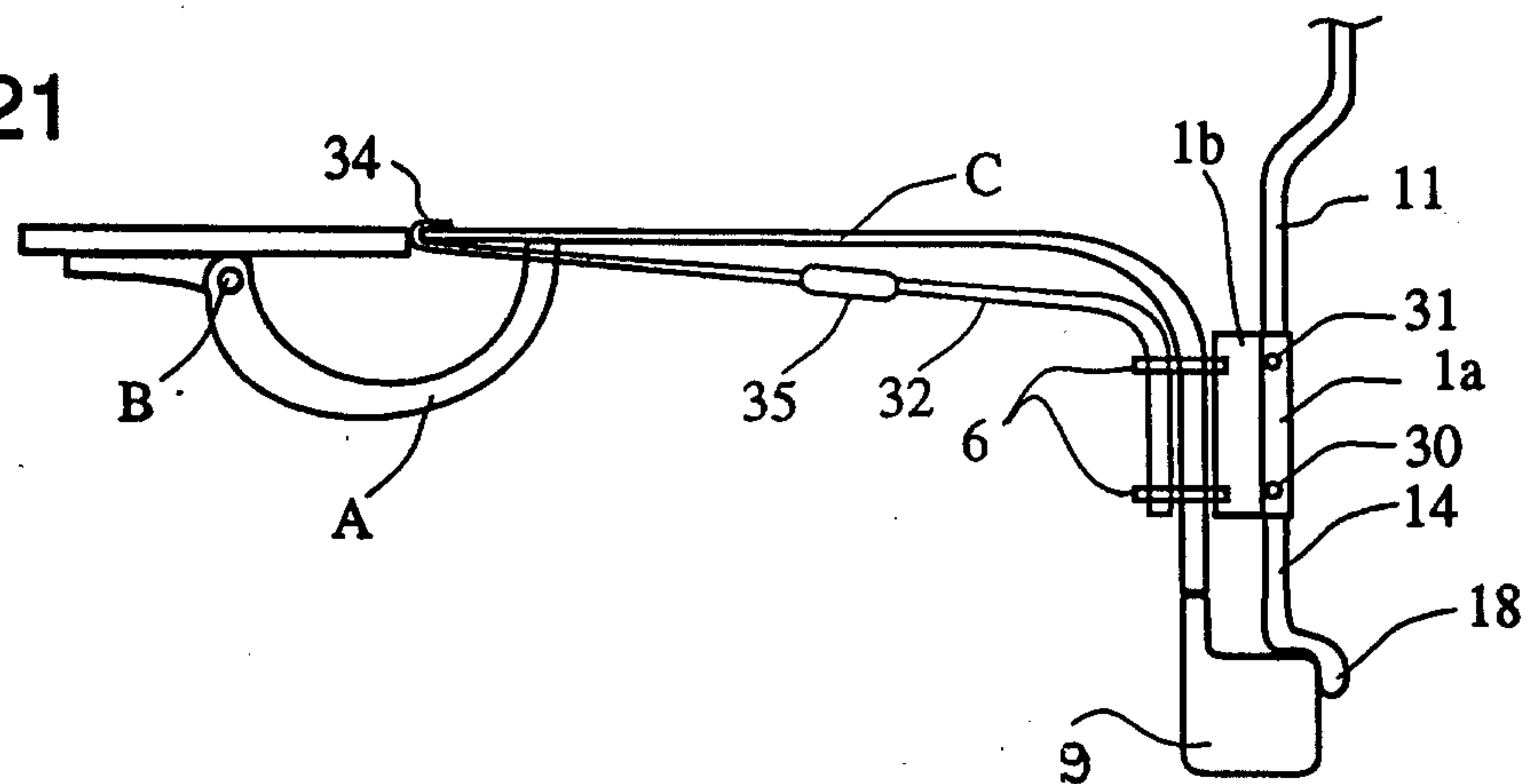


Fig 22

