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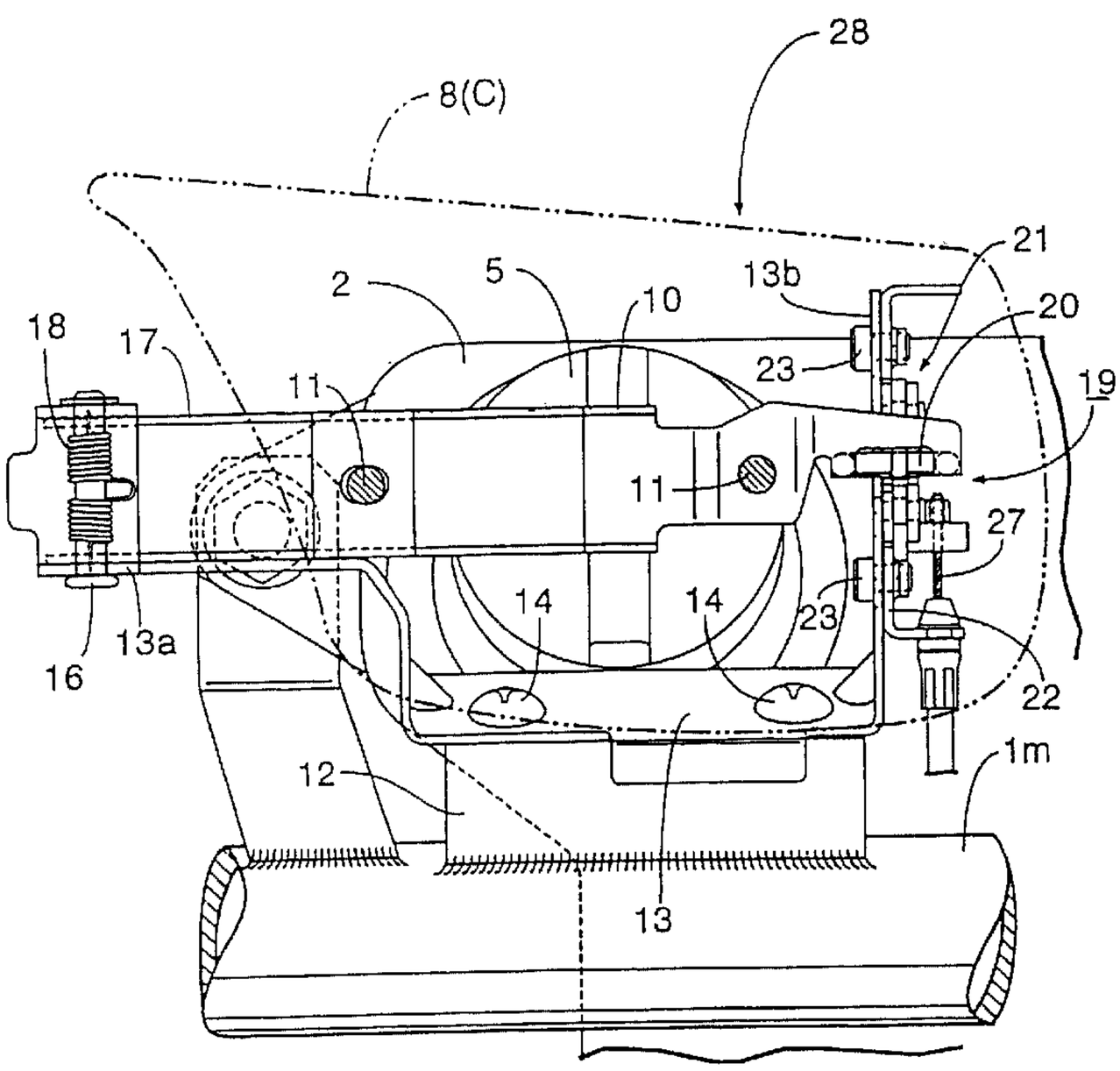
(54) Titre : COUVERCLE DE RESERVOIR DE CARBURANT POUR MOTOCYCLETTES
(54) Title: FUEL LID APPARATUS FOR MOTORCYCLES



(57) Abrégé/Abstract:
In a fuel lid apparatus for a motorcycle, to secure rigidity of a supporting section of a hinge and a lock mechanism sufficiently and prevent opening of a fuel lid for tampering without increasing the thickness of a body cover and the fuel lid. In the fuel lid apparatus for a motorcycle including a fuel filler window 7 formed on a body cover 4 for covering the fuel tank 2, the fuel filler window 7 exposing a fuel filler port 6 of the fuel tank 2 supported by a vehicle body frame 1 therethrough, a fuel lid 8 for opening and closing the fuel filler window 7, and a locking mechanism 19 for locking the fuel lid 8 at the closed position C, a reinforcing member 10 is connected to an inner surface of the fuel lid 8, the reinforcing member 10 is hinged to the vehicle body frame 1, and the locking mechanism 19 is constituted between the reinforcing member 10 and the vehicle body frame 1.

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ABSTRACT OF THE DISCLOSURE

In a fuel lid apparatus for a motorcycle, to secure rigidity of a supporting section of a hinge and a lock mechanism sufficiently and prevent opening of a fuel lid for tampering without increasing the thickness of a body cover and the fuel lid. In the fuel lid apparatus for a motorcycle including a fuel filler window 7 formed on a body cover 4 for covering the fuel tank 2, the fuel filler window 7 exposing a fuel filler port 6 of the fuel tank 2 supported by a vehicle body frame 1 therethrough, a fuel lid 8 for opening and closing the fuel filler window 7, and a locking mechanism 19 for locking the fuel lid 8 at the closed position C, a reinforcing member 10 is connected to an inner surface of the fuel lid 8, the reinforcing member 10 is hinged to the vehicle body frame 1, and the locking mechanism 19 is constituted between the reinforcing member 10 and the vehicle body frame 1.

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TITLE: FUEL LID APPARATUS FOR MOTORCYCLES

FIELD OF THE INVENTION

The present invention relates to an improvement of a fuel lid apparatus for a motorcycle including a fuel filler window formed on a body cover for covering a fuel tank, the fuel filler window exposing a fuel filler port of the fuel tank supported by a vehicle body frame therethrough, a fuel lid for opening and closing the fuel filler window, and a locking mechanism for locking the fuel lid at the closed position.

