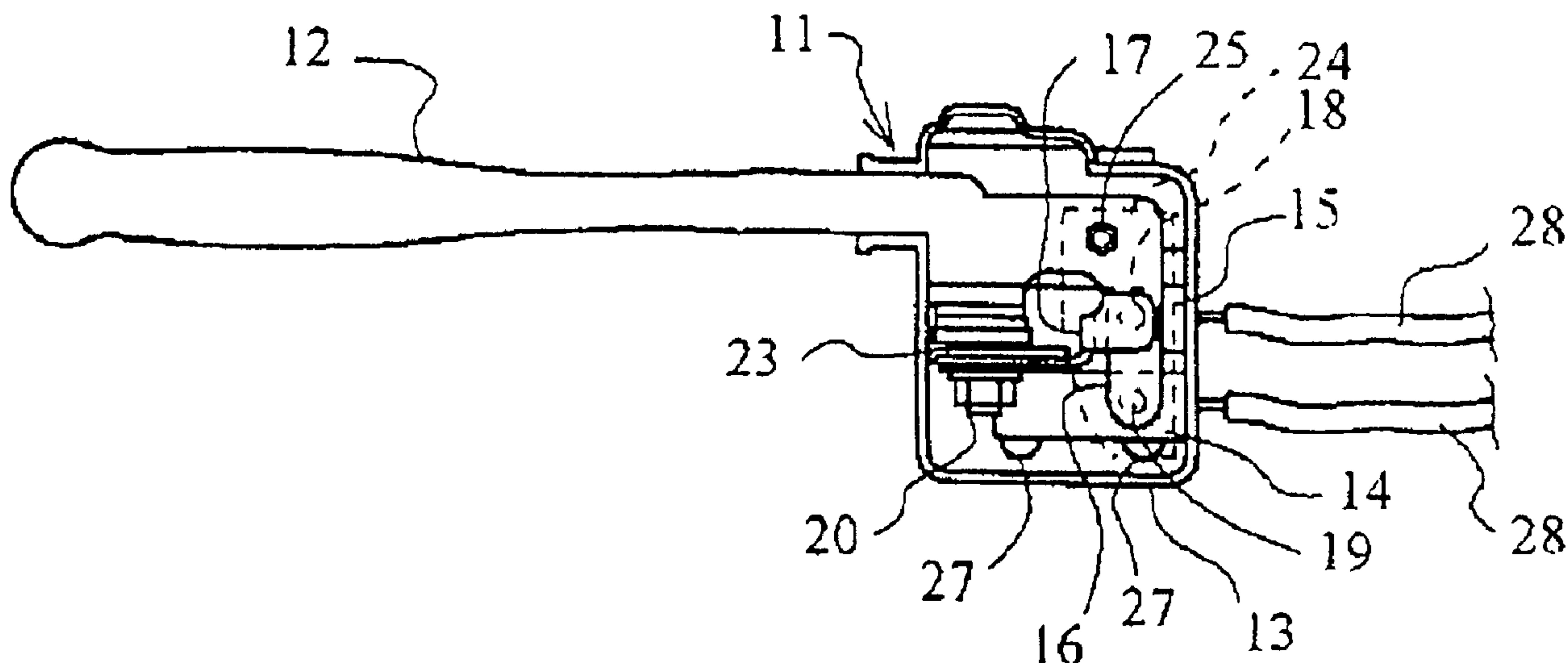




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(54) Titre : DISPOSITIF DE COMMUTATION CONJONCTIF DE LEVIER DE FREINAGE
 (54) Title: BRAKE LEVER CONJUNCTIVE SWITCH DEVICE



(57) Abrégé/Abstract:

To provide a brake lever conjunctive switch capable of making different the operating timings of a pair of switches while minimizing changes in the shape of a switch box. The means comprises a switch box 13 to which a brake lever 12 is turnably fitted, and a pair of switches 14, 15 mounted in the switch box, wherein the switches are disposed in parallel along the axial direction of turning of the brake lever, the brake lever is provided with a first contact member 16 for operating one of the switches when the brake lever is turned by a predetermined angle, and a second contact member 17 for operating the other of the switches by being oscillated by the brake lever when the brake lever is turned by not less than the predetermined angle is provided on the axis of turning of the brake lever.

ABSTRACT OF THE DISCLOSURE

To provide a brake lever conjunctive switch capable of making different the operating timings of a pair of switches while minimizing changes in the shape of a switch box. The means comprises a switch box 13 to which a brake lever 12 is turnably fitted, and a pair of switches 14, 15 mounted in the switch box, wherein the switches are disposed in parallel along the axial direction of turning of the brake lever, the brake lever is provided with a first contact member 16 for operating one of the switches when the brake lever is turned by a predetermined angle, and a second contact member 17 for operating the other of the switches by being oscillated by the brake lever when the brake lever is turned by not less than the predetermined angle is provided on the axis of turning of the brake lever.

TITLE: BRAKE LEVER CONJUNCTIVE SWITCH DEVICEFIELD OF THE INVENTION

5 The present invention relates to a brake lever conjunctive switch device used for motorcycles, saddle ride type vehicles or the like.

10 BACKGROUND OF THE INVENTION

Hitherto, in motorcycles, three-wheeled saddle ride type vehicles or four-wheeled saddle ride type vehicles or the like, a brake lever for braking the vehicle is provided at a steering handle, and a brake
15 lamp switch for turning on a brake lamp at the time of braking is provided beside the brake lever.

Some of these vehicles comprise an inhibitor switch for enabling starting of the engine in the condition where a brake is operated by a brake lever and
20 the vehicle is thereby stopped. The inhibitor switch is operated by the brake lever, together with the brake lamp switch.

