



(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
24.09.2003 Bulletin 2003/39

(51) Int Cl.7: **B65H 75/38, B65H 75/42**

(21) Application number: **03004816.9**

(22) Date of filing: **04.03.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

(72) Inventor: **Cappelloto, Luigi**
31018 Gaiarine, (Prov. of Treviso) (IT)

(74) Representative: **Modiano, Guido et al**
Modiano & Associati,
Via Meravigli, 16
20123 Milano (IT)

(30) Priority: **19.03.2002 IT PD20020071**

(71) Applicant: **Cappellotto S.p.A.**
31018 Gaiarine (Triviso) (IT)

(54) Device particularly for moving oscillating supports for hose winding reels

(57) A device particularly for moving oscillating supports for hose winding reels, of the type that comprises a bracket (16) that is rigidly coupled to a tank and to which a fork (17) is articulated about a substantially vertical axis, the hose winding reel (12) being coupled to the fork (17) so that it can rotate about a horizontal axis. The device further comprises a double-acting hydraulic actuator (18) that is articulated to the bracket (16) and is connected, by means of a kinematic chain that com-

prises a lever (19) with lever systems and crank systems, to the rotation shaft (22) of the fork (17). The actuator (18) determines two limit operating configurations for the device: a closed one, with the reel (12) adjacent to the tank, and an open one, with the reel (12) rotated substantially through 180 sexagesimal degrees. The actuator (18), the lever systems and the crank systems are substantially comprised within the longitudinal dimensions of the lever (19) when the device (10) is arranged in the closed configuration.

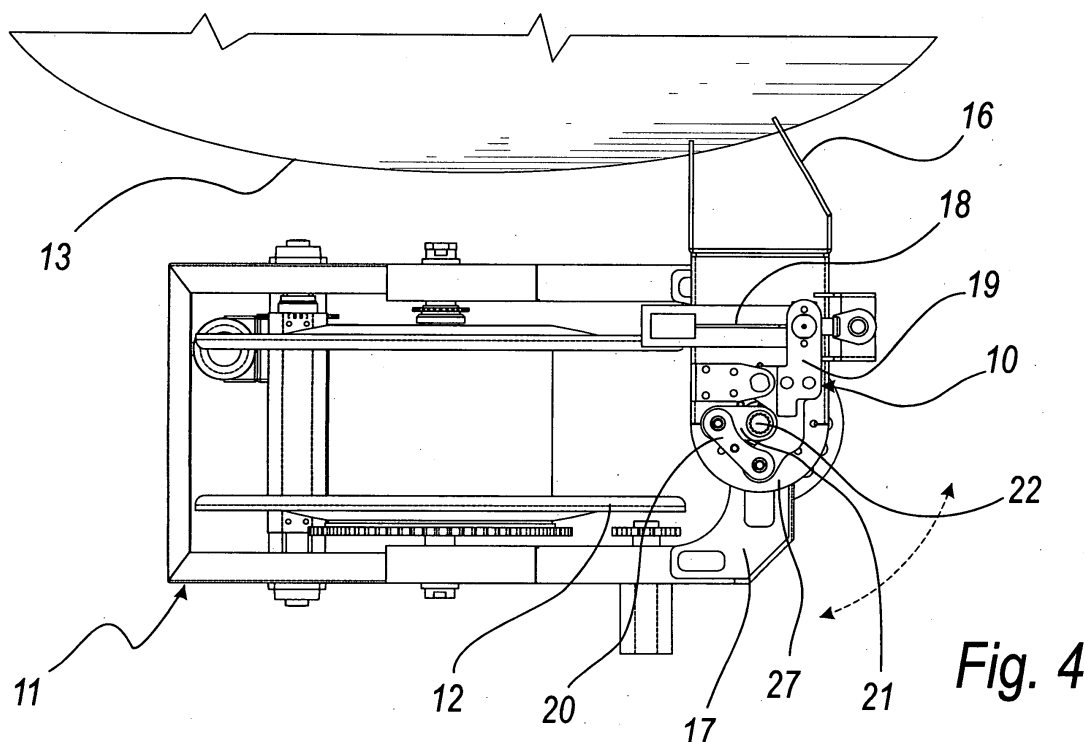


Fig. 4

Description

[0001] The present invention relates to a device particularly for moving oscillating supports for hose winding reels.