BACKGROUND OF THE INVENTION

In a fuel lid apparatus for a motorcycle in the related art, as disclosed in Patent Document 1, for example, a fuel lid formed of synthetic resin is directly hinged to a body cover formed of synthetic resin, and a locking mechanism is constructed between the fuel lid and the body cover. Japanese Utilitv Model Registration No. 2, 536, 622 published July 18, 1989.

In such the fuel lid apparatus for a motorcycle, it is necessary to secure sufficient rigidity at a supporting section of the hinge and a locking mechanism in order to prevent the fuel lid from being opened for tampering. Therefore, in the fuel lid apparatus in the related art, the thickness of the body cover and the fuel lid formed of synthetic resin is relatively thick for securing the rigidity of the supporting section. However, molding them into an increased thickness causes increase in weight or costs.

In view of such circumstances in view, an object of the invention is to provide the fuel lid apparatus for a motorcycle which can secure a sufficient rigidity at the supporting section of the hinge and the locking mechanism and opening of the fuel lid for

tampering can be prevented without increasing the thickness of the body cover and the fuel lid.

SUMMARY OF THE INVENTION

In order to achieve the object described above, in the fuel lid apparatus for a motorcycle including a fuel filler window formed on the body cover for covering a fuel tank, the fuel filler window exposing a fuel filler port of the fuel tank supported by a vehicle body frame therethrough, the fuel lid for opening and closing the fuel filler window, and the locking mechanism for locking the fuel lid at the closed position, the first aspect of the invention is that a reinforcing member is connected to an inner surface of the fuel lid for enhancing rigidity thereof, the reinforcing member is journaled by the vehicle body frame so as to be openable and closable, and the locking mechanism is constructed between the reinforcing member and the vehicle body frame.

According to the first aspect, since rigidity of the fuel lid is increased by the reinforcing member, deformation of the fuel lid may be limited to a small extent even when an external force is exerted thereon, and since the reinforcing member and the locking mechanism is firmly supported on the vehicle body frame side, and the body cover is not involved in its support at all, the fuel lid can keep the tank cap being covered normally and prevent a tank cap from being opened even when the body cover is deformed for tampering. From these reasons, the thickness of the body cover and the fuel lid can be reduced, and hence the weight and the cost may be reduced.

In addition to the first aspect, a second aspect of the invention is that the fuel lid is formed of synthetic resin, and the reinforcing member to be fixed

thereto is hinged to one end of a highly rigid base, which is fixed to the vehicle body frame, and the locking mechanism is constructed between the other end of the base and the reinforcing member.

According to the second aspect, it is possible to construct a fuel lid apparatus assembly by assembling the fuel lid and the locking mechanism to the common base, which is fixed to the vehicle body frame, whereby assemblability is improved.

In addition to the first or the second aspect, a third aspect of the invention is that the fuel tank is arranged so that the bottom thereof is located below a step floor of a scooter-type motorcycle, and a body cover formed with the fuel filler window is disposed at the center of the step floor.

According to the third aspect, since the fuel tank is arranged below the step floor, the center of gravity of the motorcycle can be lowered, and even when an user steps on the body cover or the fuel lid, unintended opening of the fuel lid can be prevented.

BRIEF DESCRIPTION OF THE DRAWINGS

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

Fig. 1 is a side view of a motorcycle including a fuel lid apparatus according to the invention.

Fig. 2 is an enlarged view of Fig. 1 viewed in the direction indicated by an arrow 2.

Fig. 3 is a cross-sectional view taken along the line 3-3 in Fig. 2.

Fig. 4 is a cross sectional view taken along the line 4-4 in Fig. 3.

Fig. 5 is a cross sectional view taken along the line 5-5 in Fig. 4.

Fig. 6 is a drawing corresponding to Fig. 3, showing a state in which a fuel lid is opened.

Fig. 7 is a cross-sectional view taken along the line 7-7 in Fig. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of the invention will be described based on an example of the invention shown in attached drawings.

Fig. 1 is a side view of a motorcycle including a fuel lid apparatus according to the invention; Fig. 2 is an enlarged view of Fig. 1 viewed in the direction indicated by an arrow 2; Fig. 3 is a cross-sectional view taken along the line 3-3 in Fig. 2; Fig. 4 is a cross sectional view taken along the line 4-4 in Fig. 3; Fig .5 is a cross sectional view taken along the line 5-5 in Fig. 4; Fig. 6 is a drawing corresponding to Fig. 3, showing a state in which the fuel lid is opened; Fig. 7 is a cross-sectional view taken along the line 7-7 in Fig. 6.

In the description given below, terms "front", "rear", "left", and "right" represent directions based on a motorcycle S.

In Fig. 1 and Fig. 2, a vehicle body frame 1 of the scooter-type motorcycle S includes a head pipe 1h for steerably supporting a front fork 9, a main frame 1m extending rearward from the lower end of the head pipe 1h and being bifurcated from the midsection toward the rear end, a pair of left and right U-shaped side frames 1s, 1s welded at the front and rear ends thereof to the side surface of the lower end of the head pipe 1h and the side surface of the midsection of the main frame 1m and bypassed downwardly of the main frame 1m. A fuel tank 2 and a pair of step floors 3, 3 projecting from the fuel tank 2 toward the left and the right sides are mounted over the left and the right side frames 1s, 1s, and a

body cover 4 formed of synthetic resin is connected between both step floors 3, 3 so as to cover the front portion of the main frame 1m and the fuel tank 2 in a tunnel shape. In this case, the fuel tank 2 is disposed in such a manner that the bottom is located below the step floors 3, 3 in order to lower the center of gravity of the motorcycle S.

A tubular fuel filler port 6 of the fuel tank 2, on which a tank cap 5 is screwed, is arranged on one side of the upper surface of the fuel tank 2 so as to avoid interference with the main frame 1m, and a fuel filler window 7 opening toward the fuel filler port 6 is formed on the body cover 4. The fuel filler window 7 is provided with a fuel lid 8 formed of synthetic resin for opening and closing the same.

As shown in Fig. 3 to Fig. 5, the fuel lid 8 is integrally formed with a plurality of bosses 8a, 8a on the back surface thereof, and a reinforcing member 10 formed of a steel plate for reinforcing the fuel lid 8 is connected to the bosses 8a, 8a with screws 11, 11.

The main frame 1m is integrally connected with a mouthing seat 12 on one side by welding, and a highly rigid base 13 formed of a steel plate is fixed to the mounting seat 12 with a plurality of bolts 14, 14 and nuts 15, 15. The nuts 15, 15 are welding nuts, which are already welded to the mounting seat 12 in advance.

