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(54) **AUTOMATIC BOAT MOORING DEVICE**
AUTOMATISCHE BOOTFESTMACHUNGSVORRICHTUNG
DISPOSITIF D'AMARRAGE AUTOMATIQUE DE BATEAU

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Description

Technical Field

[0001] The invention in a broader sense belongs to the field of Nautics, and specifically relates to the mooring of boats to the port as well as to fixed and floating surfaces. (IPC B63B21/00;)

Detailed description of the invention

[0002] This device is only used for parallel mooring in the front part of the ship, the "bow of the boat", in a safe and efficient way, so that while parking we automatically moor to the device which is fixed on the dock. In order to achieve maximum efficiency, this device is designed to be used with two different connectors, so that users of the device, depending on the model of the vessel, have the opportunity to choose the necessary connector as the best option for mooring their boat. The device can be used for mooring all standard boats that have a front part with a steep and sharp bow, [Fig.2]. This device has two legs (3), four arms (4), two connector bridges (9), two heads (6), two floaters (1), the connector (A and B) and hooks (5 and 7). The head (6) has square profiles above and below it (54) for mounting the connectors (A and B). The legs (3) are made to be fixed with screws (55) to the dock which on the front vertical side has a lower axis (63) and an upper axis (64) to connect the hands (4), [Fig.1], which connect with a bridge (9). Two identical hands (4), stay parallel and are connected with a bridge (9) near the legs (3), [Fig.7]. When using the connector (A), we fix the hands (4) with the bridge (9) so that they extend away from the head (6), [Fig.7]. When we use the connector (B), we fix the hands in the opposite direction, so that they approach the head (6), [Fig.8]. Two joined hands are fixed on two legs on the lower shafts (63), on the side where they are connected with the bridge (9), and the other two hands are fixed on the upper axes (64) placed in parallel to the lower hands, and on the other side the hands are connected vertically with the two heads (6) on the lower shafts (57) and the upper shafts (58) with the same distance as the legs, so that the front of the device, the head and the connectors during the up and down movement are always vertical, [Fig.12]. Two shock absorbers (10) are attached to the legs and upper arms and two springs (12) are attached to the legs and lower arms, [Fig.1].

[0003] For the connector (A) we use two hooks (5). The efficient place for connection is in the middle of the bow part of the boat, on the left and right side under the protective tire (14) [Fig.7]. In that place the hooks (5) are mounted, one on the left side and the other on the right side. The hooks (5), [Fig.14], have their own brackets (8) which are fixed with 4 screws (61) to the boat, picture 11. The hooks and brackets are connected by toothed hinges (21), which serve to strongly fix the hooks with screws (66) in a horizontal position during use, Figs 2

and 3, and to lower them in a vertical position when not in frequent use, Fig 11. The hooks (5 and 7) are formed from stainless steel plates tightened at the beginning and widened at the bottom in the shape of a triangle, where in the outer part, widened in the form of an arc, they have an open hook (67) with a mechanism for closing the hook, which is fixed in the inner part of the hooks (5). The hook mechanism (5), [Fig.14], consists of a safeguard (46) which is attached to a shaft (50) where there is a spring (47) to hold the safeguard in the closed position and a lever (49) with which we push the safeguard to release it from the device. The hook (7), [Fig.15], has a mechanism similar to the hook (5), except that instead of the lever (49) there is a cable (48), which is mounted on the upper part of the bow of the boat in order to, by pulling the cable, release the safeguard and disconnect the boat from the device. The connector (A), figures 2 and 3, is part of the device to which the boat is automatically connected by using the hooks (5). The connector (A) consists of two identical mechanisms which are connected by a cable. The mechanism of connector (A) consists of a cable (22), a tension spring (23), a thrust spring (24), a wheel (25), a protective rubber (37), a cable and spring connector (45), a square tube housing (27), cap (69 and 74) and screws (26). The screw (26) passes through the back cover (69) and is screwed into the nut (65) which is fixed at the beginning of the tension spring (23) which is attached on the other side to the cable (22) with a square connector (45)) which moves freely back and forth through the housing (27), but cannot rotate, so we can use the screws (26) to tighten the springs and cables as needed. On the square profiles (54) on the left and right heads (6), the connectors (A) are mounted and fixed with screws (51) so that the distance between the two connectors is equal to the distance between the two hooks (5) which are fixed on the boat, figures 2 and 3. The floats (1) with their housing (71) are mounted on the left and right heads(6) with screws (68). The float has a telescopic holder (70) that passes through its housing (71) and is fixed with screws (72) which serves to keep the connector at the correct height of the boat. The tension spring (12) serves to lighten the front part of the device enabling us to use a smaller float. The shock absorbers (10) have the same two-sided resistance and eliminate uncontrolled oscillations of the device during waves, making it more stable, [Fig.1]. When the device is mounted and fixed on the dock, we measure the height between the water surface and the hooks (5) to the boat and fix the float (1) so that the center of the head (6) stands straight with the hooks (5) which are fixed to the boat.

[0004] To connect the boat to the connector (A), it is important to guide the boat towards the center of the device slowly between the two connectors (A) which are always vertical and at the height of the hooks (5). If we do not move in the right direction, the cables (22) serve as guides and help to guide and moor to the device. Firstly, we pull the boat (2) with a rod towards the device, [Fig.13], to verify the tuning, and after that we can connect to the

device directly by driving the boat slowly towards the device. After connecting the boat to the connector (A), we secure the front of the boat with a rope (34) that is fixed to the rings (73) on the holder (36) where there are springs (11) and in the middle there is a hook (35)) that we tie to the top of the boat. When we untie the boat, we do the opposite: we release the hook (35) and the hooks (5). The boat connected to the device with the connector (A) (figures 2 and 3) oscillates in a controlled and limited manner by the cables (22) by tensioning the springs (23) that control the movements of the boat and the springs (24) that serve to stop the stronger movements with a slight up and down movement of the front of the device.

[0005] The connector (B), [Fig.6], is designed for connection to the boat, at the beginning of the bow on the lower front of the boat where the hook (17), is usually location [Fig.12] . In the boat we remove the bow hook (17) and in its place we mount the hook (7), [Fig.15]. The hook (7) is dedicated to the automatic connection to the connector (B) and in the lower part there is a closed hook (13), which replaces the old hook (17) of the bow of the boat. The hook (7), for mounting on the boat has a hole for the screw (18), a cutout for the second screw (19) so that the screw can be furthered away and brought closer to fit the same holes where the hook was (17) and at the tip of the hook, a hole for the third screw (20). When mounting the device, the holder (15) of the connector (B) is inserted into the square profiles (54) on the left and right head (6), figure (5). In the middle of the holder (15), the spiral spring (28) is fixed in a vertical position with the lower holder (56) with screws (65). At the tip of the spring the upper holder (16) is fixed, which is connected to the shaft (62) with the seat (38), which can move up and down on the shaft and be fixed in the right position depending on the angle of the front of the boat. The seat has four wheels (39) on which the boat rests, two arms (40) that are attached to the seat with screws (53). The arms (40) are spread out in the shape of the letter V, at the beginning they each have one joint (52), in the middle there is a joint (41) to be tuned according to the boat and they serve to steer the boat straight to the device (B). For connection (B), the float (1) can be mounted on the opposite side, on its box (71), especially when it comes to a low boat, and it is necessary to lower the connector (B) to level it with the hook (7), [Fig.5]. The connector device (B) is leveled by adjusting the float (1) so that the height of the rod (29) is level with the top of the hook (7), picture 9. In the central part of the seat (38) [Fig.6], in the cutout (42) a mechanism with a toothed rod (30) is installed, which moves back and forth through the cutout (42) On the front side, this rod is attached to another rod (29) in the form of the letter T, which is reinforced laterally with the rods (43) in the form of the letter V, and moves by sliding between the hands (40) and the limiter (59). On the back side of the cutout (42), on the shaft (60) a toothed safeguard (31) is fixed on the toothed rod (30) that limits its movement in one direction only, so that the boat moving towards the device, [Fig.9], with the hook (7) is connected to the rod (29)

picture 4, and pushes the triangular mechanism forward until the boat is completely fixed with the seat (38), picture 5. The tension spring (75) serves to keep the mechanism in a position ready for mooring which is fixed to the seat (38) and the end of the rod (30). The safeguard (31) keeps the boat tight on the seat. This safeguard on the upper side has a ring (32) to which the cable (33) is attached and serves to pull the safeguard from the toothed rod (30). At the beginning of the cut (42) a gear (44) is fixed with which we can manually move the mechanism and tighten the boat on the seat if necessary, [Fig.6]. The moored boat with the connector (B) during waves and winds sways in a controlled and limited manner.

[0006] Since the spring (28) is fixed up and down so as not to rotate, the spring keeps the rear of the boat in check by allowing minimal left and right movement and keeps the boat in a parallel position. For mooring a boat up to two tons, the suitable dimensions of the spring (28) are: height 40 cm, length 11 cm and thickness 12 mm.

