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54 **A davit device.**

57 A davit device for pivoting an accommodation ladder (13) from a stowing position on a ship's deck (16) to a position outside the ship's side by means of a wire (14), which is connected to the ladder by at least a pulley (19) firmly mounted above the davit (11). The object is to provide a davit device which without any external facilities can be automatically brought to pivot past the dead centre at a pivoting of half a revolution, as well as at the lowering and the raising of the ladder. This has been solved by the fact that at the davit (11) there is attached at least one mechanism (15, 37) which is arranged to be switched over at the pivoting of the davit device (11, 13) substantially between its end position, so that, when the wire (14) is in its most retracted position and the davit device (11, 13) is in its raised position, the centre of gravity (36) of the davit device has passed the dead centre level, i.e. a vertical line (35) through the pivot axle (12), independent of whether the davit (11) is rotated towards or from stowing position.

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A DAVIT DEVICE

The present invention relates to a device for pivoting an accommodation ladder from a stowing position on a ship's deck to a position outside the ship's side by means of at least a wire or the like, which is connected to the ladder by at least a pulley firmly mounted above the davit.

Background of the invention

When pivoting an accommodation ladder from a stowing position on the ship's deck to a position outside the ship's side, for example 180^0 degrees, the ladder must pass the dead centre level of the davit, i.e. a vertical line through the pivot axle of the davit device, in order to be lowered. When pulling the ladder on board, the same procedure must be done in the reverse way. The operation of the accommodation ladder is performed by means of a wire, which is laid over a pulley suspended in a block at some distance above the davit. In order to pass the dead centre the pulley at the block is in a previously known construction moveably mounted in guides and displaceable by means of a suitable driving device, for example a pneumatic linear motor, through which the point of suspension of the accommodation ladder can be displaced.

According to another previously known construction the pulley at the block is mounted in one arm of two-armed link, which is pivotable between two end position, at which the pivoting is provided by a pulling force caused by the weight of the ladder. This construction operates per se perfectly, but implies that there is enough space for the displaceable two-armed link, which is not always the case if the available height is limited by e.g. an upper work. It is further a desire to concentrate the whole mechanism to the davit of the accommodation ladder, which in that way can be trimmed in the workshop, while the previously known device is divided on at least two different places, which means that it must be

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trimmed in situ.

The object and most important features of the invention

The object of the present invention is to provide a davit device which without any external facilities can be automatically brought to pivot past the dead centre at a pivoting of 180^0 degrees, as well as at the lowering and the raising of the ladder. Another object of the invention is to provide a simple and reliable and at the same time cheap construction, which consists of a few moveable parts. These objects have been solved by the fact that at the davit there is attached at least one mechanism which is arranged to be switched over at the pivoting of the davit device substantially between its end position, so that, when the wire is in its most retracted position and the davit device is in its raised position, the centre of gravity of the davit device has passed the dead centre level, i.e. a vertical line through the pivot axel, independent of whether the davit is rotated towards or from stowing position.

Description of the drawings

Fig. 1 shows a side view of a davit device according to the invention in inwards pivoted stowing position, shown with continuous lines and in partly outwards pivoted position, shown with dash dotted lines,

Fig. 2 is an analogous view with fig. 1 and with the davit device in outwards pivoted position (continuous lines) and during the inwards pivoting to stowing position (dash dotted lines),

Fig. 3 shows the davit device with adherent block in a view from above,

Fig. 4 to 7 show side views of a modified embodiment of the davit device according to the invention in different pivoting positions,

Fig. 8 and 9 show side views of a further embodiment.

Description of embodiments

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The davit device according to the invention consists of one or several davit arms 11, one end of which is pivotably mounted about an axle 12, and an accommodation ladder 13 supported by the davit arms, which during out- and inwards rotation by means of a wire system 14 is held in close contact against the davit arm 11. At the free end of the davit arm 11 remote from the pivot axle 12, a wire guiding device 15 is rotatably mounted, alternatively if double wires are used, as in the case shown in the embodiment, a wire guiding device 15 according to fig. 3 is arranged on each side of the davit arm.

At the side of the davit arm 11 on the ship's deck there is fixed a block 17, the block head of which is located above the stowing place of the accommodation ladder and which supports a undisplaceably mounted pulley 19. In stead of the block 17 the pulley 19 can be mounted at an arbitrary constructive element, which is available for the purpose. At the block 17 there is arranged a wsinsch 22 for the wires 14a and 14b and which is provided with double cable drums 21.

The wire guiding device of the davit arm consists of a two-armed link 23, the first link arm 24 of which is provided with a first pulley 25 and which at the rotation axle 26 between the arms 24, 28 is provided with a second pulley 27. At the free end of the other link arm 28 there is arranged a sleeve 29 extending over the davit arm, and which on the side the davit arm is connected with another similar wire guiding device 15.

In the position shown in fig. 1 with continuous lines the sleeve 29 is connected with a locking means 30, comprising a connecting member rotatable about a shaft pivot 31, e.g. a hook 32, which is provided with a counterweight 33, the object of which is to hold the hook in engagement with the sleeve as long as the davit and by that also the accommodation ladder 13 have passed the dead centre level 35 of the davit arm.