The base 13 includes a front end portion 13a and a rear end portion 13b bent so as to sandwich the fuel filler port 6 on one side thereof from the front and the rear, and a hinge shaft 16 is attached to the front end portion 13a. A hinge arm 17, which is integrally connected to one end of the reinforcing member 10, is rotatably supported by the hinge shaft 16. When the hinge arm 17 rotates about the hinge shaft 16, the fuel lid 8 rotates between a closed position C (see Fig. 3 and

Fig. 4) where the fuel filler window 7 is closed, and an opened position O where the fuel filler window 7 is opened (See Fig. 6 and Fig. 7). An opening spring 18, being a torsion coil spring, for urging the hinge arm 17 in the direction to open the fuel lid 8 is mounted to the hinge shaft 16.

An angular U shaped latch 20 projecting downward is fixed to the other end of the reinforcing member 10. A base plate 22 of a latch catch 21 for locking the fuel lid 8 in its closed position C in cooperation with the latch 20 is secured to the rear end portion 13b of the base 13 with a plurality of bolts 23, 23. The latch 20 and the latch catch 21 constitute the locking mechanism 19.

The latch catch 21 is known in the related art, and includes the base plate 22 having an U-shaped groove 25 for receiving the latch 20, and a locking claw member 26 rotatably journaled by the base plate 22 for holding the latch 20 in cooperation with the U-shaped groove 25. The locking claw member 26 is urged by the spring in the locking direction for holding the latch 20, and is connected to the operating wire 27 so as to rotate in the unlocking direction for releasing the latch 20 by pulling the operating wire 27. The operating wire 27 is interlocked with a combination switch (not shown), which is actuated by an engine key, so as to be pulled when the switch is operated to a predetermined FUEL LID OPEN position.

Therefore, the base 13 and the fuel lid 8 and the locking mechanism 19 attached thereto constitute a fuel lid apparatus assembly 28, and after the assembly 28 is assembled, the base 13 is secure to the mounting seat 12.

The reinforcing member 10 faces the upper surface of the tank cap 5 when the fuel lid 8 is held in

the closed position C, and restrains opening of the tank cap 5 by itself. Therefore, even when the fuel lid 8 is broken by any chance, the tank cap 5 is prevented from being opened for tampering.

In the drawing, reference numeral 29 is a fuel tray attached to a neck portion of the fuel filler port 6 of the fuel tank 2 for receiving fuel leaked from the fuel filler port 6 while filling, and discharge to a discharge pipe, not shown.

The operation of the present embodiment will be described.

When filling fuel into the fuel tank 2, in a first place, the latch 20 is unlocked by operating the combination switch to a predetermined FUEL LID OPEN position by the engine key to pull the operating wire 27 and rotate the locking claw member 26 to the opened position. Then, as shown in Fig. 6 and Fig. 7, the fuel lid 8 is opened and rotated upward by an urging force of the opening spring 18, so that the fuel filler window 7 can be opened. When the tank cap 5 is removed from the fuel filler port 6, fuel can be filled into the fuel tank 2 from the fuel filler port 6 through the fuel filler window 7.

After fuel is filled, the latches 20 is received in the U-shaped groove 25 on the base plate 22 of the latch catch 21 and held by the locking claw member 26 by putting the tank cap 5 on the fuel filler port 6 and closing the fuel lid 8 against the urging force of the opening spring 18 as shown in Fig. 3 and Fig. 4, and the locked state is achieved.

Since the fuel lid 8 formed of synthetic resin is increased in rigidity by the reinforcing member 10 secured on the back surface thereof, when an external force is exerted, for example, by being stepped by the user, deformation may be minimized. In addition, since

the hinge arm 17 continuing integrally to the reinforcing member 10 is hinged to the highly rigid base 13 secured to the main frame 1m and the locking mechanism 19 is constructed between the base 13 and the reinforcing member 10, the body cover 4 having the fuel filler window 7 is not involved in the support of the fuel lid 8 and the locking mechanism 19 at all, and thus even when the body cover 4 is deformed by being stepped by the user or for tampering, unintended opening of the fuel lid 8 may be prevented. Consequently, the fuel lid 8 can keep the tank cap 5 being covered normally and prevent the tank cap 5 from being opened. Consequently, the thickness of the body cover 4 and the fuel lid 8 can be reduced, which contributes reduction of the weight and the costs.

The invention is not limited to the above-described embodiment, and may be modified variously without departing from the scope of the invention.

As described above, in a fuel lid apparatus for a motorcycle including a fuel filler window formed on the body cover for covering the fuel tank, the fuel filler window exposing the fuel filler port of the fuel tank supported by a vehicle body frame therethrough, a fuel lid for opening and closing the fuel filler window, and a locking mechanism for locking the fuel lid at the closed position, the first embodiment of the invention is that the reinforcing member is connected to the inner surface of the fuel lid for enhancing rigidity thereof, the reinforcing member is journaled by the vehicle body frame so as to be openable and closable, and the locking mechanism is constructed between the reinforcing member and the vehicle body frame. Therefore, since rigidity of the fuel lid is increased by the reinforcing member, deformation of the fuel lid may be limited to a small extent even when the external force is exerted thereon, and since the reinforcing member and the locking

mechanism is firmly supported on the vehicle body frame side, and the body cover is not involved in its support at all, the fuel lid can keep the tank cap being covered normally and prevent the tank cap from being opened even when the body cover is deformed for tampering. From these reasons, the thickness of the body cover and the fuel lid can be reduced, and hence the weight and the cost may be reduced.

In addition to the first embodiment, a second embodiment of the invention is that the fuel lid is formed of synthetic resin, and the reinforcing member to be fixed thereto is hinged to one end of the highly rigid base, which is fixed to the vehicle body frame, and the locking mechanism is constructed between the other end of the base and the reinforcing member. Therefore, it is possible to construct the fuel lid apparatus assembly by assembling the fuel lid and the locking mechanism to the common base, which is fixed to the vehicle body frame, whereby assemblability is improved.

In addition to the first or the second embodiment, a third embodiment of the invention is that the fuel tank is arranged so that the bottom thereof is located below the step floor of a scooter-type motorcycle, and the body cover formed with the fuel filler window is disposed at the center of the step floor. Therefore, the center of gravity of the motorcycle can be lowered, and even when the user steps on the body cover or the fuel lid, unintended opening of the fuel lid can be prevented.

Although various preferred embodiments of the present invention have been described herein in detail, 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.