Technical Problem

[0007] Older methods of mooring boats, mainly using buoys, anchors and ropes are most frequently used, which means that new research have not brought an effective solution. The essence is that every previous method of mooring boats has its shortcomings, and the result is a large number of damaged vessels at the docks. The most frequently used method of mooring boats is with buoys that serve to prevent the moored boat from coming into direct contact with the dock. Buoys often do not help under the influence of weather conditions such as winds, waves, and fluctuating water levels. Another commonly used method is to use the anchor on the opposite side, to keep the boat away from the dock, but it is not an adequate solution because occasionally the anchor loosens, which causes the boat to come into direct contact with the surface where it is moored. Also, old methods of mooring require a lot more time and effort as well as more human assistance. New research on mooring boats is most often based on suspending boats and keeping them away from the dock. The published U.S. Patent Application 4,250,827 describes a device that uses telescopes with springs to buffer forward-backward motion, this and all other models that use springs in a similar way do not give a good result because the spring has the certain strength, and the boat has uncertain strength when swinging, meaning that the spring cannot be adjusted since a strong spring is useless and a soft one will shrink to the end, transferring the impact and thus damaging the device and the boat. The published U.S. application, patent 5,361,716 shows a device having a spring fixed to the base on one side and fixed to the handle attached to the boat on the other side by bending the spring at an angle of 90 o or semicircular depending on the water level, which means that the spring must be so weak that we can bend it in a semicircle with one hand to tie it to the boat with the other, and the movement of the

middle boat under the influence of the wave can have as much as 20 times more force than that spring and will not be bothered by it while impacting the port. The published application US2938492A shows the device that uses the spring that is installed on the vessel, on the top of which the telescopic tube is fastened and attached to the dock. The device is not efficient because during waves and boat lowering the telescopic tube and spring touch the boat and damage it and it also is not esthetic when the spring is on a vessel, and it is not efficient to dismantle it every time. CN 112 942 252 A shows a ship berthing device comprising a bidirectional controlling mechanism used for continuously pulling a ship to the pier side when the ship is subjected to offshore wind and avoiding surface damage of the ship. The device is provided with two pairs of parallel hands, with the lower ends of the hands attached to a horizontally movable support in the pier, and the upper ends of hands attached to a horizontal positioning rod which is attached to the ship.

Solution of Problem

[0008] This invention solves a technical problem with a new device that is easily manufactured and practical for use. The essence of the invention is a new device for the mooring of boats to docks, whose connectors ensure the necessary height of the boat even when it is not moored, so that when the boat approaches the device it is automatically moored efficiently and safely. The device monitors and controls the movements of the moored boat during waves and winds, tides, ebbs, and when the water level falls and rises.

[0009] The device is designed to secure the boat at the same time with several mechanisms that activate based on the strength of the boat's movement and allow the boat to rock in a controlled manner under the influence of smaller waves and control the movement of the boat under the influence of medium and strong waves, making the device efficient.

[0010] When the weather conditions are good and there are no waves, this device with the connectors (A and B) always keep the boat moored in the same position, which means that less space is needed on the dock compared to other mooring methods.

[0011] During waves and storms, the device with connector (A) monitors and limits the movements of the boat with cables attached to the springs, while the connector (B) monitors and limits the movements of the boat with a spring in a flexible way, on which the boat is connected to the front part.

[0012] When it comes to stronger waves, the connector (A) also has a pressure spring that is activated to soften the strong movements, while the connector (B) has a spring that moves flexibly and attractively to absorb the movements.

[0013] The arms of the device are connected to the base of the shaft and equipped with shock absorbers so that they move up and down during the waves, tracking

and limiting the movements of the moored boat.

Brief description of draft images

[0014] [Fig.1] shows the side view of the device. [Fig.2] shows the frontal view of the boat moored to the device with the connector (A). [Fig.3] shows in detail the connector (A) in the cross-section, outside of the device and connected to the device. [Fig.4] shows the first stage of connecting the boat to the connector (B). [Fig.5] shows the boat fully connected to the connector (B). [Fig.6] shows the side and front view, detailing the connector (B). [Fig.7] shows a top view of the boat moored to the device with the connector (A). [Fig.8] shows the device from above with the connector (B). [Fig.9] shows the tuning of the device with the connector (B) and the boat. [Fig.10] shows the front view of the device with the connector (B). Fig 11 shows the hook (5) in the position when it is not in use. [Fig.12] shows the boat moored to the device with the connector (A) when the water level lowers and rises. [Fig.13] shows the boat and the device with the connector (A) during tuning and when we manually test the anchor for the first time. [Fig.14] shows the hook (5) in detail. [Fig.15] shows the hook (7) in detail.

Claims

1. A device for mooring boats comprising a connector (A; B) and further comprising

two first hands (4) connected to a bridge (9) and on one side being connected horizontally to two legs (3) on first lower shafts (63), and two second hands (4) connected to the legs (3) on first upper shafts (64), wherein each of the first hands (4) on the other side are vertically connected to a respective one of the second hands (4) by a head (6) via second lower shafts (57) and second upper shafts (58), the second lower shafts (57) and second upper shafts (58) having the same distance in between as the first lower shafts and first upper shafts; wherein the heads (6) have

on upper and lower sides square profiles (54) for mounting the connectors (A; B), screws (51) for fixing, a float (1) at a frontal side of the head (6) with a telescopic holder (70), which passes through its housing (71), fixed on the head (6) with screws (68), wherein the device further comprises two springs (12) connected to the legs (3) and the first hands (4) and two shock absorbers (10) connected to the legs (3) and the second hands (4).

2. The device according to claim 1, wherein the connector (A) comprises a screw (26) passing through a cover (69) on a back side of a first square housing (27) and being screwed into a nut (65) which is fixed at the beginning of a tension spring (23), wherein the tension spring, on the other side is connected with a square connector (45) having a cable (22) which passes through a compression spring (24), through a front cover (74) and through a wheel (25), exits the first housing (27) with a length equal to the distance between the two profiles (54) and is connected to a second housing (27) which has the same mechanism as the first one.
3. The device according to claim 1, wherein the connector (B) comprises a coil spring (28) being fixed on a lower side to a holder (15), and on an upper side to a support (16), the support (16) having a shaft (62) on an upper side, where a seat (38) is connected so that it can move up and down and be fixed in the right position with screws, wherein the seat (38) has four wheels (39) at respective ends, in the middle there is a cut (42) through which a toothed rod (30) passes, wherein, on a front part of the toothed rod (30), another rod (29) is attached forming the shape of the letter T, which is reinforced laterally with further rods (43) forming a triangle with an end of the toothed rod (30), wherein, at a rear end of the cut (42), there is a toothed safeguard (31) that allows movement of the toothed rod (30) only in one direction, and, at a front end of the cut (42), there is a gear (44); wherein the connector (B) further comprises two hands (40) which are fixed with screws (53) laterally on the seat (38) in the shape of the letter V, the two hands (40) have on an upper side a limiter (59), at the beginning they each have a joint (52) and in the middle the hands (40) each extend with a joint (41).
4. The device according to claim 1 to 3, further comprising hooks (5), each hook comprising a stainless steel plate having a triangular shape, sharp at the beginning and a bow shaped open hook (67) in a widened lower part, wherein in the middle there is an internal cut and a mechanism with a safeguard (46) being fixed on a shaft (50), wherein the mechanism comprises a spring (47) to hold the safeguard (46) in a closed position and a lever (49) to release the safeguard (46) and wherein the hook (5) further comprises, on an upper side, two holders (8) connected by toothed hinges (21).
5. The device according to claims 1 to 3, further comprising a hook (7), the hook comprising a stainless steel plate in the shape of a triangle with a sharp beginning and an extended end in the form of a bow with a closed hook (13) and, before the extended end on a lower side, an open hook (67), an internal cutout in the middle and a mechanism with a safeguard (46)

fixed on a shaft (50), wherein the mechanism comprises a spring (47) to hold the safeguard (46) in a closed position and a cable (48) to release the safeguard (46), wherein the hook (7) further comprises, on an upper side, a first hole for a screw (18), a second hole for a further screw (20) and a cutout for a tuning screw (19).

10 Patentansprüche

1. Vorrichtung zum Festmachen von Booten, die einen Verbinder (A; B) aufweist und ferner zwei erste Arme (4), die mit einer Brücke (9) verbunden sind und auf einer Seite horizontal mit zwei Schenkeln (3) auf ersten unteren Achsen (63) verbunden sind, und zwei zweite Arme (4), die mit den Schenkeln (3) auf ersten oberen Achsen (64) verbunden sind, aufweist, wobei jeder der ersten Arme (4) auf der anderen Seite vertikal mit einem entsprechenden der zweiten Arme (4) durch einen Kopf (6) über zweite untere Achsen (57) und zweite obere Achsen (58) verbunden sind, wobei die zweiten unteren Achsen (57) und zweiten oberen Achsen (58) dazwischen den gleichen Abstand haben wie die ersten unteren Achsen und ersten oberen Achsen; wobei

die Köpfe (6) aufweisen:

an oberen und unteren Seiten quadratische Profile (54) zum Anbringen der Verbinder (A; B),

Schrauben (51) zum Befestigen, einen Schwimmer (1) an einer Vorderseite des Kopfes (6) mit einem teleskopischen Halter (70), der durch sein Gehäuse (71) hindurchgeht, das am Kopf (6) mit Schrauben (68) befestigt ist, wobei die Vorrichtung ferner

zwei Federn (12), die mit den Schenkeln (3) und den ersten Armen (4) verbunden sind, und zwei Dämpfer (10), die mit den Schenkeln (3) und den zweiten Armen (4) verbunden sind, aufweist.

2. Vorrichtung nach Anspruch 1, wobei der Verbinder (A) eine Schraube (26) aufweist, die durch eine Abdeckung (69) auf einer Rückseite eines ersten quadratischen Gehäuses (27) hindurchgeht und in eine Mutter (65) eingeschraubt ist, die am Anfang einer Zugfeder (23) befestigt ist, wobei die Zugfeder auf der anderen Seite mit einem quadratischen Verbinder (45) verbunden ist, der ein Kabel (22) aufweist, das durch eine Druckfeder (24), durch eine Frontabdeckung (74) und durch ein Rad (25) hindurchgeht, das erste Gehäuse (27) mit einer Länge verlässt, die gleich dem Abstand zwischen den beiden Profilen (54) ist, und mit einem zweiten Gehäuse

(27) verbunden ist, das den gleichen Mechanismus wie das erste aufweist.