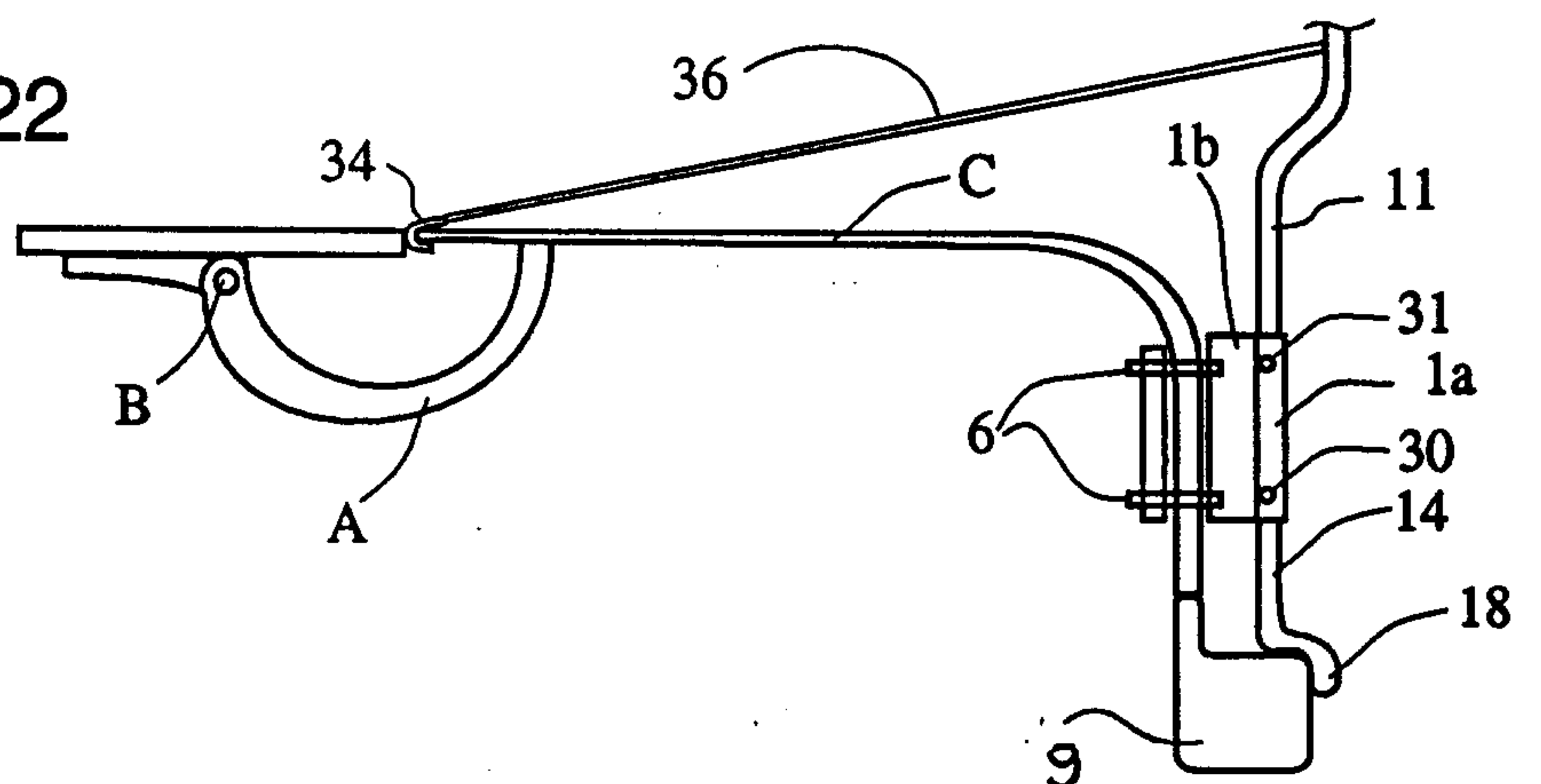


Fig 23