The davit device operates in the following way. By pivoting

the accommodation ladder from the stowing position, shown in fig. 1 with continuous lines, the wires 14 are hoisted home, at which the davit arms 11 with the accommodation ladder will pivot about the axle 12. In this position the wire guiding device 15 is locked to the davit by means of the locking means 30, so that the first arm 24 of the two-armed link 23 takes an outward pivoted position, in which the first pulley 25 is located outside the davit arm. When the wire 14 has been hoisted home as much as possible, the davit arm with the accommodation ladder 13 connected thereto has passed the dead centre level 35, which means that the centre of gravity 36 of the accommodation ladder has passed a vertical line through the pivot axle 12 of the davit arm, so that when slackening the wire 14 the davit arm 11 completes its 180° degrees pivoting movement, so that the arm will be located outside the ship's side, as is shown in fig. 2. After that the davit arm 11 has passed the dead centre position the counterweight 33 at the hook 32 will make a limited rotating movement counter-clockwise about the shaft pivot 31, at which the wire guiding member 15 is released, so that it can rotate about the axle 26 a continued lowering of the davit arm to outwards rotated position. The wire 14 will during this rotating movement leave the first pulley 25, which then becomes inactive, while the pulley 26 takes over the function as the last pulley towards the fixed pulley 19.

By rotating the davit arm inwards from lowered position, as is shown in fig. 2 with dash dotted lines, the davit arm will be rotated inwards as much as permitted by the wire 14, in a position in which the centre of gravity 36 of the accommodation ladder has reached the other side of the dead centre level 35, at which the davit arm by slackening of the wire is rotated downwards in the direction towards the deck. In the end of the rotation phase the sleeve 29 at the other arm 28 of the link 23 will be brought to close contact with a fixed guiding surface 34, which forces the link 23 to rotate back to its initial position, in which the wire guiding device is reblocked by the locking means 30.

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The rotation of the davit device past the dead centre level 35 can also be supported by means of a pressure member 37 either in combination with the wire guiding member 15 shown in figs. 1-3 or just by means of the pressure member as is shown in the figs. 4-7. The pressure member 37 comprises an arm 39 actuated by a pressure spring 38 which in one end cooperates with the davit 11, while its other end is displaceably mounted in a bracket 41 which is rotatable about a shaft pivot. Between the bracket and an attachment 42 fixedly arranged on the arm 29 said pressure spring 38 is fixed, which thus presses the arm against the davit 11. The bearing shaft 40 is arranged eccentrically with respect to the pivot axle 12 of the davit and is preferably located on a vertical line through and above the pivot axle 12. The end 43 of the arm 39 cooperating with the davit 11 is displaceably mounted in a guide rail 44 between two distinct end positions, said guide rail is fixedly connected to the davit. Two brackets 46 and 47, which delimit the pivoting movement of the arm 39 to 180 degrees, are also arranged at the stand 45 supporting the pivot axle 12 of the davit.

When pivoting the davit device from the stowing position shown in fig. 4 to the raised position shown in fig. 5 in which the wire 14 has been hoisted home maximally, the pressure spring 38 has been compressed so much that when the wire 14 then is slackened the compressive force of the spring will press the davit device outwards from the ship, so that its centre of gravity 36 will get past the dead centre level 35 of the davit device. This can be made by arranging the pivot centre 40 of the pressure member excentrically with respect to the pivot axle 12 of the davit, at which a lever effect is provided striving to press the davit device in the direction away from its stowing position. At the continued pivoting movement the spring 38 will be unloaded until the end plate 42 of the arm 39 abuts the bracket 47, which prevents a continued pivoting of the arm 39. However the davit device has in this position not yet reached its end position and at a continued lowering of the wire 14 the end 43 of the arm 39 will be displaced in the guide rail 44 to the opposite end position, as is shown in

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fig. 6.

When pivoting the davit device inwards from its lowered, active position outside the ship's side - fig. 6 - to its stowing position on the ship's deck - fig. 4 - the spring will be stretched, so that when the davit device reaches its raised position - fig. 7 -, in which the wire 14 is hoisted home as far as possible, the spring force will again act upon the davit in the direction towards the ship's deck so that the centre of gravity 36 of the davit device safely is brought past the dead centre level 35. At the continued pivoting movement the end plate 42 of the arm will abut the bracket 46, which prevents a continued movement of the arm at the same time as a continued lowering of the davit device results in a displacement of the end 43 of the arm 39 in the guide rail to the opposite end position.

The embodiment according to figs. 8 and 9 differs from the one disclosed in figs. 1-3 by the fact that the connection member, i.e. the hook 32 mounted at the davit 11, has been replaced by a rod 48, which is pivotally mounted at one arm 28 of the two-armed link 23 about a pivot 49. The rod 48 cooperates and passes through a yoke 50 fixedly attached to the davit 11. The rod 48 is provided with a recess 51, which is so placed that it in one end position of the wire guiding device 15, i.e. the stowing position according to fig. 8, overlaps the yoke 50 so that the wire guiding device 15 is blocked from being pivoted about the shaft pivot 26.

The yoke 50 has such a free height that the rod 48 freely can pass under the yoke, which is done when the davit 11 with the ladder 13 connected thereto has passed the dead centre level 35. By the weight of the rod it will thus be disengaged from the yoke 50, as is shown in fig. 9, which means that when the davit is pivoted back from its lowered position, the farthest out point of action of the wire 14 at the davit 11 will no longer be the pulley 25 but instead the pulley 27, which is located further in towards the davit, which means that when the wire 14 is retracted as far as possible, the common centre

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of gravity 36 of the davit and ladder has passed the dead centre level 35.

In order to reset the wire guiding device 15 to its initial position, shown with continuous lines in fig. 8, a fixed guide member 52 is arranged on the ship's deck 16, said guide member cooperates with a lever arm 53 at the two-armed link 23. When the davit 11 is lowered in the direction towards the deck 16 the lever arm 53 will abut the guide member 52, so that the two-armed link 23 is pivoted clockwise to the position shown in fig. 8 with continuous lines.