3. Vorrichtung nach Anspruch 1, wobei der Verbinder (B) eine Spiralfeder (28) aufweist, die an einer unteren Seite an einem Halter (15) und an einer oberen Seite an einer Stütze (16) befestigt ist, wobei die Stütze (16) an einer oberen Seite eine Achse (62) aufweist, mit der ein Sitz (38) verbunden ist, so dass er sich auf und ab bewegen und in der richtigen Position mit Schrauben befestigt werden kann, wobei der Sitz (38) an den jeweiligen Enden vier Räder (39) aufweist, in der Mitte ein Einschnitt (42) vorhanden ist, durch den eine Zahnstange (30) verläuft, wobei an einem vorderen Teil der Zahnstange (30) eine weitere Stange (29) angebracht ist, die die Form des Buchstabens T bildet und lateral mit weiteren Stangen (43) verstärkt ist, die mit einem Ende der Zahnstange (30) ein Dreieck bilden, wobei sich an einem hinteren Ende des Einschnitts (42) eine Zahn-
sicherung (31) befindet, die eine Bewegung der Zahnstange (30) nur in eine Richtung zulässt, und sich an einem vorderen Ende des Einschnitts (42) ein Zahnrad (44) befindet; wobei der Verbinder (B) ferner zwei Arme (40) aufweist, die mit Schrauben (53) lateral am Sitz (38) in der Form des Buchstabens V befestigt sind, wobei die beiden Arme (40) an einer Oberseite einen Begrenzer (59) aufweisen, am Anfang jeweils ein Gelenk (52) aufweisen und sich in der Mitte die Arme (40) jeweils mit einem Gelenk (41) erstrecken.
4. Vorrichtung nach Anspruch 1 bis 3, die ferner Haken (5) aufweist, wobei jeder Haken eine Edelstahlplatte mit einer dreieckigen Form aufweist, die am Anfang spitz zuläuft und in einem verbreiterten unteren Teil einen bogenförmigen offenen Haken (67) aufweist, wobei in der Mitte ein innerer Einschnitt vorhanden ist und ein Mechanismus mit einer Sicherung (46) an einer Achse (50) befestigt ist, wobei der Mechanismus eine Feder (47) zum Halten der Sicherung (46) in einer geschlossenen Position und einen Hebel (49) zum Lösen der Sicherung (46) aufweist und wobei der Haken (5) ferner an einer Oberseite zwei Halter (8) aufweist, die durch gezahnte Scharniere (21) verbunden sind.
5. Vorrichtung nach den Ansprüchen 1 bis 3, die ferner einen Haken (7) aufweist, wobei der Haken eine Edelstahlplatte in Form eines Dreiecks mit einem spitzen Anfang und einem verlängerten Ende in Form eines Bogens mit einem geschlossenen Haken (13) und vor dem verlängerten Ende an einer unteren Seite einen offenen Haken (67), einen inneren Ausschnitt in der Mitte und einen Mechanismus mit einer Sicherung (46) aufweist, der an einer Welle (50) befestigt ist, wobei der Mechanismus eine Feder (47) zum Halten der Sicherung (46) in einer

geschlossenen Position und ein Kabel (48) zum Lösen der Sicherung (46) aufweist, wobei der Haken (7) ferner auf einer Oberseite ein erstes Loch für eine Schraube (18), ein zweites Loch für eine weitere Schraube (20) und einen Ausschnitt für eine Abstimmerschraube (19) aufweist.

Revendications

1. Dispositif d'amarrage de bateaux comprenant un connecteur (A ; B) et comprenant en outre

deux premiers bras (4) raccordés à un pont (9) et raccordés horizontalement d'un côté à deux jambages (3) sur des premiers axes inférieurs (63), et

deux deuxièmes bras (4) raccordés aux jambages (3) sur des premiers axes supérieurs (64), chacun des premiers bras (4) étant raccordé verticalement de l'autre côté par une tête (6) à un deuxième bras (4) respectif au moyen de deuxièmes axes inférieurs (57) et de deuxièmes axes supérieurs (58), les deuxièmes axes inférieurs (57) et les deuxièmes axes supérieurs (58) ayant la même distance entre eux que les premiers axes inférieurs et les premiers axes supérieurs ; où les têtes (6) ont

en haut et en bas, des profilés carrés (54) pour le montage des connecteurs (A ; B), des vis (51) pour la fixation, un flotteur (1) sur un côté frontal de la tête (6), avec un support télescopique (70) passant dans son boîtier (71), fixé sur la tête (6) au moyen de vis (68), ledit dispositif comprenant en outre

deux ressorts (12) raccordés aux jambages (3) et aux premiers bras (4) et deux amortisseurs (10) raccordés aux jambages (3) et aux deuxièmes bras (4).

2. Dispositif selon la revendication 1, où le connecteur (A) comprend une vis (26) traversant un couvercle (69) sur un côté arrière d'un premier boîtier carré (27) et serrée dans un écrou (65) fixé au commencement d'un ressort de traction (23), ledit ressort de traction, étant raccordé sur l'autre côté à un connecteur carré (45) comportant un câble (22) passant dans un ressort de compression (24) en traversant un couvercle avant (74) et une roulette (25), sortant du premier boîtier (27) d'une longueur égale à la distance entre les deux profilés (54) et raccordé à un deuxième boîtier (27) pourvu du même mécanisme que le premier.

3. Dispositif selon la revendication 1, où le connecteur (B) comprend un ressort hélicoïdal (28) fixé sur le bas à un appui (15), et sur le haut à un support (16), ledit support (16) ayant un axe (62) sur le haut, où une assise (38) est raccordée de manière à pouvoir se déplacer vers le haut et vers le bas et être fixée dans la bonne position par des vis, où l'assise (38) a quatre roulettes (39) à ses extrémités respectives, une découpe (42) étant ménagée au centre, dans laquelle passe une crémaillère (30), où, sur une partie avant de la crémaillère (30), une autre tige (29) est fixée de manière à former la lettre T, renforcée latéralement par d'autres tiges (43) formant un triangle avec une extrémité de la crémaillère (30), où, à une extrémité arrière de la découpe (42), est présentée une sécurité dentée (31) permettant un mouvement de la crémaillère (30) dans une seule direction, et, à une extrémité avant de la découpe (42), est présenté un pignon (44) ; où le connecteur (B) comprend en outre deux bras (40) fixés latéralement sur l'assise (38) en forme de la lettre V au moyen de vis (53), les deux bras (40) comportant sur leur face supérieure un limiteur (59), et à leur commencement une articulation (52) chacun, lesdits bras (40) s'étendant au milieu avec une articulation (41) chacun.
4. Dispositif selon les revendications 1 à 3, comprenant en outre des crochets (5), chaque crochet comprenant une plaque en acier inoxydable de forme triangulaire, pointue au commencement et un crochet ouvert en forme d'arc (67) dans une partie inférieure élargie, une découpe intérieure étant présentée au milieu et un mécanisme avec une sécurité (46) étant fixé sur un axe (50), où le mécanisme comprend un ressort (47) pour maintenir la sécurité (46) en position fermée et un levier (49) pour libérer la sécurité (46) et où le crochet (5) comprend en outre, sur le haut, deux supports (8) raccordés par des charnières dentées (21).
5. Dispositif selon les revendications 1 à 3, comprenant en outre un crochet (7), le crochet comprenant une plaque en acier inoxydable de forme triangulaire, pointue au commencement, et une extrémité prolongée en forme d'arc avec un crochet fermé (13) et, sur le bas, avant l'extrémité prolongée, un crochet ouvert (67), une découpe intérieure au milieu et un mécanisme avec une sécurité (46) fixé sur un axe (50), où le mécanisme comprend un ressort (47) pour maintenir la sécurité (46) en position fermée et un câble (48) pour libérer la sécurité (46), et où le crochet (7) comprend en outre, sur le haut, un premier trou pour une vis (18), un deuxième trou pour une autre vis (20) et une découpe pour une vis de réglage (19).