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

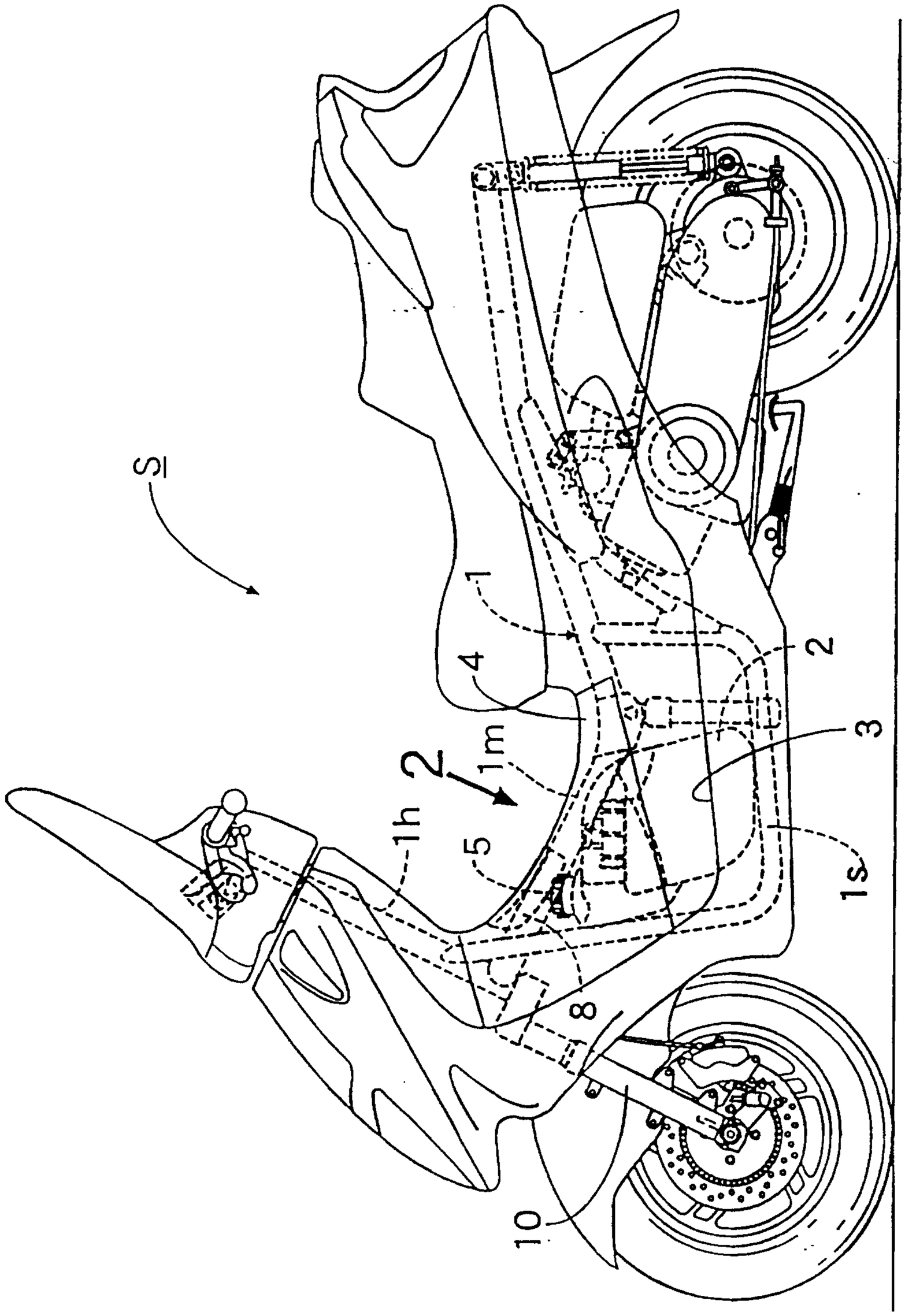
1. A fuel lid apparatus for a motorcycle comprising a fuel filler window (7) formed on a body cover (4) for covering a fuel tank (2), the fuel filler window (7) exposing a fuel filler port (6) of the fuel tank (2) supported by a vehicle body frame (1) therethrough, a fuel lid (8) for opening and closing the fuel filler window (7), and a locking mechanism (19) for locking the fuel lid (8) at a closed position (C), characterized in that a separate reinforcing member (10) is connected to and extends across an inner surface of the fuel lid (8) for enhancing rigidity thereof, the reinforcing member (10) is journaled by the vehicle body frame (1) so as to be openable and closable, and the locking mechanism (19) is constructed between the reinforcing member (10) and the vehicle body frame (1).

2. A fuel lid apparatus for a motorcycle according to Claim 1, characterized in that the fuel lid (8) is formed of synthetic resin, and the reinforcing member (10) to be fixed thereto is hinged to one end (13a) of a highly rigid base (13), which is fixed to the vehicle body frame (1), and the locking mechanism (19) is constructed between the other end (13b) of the base (13) and the reinforcing member (10).

