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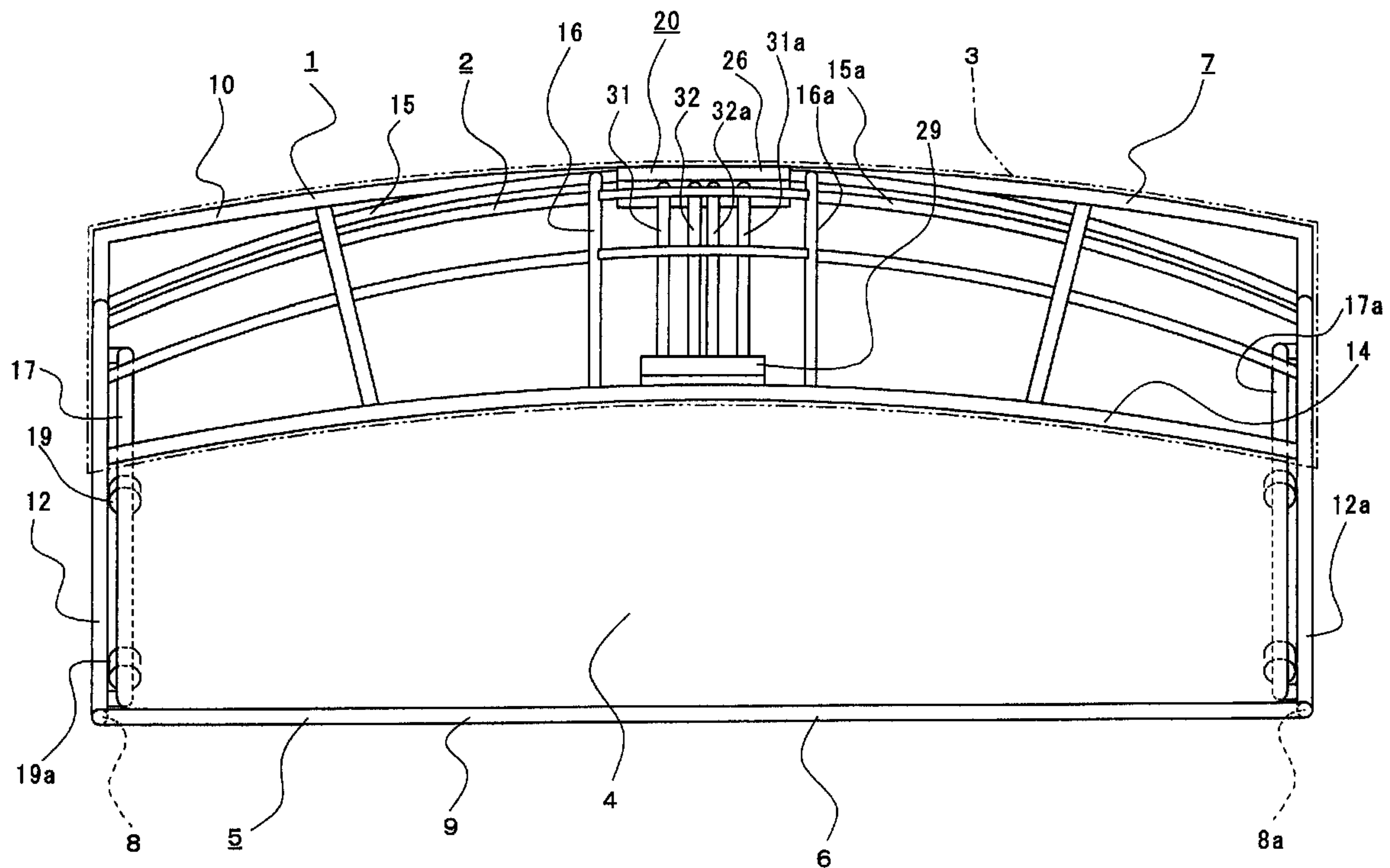
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(54) Titre : LEVE-GLACE DE TAUD RIGIDE POUR BATEAU DE CROISIERE

(54) Title: WINDOW REGULATOR OF AWNING FOR CRUISER



(57) Abrégé/Abstract:

An awning for a cruiser includes a roof frame longitudinally curved and inclined down ahead above an open cabin; a roof cover for the roof frame; a transparent window panel movable in a space between front end of the roof frame and front portion of the open cabin present in front of the roof frame to slidably open and close the space; a slide rail below a side frame on left and right edges of the roof frame, a distance between the slide rail and the side frame always being constant; and a slider fixed to left and right sides of the window panel and slidably attached onto the slide rail. A transfer reciprocating between the front end and a rear portion of the roof frame along a curved shape of the roof frame is provided on the roof frame. The window panel is connected to the transfer.

Abstract

An awning for a cruiser includes a roof frame longitudinally curved and inclined down ahead above an open cabin; a roof cover for the roof frame; a transparent window panel movable in a space between front end of the roof frame and front portion of the open cabin present in front of the roof frame to slidably open and close the space; a slide rail below a side frame on left and right edges of the roof frame, a distance between the slide rail and the side frame always being constant; and a slider fixed to left and right sides of the window panel and slidably attached onto the slide rail. A transfer reciprocating between the front end and a rear portion of the roof frame along a curved shape of the roof frame is provided on the roof frame. The window panel is connected to the transfer.

TITLE OF THE INVENTION

WINDOW REGULATOR OF AWNING FOR CRUISER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a window regulator for automatically opening and closing a window of an awning equipped in an open cabin of a cruiser.

2. Description of the Related Art

There are conventionally known, as a cabin of a cruiser, cabins whose overhead areas are in an open state (hereinafter, cabins of this type will be generically referred to as "open cabins") such as a main cabin equipped with a helm and provided in the open air or a main cabin having a flying deck (also called "flying bridge") mounted on a roof of the main cabin and equipped with a helm.

In an open cabin of this type, a user can do open and exhilarating steering because overhead the cabin is in an open state.

During steering in the open cabin, the user is lashed against by a strong head wind, poured with the sea spray or exposed to the sunlight. This is why an enclosure enclosing a helm position is installed in the open cabin.

While enclosures of various shapes are proposed, most of the enclosures are structured as follows. A clear vinyl sheet is stuck onto a front surface and both side surfaces of a main frame assembled into a box shape on the open cabin using a fastener and a lightproof sheet is stuck onto an upper portion

of the main frame. Since the box-type enclosure apparently projects from a streamlined body of the cruiser, the box-type enclosure has problems of being poor looking and unattractive.

Furthermore, the clear vinyl sheet is made open by the fastener so as to ventilate an interior of the enclosure. However, since the cruiser is generally anchored at a marina while being left in the rain, the clear vinyl sheet deforms due to a difference in temperature or other conditions. As a result, the fastener cannot be smoothly opened or closed, thus making the enclosure less user-friendly.

Considering these problems, the applicant of the present invention developed the following awning as disclosed in Japanese Patent No. 3443397. In the awning having a transparent window panel provided in front of a lightproof roof cover arranged above an open cabin of a cruiser and slidably opening and closing a space between a front end of the roof cover and a front portion of the open cabin in front of the roof cover, the roof cover is inclined down ahead, the window panel is inclined to be continuous to inclination of the roof cover, slide rails are arranged below side frames supporting the roof cover always at constant distance to the side frames, respectively, and left and right sides of the window panel are slidably attached to the slide rails, respectively.

Many features of the awning disclosed in the Japanese Patent No. 3443397 win popularity among consumers. For example, the window panel has good opening and closing operability. The awning has a streamlined external shape that prompts the wind

blowing down ahead from the window panel to the roof cover particularly when the window panel is closed.

However, in case of the conventional awning, the user is disadvantageously required to manually operate a grip provided on the window panel so as to open or close a window. The manual operation is quite cumbersome and automatic operation is desired.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to solve the conventional problems and improve opening and closing operability by attaching an awning-dedicated window regulator for automatically opening and closing a window panel.

To attain the object, a window regulator according to one aspect of the present invention has the following features with respect to an awning: a roof frame longitudinally curved is arranged to be inclined down ahead above an open cabin of the cruiser; a lightproof roof cover is provided to be put on the roof frame; a transparent window panel that moves in a space between a front end of the roof frame and a front portion of the open cabin present in front of the roof frame so as to be able to slidably open and close the space is provided to be inclined to be continuous to the inclination of the roof frame; a slide rail is arranged below a side frame arranged on each of left and right edges of the roof frame, a distance between the slide rail and the side frame being always constant; and a slider fixed to each of left and right sides of the window panel and slidably attached onto the slide rail, wherein a

transfer reciprocating between the front end of the roof frame and a rear portion of the roof frame along a curved shape of the roof frame is provided on the roof frame, and the window panel is connected to the transfer.

Further, the transfer protrudes downward from a casing attached to a center of the roof frame as a part of the roof frame.

Furthermore, the casing includes a flat driving box and a flat driven box that are provided in a front end portion and a rear end portion thereof, respectively, wherein the flat driving box bilaterally symmetrically includes driving pulleys having driving shafts vertically, and the flat driven box bilaterally symmetrically includes driven pulleys having driven shafts vertically; four wire rows are inserted into the driving box and the driven box by winding a wire around each of the driving pulleys and each of the driven pulleys provided in front and in rear, respectively, between the driving box and the driven box; a plurality of guide pipes matched to the curved surface of the roof frame are bridged between the driving box and the driven box; slits are formed in opposing side surfaces of two central guide pipes among the plurality of guide pipes, respectively over a length direction of the guide pipes; left and right side portions of a plate-like moving member are inserted into the respective slits with margins given, the transfer being provided in the moving member; and a front end portion and a rear end portion of each of the wires are locked to front and rear ends of each of side portions of the moving

member present on the guide pipes.