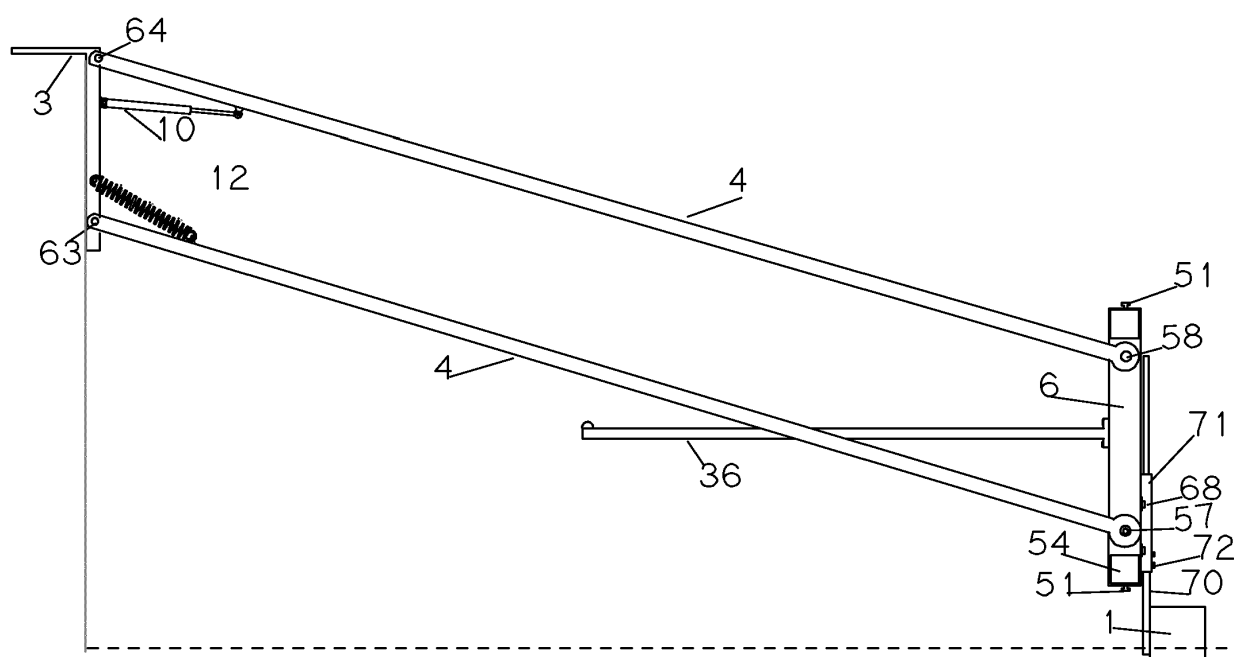


Fig. 1

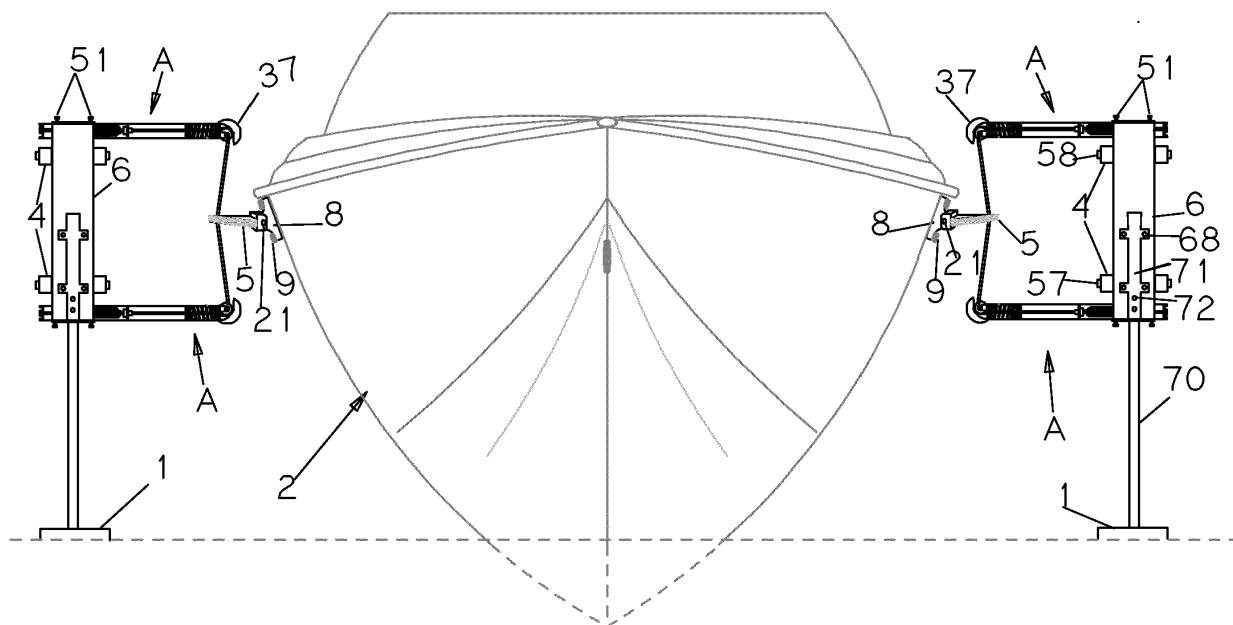
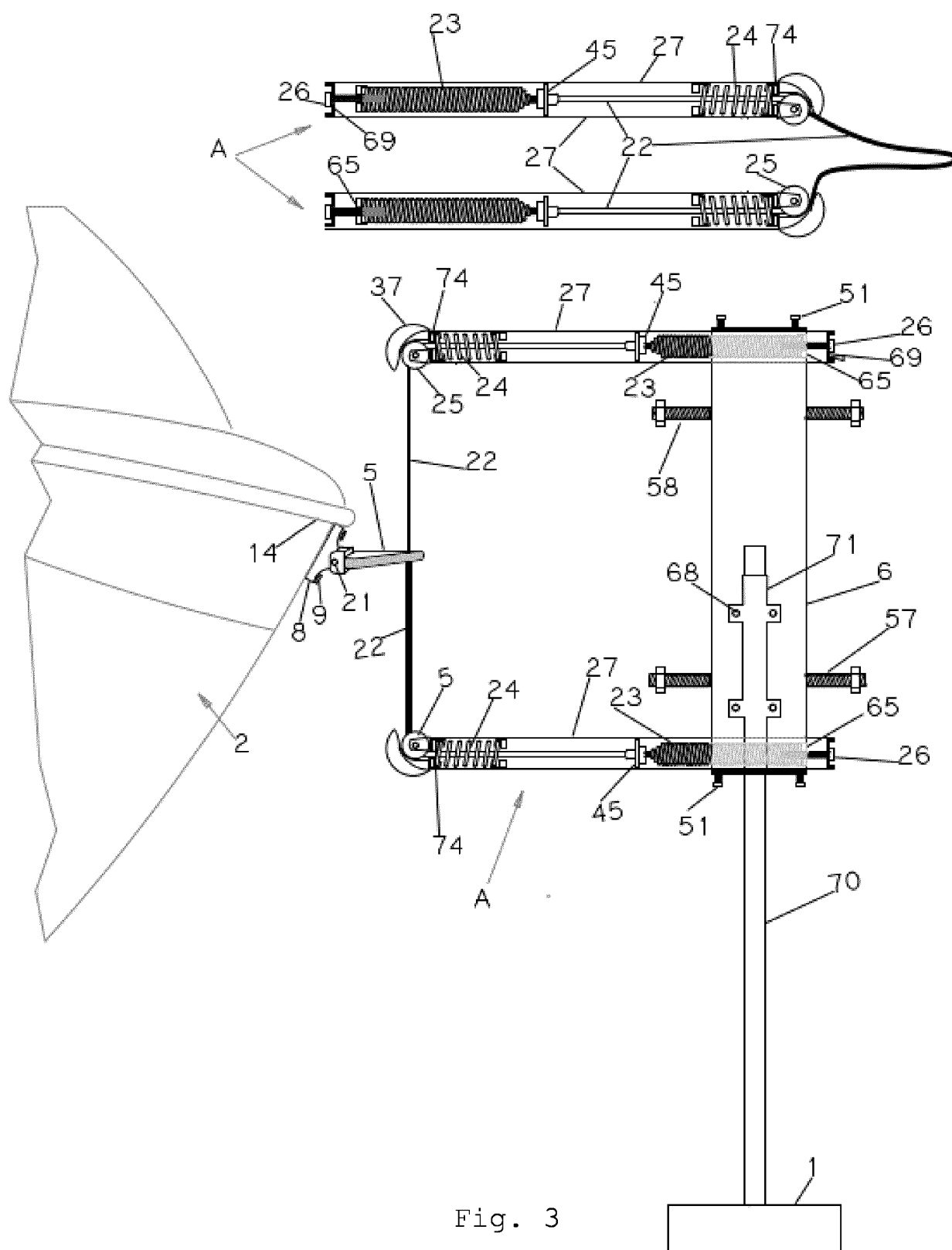