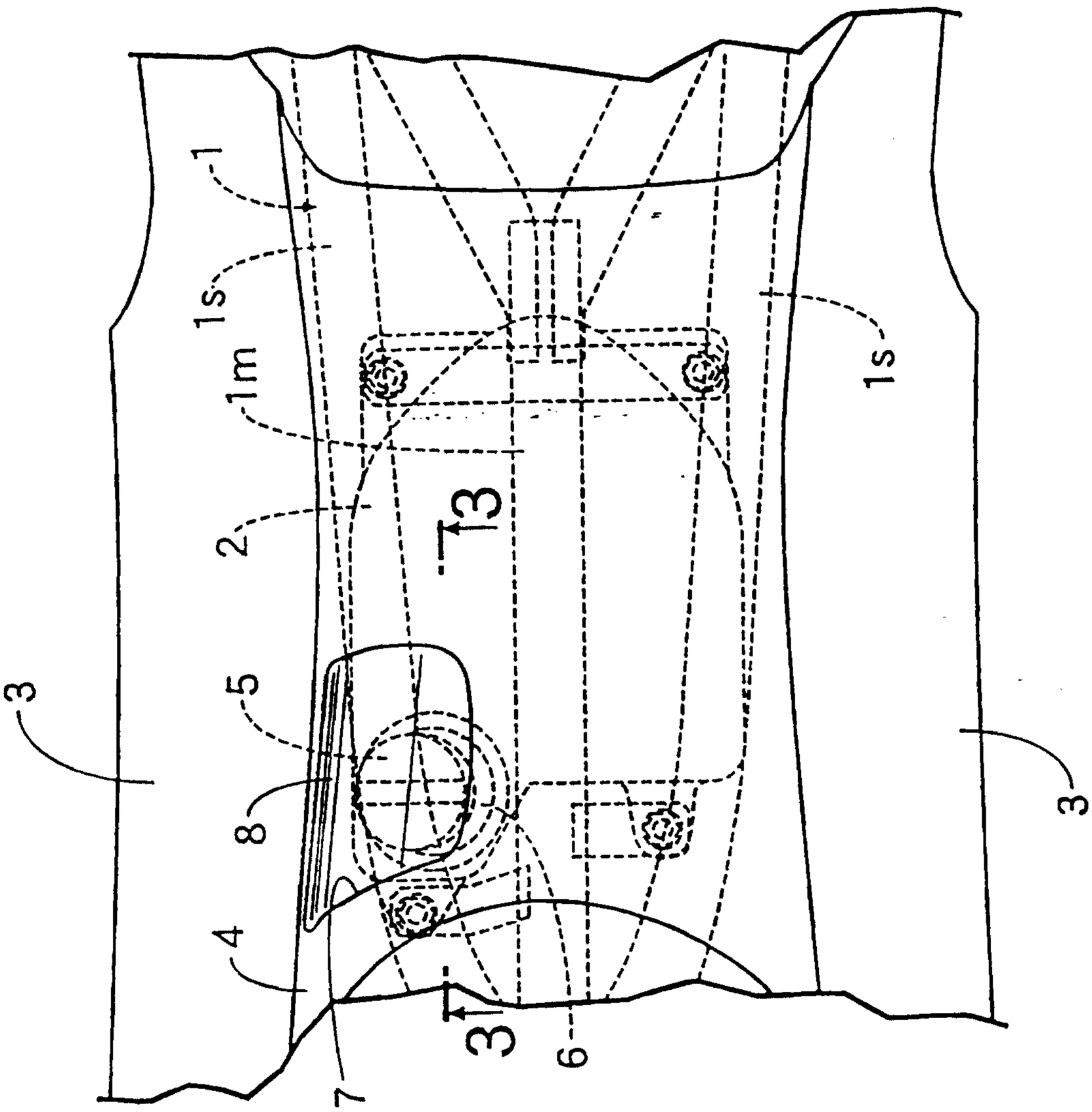
3. A fuel lid apparatus for a motorcycle according to Claim 1 or 2, characterized in that the fuel tank (2) is arranged so that a bottom thereof is located below a step floor (3) of a scooter-type motorcycle, and the body cover (4) formed with the fuel filler window (7) is disposed at the center of the step floor (3).

[Name of Document] Figures

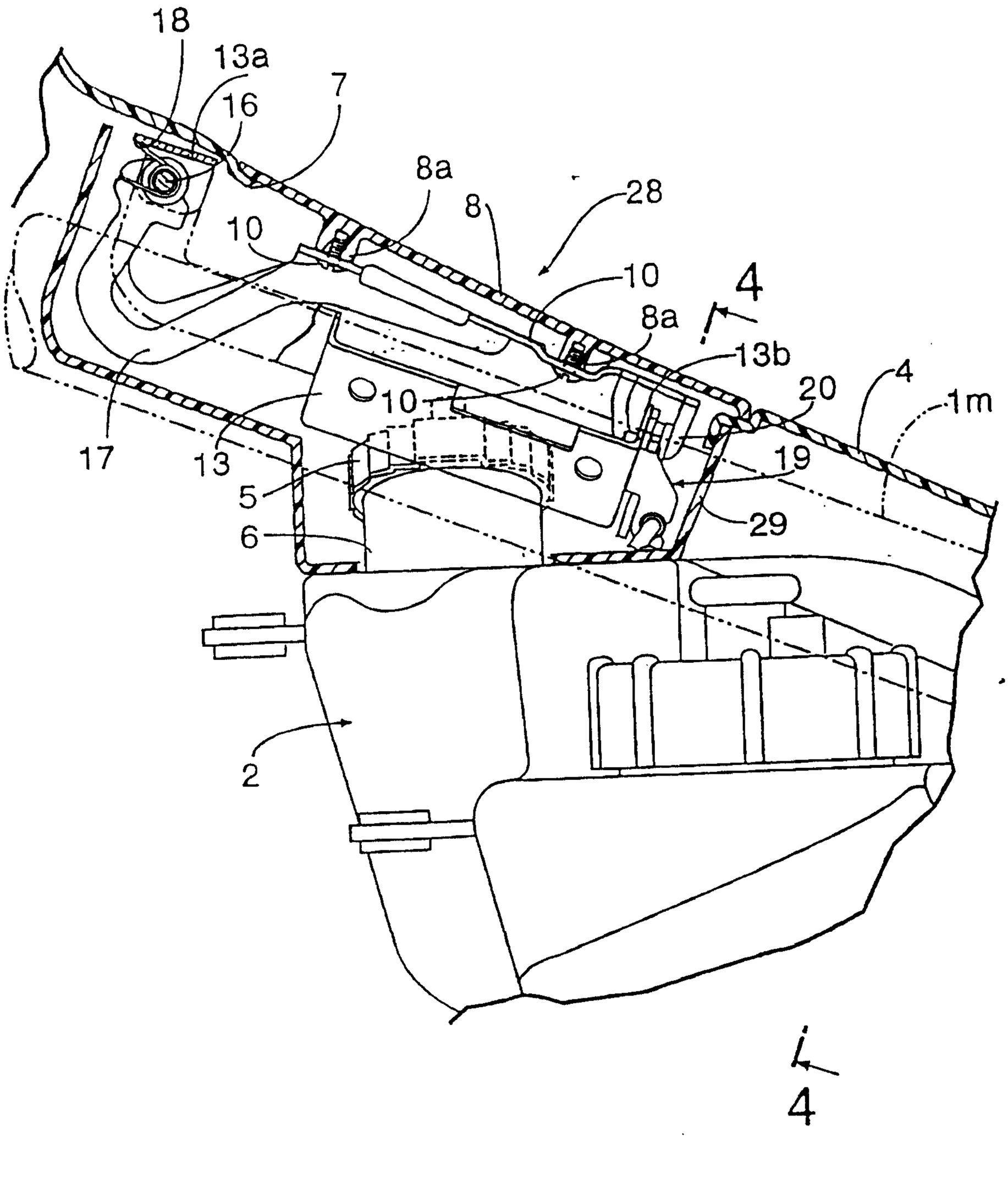
[Fig. 1]