Moreover, a pair of moving wheels made of synthetic resin and rolling on each of the guide pipes are provided in each of left and right side portions of the moving member present inward of the two central guide pipes.

In summary, in the awning constituted as stated above and including the window regulator according to one aspect of the present invention, a transfer reciprocating between the front end of the roof frame and a rear portion of the roof frame along a curved shape of the roof frame is provided on the roof frame, and the window panel is connected to the transfer. Therefore, the window panel can be operated to be automatically slidably opened and closed by actuating the transfer.

The transfer protrudes downward from a casing attached to a center of the roof frame as a part of the roof frame. Therefore, the transfer does not narrow the space of the open cabin created by the awning and is matched to a structure of the awning. Accordingly, the transfer does not mar the beauty of the awning and is integrated with the room frame. It is, therefore, possible to improve strength of the roof frame as compared with that provided in the conventional awning.

The casing includes a flat driving box and a flat driven box that are provided in a front end portion and a rear end portion thereof, respectively, wherein the flat driving box bilaterally symmetrically includes driving pulleys having driving shafts vertically, and the flat driven box bilaterally symmetrically includes driven pulleys having driven shafts

vertically; four wire rows are inserted into the driving box and the driven box by winding a wire around each of the driving pulleys and each of the driven pulleys provided in front and in rear, respectively, between the driving box and the driven box; a plurality of guide pipes matched to the curved surface of the roof frame are bridged between the driving box and the driven box; slits are formed in opposing side surfaces of two central guide pipes among the plurality of guide pipes, respectively over a length direction of the guide pipes; left and right side portions of a plate-like moving member are inserted into the respective slits with margins given, the transfer being provided in the moving member; and a front end portion and a rear end portion of each of the wires are locked to front and rear ends of each of side portions of the moving member present on the guide pipes. Therefore, the wires that move the moving member are inserted into the curved guide pipes. Further, each of the wires is not inclined in a linearly exposed state and the driving box and the driven box are flat. Due to this, the space of the open cabin created by the awning is not narrowed and there is no probability that a wire is or wires are caught in the head of a person on board. Besides, the moving member is arranged between the two central guide pipes and the left and right side portions of the moving member except for the central portion thereof from which the transfer protrudes downward are present on the guide pipes. Due to this, the casing does not mar the beauty of the awning. Moreover, a strength of the roof frame can be improved by the four guide pipes.

A pair of moving wheels made of synthetic resin and rolling on each of the guide pipes are provided in each of left and right side portions of the moving member present inward of the two central guide pipes. Therefore, the moving member can move inward of the two central guide pipes more smoothly without causing noise and vibration due to rubbing between the moving member and the two central guide pipes or without attrition of the moving member itself. In addition, the window panel can be smoothly and slidably moved. In this way, the wind regulator of the awning for the cruiser according to the present invention is quite advantageous practically.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front view of an awning to which a window regulator according to an embodiment of the present invention is attached;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a cross-sectional view taken along a line A-A of Fig. 2;

Fig. 4 is an enlarged view of principal parts of Fig. 3;

Fig. 5 is a side view of Fig. 1;

Fig. 6 is a side view of the awning in a state in which a window panel is open;

Fig. 7 is a front view of the window regulator;

Fig. 8 is a plan view of Fig. 7;

Fig. 9 is a side view of Fig. 7;

Fig. 10 is a configuration diagram showing an internal structure of the window regulator;

Fig. 11 is an enlarged view taken along a line B-B of Fig. 10;

Fig. 12 is a cross-sectional view taken along a line X-X of Fig. 11;

Fig. 13 is a cross-sectional view taken along a line Y-Y of Fig. 11; and

Fig. 14 is a side view of a cruiser to which the awning is attached.

DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention will be described hereinafter with reference to the accompanying drawings.

Fig. 1 is a front view of an awning to which a window regulator according to the embodiment of the present invention is attached. Fig. 2 is a plan view of Fig. 1, Fig. 3 is a cross-sectional view taken along a line A-A of Fig. 2 and Fig. 4 is an enlarged view of principal parts of Fig. 3.

An awning 1 shown in the drawings is structured as follows. A longitudinally curved roof frame 2 is arranged to be inclined down ahead above an open cabin C1 of a cruiser C shown in Fig. 14. A lightproof and waterproof sheet-like roof cover 3 is put up on the roof frame 2. Further, a transparent window panel 4 moving in a space S between a front end of the roof frame 2 and a front portion of the open cabin C1 present in front of the roof frame 2 to be able to slidably open and close the space S is provided to be inclined to be continuous to inclination of the roof frame 2 in a closed state.

In the drawings (except for Fig. 14), the roof cover 3

is indicated by a two-dot chain line for sake of description.

The cruiser C shown in Fig. 14 is of a type having a structure in which the flying deck (open cabin C1) is provided on a roof of a main cabin. Needless to say, the awning 1 is applicable not only to the cruiser C shown in Fig. 14 but also to an arbitrary cruiser of any type, as long as the cruiser includes an open cabin of a roofless open shape.

The roof frame 2 is configured as a part of a main frame 5 to be described below.

This main frame 5 is configured so that a front frame 6 and a rear frame 7 are formed integrally. As shown in Fig. 2, the main frame 5 is formed into a generally horizontally long rectangle that has bilaterally symmetric and projecting front and rear portions in a plan view.

The front frame 6 is formed into a generally U shape by connecting parallel rods 8 and 8a, which are arranged left and right to be parallel to and flush with each other, to front ends of the parallel rods 8 and 8a by a front circular arc rod 9 curved forward.

Rear ends of the parallel rods 8 and 8a are formed to be continuous to the rear frame 7. The rear frame 7 is formed by forming arched rods 11 and 11a inclined down ahead to be arched to be continuous to an end of a rear circular arc rod 10 curved backward, having a curvature equal to that of the front circular arc rod 9 and constituting a rear end of the roof frame 2 as shown in Fig. 3. Lower ends of the arched rods 11 and 11a are connected to rear ends of the parallel rods 8 and 8a almost at

right angle, respectively, thereby integrating the main frame 5.

In the main frame 5, arched side frames 12 and 12a gently curved are arranged to spread in ranges from the front ends of the parallel rods 8 and 8a to rear regions of the arched rods 11 and 11a, and to be parallel to each other and to be superimposed on the parallel rods 8 and 8a and the arched rods 11 and 11a, respectively. The arched side frames 12 and 12a constitute left and right side edges of the roof frame 2, respectively.

Standing portions 13 and 13a are formed out of short connection regions in which the parallel rods 8 and 8a are connected to front ends of the side frames 12 and 12a on the front ends of the side frames 12 and 12a, respectively.

Furthermore, an arched front frame 14 (hereinafter, also referred to as "front end 14") constituting a front end of the roof frame 2 is provided to be bridged between regions near front portions of the side frames 12 and 12a.

Thus, the front frame 14, the side frames 12 and 12a and the rear circular arc rod 10 constitute the curved roof frame 2 inclined down ahead, and the roof cover 3 is put on the roof frame 2.

As shown in Fig. 14, this roof frame 3 is configured so that the rear end of the roof cover 3 is formed to extend so as to cover up a range over a rear deck C2 of the cruiser C in a state in which the awning 1 is attached to the cruiser C.

By doing so, the roof cover 3 shields light not only at

a helm position of the open cabin C1 but also over the rear deck C2 present in rear of the open cabin C1.

It is to be noted that the roof frame 2 is configured to include not only the front frame 14, the side frames 12 and 12a and the rear circular arc rod 10 all of which constitute an outer hull of the roof frame 2 but also a plurality of lateral support rods 15, 15a ... and a plurality of longitudinal support rods 16, 16a The lateral support rods 15, 15a ... and the longitudinal support rods 16, 16a ... are appropriately arranged to cross one another so as to constitute a curved surface of the roof frame 2 between the front frame 14 and the rear circular arc rod 10 and between the side frames 12 and 12a.

As is also shown in Fig. 5, slide rails 17 and 17a away from the side frames 12 and 12a always at constant distances are provided below the side frames 12 and 12a, respectively. Front and rear ends of the slide rails 17 and 17a are connected to the standing portions 13 and 13a of the side frames 12 and 12a and rear regions of the arched rods 11 and 11a, respectively.

The window panel 4, which is made of plastic such as polycarbonate, has an area almost matched to a space S surrounded by the front frame 14, the front circular arc rod 9 and the side frames 12 and 12a. Further, the window panel 4 is formed to be curved into an arch similarly to the front frame 14 in a horizontal direction.

A reinforcement frame 18 (partially not shown in the drawings) is provided around a lower portion of the window panel 4. Sliders 19 and 19a are fixed to front and rear ends of each

of left and right sides of the reinforcement frame 18, respectively. The sliders 19 and 19a are slidably attached onto each of the slide rails 17 and 17a and the window panel 4 is moved along the slide rails 17 and 17a. By doing so, the window panel 4 can slidably open and close the space S between the front frame 14 and the front circular arc rod 9 (corresponding to the space S between the front end 14 of the roof frame 2 and a front portion of the open cabin C1).