Fig. 2



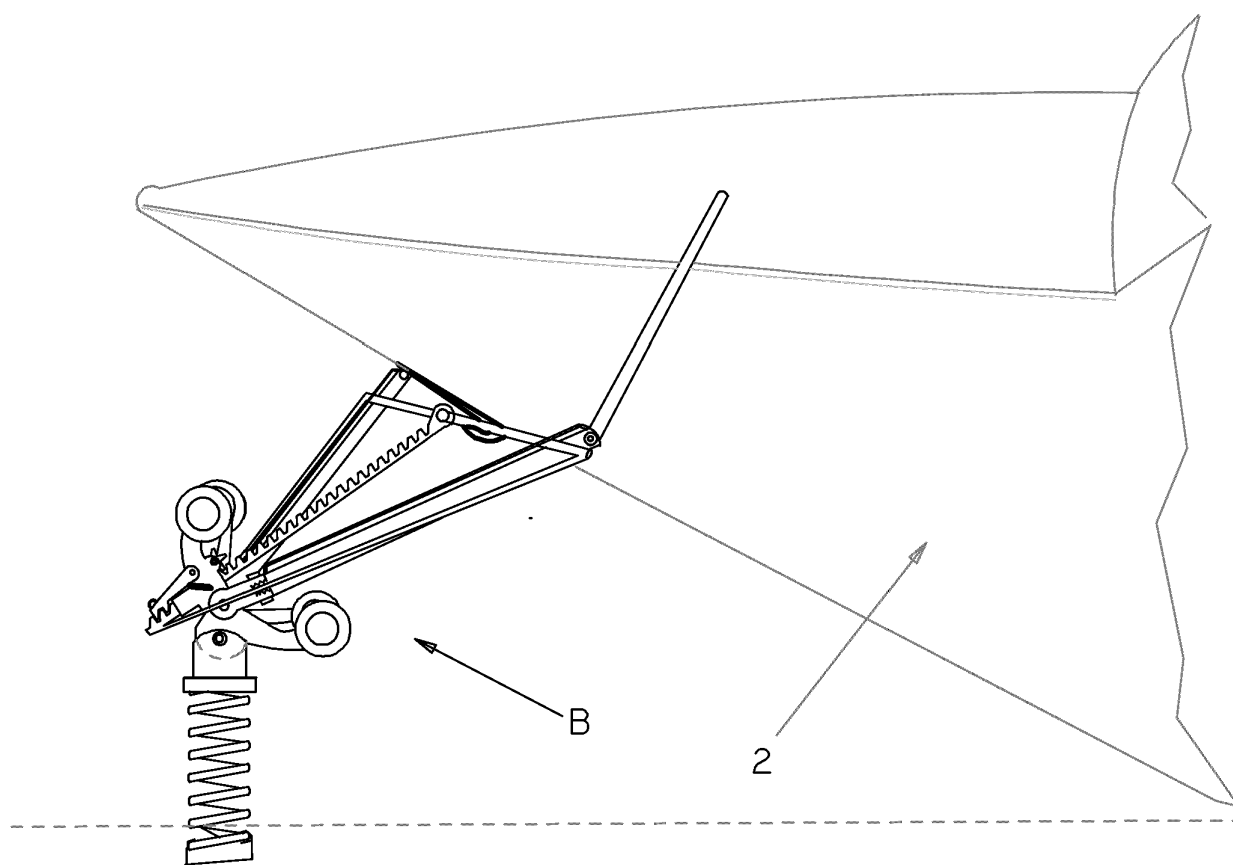


Fig. 4

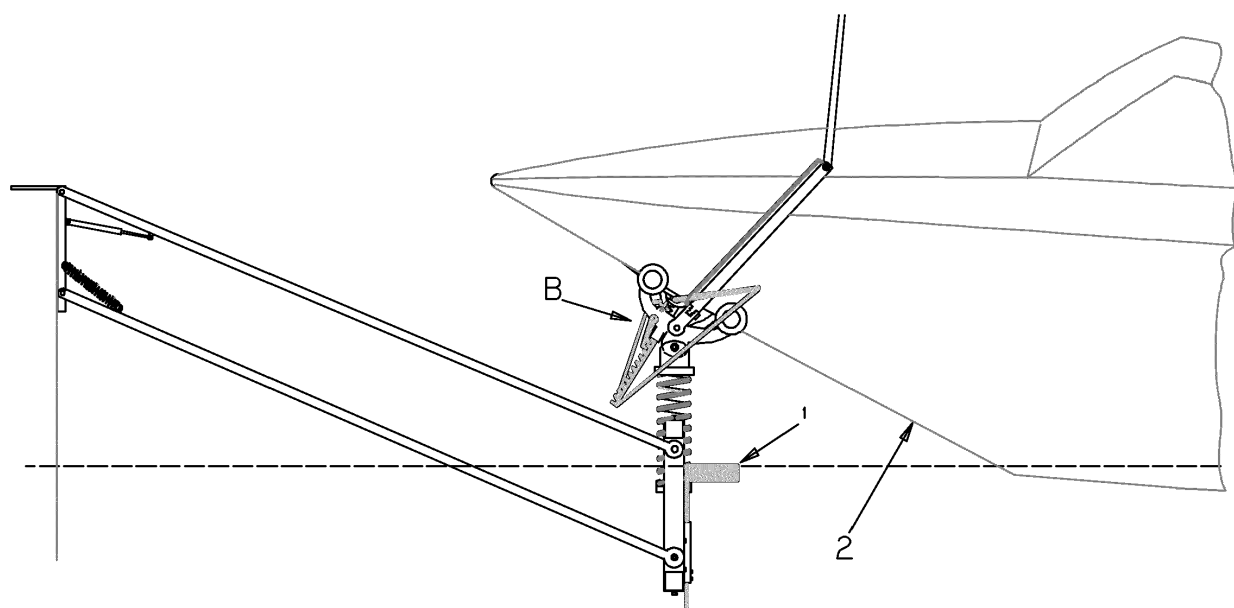


Fig. 5

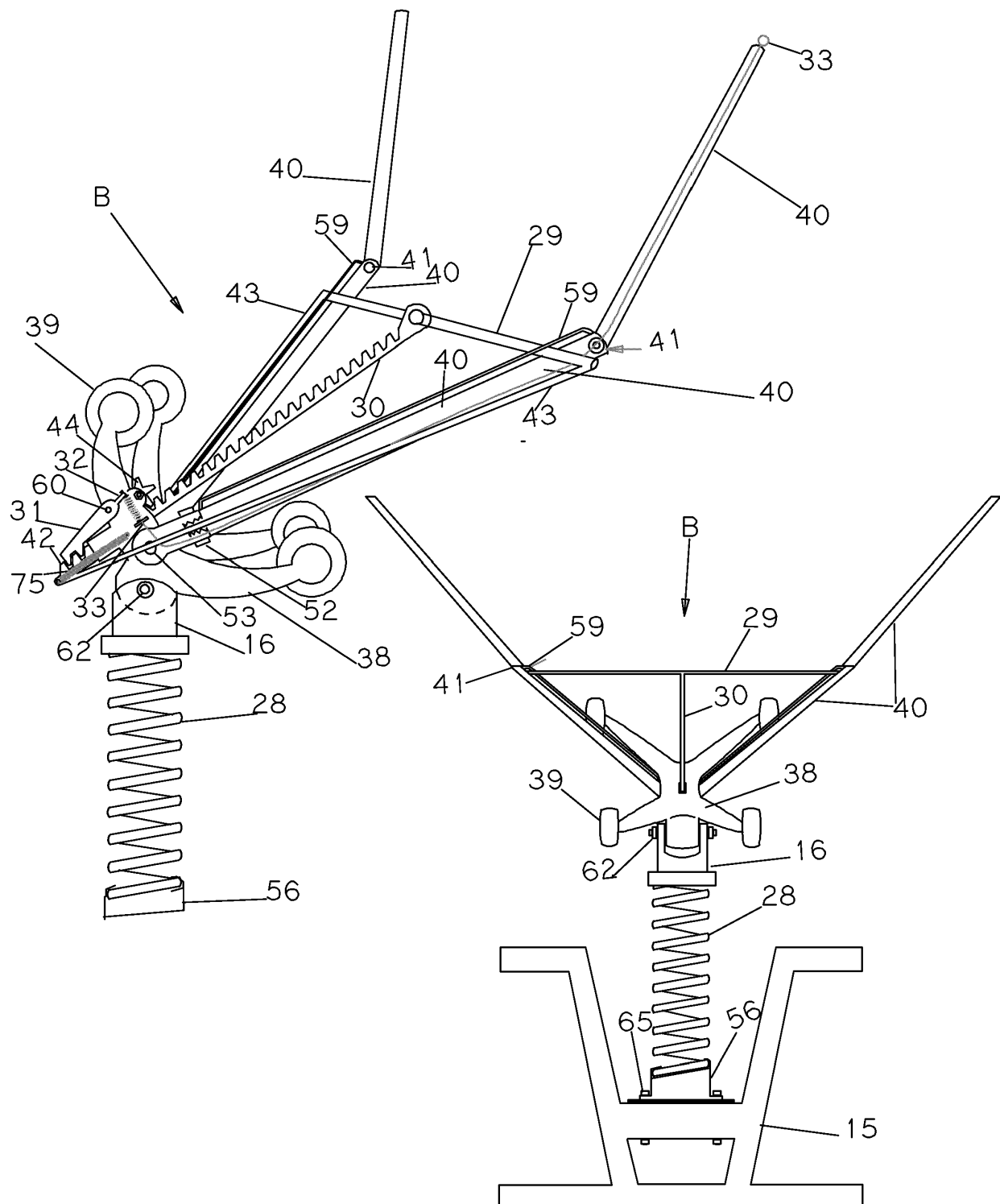


Fig. 6

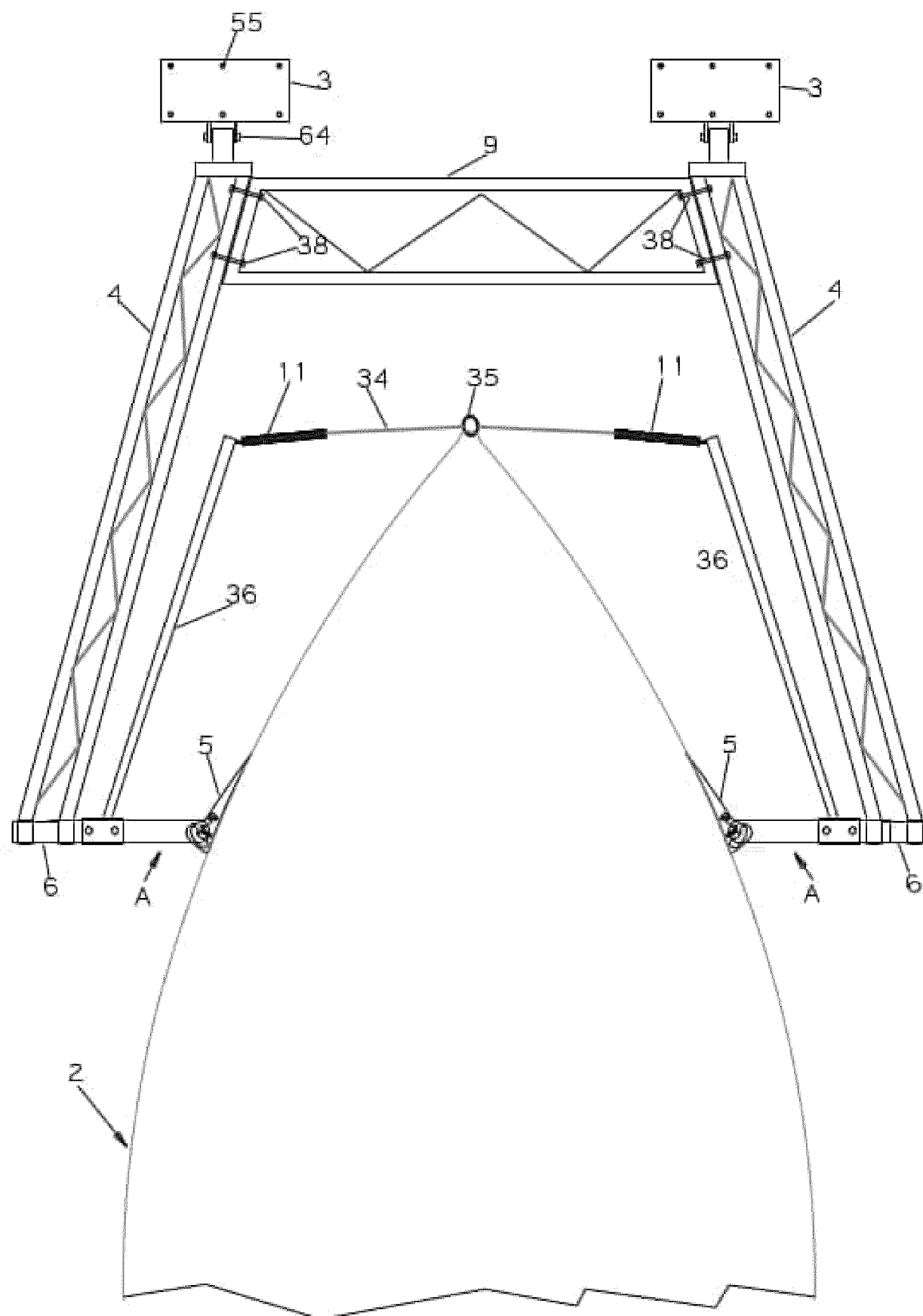