The invention is not limited to the embodiments shown but a plurality of modifications are possible within the scope of the claims. Thus the locking effect of the locking member 30 can be ceased e.g. by cooperation with an appropriate cam disk of the like instead of by means of a counterweight. In the embodiment shown the wire 14 also serves as a lowering member for lowering and raising the accommodation ladder, but it would of course also be possible to have separate wires for these two functions. Further it is possible and in certain cases also recommendable to combine certain structural parts according to some of the shown embodiments with each other.

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CLAIMS

1. A device for pivoting an accommodation ladder (13) from a stowing position on a ship's deck (16) to a position outside the ship's side by means of at least a wire (14) or the like, which is connected to the ladder by at least a pulley firmly mounted above the davit (11),

c h a r a c t e r i z e d i n,

that at the davit (11) there is attached at least one mechanism (15,37) which is arranged to be switched over at the pivoting of the davit device (11,13) substantially between its end positions, so that, when the wire (14) is in its most retracted position and the davit device (11,13) is in its raised position, the centre of gravity of the davit device (36) has passed the dead centre level, i.e. a vertical line (35) through the pivot axle (12), independent of whether the davit (11) is rotated towards or from stowing position.

2. A davit device according to claim 1,

c h a r a c t e r i z e d i n,

that the mechanism (15, 37) comprises at least one wire guiding device (15) and/or at least one pressure means (37), said wire guiding member being attached at the one free end of the davit (11) and is moveable between two end position, for displacing the point of action of the wire (14) at the davit device (11, 13) and that the pressure means (37), which is rotatably mounted between the davit and a mounting point located eccentrically with respect to the pivot axle (12), is designed to exert a turning moment on the davit device (11, 13) past the dead centre level (35) in the raised position of the davit device.

3. A davit device according to claim 2,

c h a r a c t e r i z e d i n,

that the wire guiding device (15) is arranged in its one for example outward pivoted end position to make a fixed extension of the point of action of the wire outside the davit (11) and in its other for example inwards pivoted position is

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disconnectable, with the point of action of the wire (14) located inside the davit, that the wire guiding device (15) is arranged during the pivoting of the davit to its first position cooperate with a fixed guiding surface (34), for pivoting the davit device outwards and that a locking means (30) is arranged to release the wire guiding device (15) at the pivoting of the davit from its first position, past the dead point.

4. A davit device according to claim 3, characterized in, that the wire guiding device (15) comprises at least a two-armed link (23) provided with a first pulley (25) for the wire (14) mounted at the free end of one, first arm (24) of said link and a second pulley (27) mounted at the rotation axle (26) of the link between said arms (24, 28) and that the free end of the second arm (28) is arranged to cooperate with said locking means (30).

5. A davit device according to claim 3 or 4, characterized in, that the locking means (30) comprises a connecting means (32) rotatable about a shaft pivot (31), which is arranged that at the rotation of the davit from its one position, past the dead point of the davit release by action of gravity the wire guiding device (15) from the davit (11).

6. A davit device according to claim 2, characterized in, that the pressure means (37) comprises an arm (39) actuated by a spring force, the one end of which cooperating with the davit (11) is displaceable between two end position in a guide rail (41) firmly connected with the davit (11).