Namely, as shown in Figs. 3 and 5, in a state in which the window panel 4 closes the space S, a front side 18a and a rear side 18b of the reinforcement frame 18 are arranged to be superimposed on an upper portion of the front circular arc rod 9 and a lower portion of the front frame 14, respectively. As shown in Fig. 6, in a state in which the window panel 4 is moved to slide rearward to open the space S, the window panel 4 is arranged to be superimposed on a lower portion of the roof frame 2 (roof cover 3) in parallel at a certain distance kept between the window panel 4 and the lower portion of the roof frame 2 (roof cover 3).

The window regulator attached to the awning 1 configured as stated above will next be described.

The window regulator is configured as follows. Referring to Figs. 1 to 4, a transfer 21 protruding downward from a casing 20 attached to a center of the roof frame 2 as a part of the roof frame 2 is provided along a longitudinally curved shape of the roof frame 2 to freely reciprocate between the front end 14 and a rear portion of the roof frame 2. A projection piece

22 projecting rearward toward an intermediate portion of the rear side 18b of the reinforcement frame 18 corresponding to an upper side edge of the window panel 4 is pivotally connected to the transfer 21 via a connection rod 23, thereby connecting the transfer 21 to the window panel 4. Furthermore, as shown in Figs. 5 and 6, the window panel 4 automatically slidably opens or closes by moving of the transfer 21.

The casing 20 is configured as follows. As shown in Figs. 7 to 10, a flat driving box 26 in which driving pulleys 25 and 25a including driving shafts 24 and 24a, respectively are included bilaterally symmetrically is provided in a rear end portion of the casing 20 in a vertical direction. A flat driven box 29 in which driven pulleys 28 and 28a including driven shafts 27 and 27a, respectively are included bilaterally symmetrically is provided in a front end portion of the casing 20 in the vertical direction. Wires 30 and 30a are wound around the front and rear driving and driven pulleys 25 and 28 and around the front and rear driving and driven pulleys 25a and 28a, respectively between the driving and driven boxes 26 and 29. Four wire rows W1 to W4 are thereby inserted into the driving and driven boxes 26 and 29, respectively. In addition, guide pipes 31, 31a, 32 and 32a matched to the longitudinally curved shape of the roof frame 2 are provided to be bridged between the driving and driven boxes 26 and 29.

Slits 33 and 33a are formed in opposing side surfaces of the two central guide pipes 32 and 32a in a length direction of the guide pipes 32 and 32a, respectively. Left and right

side portions of a plate-like moving member 34, on a central bottom of which the transfer 21 is provided, are inserted into the respective slits 33 and 33a with margins given. Further, loops formed on front and rear ends of each of the wires 30 and 30a are locked to hooks 35 and 35a provided on front and rear ends, respectively of each of side portions of the moving member 34 present on the guide pipes 32 and 32a.

If the casing 20 is to be attached to the roof frame 2, then a front wall of the driven box 29 serving as a front end portion of the casing 20 and an intermediate portion of the front frame 14 are fixed between the two longitudinal support rods 16 and 16a located at center of the roof frame 2 via a bracket V. Left and right sidewalls of the driving box 26 serving as a rear end portion of the casing 20 and rear side surfaces of the longitudinal support rods 16 and 16a are fixed between the two longitudinal support rods 16 and 16a located at the center of the roof frame 2 via brackets V1 and V2, respectively. Further, front and rear portions of the guide pipes 31, 31a, 32 and 32a are fixed to a lower portion of a band plate member bridged between the longitudinal support rods 16 and 16a. By doing so, the casing 20 can be integrated with the roof frame 2 and strength of the roof frame 2 is improved accordingly.

In Fig. 10, the guide pipes 31, 31a, 32 and 32a are short straight pipes and the driving box 26 and the driven box 29 are arranged on one horizontal surface for convenience's sake so as to explain an internal structure of the casing 20.

In the driving box 26, electrically-driven motors 36 and

36a are disposed to drive the driving pulleys 25 and 25a, respectively. Driving gears 37 and 37a axially attached to shafts, not shown, of the electrically-driven motors 36 and 36a are engaged with driven gears 38 and 38a coaxial with the driving pulleys 25 and 25a, respectively.

By actuating the electrically-driven motors 36 and 36a, the driving pulleys 25 and 25a are driven to rotate in opposite directions, the moving member 34 moves longitudinally via the wires 30 and 30a and the transfer 21 reciprocates between the front end 14 of the roof frame 2 and the rear portion of the roof frame 2.

It is to be noted that the respective electrically-driven motors 36 and 36a are set to be synchronized with each other so that the moving member 34 can smoothly move without trouble.

The driven pulleys 28 and 28a provided in the driven box 29 are attached to a tension bracket 39 constituted by two vertical substrates interposing driven shafts 27 and 27a of the driven pulleys 28 and 28a therebetween. Positioning bolts 42 and 42a inserted, from exteriorly, into a longitudinally long elongated hole 41 penetrating through left and right sidewalls of the driven box 29 are threaded with left and right sidewalls 40 and 40a of the tension bracket 39, respectively.

Moreover, tension bolts 44 and 44a inserted into a front wall of the driven box 29 from exteriorly are threaded with left and right front walls 43 and 43a of the tension bracket 39, respectively.

If tensions of the wires 30 and 30a are to be adjusted,

then the positioning bolts 42 and 42a are temporarily loosened to turn the tension bracket 39 into a longitudinally movable state, and the tension bolts 44 and 44a are threaded forward or backward to thereby make fine adjustments of the tension bolts 44 and 44a in a longitudinal direction and relax or tense the wires 30 and 30a. After the adjustments, the positioning bolts 42 and 42a are fastened again, thereby firmly fixing the positioning-adjusted tension bracket 39 into the driven box 29.

As shown in Figs. 11 to 13, the moving member 34 includes, as a substrate, a rectangular plate having its entire length and thickness set not to interfere the curved slits 33 and 33a during moving of the moving member 34. Further, the hooks 35 and 35a... are formed on front and rear ends of each of the left and right side portions of the moving member 34 present inward of the guide pipes 32 and 32a. A pair of front and rear moving wheels 45 and 45a made of synthetic resin and rolling on each of the guide pipes 32 and 32a are provided between the front and rear hooks 35 and 35a... in each side portion of the moving member 34.

By thus providing the synthetic resin moving wheels 45 and 45a on the moving member 34, the moving member 34 is configured to be able to move on the guide pipes 32 and 32a more smoothly without causing noise and vibration due to rubbing between the substrate of the moving member 34 and the two central guide pipes 32 and 32a during moving of the moving member 34 or without attrition of the substrate of the moving member 34.

As shown in Fig. 14, in the awning 1 equipped with the

window regulator as stated above, the parallel rods 8 and 8a are arranged to be superimposed on and parallel to horizontal portions of handrails H already provided on left and right outer edges of the open cabin C1 of the cruiser C and are fixed by clamps.

Moreover, a pillar P connecting and supporting the front circular arc rod 9 of the main frame 5 is provided to stand in the front portion of the open cabin C1.

By doing so, the awning 1 is fixed to the open cabin C1 and configured to close the space S constituted by an upper edge of a front surface of a windshield panel C3 provided around the open cabin C1 as well as by a front end of the roof cover 3 in a state in which the window panel 4 is closed.

The open cabin C1 does not always include the handrails H depending on types of the cruiser C. If the handrails H are not provided, the front circular arc rod 9 and the parallel rods 8 and 8a of the main frame 5 are connected and supported by either providing upright a plurality of pillars P around the open cabin C1 or providing an appropriate base frame (not shown).

The awning 1 attached to the open cabin C1 as stated above actuates the window panel 4 to be opened or closed using the window regulator.

That is, when windshield is unnecessary, the driving and driven pulleys 25, 25a, 28 and 28a rotated by actuation of the electrically-driven motors 36 and 36a move the moving member 34 rearward via the wires 30 and 30a.

By doing so, the transfer 21 slidably moves the window

panel 4 rearward via the connection rod 23 and opens the space S between the front end 14 of the roof frame 2 and the front portion of the open cabin 2 (an upper edge of a front surface of the windshield panel C3).

To close the window panel 4 from the open state as necessary, the electrically-driven motors 36 and 36a are actuated to rotate in the direction opposite to that stated above. Consequently, the moving member 34 is moved forward by procedures opposite to those stated above to slidably move the window panel 4 forward of the roof frame 2, thereby closing the space S.

It is to be noted that the space S can be opened at a predetermined opening degree by stopping the electrically-driven motors 36 and 36a during opening or closing operation of the window panel 4.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A window regulator of an awning for a cruiser, the awning including:

a roof frame longitudinally curved and arranged to be inclined down ahead above an open cabin of the cruiser;

a lightproof roof cover provided to be put on the roof frame;

a transparent window panel that is provided to be inclined to be continuous to inclination of the roof frame and moves in a space between a front end of the roof frame and a front portion of the open cabin present in front of the roof frame so as to be able to slidably open and close the space;

a slide rail arranged below a side frame arranged on each of left and right edges of the roof frame, a distance between the slide rail and the side frame being always constant; and

a slider fixed to each of left and right sides of the window panel and slidably attached onto the slide rail,

wherein a transfer reciprocating between the front end of the roof frame and a rear portion of the roof frame along a curved shape of the roof frame is provided on the roof frame, and

the window panel is connected to the transfer.

2. The window regulator of the awning for the cruiser according to claim 1,

wherein the transfer protrudes downward from a casing attached to a center of the roof frame as a part of the roof frame.