Fig. 7

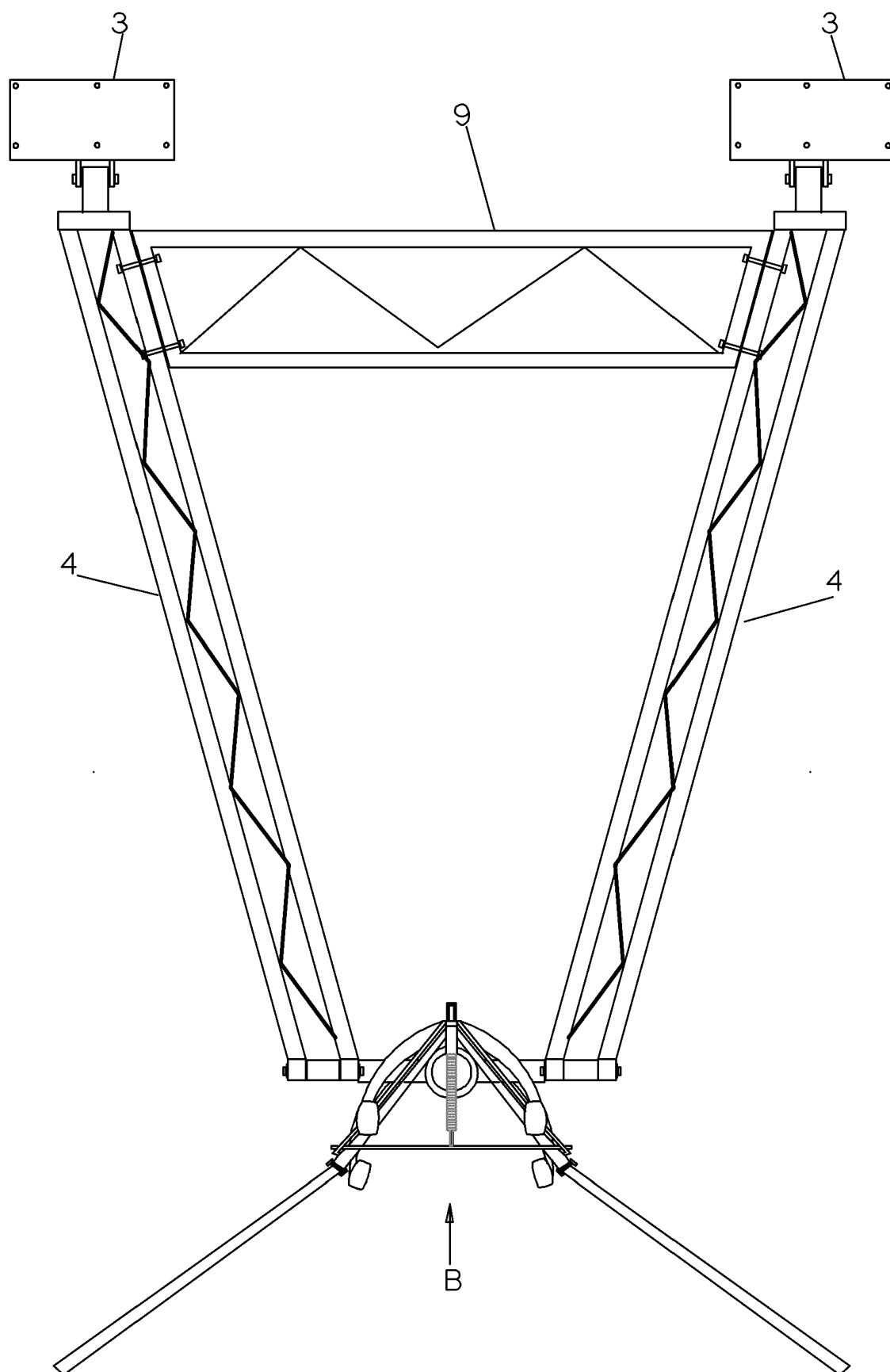


Fig. 8

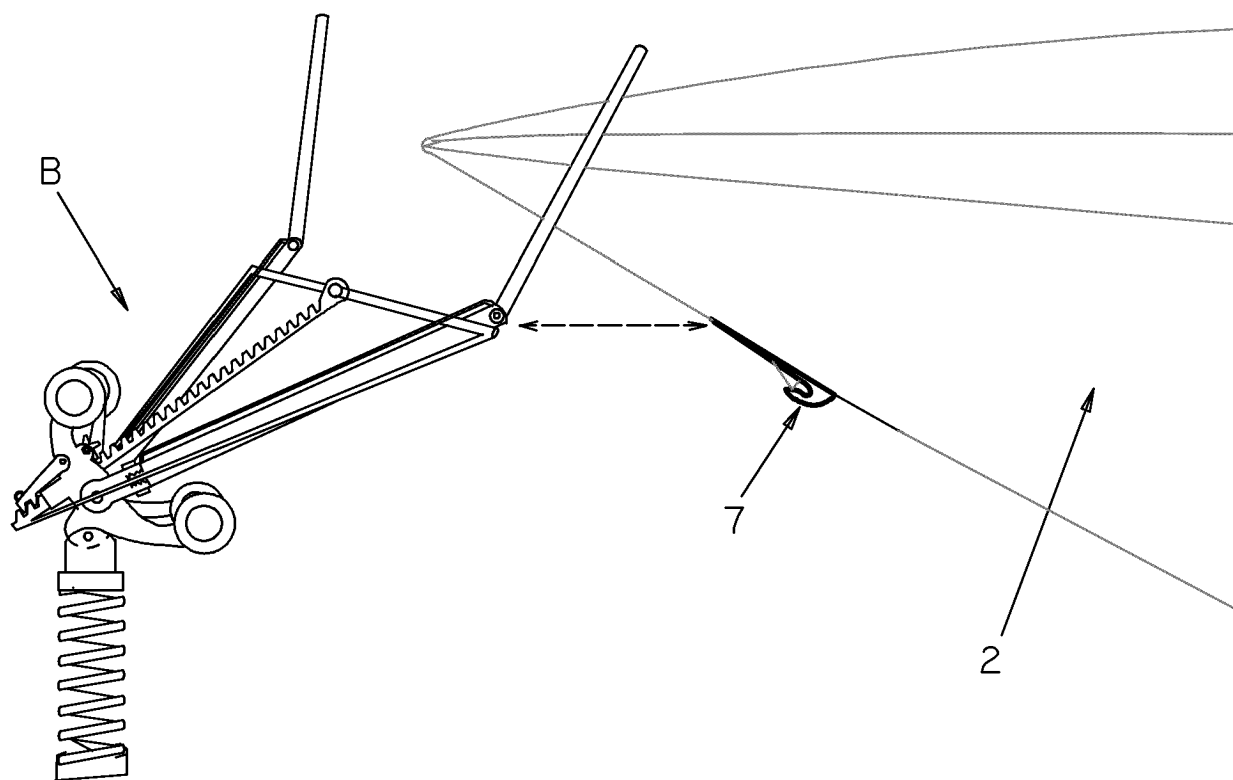


Fig. 9

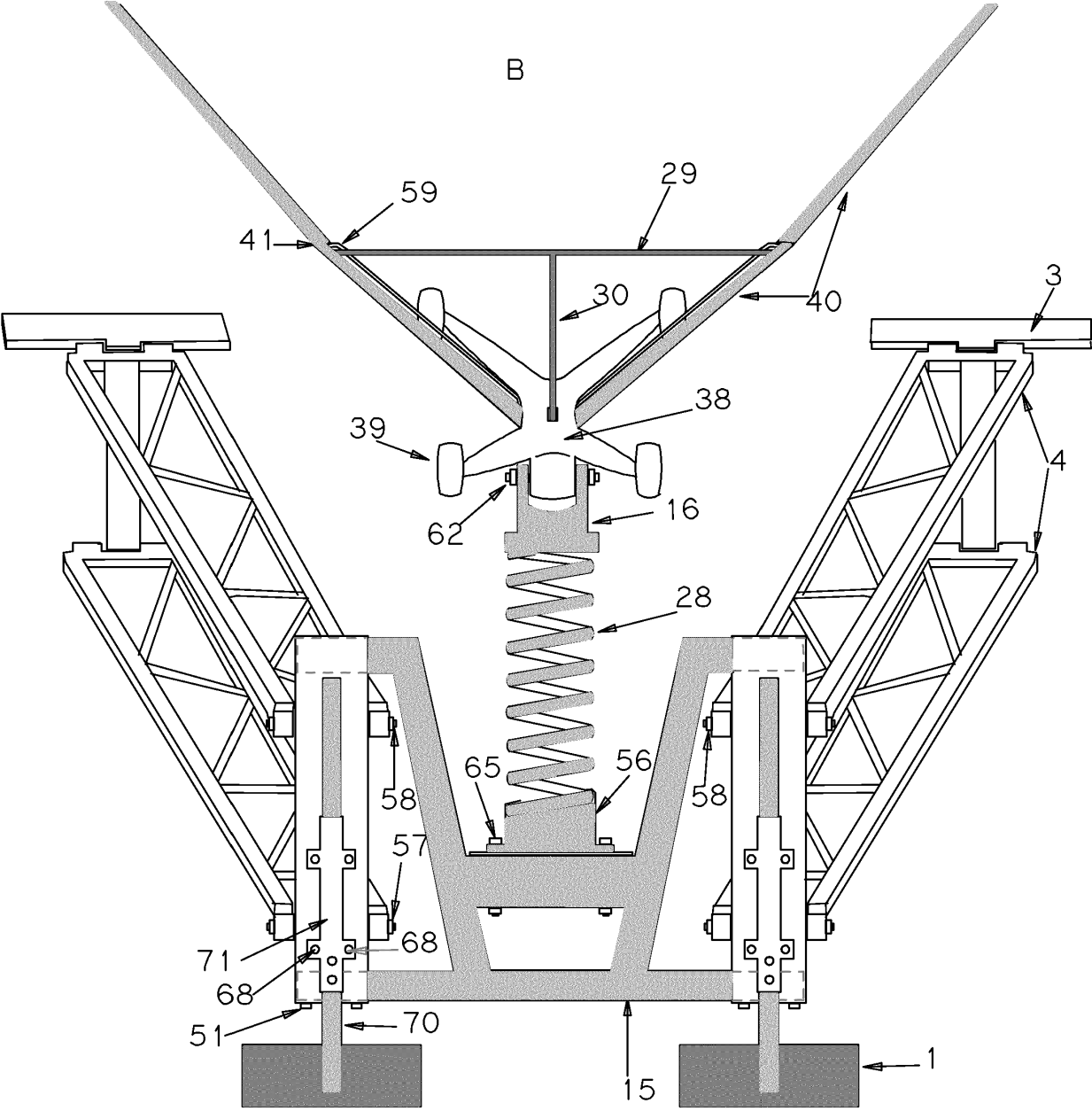


Fig. 10