The operation timings of the brake lamp switch and the inhibitor switch are set to be different from
25 each other. A brake lever conjunctive switch having the function to set the operation timings different from each other has been proposed by the present applicant in Japanese Patent Laid-open No. 10-297364 (1998).

The technology proposed comprises a switch box,
30 a swing plate fitted to the switch box to swing in conjunction with a brake lever, a plurality of push rods fitted to a switch case so as to be pressed down by the swing plate, the push rods differing in distance from the center of rotation of the swing plate, and switch means
35 faced respectively to the push rods.

In the above-mentioned proposal, the switch means have special structures and, therefore, there is a

problem that the shape of the switch box must be changed largely.

The present invention has been made in consideration of the prior-art problems as mentioned
5 above and, accordingly, an object of the invention is to provide a brake lever conjunctive switch capable of making the operation timings of a pair of switches different while minimizing the change in the shape of the switch box.

10

SUMMARY OF THE INVENTION

In order to attain the object, a brake lever conjunctive switch device according to an aspect of the present invention is characterized in that it comprises a
15 switch box to which a brake lever is turnably fitted, and a pair of switches mounted in the switch box, wherein the switches are disposed in parallel along the axial direction of turning of the brake lever, a first contact member for operating one of the switches when the brake
20 lever is turned by a predetermined angle is provided on the brake lever, and a second contact member for operating the other of the switches by being oscillated by the brake lever when the brake lever is turned by not less than the predetermined angle is provided on the axis
25 of turning of the brake lever.

A brake lever conjunctive switch device according to another aspect of the invention is characterized in that the second contact member as set forth in above is provided with a contact piece opposed
30 to the first contact member with a predetermined interval therebetween along the direction of oscillation thereof, and the first contact member is brought into contact with the contact piece, whereby the second contact piece is oscillated, when the brake lever is turned by not less
35 than the predetermined angle.

A brake lever conjunctive switch device according to yet another aspect of the invention is characterized in that the one switch as set forth above

is a stop lamp switch and the other switch is an inhibitor switch.

BRIEF DESCRIPTION OF THE DRAWINGS

5 Preferred embodiments of the invention are shown in the drawings, wherein:

Fig. 1 is a side view showing a four-wheeled saddle ride type vehicle to which one embodiment of the invention has been applied.

10 Fig. 2 is a plan view of a major portion of the four-wheeled saddle ride type vehicle to which the embodiment of the invention has been applied.

Fig. 3 is a partially broken plan view showing a major portion of the embodiment of the invention.

15 Fig. 4 is a view taken along arrow A of Fig. 3.

Fig. 5 is a sectional view taken along line B-B of Fig. 3, for illustrating the operation of the embodiment of the invention.

20 Fig. 6 is a sectional view taken along line B-B of Fig. 3, for illustrating the operation of the embodiment of the invention.

Fig. 7 is a sectional view taken along line B-B of Fig. 3, for illustrating the operation of the embodiment of the invention.

25 Fig. 8 is a system diagram of an inhibitor system in the embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

30 Fig. 1 shows a four-wheeled saddle ride type vehicle (hereinafter referred to simply as vehicle) to which the embodiment has been applied, and the vehicle is denoted by numeral 1.

35 The vehicle 1 comprises a vehicle body frame 2, front wheels 3 disposed at both side portions of a front portion of the vehicle body frame 2, rear wheels 4 disposed on both sides of a rear portion of the vehicle body frame 2, a steering handle 5 disposed on the upper

side of a front portion of the vehicle body frame 2 for steering the front wheels 3, a fuel tank 6 mounted on the rear side of the steering handle 5, a seat 7 fitted on the rear side of the fuel tank 6, a front fender 8
5 disposed to cover the upper side of the front wheels 3, and a rear fender 9 disposed to cover the upper side of the rear wheels 4. As shown in Fig. 2, brake devices 10, 11 for braking the vehicle 1 are provided at both end portions of the steering handle 5, and the brake device
10 11 on one side is provided with a brake lever conjunctive switch according to the present embodiment.

The brake lever conjunctive switch according to the embodiment, as shown in Fig. 3 and Fig. 4, comprises a switch box 13 to which a brake lever 12 is turnably
15 fitted, and a pair of switches 14, 15 mounted in the switch box 13, wherein the switches 14, 15 are disposed in parallel along the axial direction of turning of the brake lever 12, a first contact member 16 for operating one of the switches 14 when the brake lever 12 is turned
20 by a predetermined angle is provided on the brake lever 12, and a second contact member 17 for operating the other of the switches 15 by being oscillated by the brake lever 12 when the brake lever 12 is turned by not less than the predetermined angle is provided on the axis of
25 turning of the brake lever 12.

In detail, the switches 14, 15 are the same type of switch, and one 14 of the switches is a brake lamp switch, while the other 15 of the switches is an inhibitor switch.

30 Operating pins 18, 19 of the switches 14, 15 are located in the same plane parallel to a pivotal shaft 20 of the brake lever 12.

The first contact member 16 is provided as one body with the brake lever 12, and is located to overlap
35 with the operating pins 18, 19. At the position opposed to the other switch 15 (inhibitor switch), the first contact member 16 is provided with a cutaway 21 through

which a portion of the second contact member 17 is passed.

The second contact member 17 is provided oscillatably on the pivotal shaft 20, and is provided, at
5 its end portion of oscillation, with a contact piece 22 which has a U-shaped cross section and through which the first contact member 16 is passed.

The contact piece 22 has its one end portion 22a (the lower end portion in Fig. 3 and Fig. 5) passed
10 through the cutaway 21 of the first contact member 16 and brought into contact with the operating pin 19 of the other switch 15 (inhibitor switch).