3. The window regulator of the awning for the cruiser according to claim 2,

wherein the casing includes a flat driving box and a flat driven box that are provided in a front end portion and a rear end portion thereof, respectively, wherein the flat driving box bilaterally symmetrically includes driving pulleys having driving shafts vertically, and the flat driven box bilaterally symmetrically includes driven pulleys having driven shafts vertically,

four wire rows are inserted into the driving box and the driven box by winding a wire around each of the driving pulleys and each of the driven pulleys provided in front and in rear, respectively, between the driving box and the driven box,

a plurality of guide pipes matched to the curved surface of the roof frame are bridged between the driving box and the driven box,

slits are formed in opposing side surfaces of two central guide pipes among the plurality of guide pipes, respectively over a length direction of the guide pipes,

left and right side portions of a moving member are inserted into the respective slits with margins given, the transfer being provided in the moving member, and

a front end portion and a rear end portion of each of the wires are locked to front and rear ends of each of side portions of the moving member present on the guide pipes.

4. The window regulator of the awning for the cruiser according to claim 3,

wherein a pair of moving wheels made of synthetic resin and rolling on each of the guide pipes are provided in each of the left and right side portions of the moving member present inward of the two central guide pipes.

Fig.1

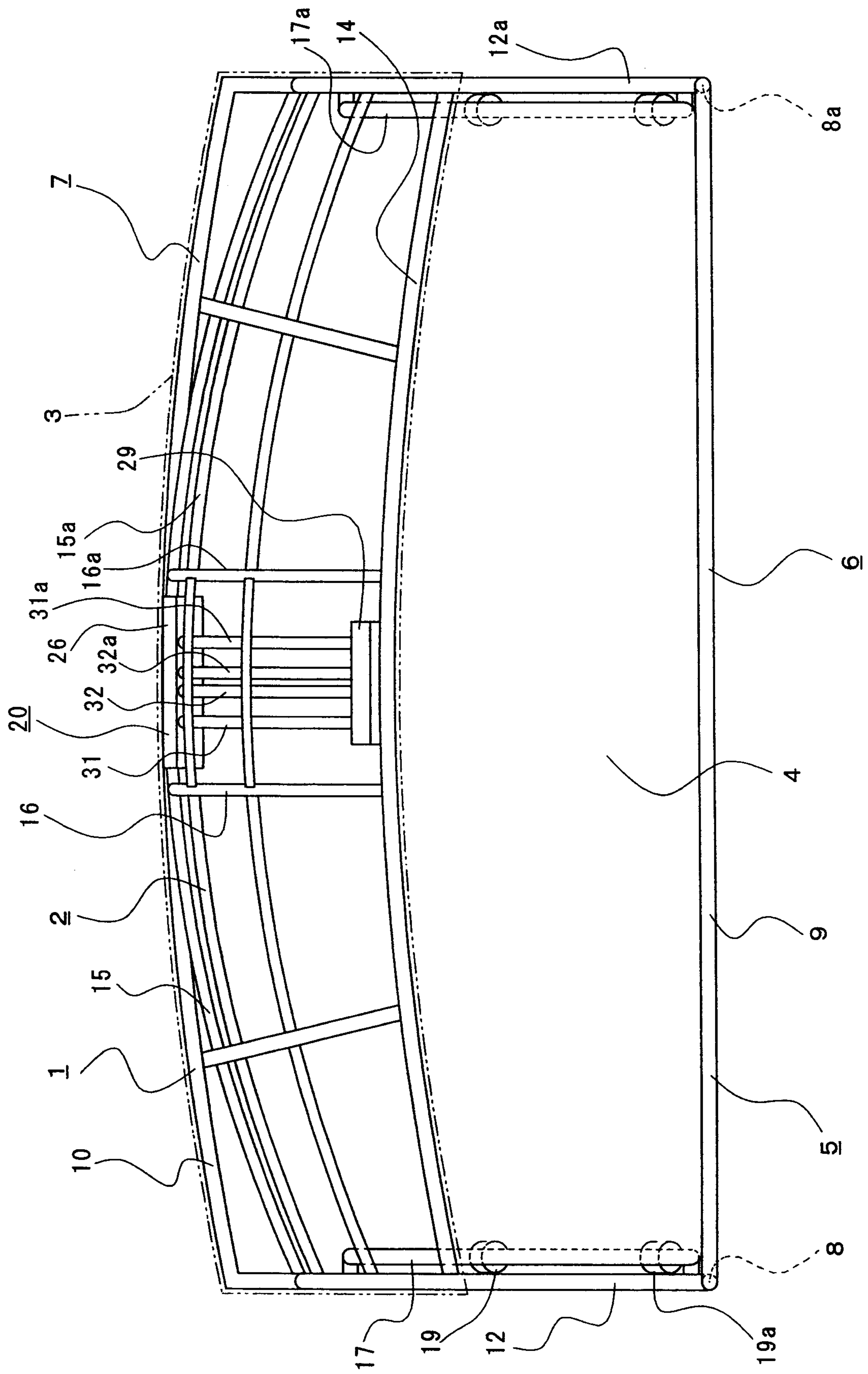


Fig.2

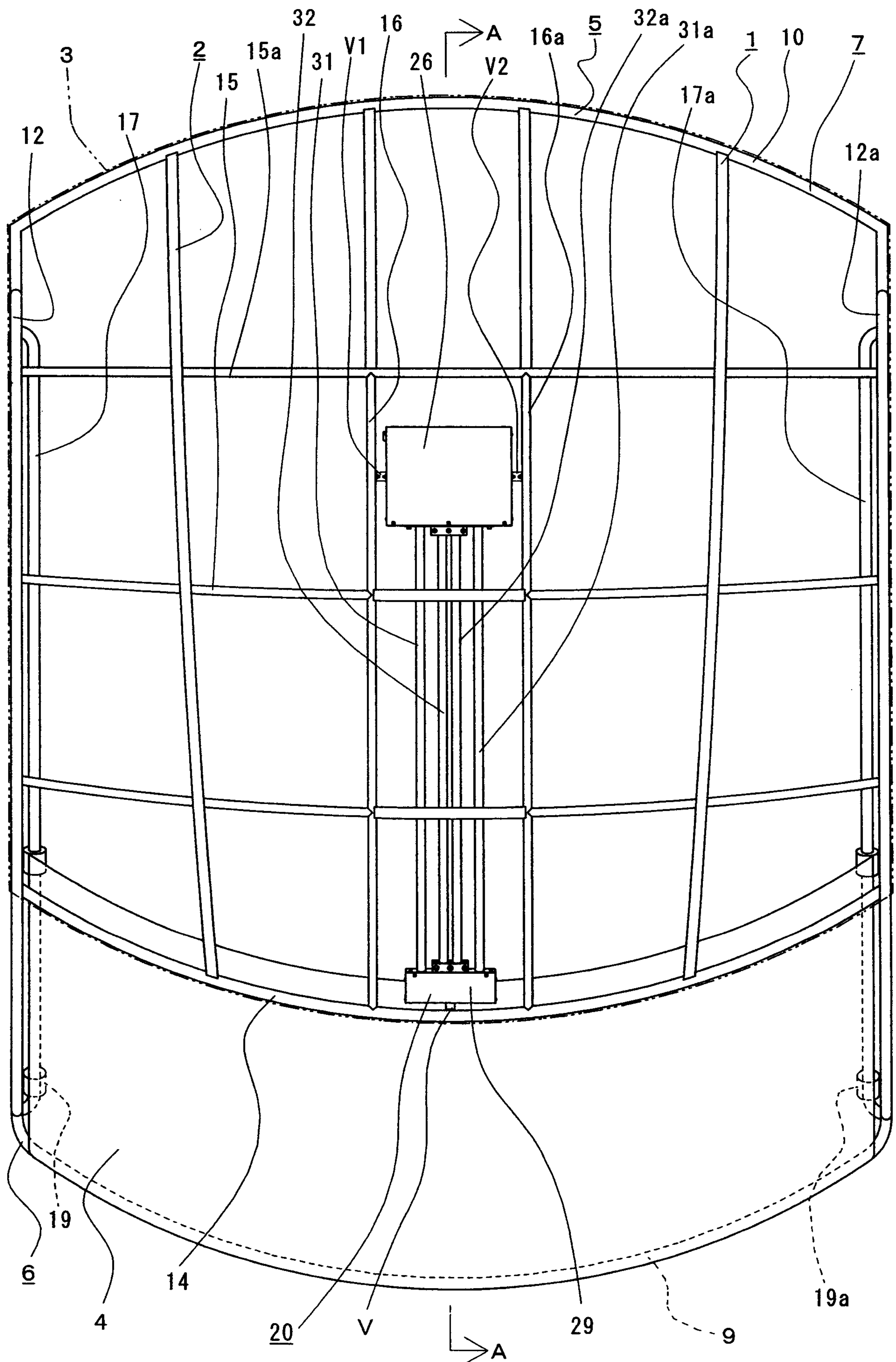


Fig.3

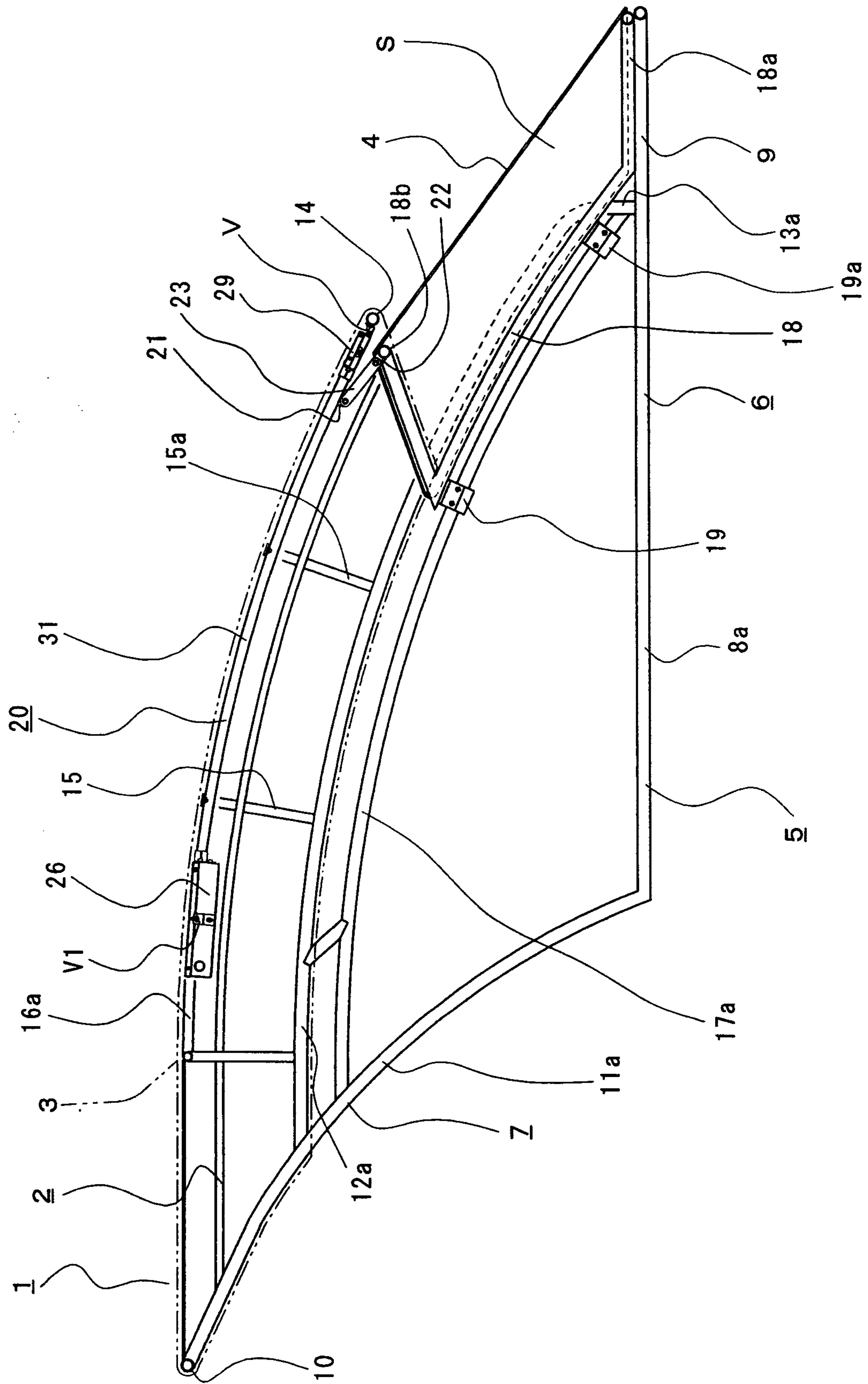
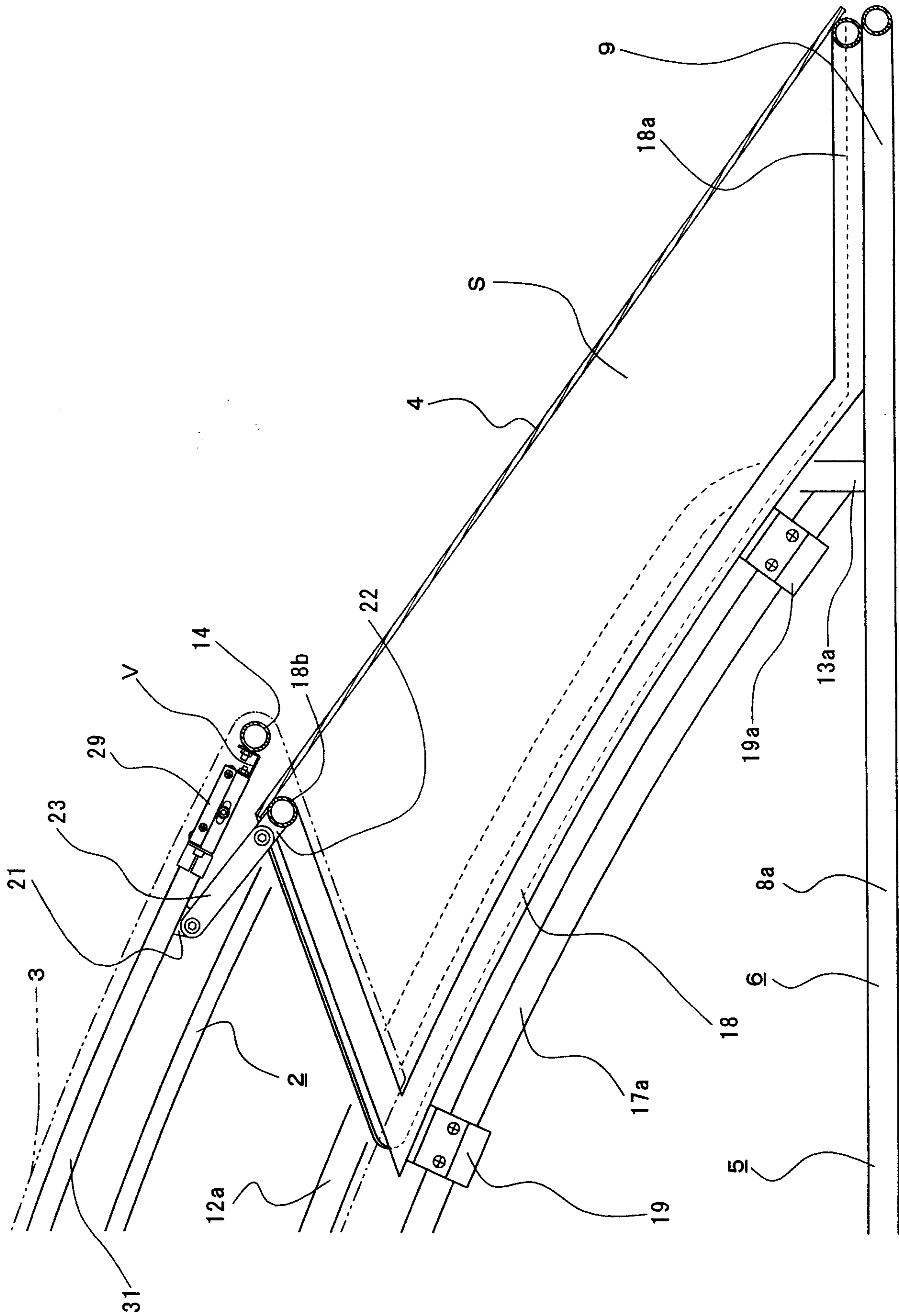
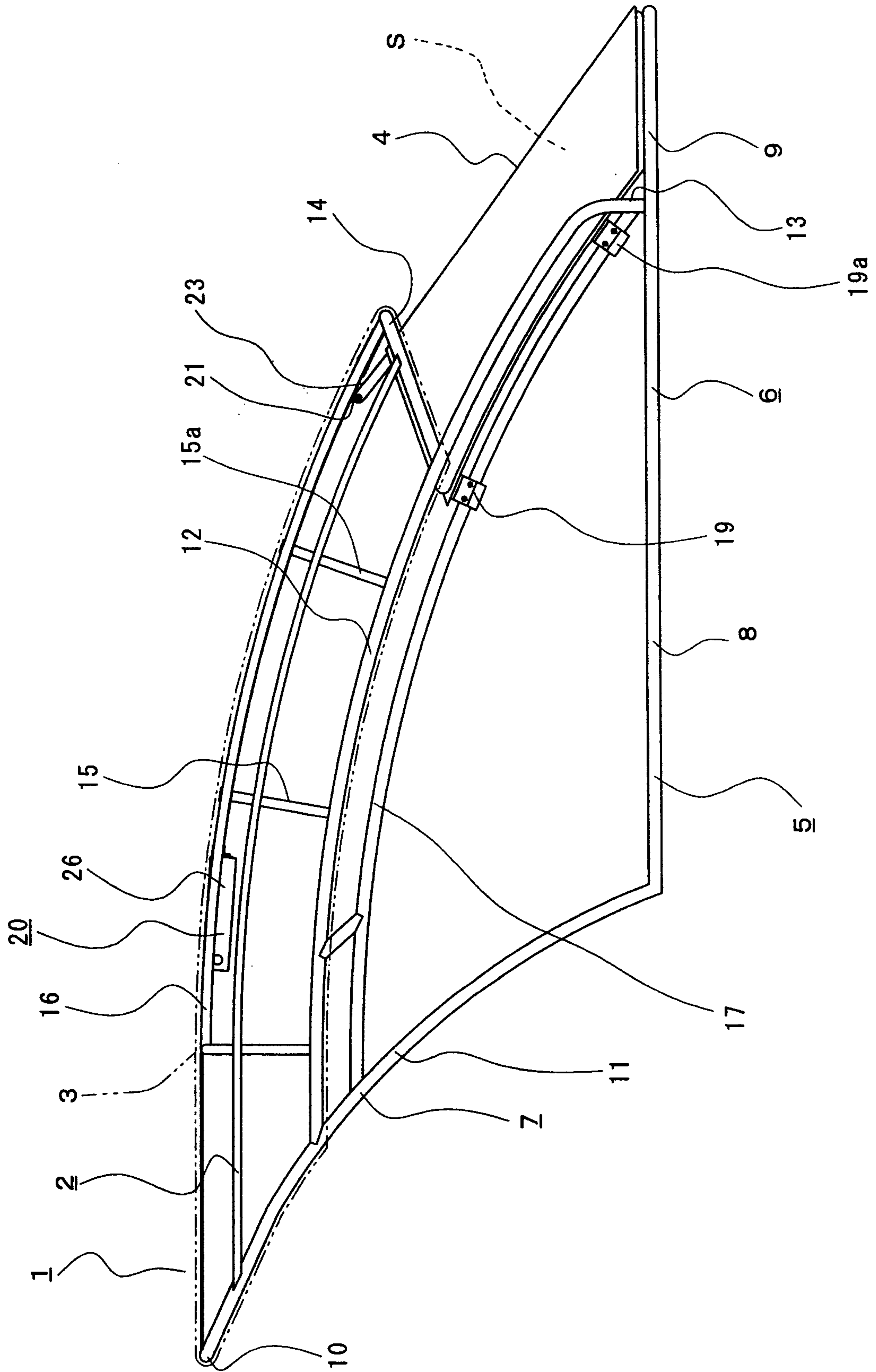