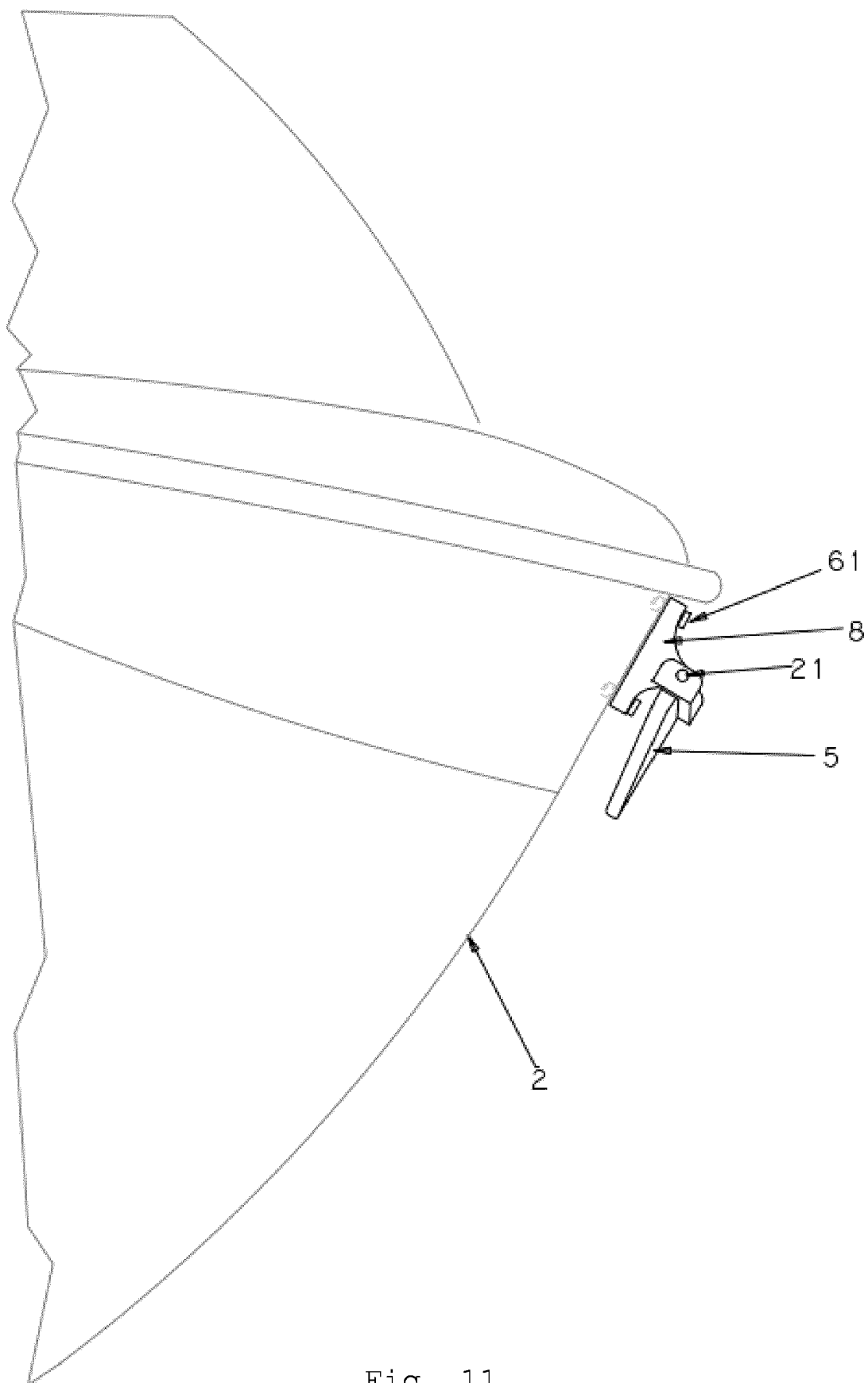


Fig. 11

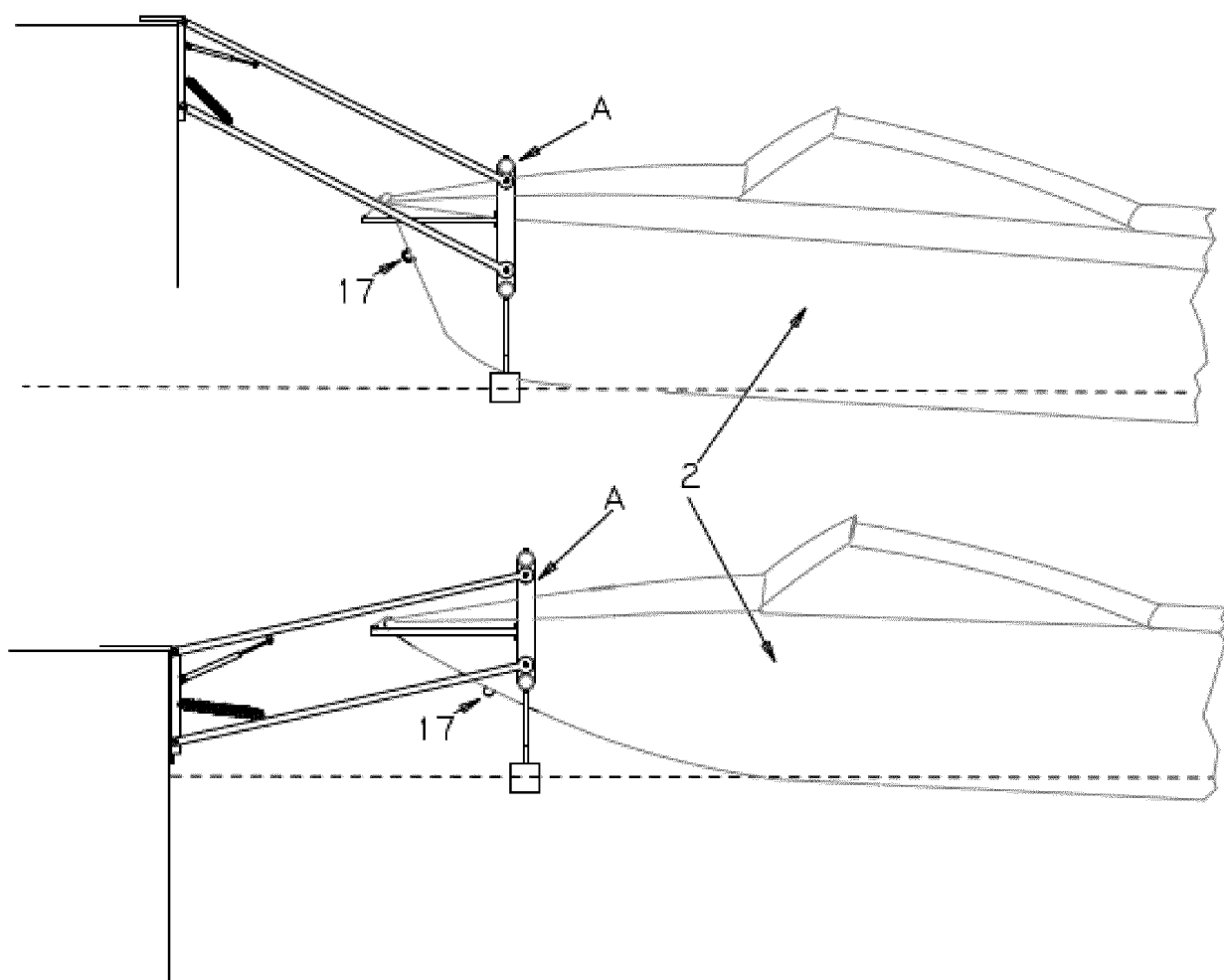


Fig. 12

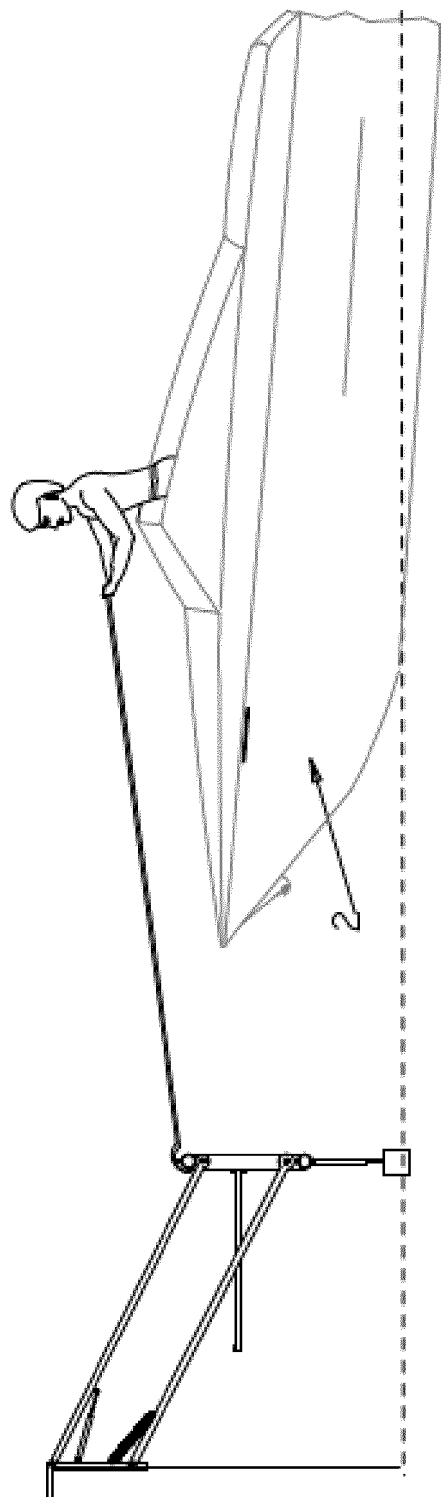


Fig. 13

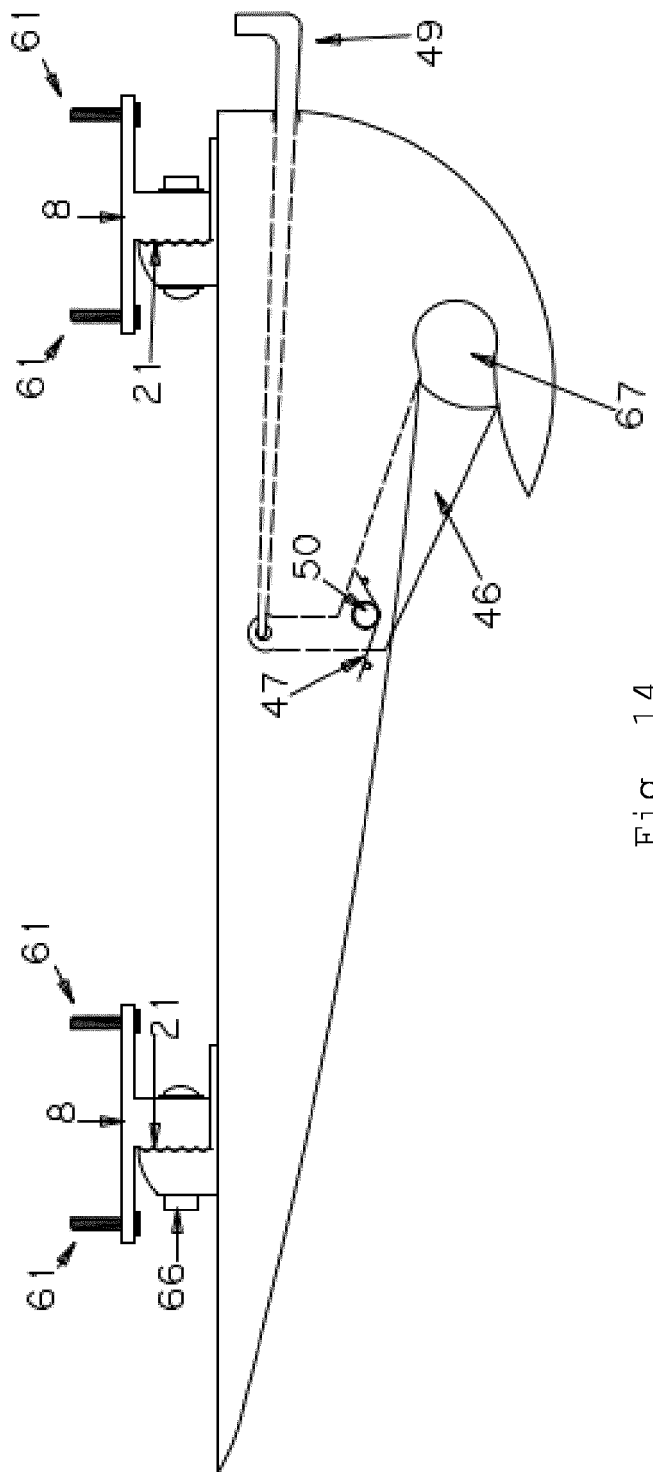


Fig. 14