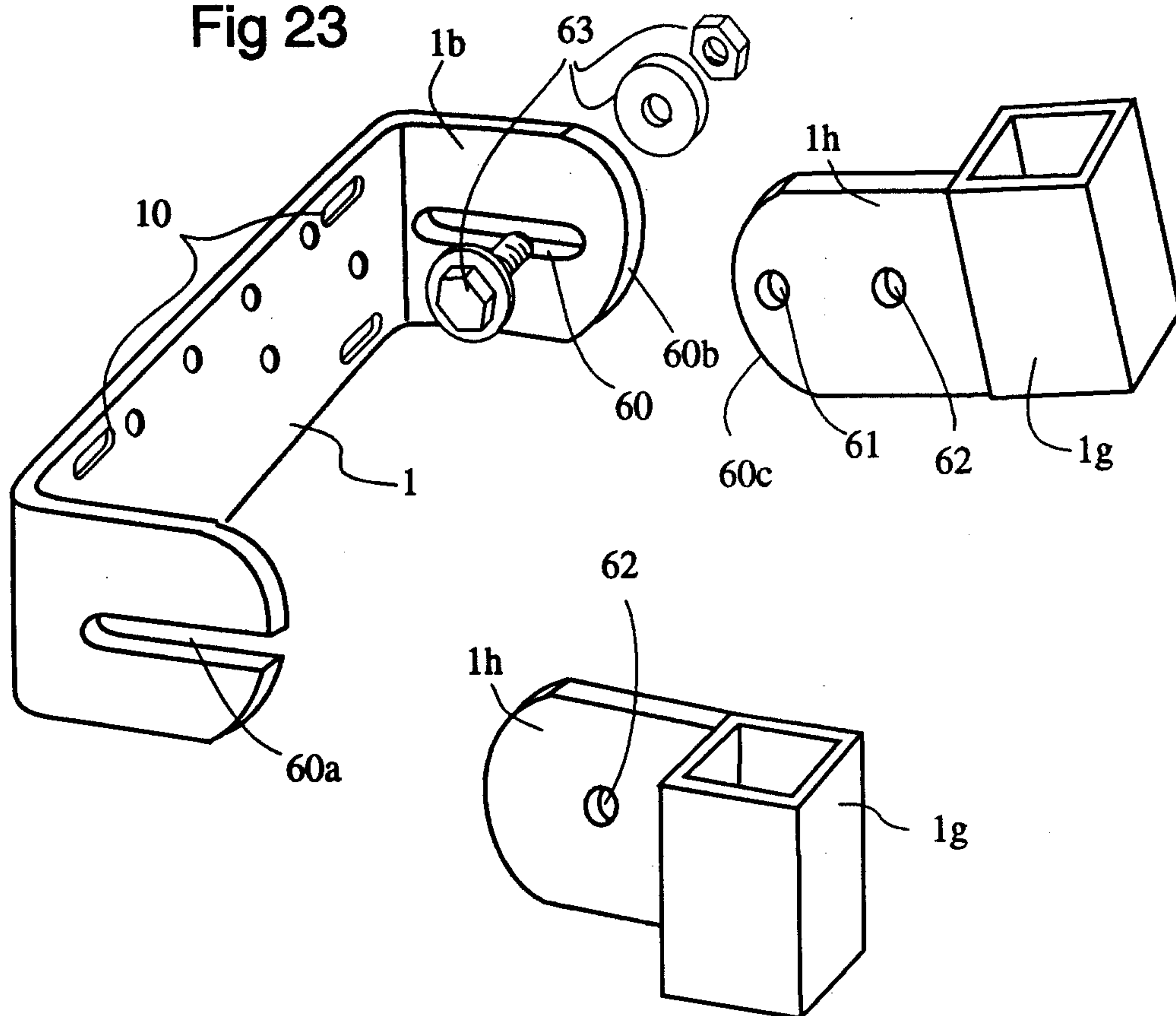


Fig 24