Fig.4



50



65

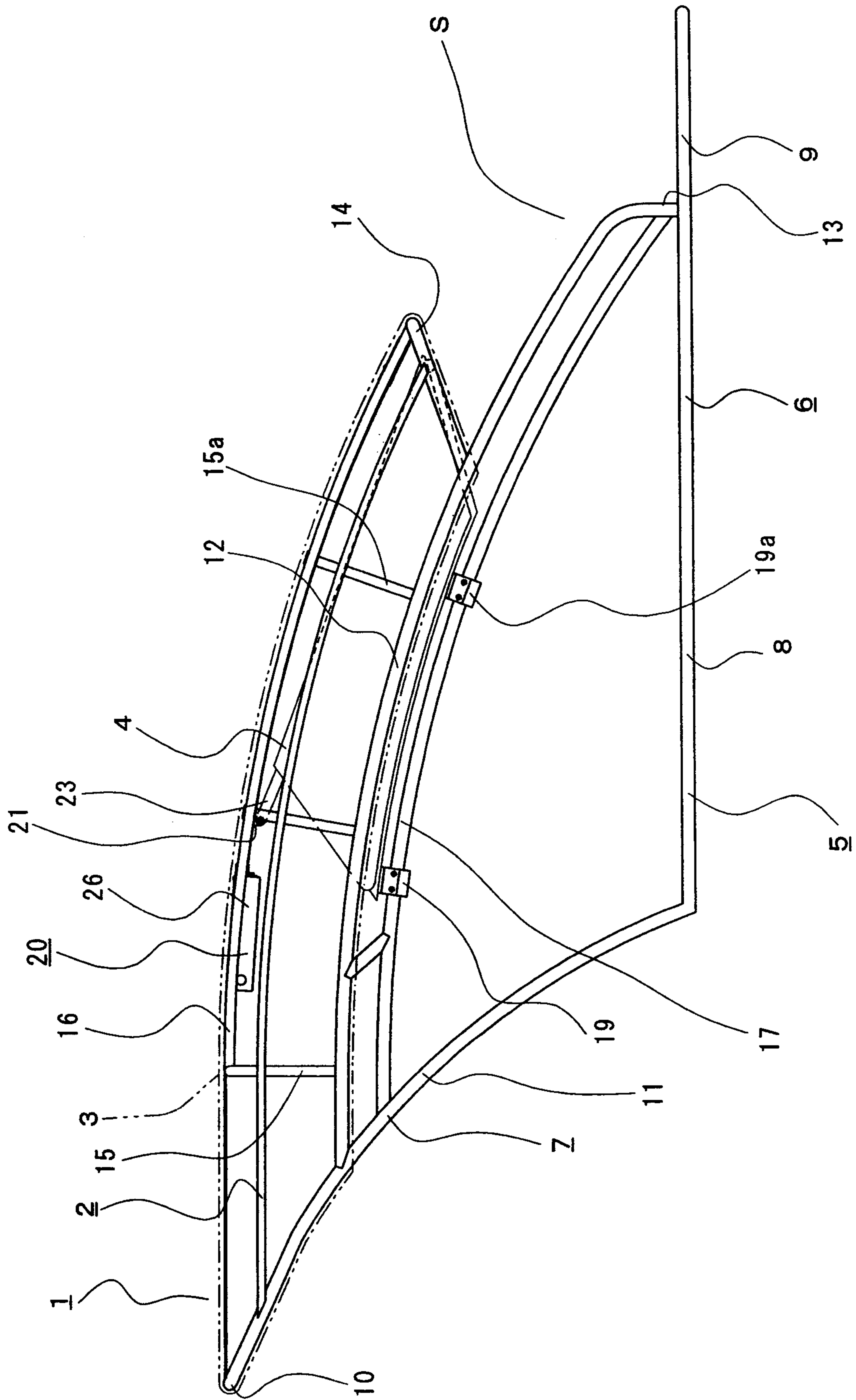


Fig.7

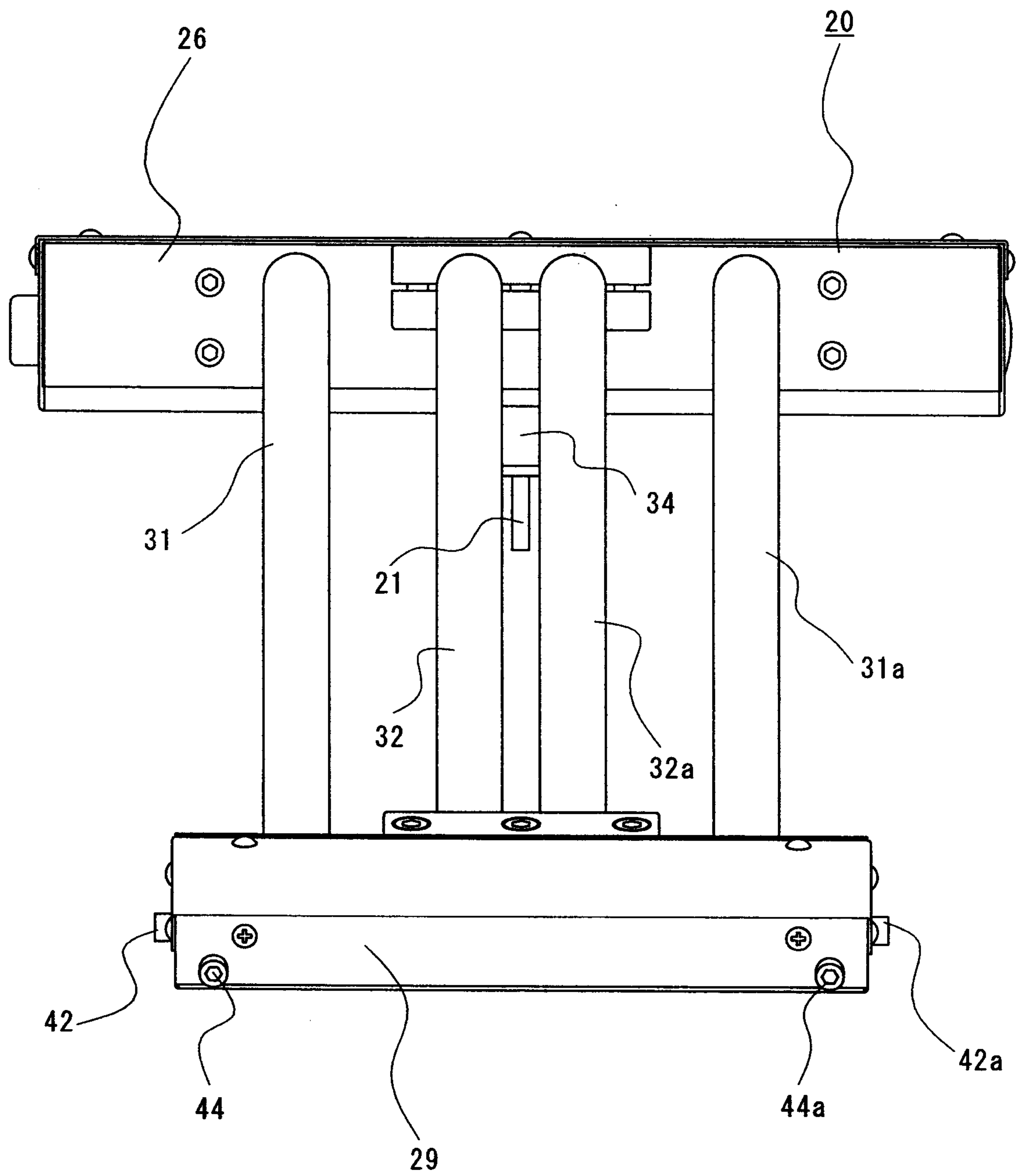


Fig.8

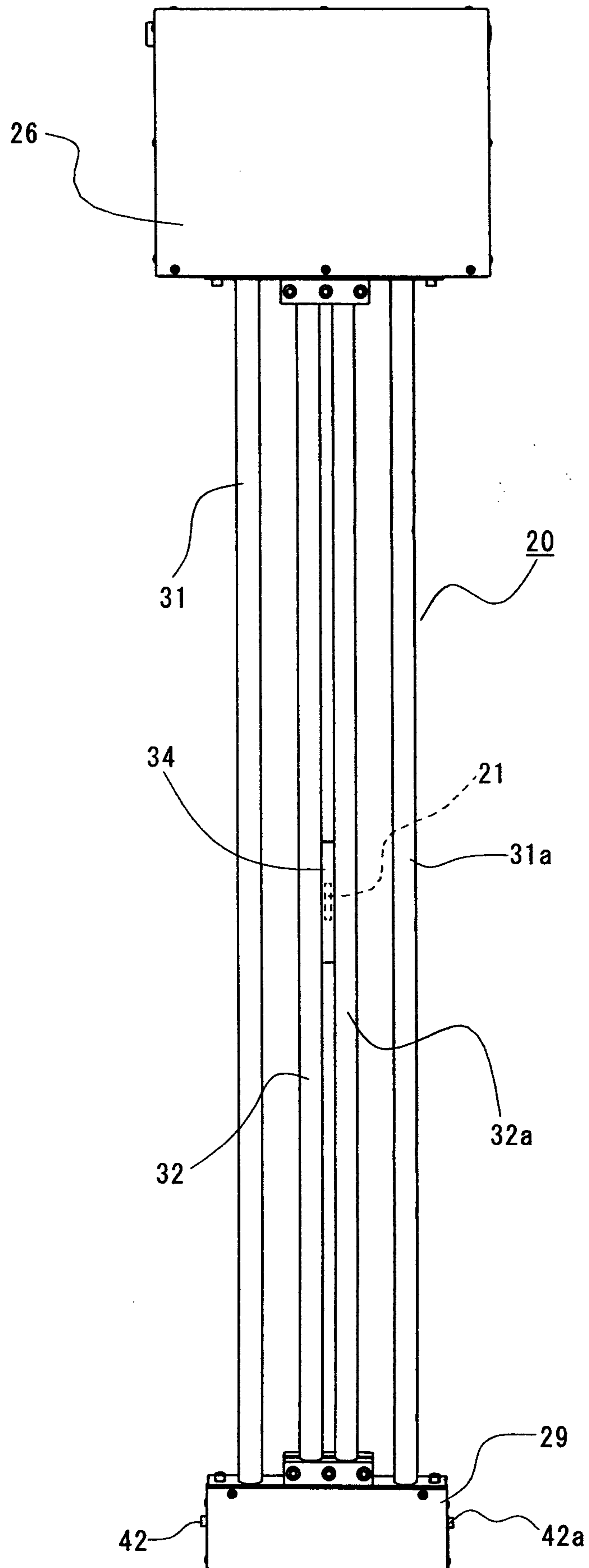