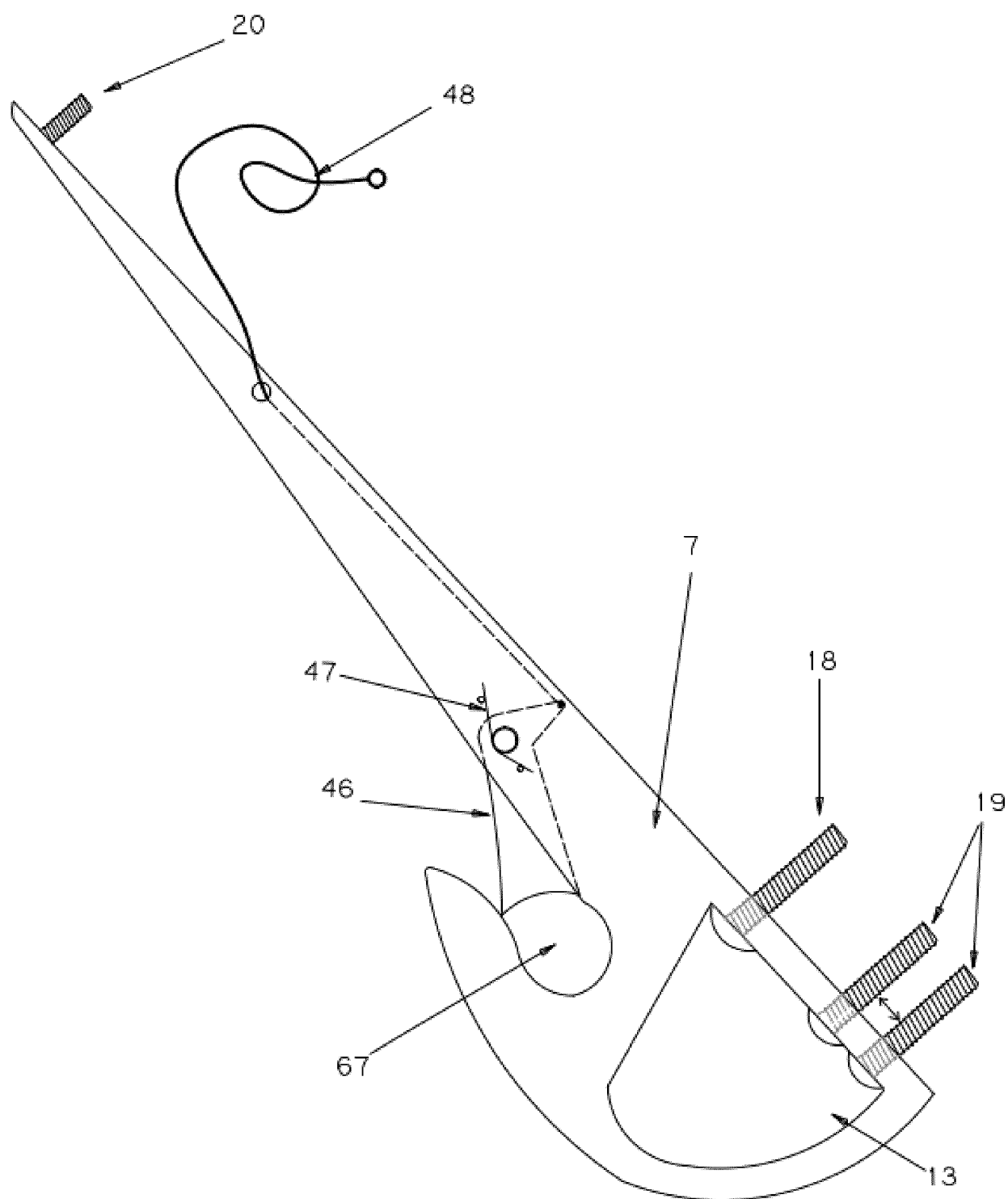


Fig. 15

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4250827 A [0007]
- US 5361716 A [0007]
- US 2938492 A [0007]
- CN 112942252 A [0007]