The other end portion 22b (the upper end portion in Fig. 3 and Fig. 5) of the second contact piece
15 17 is located on the opposite side of the one end portion 22a with respect to the first contact member 16, and is located on the locus of movement of the first contact member 16.

Further, the one end portion 22a and the other
20 end portion 22b of the second contact piece 17 disposed with such an interval that only the first contact member 16 can be moved while the first contact member 16 is moved a predetermined distance during when the first contact member 16 is moved attendant on a turning
25 operation of the brake lever 12.

The brake lever 12 is biased by a spring (not shown) in such a direction that the first contact member presses down the operating pin 18 of the one switch
30 (brake lamp switch) 14. The second contact member 17 is biased by a spring 23 fitted onto the pivotal shaft 20 in such a direction that its one end portion 22a presses down the operating pin 19 of the other switch (inhibitor switch) 15.

35 On the other hand, numeral 24 in Figs. 3 to 5 denotes a guide plate provided so as to cover the second contact member 17 and fixed to the brake lever 12 by a bolt 25.

As shown in Fig. 5, the switches 14 and 15 are disposed with a spacer 26 therebetween, and are fixed by a bolt 27 penetrating therethrough. As shown in Fig. 4, signal lines 28 are connected to the switches 14 and 15.

5 Fig. 8 is a system diagram of an inhibitor system to which the present embodiment is applied.

The inhibitor system comprises a cell motor 29 provided at a side of the engine, a sta-mag switch 30 for supplying a driving current from a battery (not shown) to
10 the cell motor 29, a start switch 31 turning ON and OFF a driving current supplied from a battery to the sta-mag switch 30, a neutral switch 32 provided in series with the start switch 31 with the sta-mag switch 30 there between, and the switch (inhibitor switch) 15 provided in
15 parallel with the neutral switch 32.

In the figure, numeral 33 denotes a neutral position lamp turned ON to display neutral position when the neutral switch 32 is ON, and numeral 34 denotes a control unit for controlling the driving of the engine.

20 In the brake lever conjunctive switch according to this embodiment constructed as described above, in the condition where the brake lever 12 is not operated, the operating pins 18, 19 of the switches 14, 15 are kept pressed down by the first contact member 16 and the
25 second contact member 17, as shown in Fig. 3 and Fig. 5.

In this condition, a brake lamp is not turned ON, and the switch (inhibitor switch) 15 is turned OFF, whereby starting or restarting of the engine is restrained.

30 When a braking operation is done during normal running or the like, the first contact member 16 is moved by the brake lever 12 away from the one switch 14 (brake lamp switch). Where the angle of turning of the brake lever 12 is not more than a predetermined angle, the
35 second contact member 17 is kept pressing down the operating pin 19 of the other switch (inhibitor switch) 15.

By this, turning ON of the brake lamp attendant on the braking operation is achieved.

Next, methods of starting the engine in the present embodiment will be described.

5 In this embodiment, there are two methods of starting the engine.

In one of the two starting methods, first, a transmission provided at a side of the engine is set into a neutral position.

10 Attendant on this, the neutral switch 32 is turned ON. When the start switch 31 is turned ON in this condition, the sta-mag switch 30 is connected to the battery through the start switch 31 and the neutral switch 32, whereby a driving current is supplied from the
15 battery to the sta-mag switch 30, and the sta-mag switch 30 is turned ON.

As a result, a driving current is supplied to the cell motor 29 through the sta-mag switch 30, and the engine is started.

20 Such a method of starting the engine is often used at the time of starting use of the vehicle 1.

Next, the other of the starting methods will be described.

This starting method is often used at the time
25 of restarting the engine, and is a starting method in the condition where the transmission is maintained in other position than the neutral position and the reverse position.

30 In detail, first, the brake lever 12 is turned to a turning angle not less than that at the time of a normal braking operation.

By such an operation, the first contact member 16 is further moved in the direction of parting away from the switches 14, 15 to make contact with one end portion
35 22a of the second contact member 17 as shown in Fig. 6. Thereafter, as shown in Fig. 7, the first contact member 16 separates the second contact member 17 from the other switch (inhibitor switch) 15, and releases the pressing

on the operating pin 19 of the other switch (inhibitor switch) 15.

By this, the switch (inhibitor switch) 15 is turned ON; when the start switch 31 is turned ON in this condition, the sta-mag switch 30 is connected to the battery through the start switch 31 and the switch (inhibitor switch) 15. As a result, the sta-mag switch 30 is turned ON, and a driving current is supplied to the cell motor 29, whereby starting or restarting of the engine is enabled.

According to the brake lever conjunctive switch device of the embodiment as described above, the same type switches 14, 15 are mounted in parallel in the switch box 13, the brake lever 12 is provided with the first contact member 16 for operating the one switch (brake lamp switch) 14, and the second contact member 17 for operating the other switch (inhibitor switch) 15 by being oscillated by the brake lever 12 when the brake lever 12 is turned by not less than the predetermined angle is provided on the pivotal shaft 20 of the brake lever 12. By this arrangement, it is possible to assuredly obtain a mechanism for making different the operation timings of the two switches 14, 15 without any large change in the shape of the switch box 13.

The shapes, dimensions and the like of component parts illustrated in the embodiment are given by way of example, and modifications thereof can be made based on design requirement and the like.

As has been described above, according to the invention, a brake lever is provided with a first contact member for operating one switch, and a second contact member for operating the other switch by being oscillated by the brake lever when the brake lever is turned by not less than a predetermined angle is provided on the axis of turning of the brake lever. By this arrangement, the same type switches can be provided in parallel in a switch box, and it is possible to assuredly obtain a mechanism for operating the two switches with different

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timings without any great change in the shape of the switch box.