Fig.9

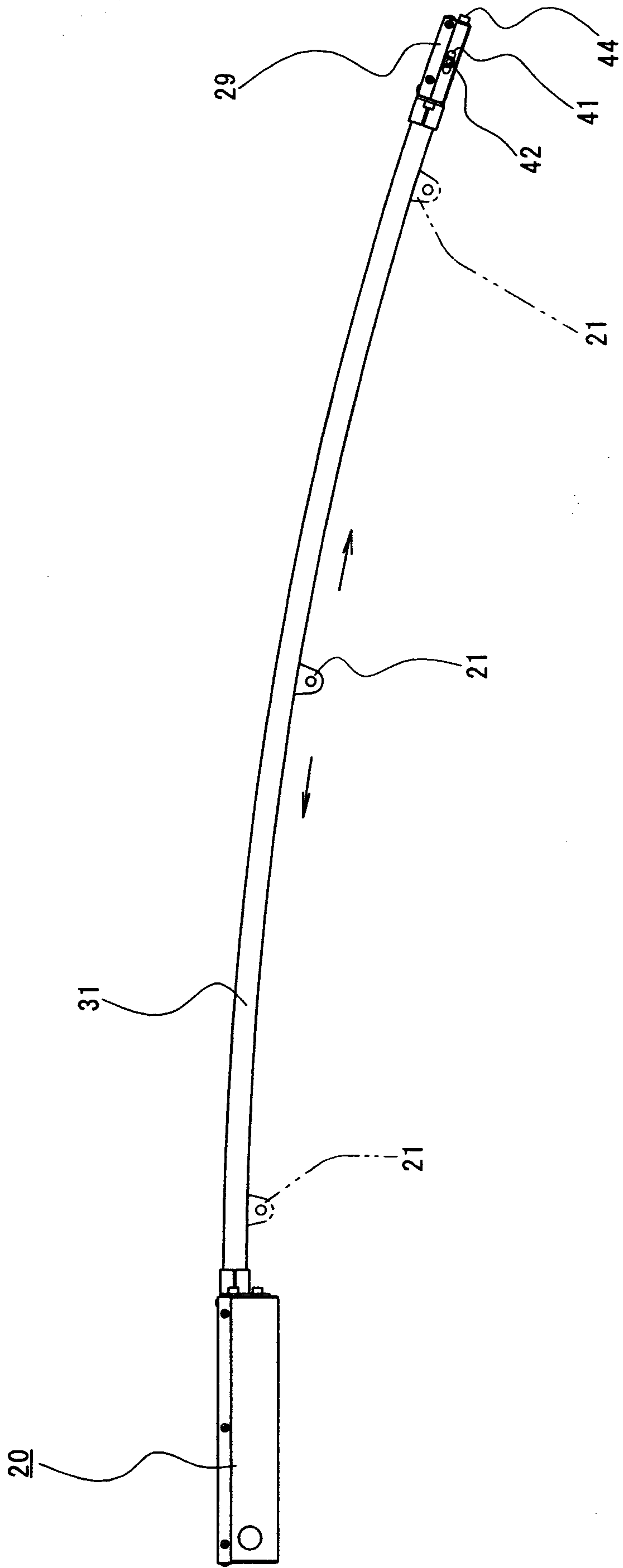


Fig.10

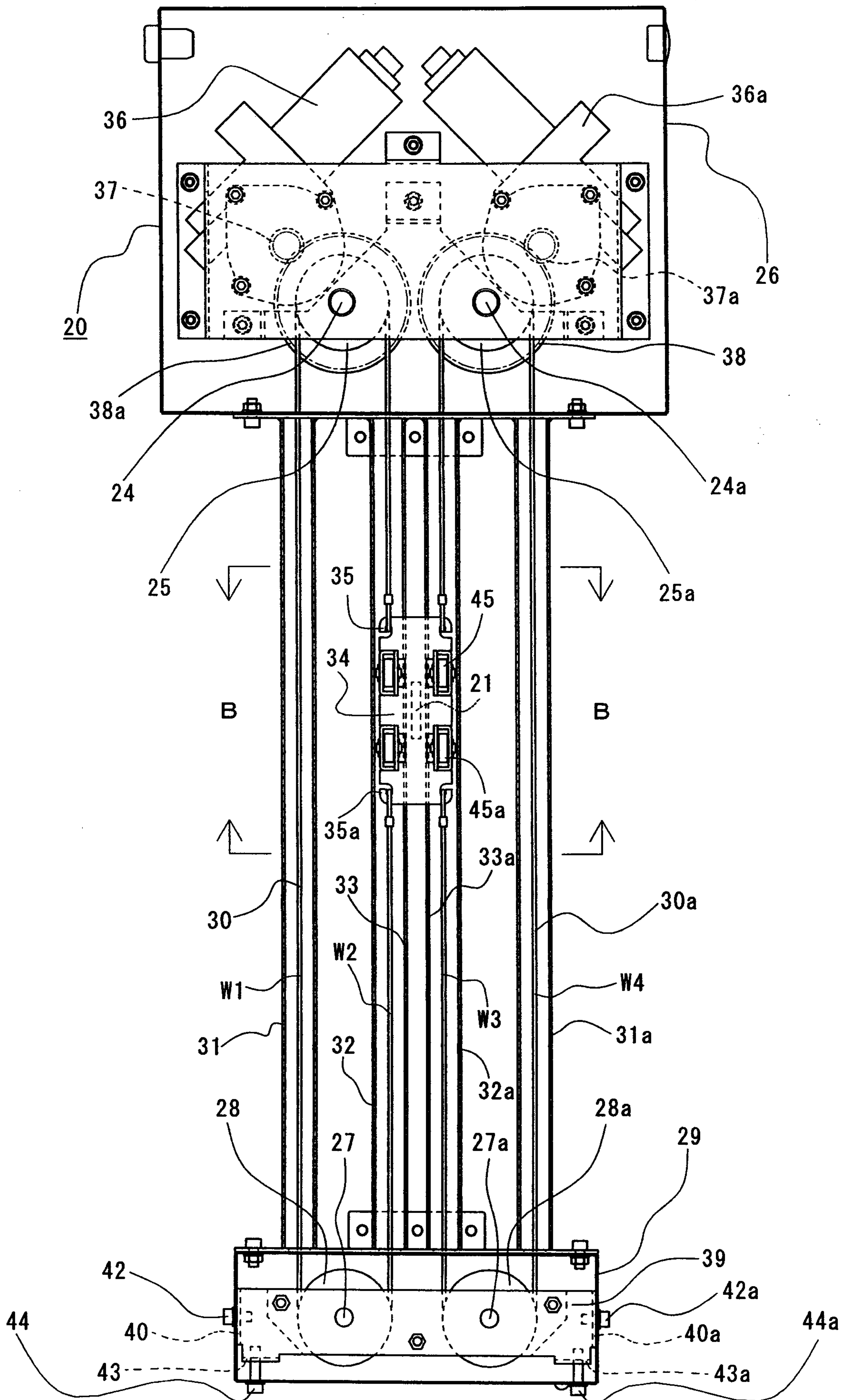


Fig.11