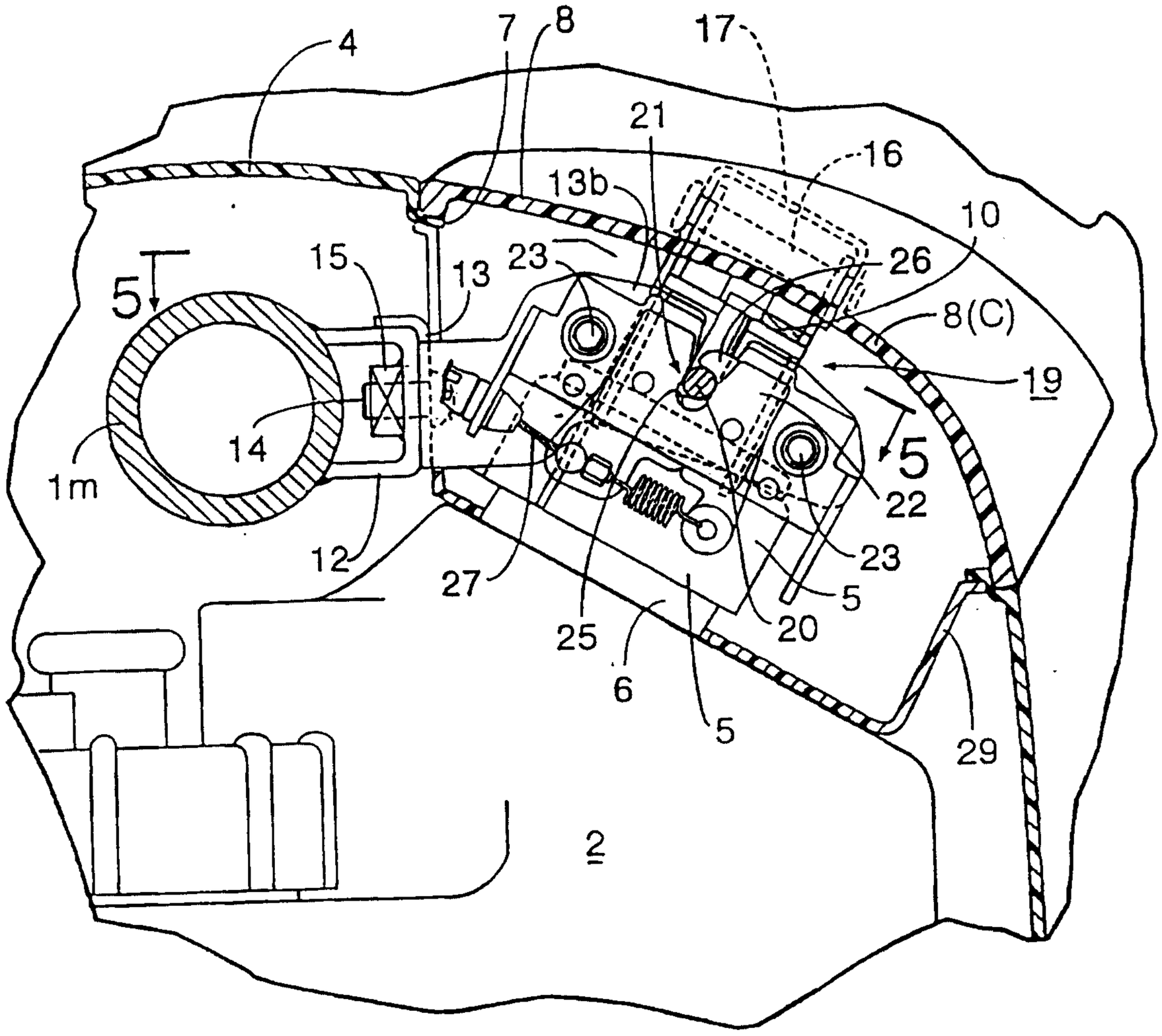
[Fig. 2]



[Fig. 3]