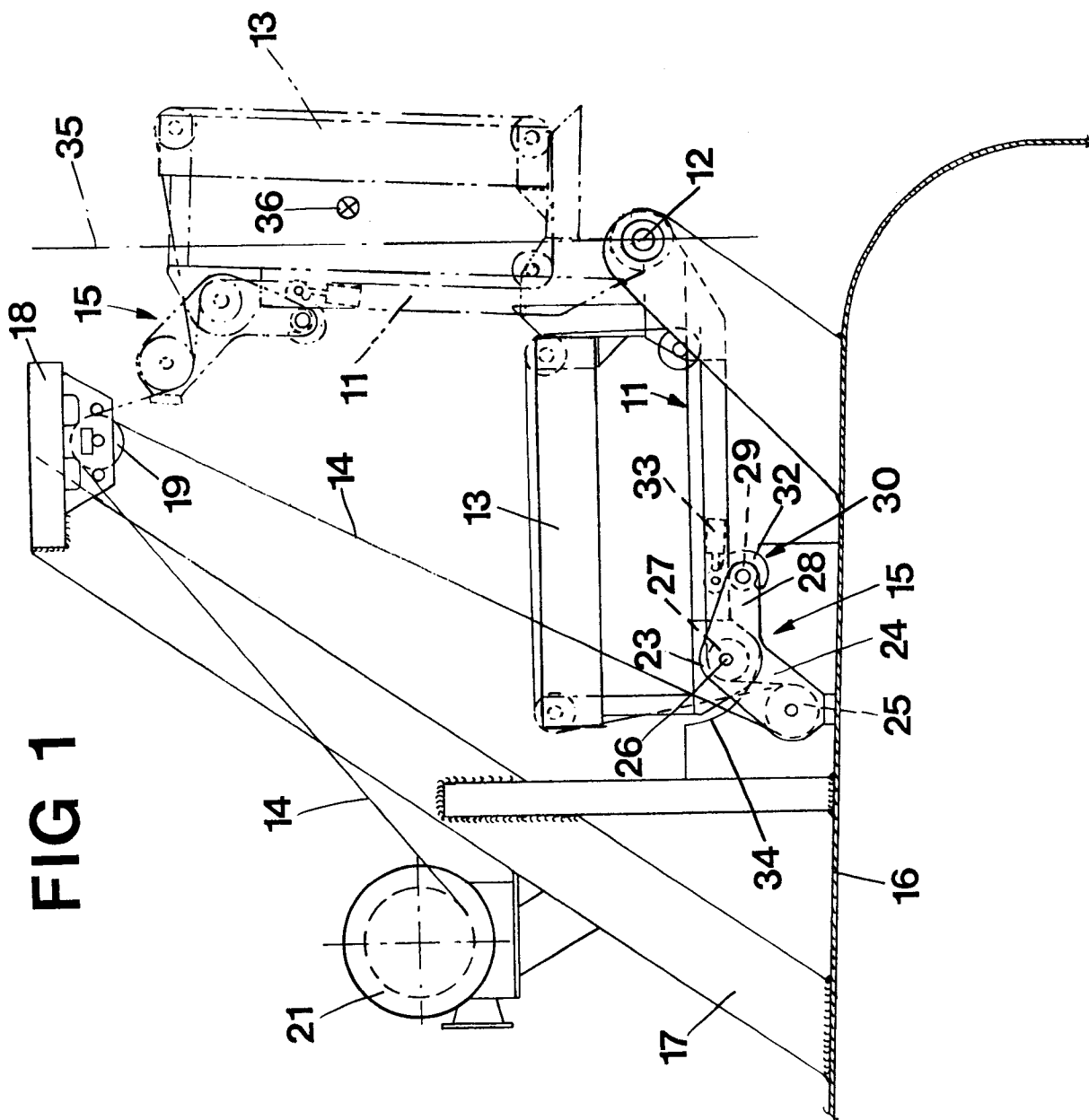


FIG 2

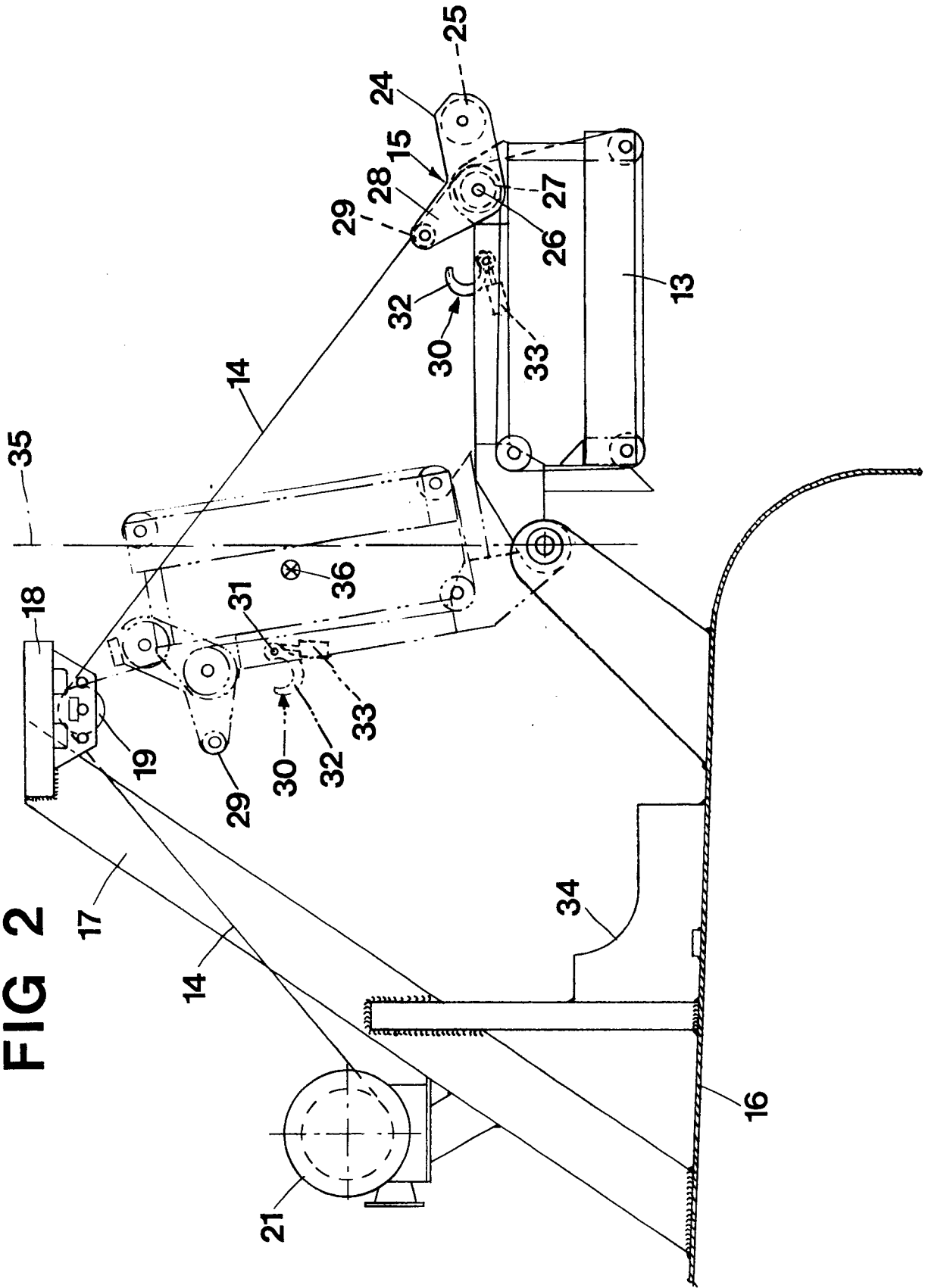