Although various preferred embodiments of the present invention have been described herein in detail,
5 it will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A brake lever conjunctive switch device comprising a switch box to which a brake lever is pivotably fitted, and a pair of switches mounted in said switch box, wherein said switches are disposed in parallel along the axial direction of pivoting of said brake lever, a first contact member for operating one of said switches when said brake lever is pivoted by a predetermined angle is provided on said brake lever, and a second contact member for operating the other of said switches by being oscillated by said brake lever when said brake lever is pivoted by not less than said predetermined angle is provided on the pivot axis of said brake lever.

2. A brake lever conjunctive switch device as set forth in claim 1, wherein said second contact member is provided with a contact piece opposed to said first contact member with a predetermined interval there between along the direction of oscillation thereof, and said first contact member is brought into contact with said contact piece of said second contact member, whereby said contact piece of said second contact member is oscillated, when said brake lever is pivoted by not less than said predetermined angle.

3. A brake lever conjunctive switch device as set forth in claim 1 or 2, wherein said pair of switches are a stop lamp switch and an inhibitor switch.

FIG. 1

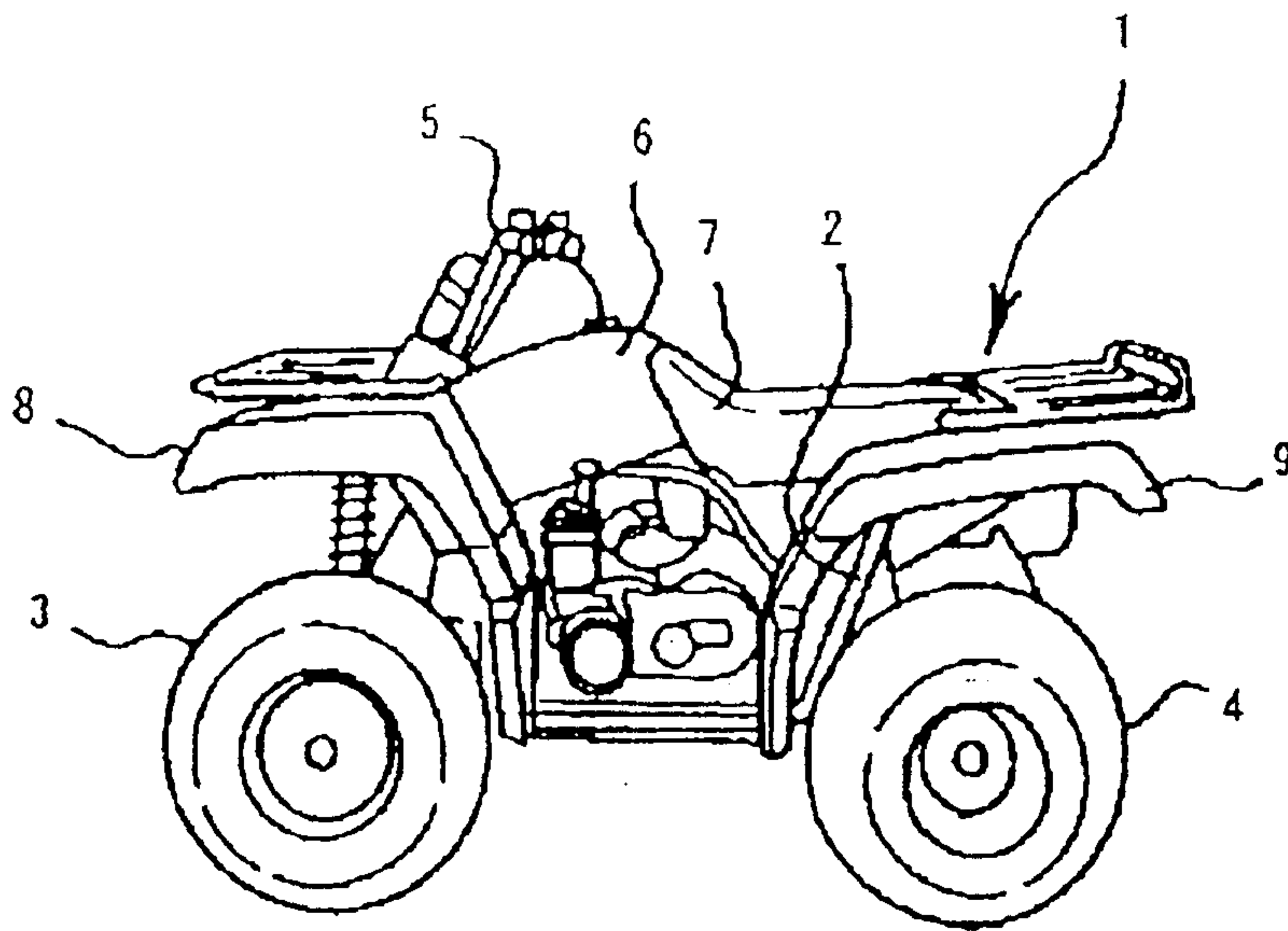


FIG. 2

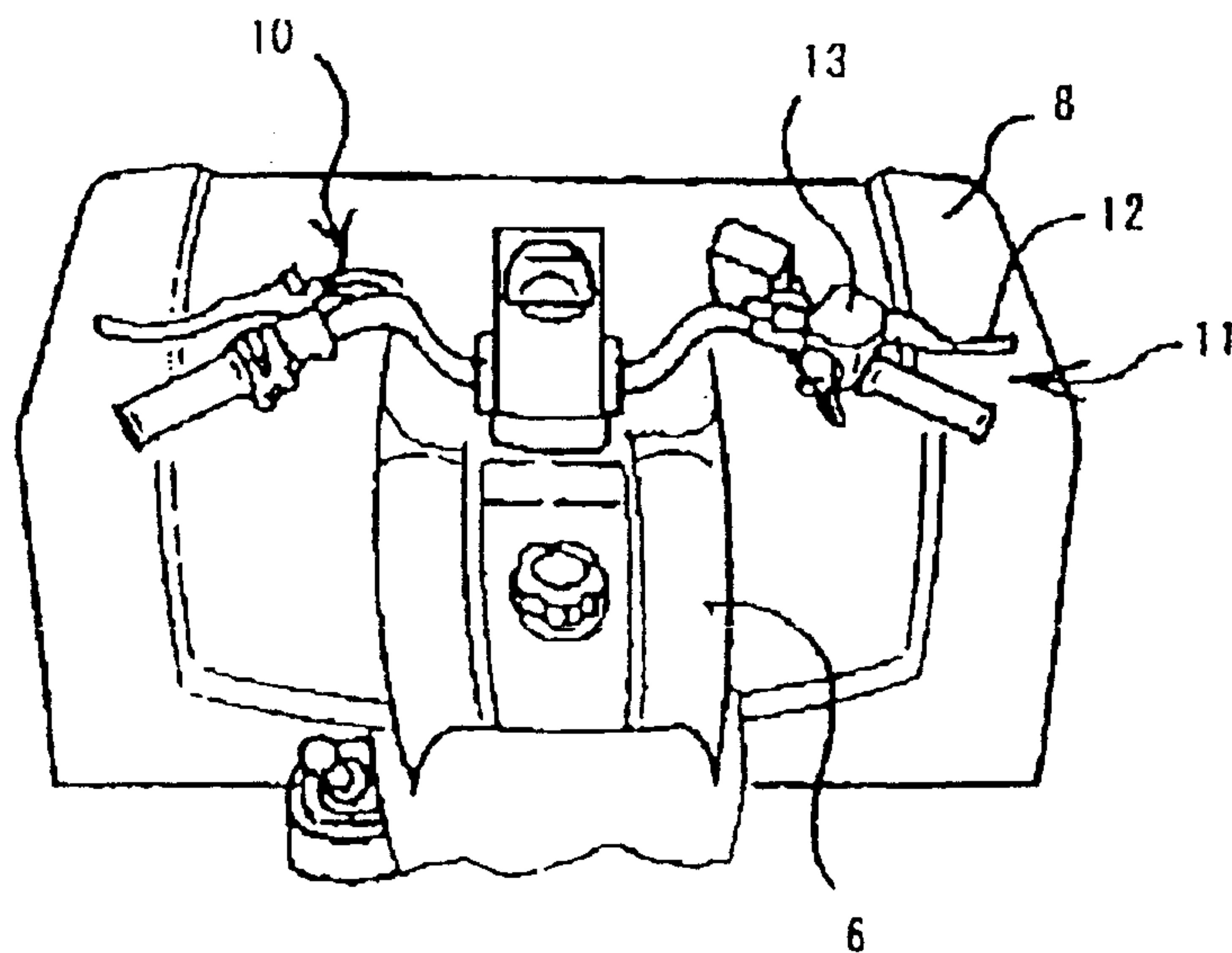


FIG. 3

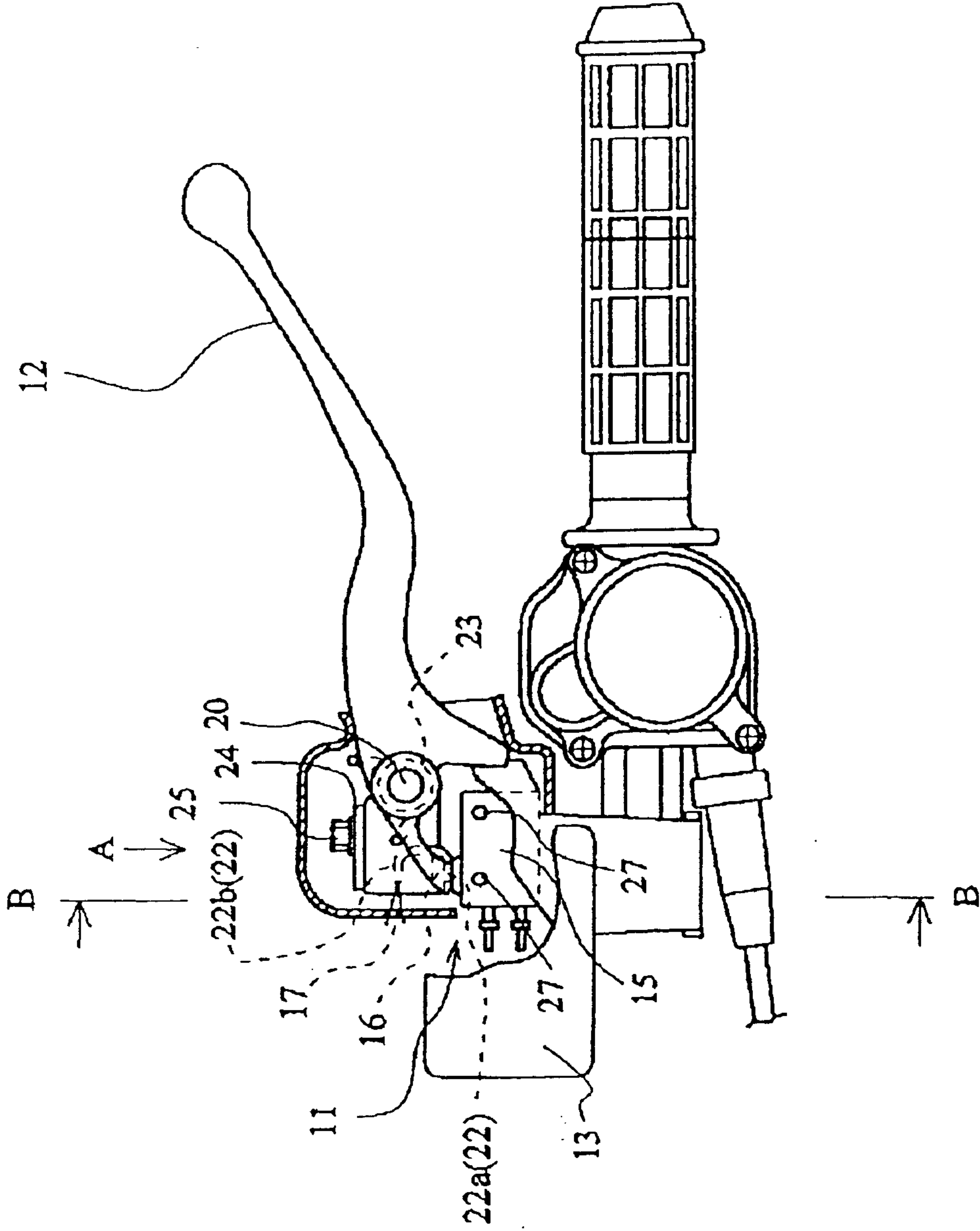


FIG. 4

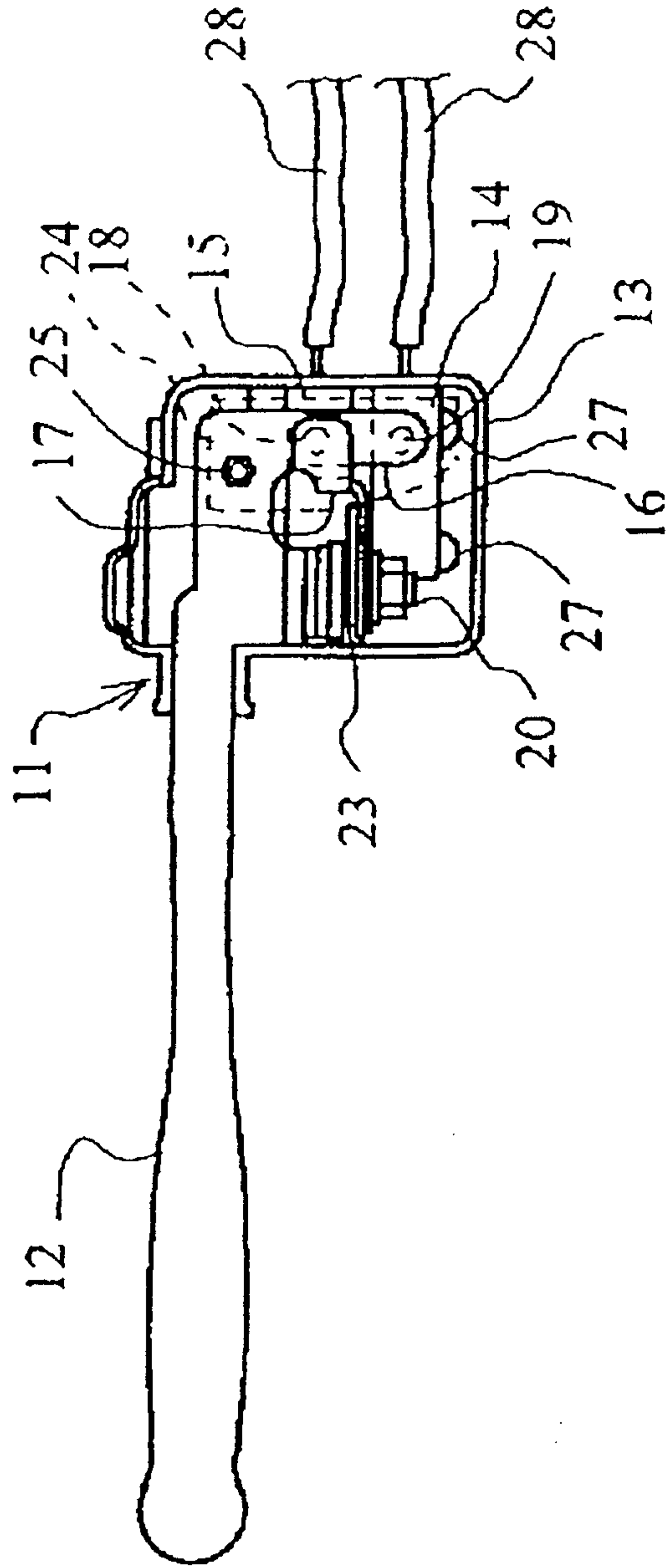


FIG. 5

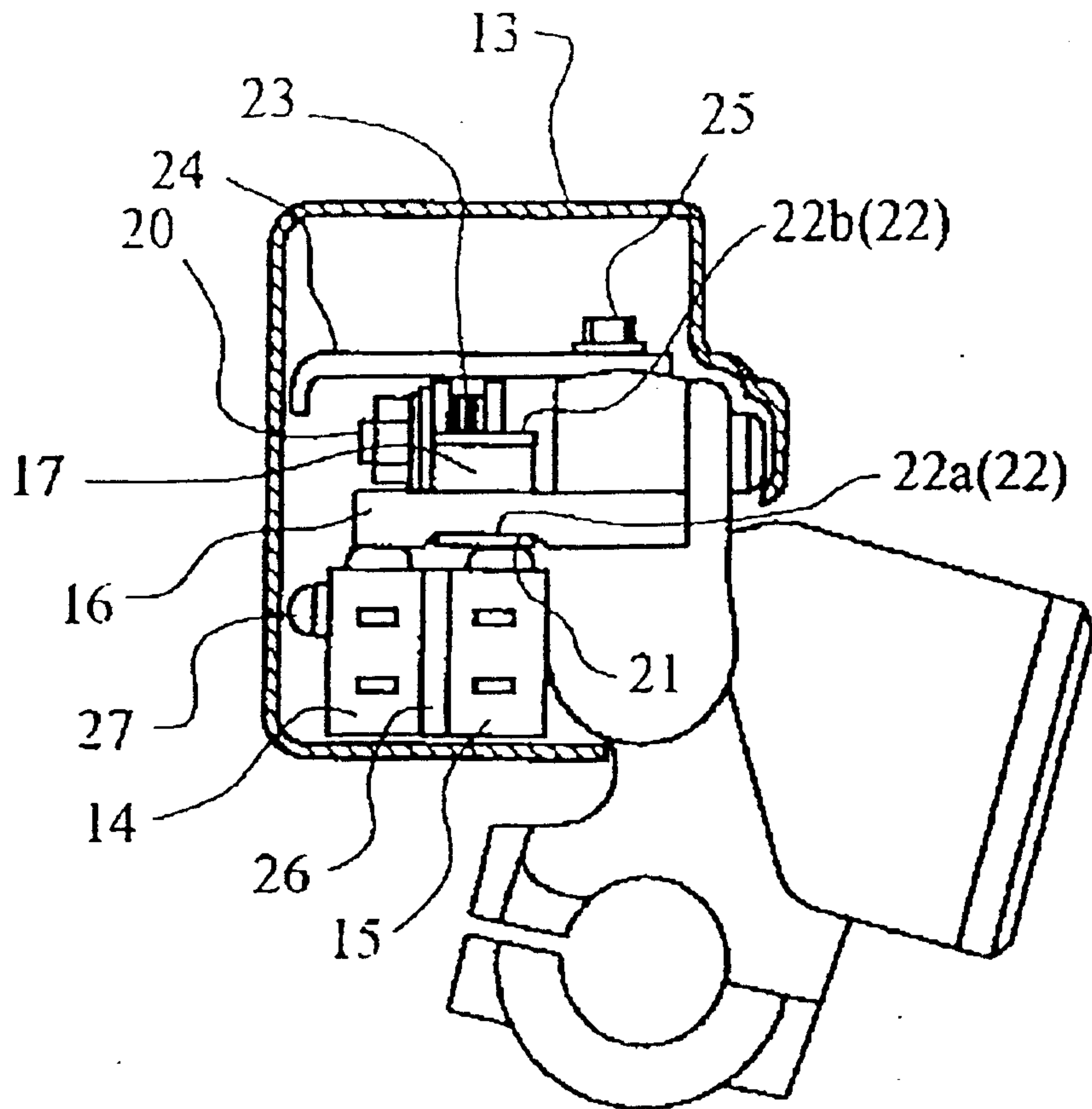


FIG. 6

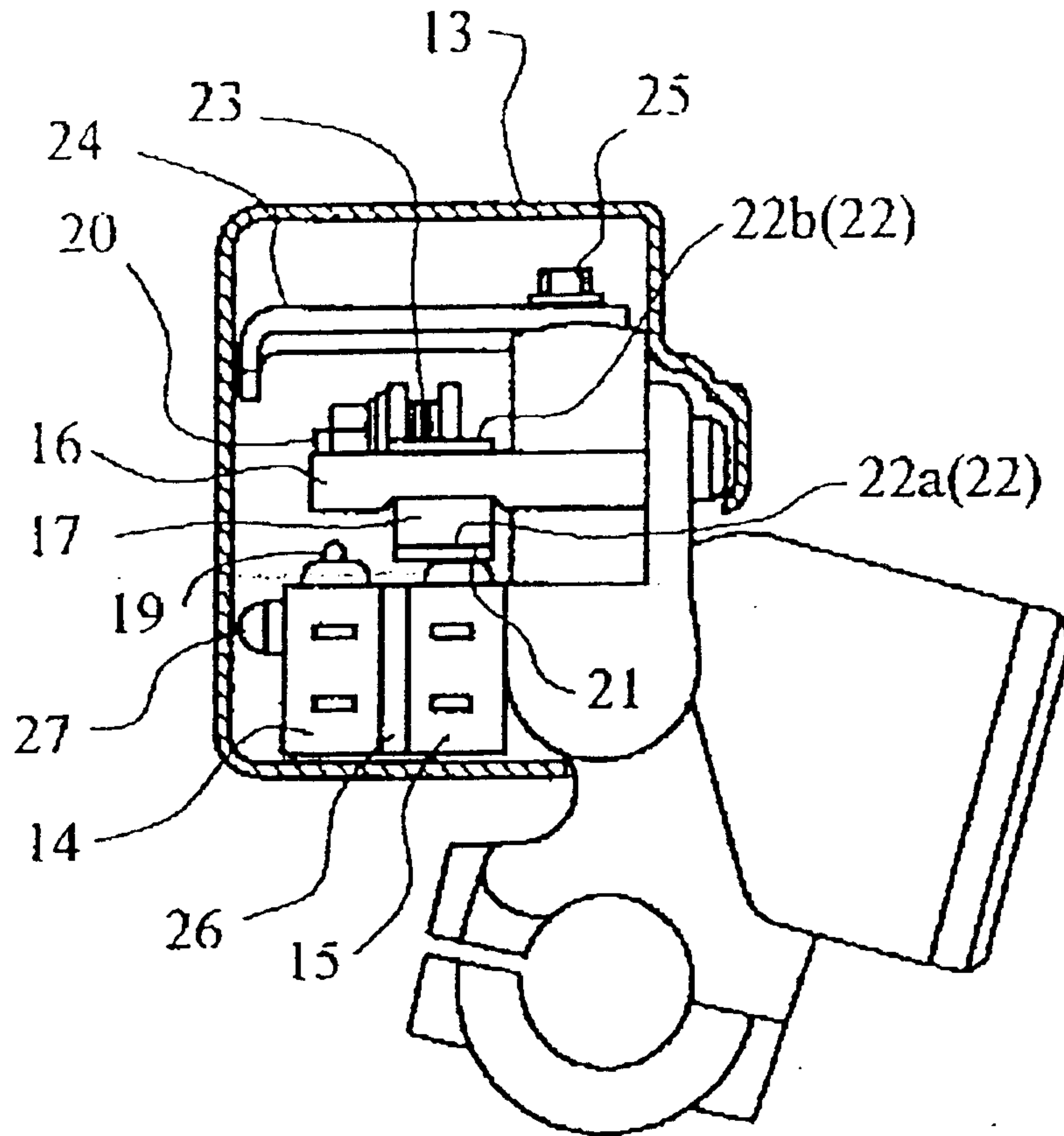


FIG. 7

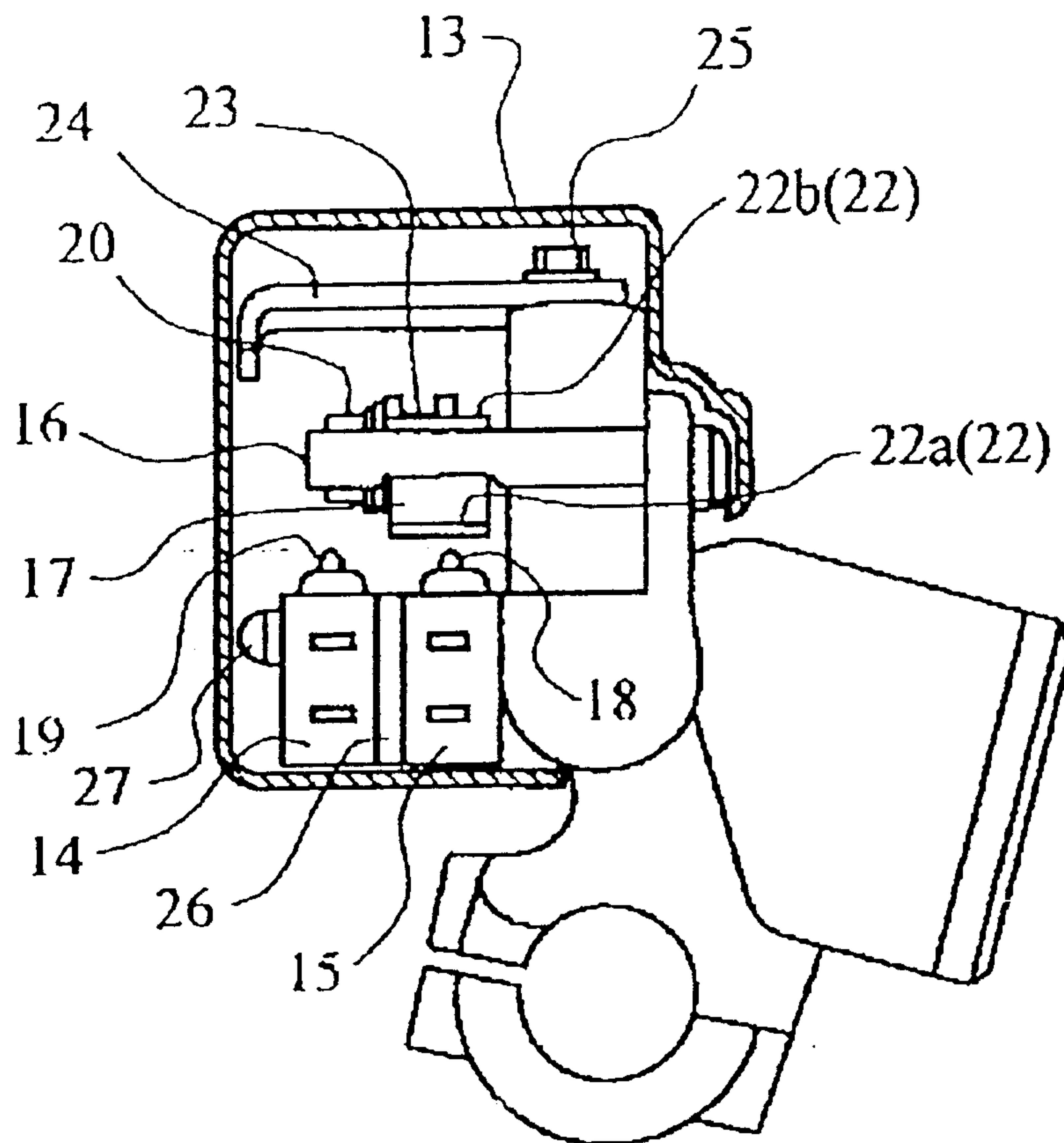


FIG. 8