[Fig. 4]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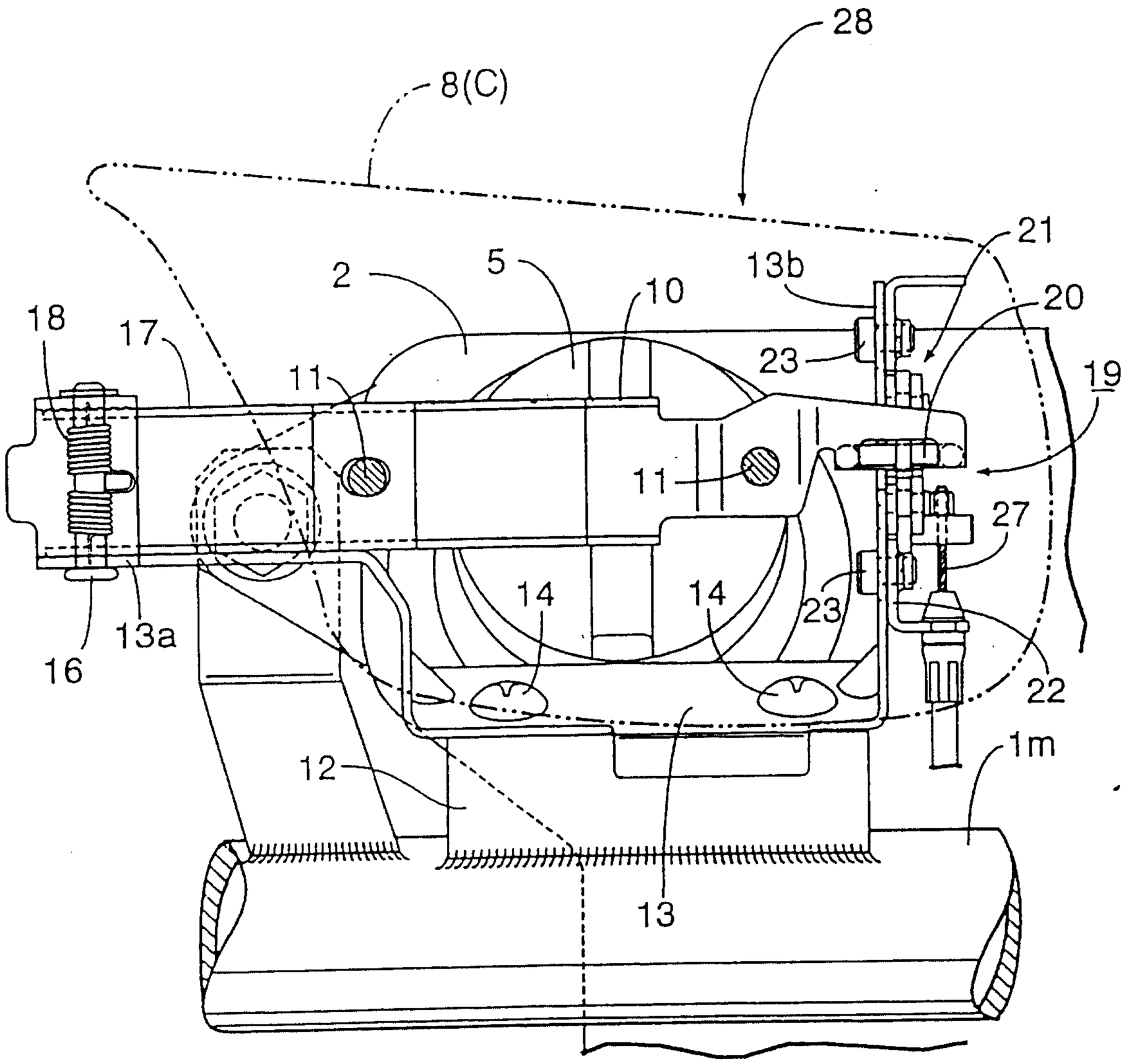
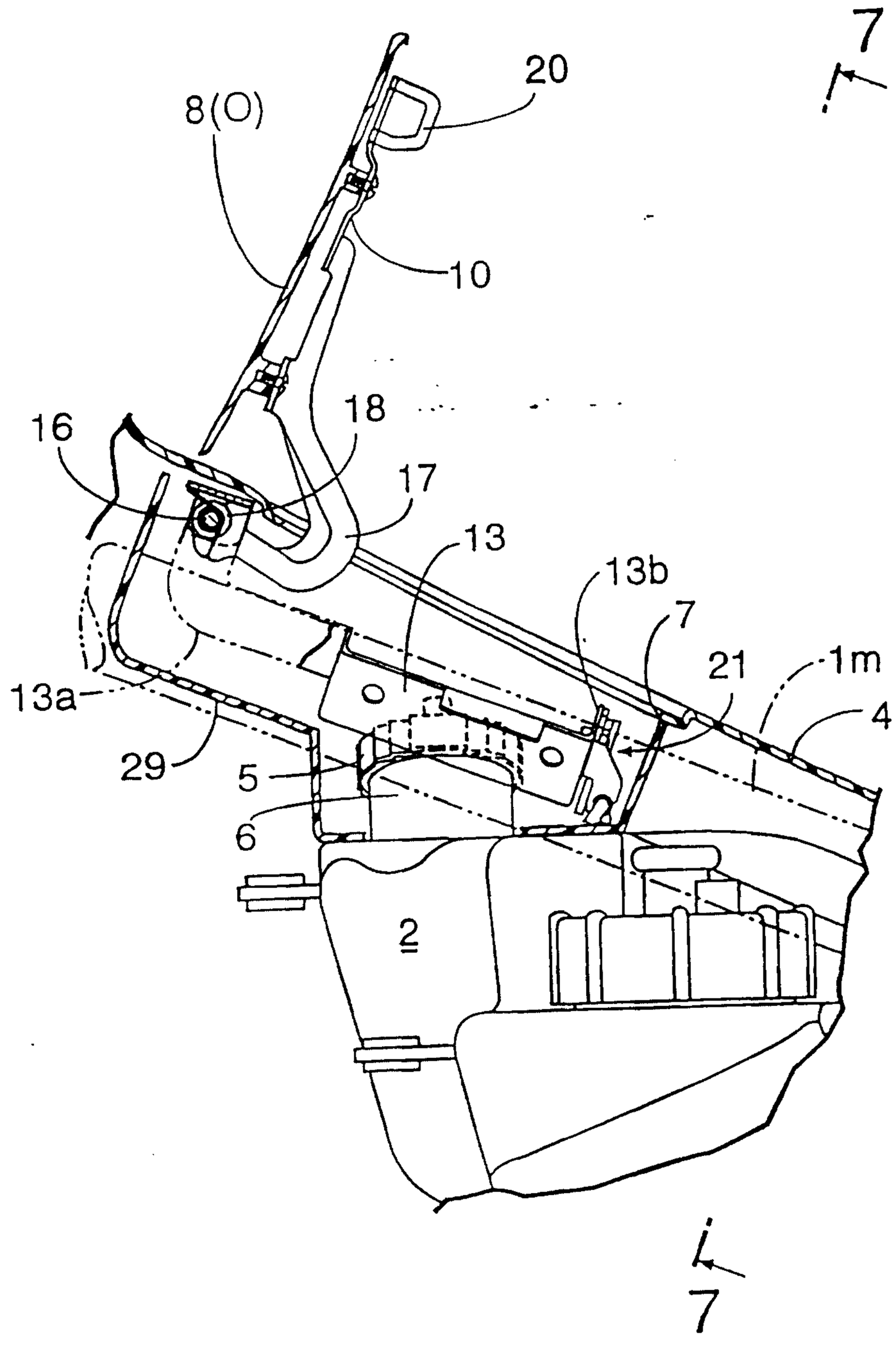
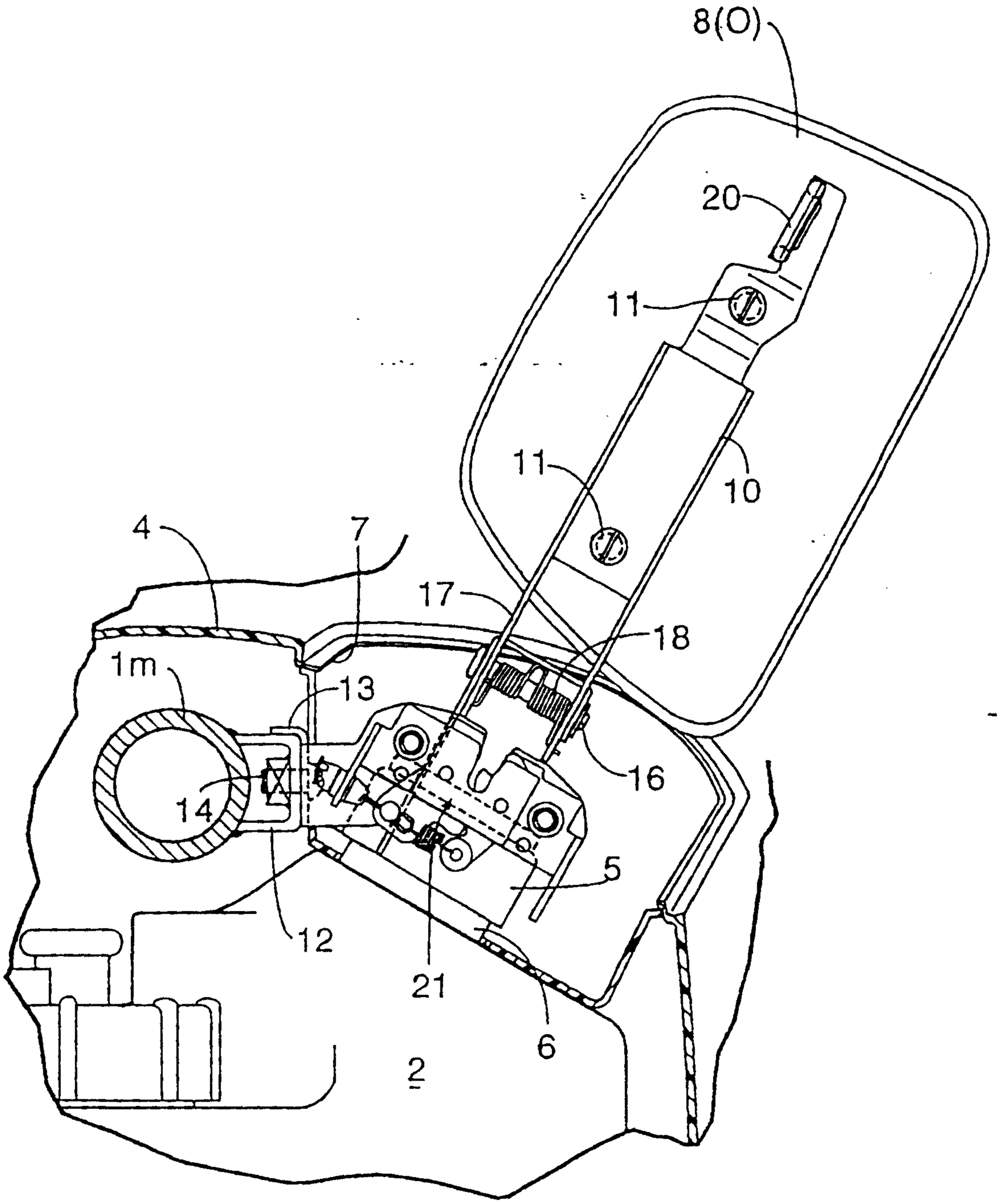
[Fig. 5]