FIG 3

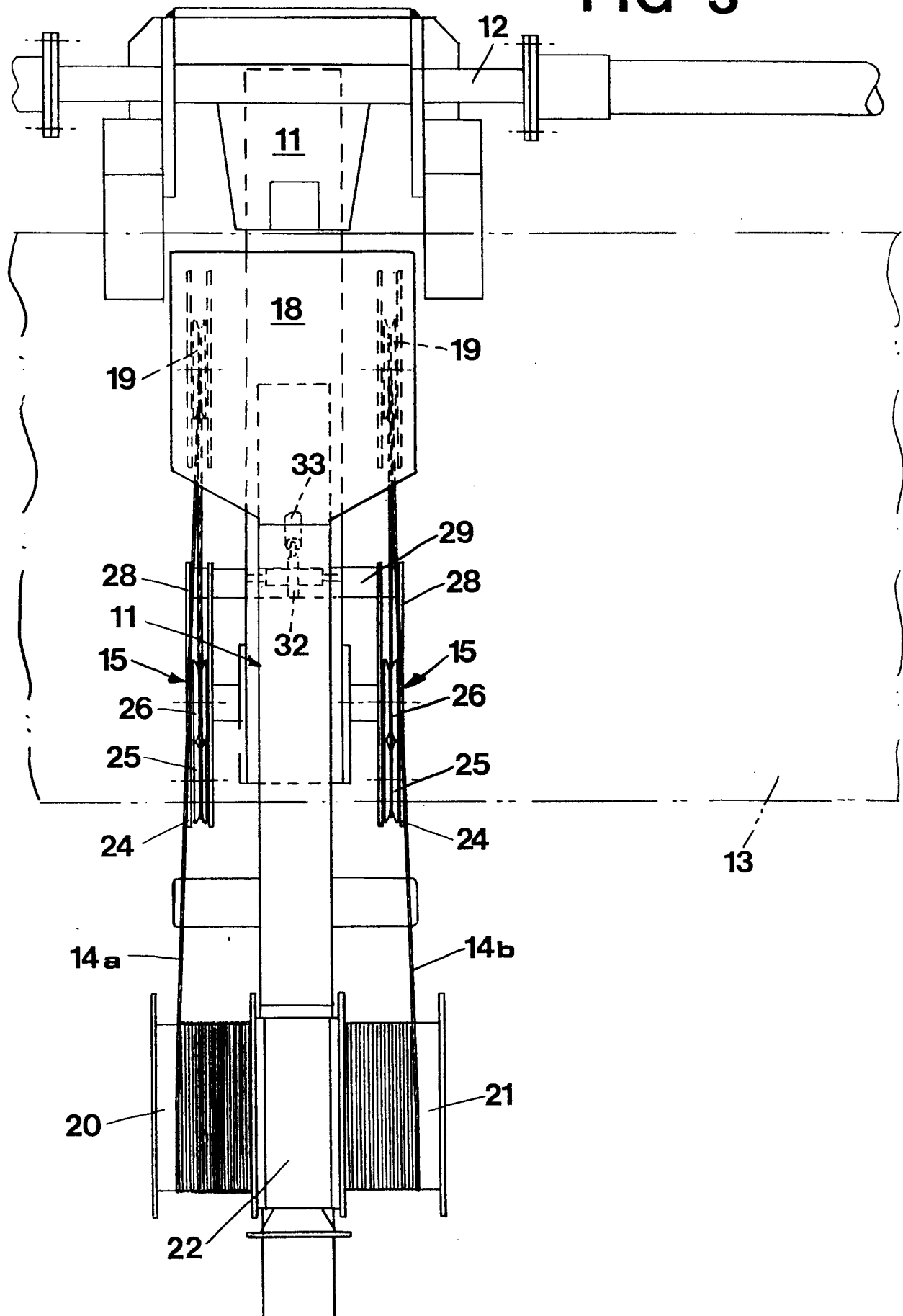


FIG 4