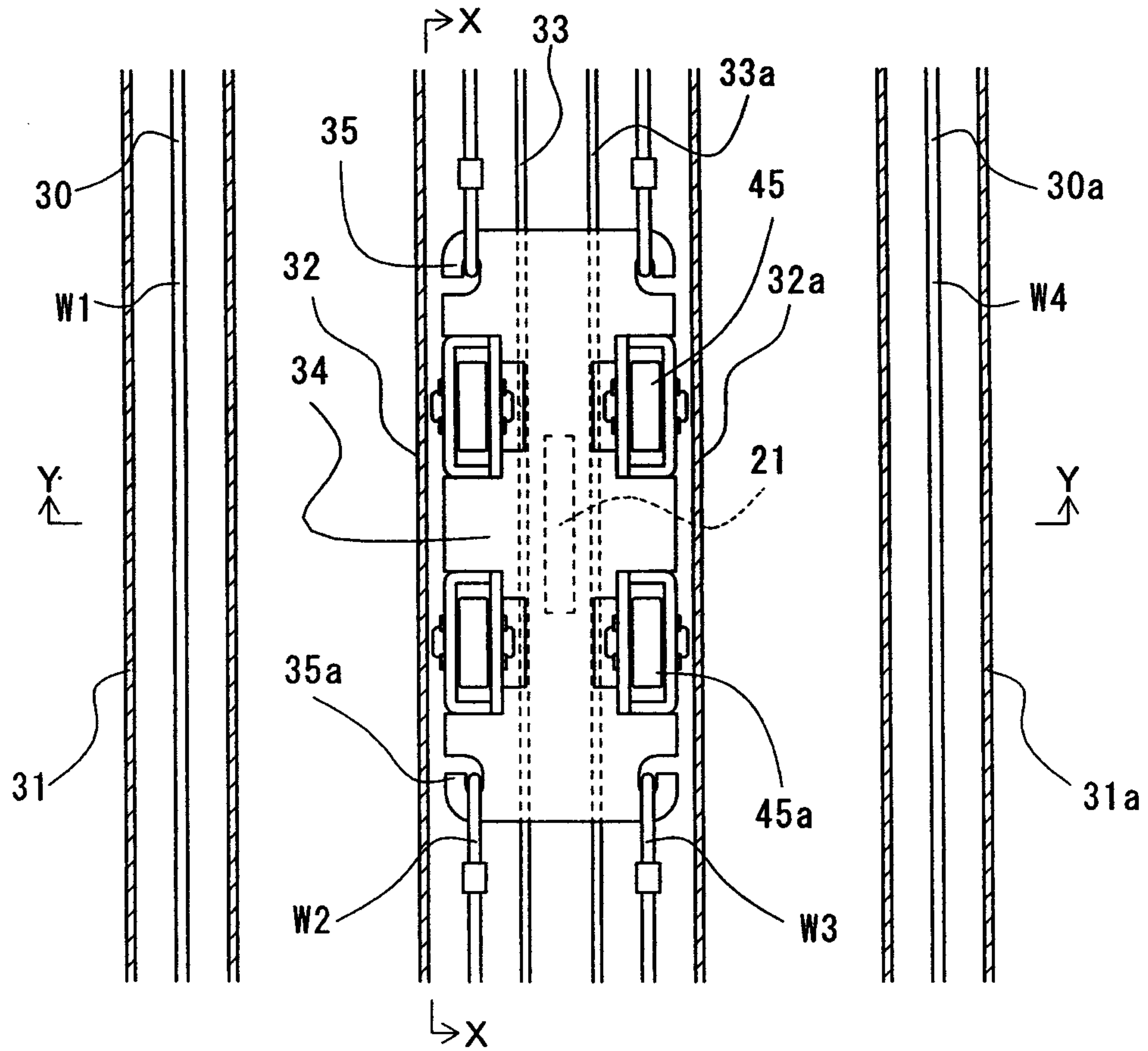


Fig.12

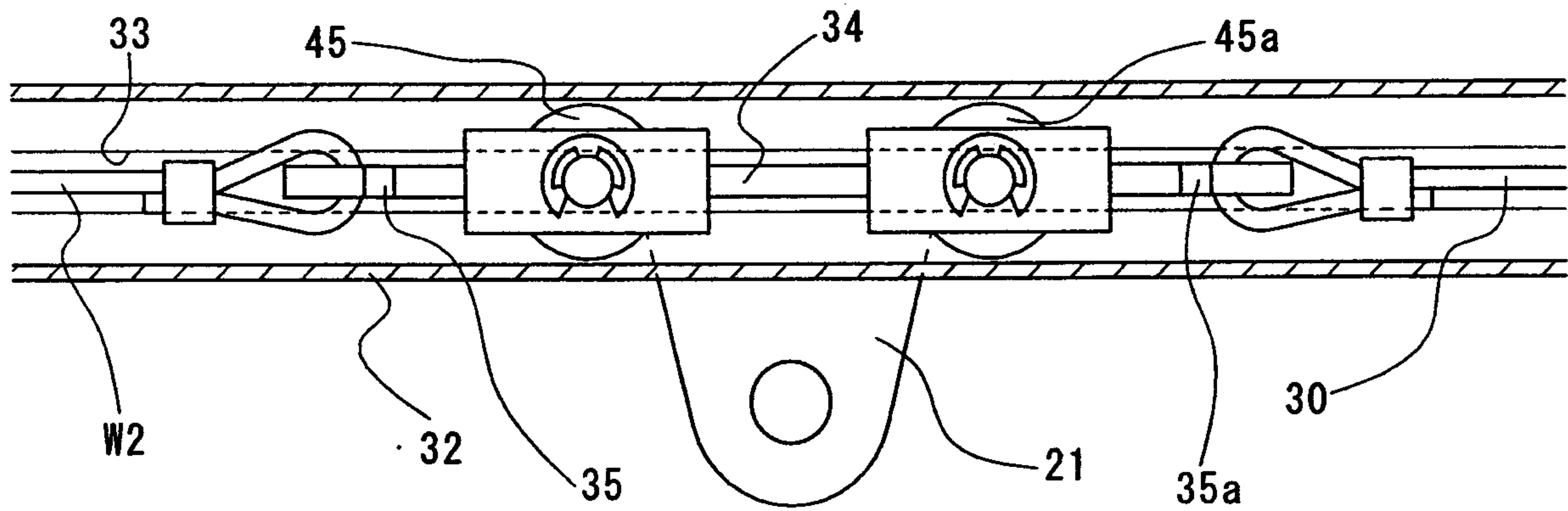


Fig.13

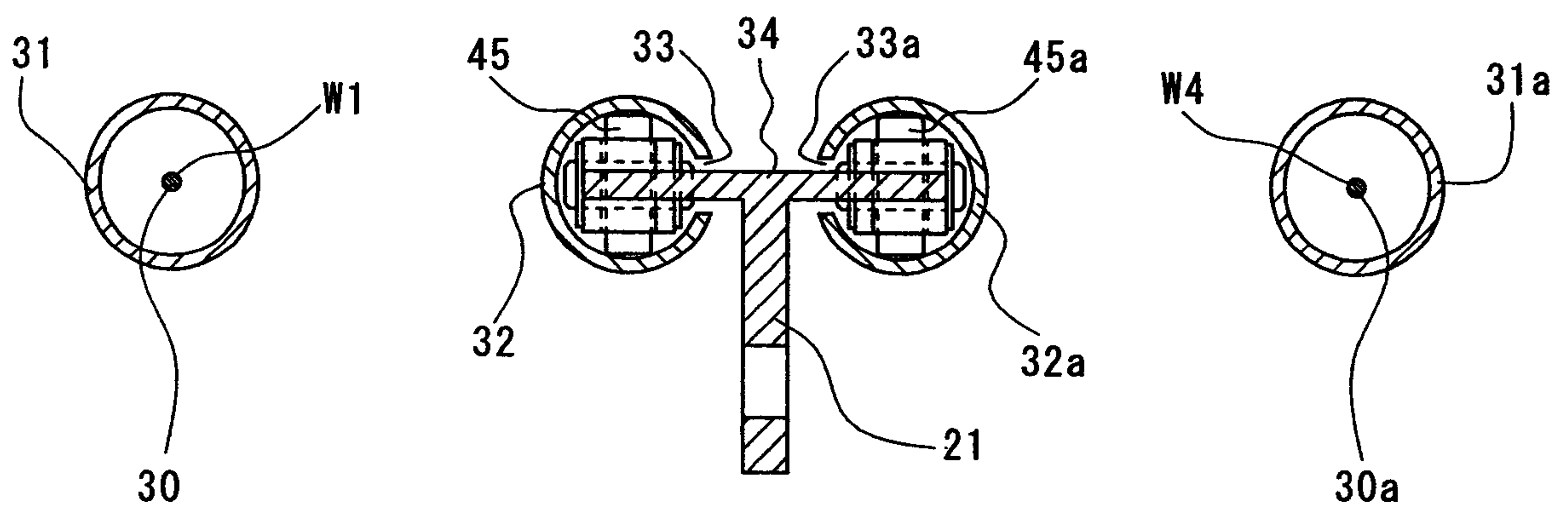


Fig.14