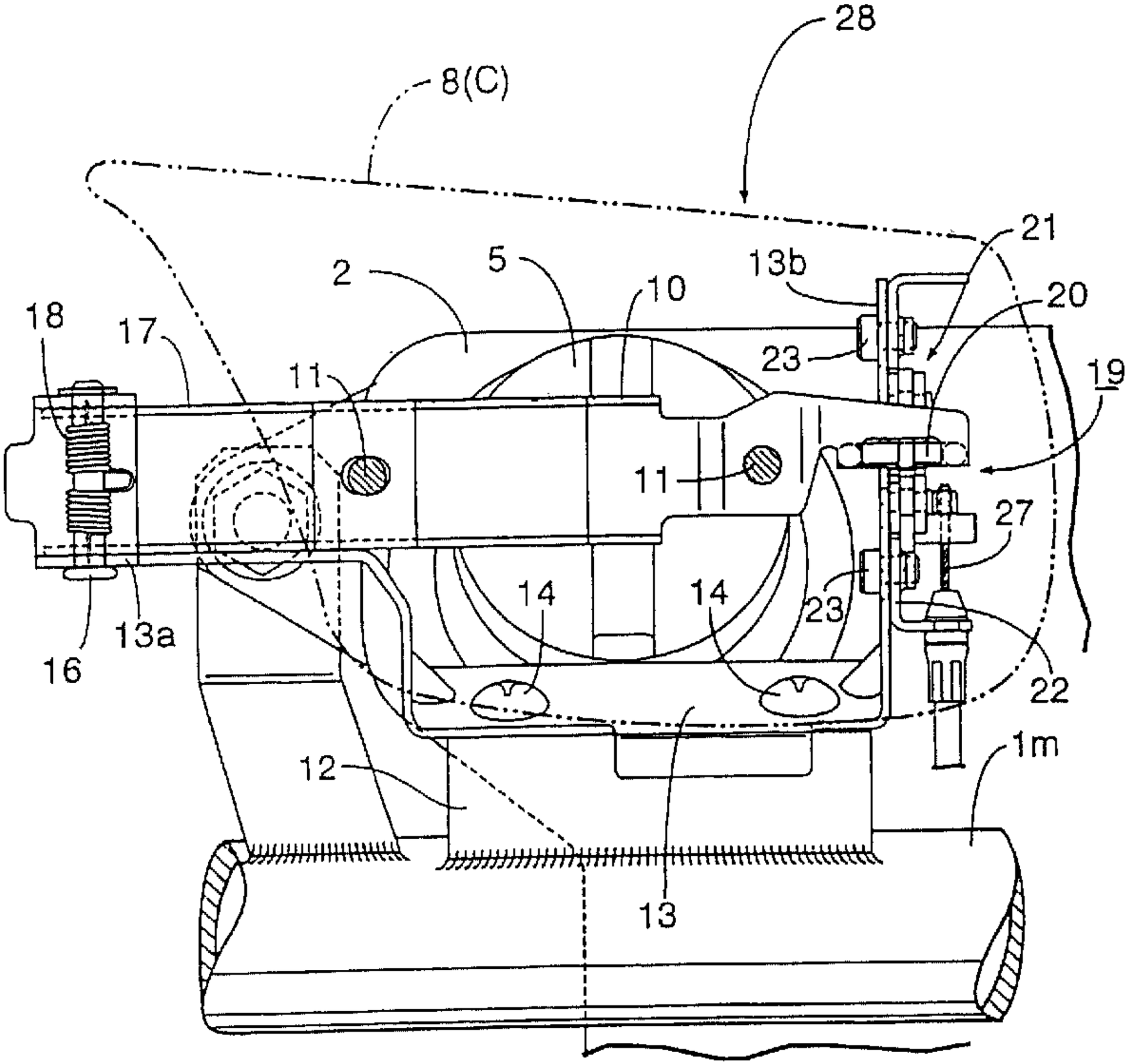


[Fig. 6]



[Fig. 7]

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