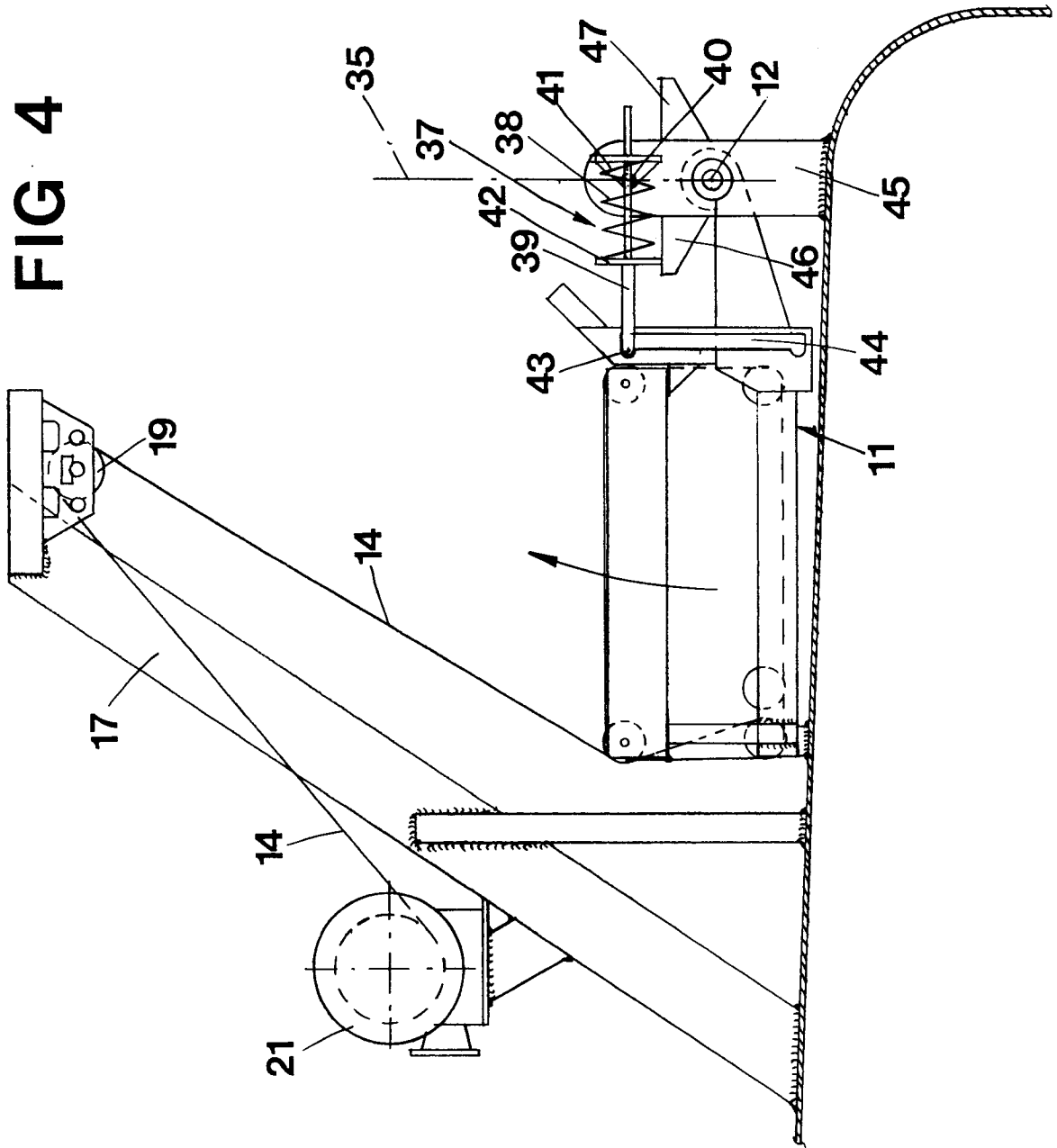
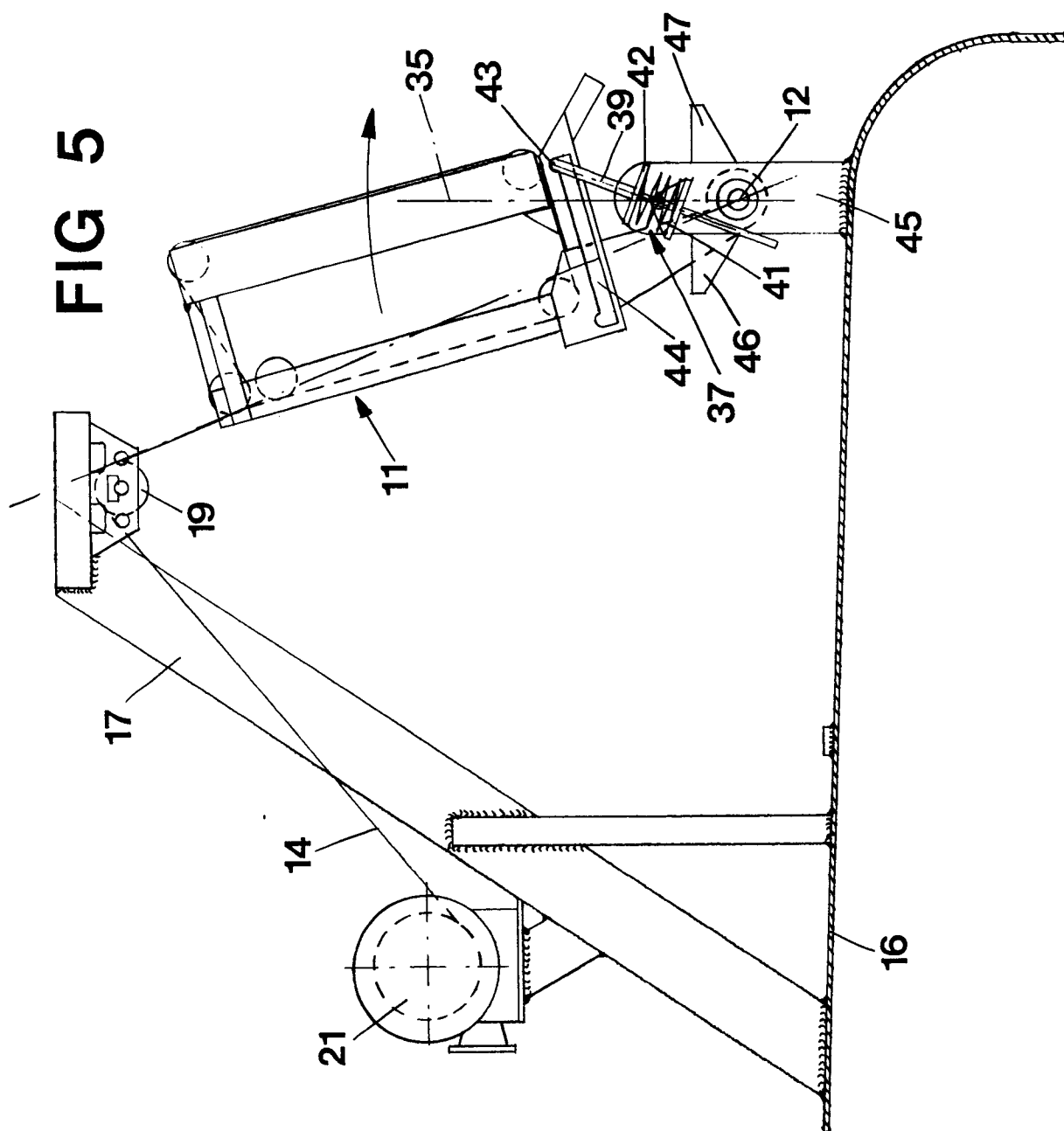


FIG 5



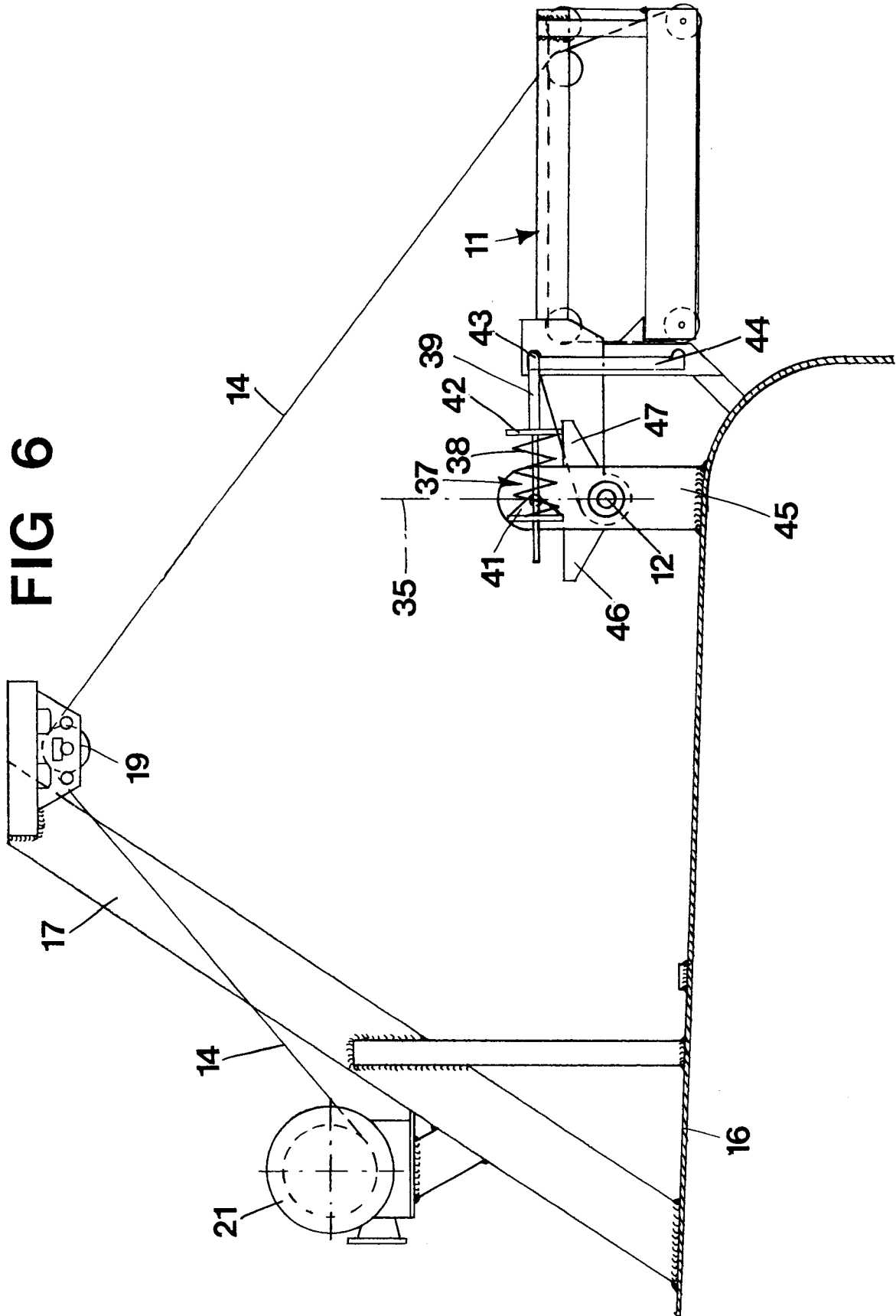
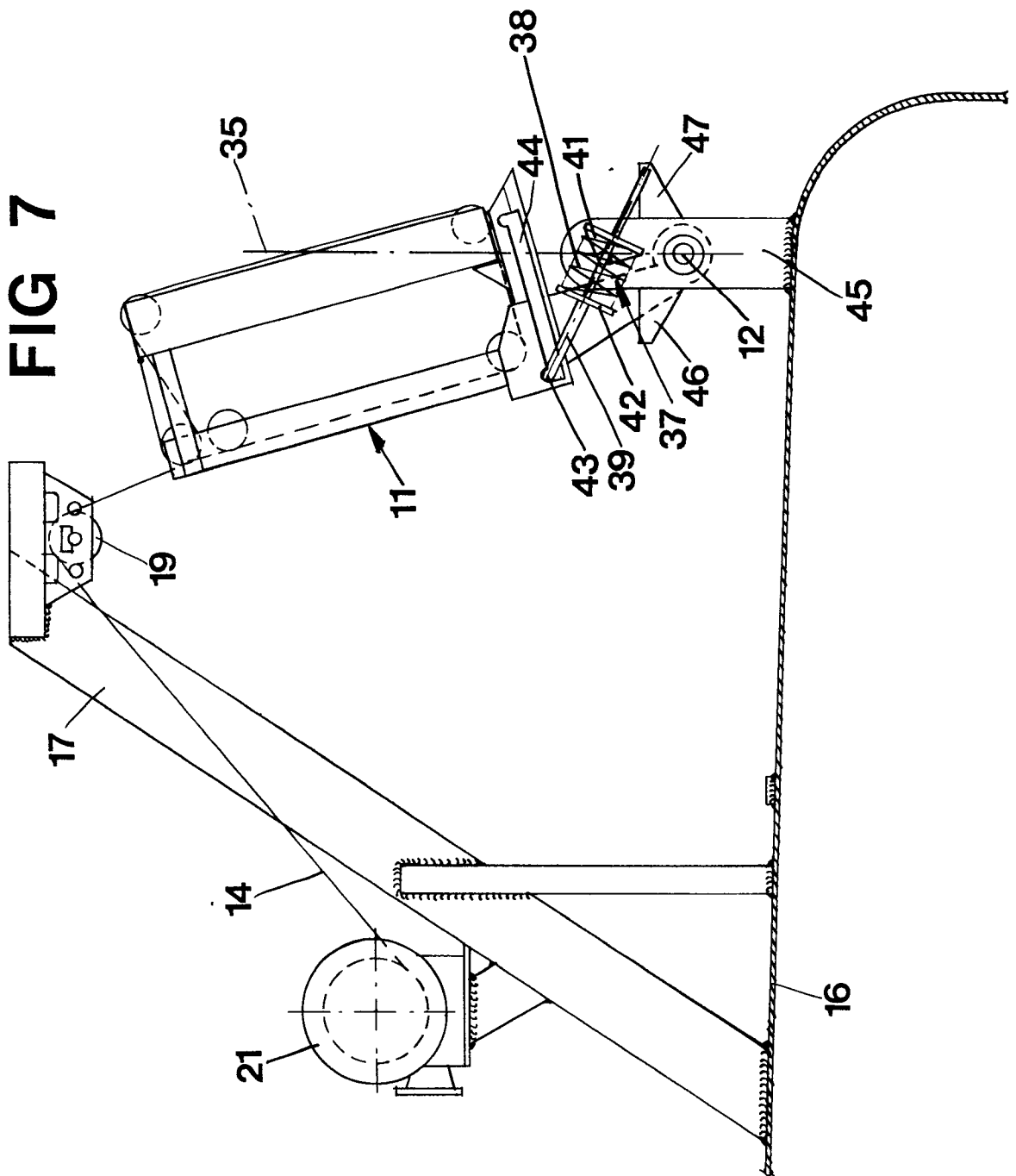


FIG 7



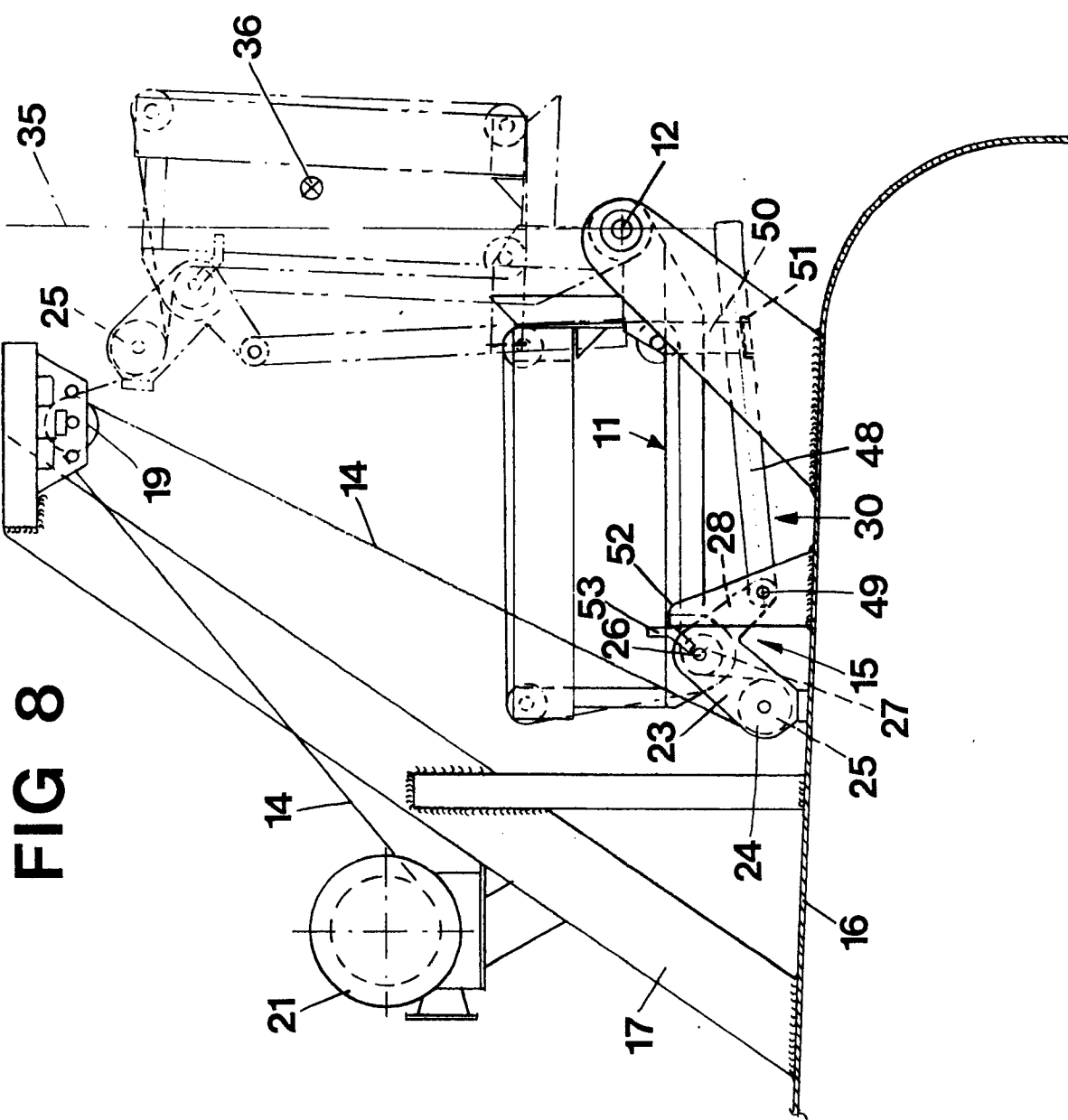


FIG 9