[0002] As is known, when it is necessary to clear obstructions and deposits from piping, for example of water or sewage networks, trucks are used which are provided with tanks and hoses wound on reels, through which it is possible to pump water at high pressure into the obstructed ducts.

[0003] So-called aspirator trucks are also known whereby dust and debris are aspirated into a tank by using hoses, which are also usually wound on reels.

[0004] As mentioned, the hoses are wound on reels, which are arranged on corresponding supports to the rear of the truck.

[0005] One known type of support comprises a bracket that is fixed to the bottom of the tank and supports, so that it is articulated on a substantially vertical axis, a fork to which the hose winding reel is coupled so that it can rotate about a horizontal axis.

[0006] For better ergonomics and practicality of use, the supports are associated with devices for moving the fork from a position in which the reel is arranged adjacent to the tank to a position in which the reel is rotated substantially through 180 sexagesimal degrees.

[0007] Devices are known which are constituted by a hydraulic gearmotor, which however has the considerable drawback of being particularly bulky, constructively complicated and expensive.

[0008] In other cases instead hydraulic actuators are used in which the body is articulated to the tank and the stem of the actuator is articulated to the fork; however, the actuators must have large dimensions in order to allow an angular stroke of the fork of at least 180 sexagesimal degrees.

[0009] The aim of the present invention is to provide a device particularly for moving oscillating supports for hose winding reels that solves or substantially reduces the problems of conventional devices.

[0010] Within this aim, an object of the invention is to provide a device that has a simple structure.

[0011] Another object is to provide a device that is very compact.

[0012] Another object is to provide a device that has a low cost.

[0013] This aim and these and other objects that will become better apparent hereinafter are achieved by a device for moving an oscillating support for hose winding reels, of the type that comprises a bracket that is rigidly coupled to a tank and to which a fork is articulated about a substantially vertical axis, the hose winding reel being coupled to said fork so that it can rotate about a horizontal axis, said device being characterized in that it comprises a double-acting hydraulic actuator that is articulated to said bracket and is connected, by means of a kinematic chain that comprises a lever with lever

systems and crank systems, to a rotation shaft of said fork, said actuator determining two limit operating configurations for said device, one of said configurations being closed, with the reel adjacent to said tank, and one of said configurations being open, with the reel rotated substantially through 180 sexagesimal degrees, said actuator, said lever systems and said crank systems being substantially comprised within the longitudinal dimensions of said lever when said device is arranged in the closed configuration.

[0014] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a side view of a tank truck, to the rear of which there is a hose winding reel on a support provided with a device according to the invention;

Figure 2 is a perspective view of the hose winding reel of Figure 1 with the device according to the invention;

Figures 3 and 4 are respectively a side view and a plan view of the hose winding reel of Figures 1 and 2, with which the device according to the invention is associated;

Figures 5 and 6 are respectively a perspective view and a plan view of a device according to the invention;

Figure 7 is a schematic plan view of the device according to the invention in two different operating configurations.

[0015] With reference to the figures, a device particularly for moving oscillating supports for hose winding reels according to the invention is generally designated by the reference numeral 10.

[0016] The device 10 is associated with a support 11 of the oscillating type for a hose winding reel 12, which is fixed to a rear end 13 of a tank 14 of a truck generally designated by the reference numeral 15.

[0017] The support 11 comprises a bracket 16, which is rigidly coupled to the rear end 13 and to which a fork 17 is articulated about a vertical axis; the hose winding reel 12 is coupled to the fork so that it can rotate about a horizontal axis.

[0018] The device 10 is arranged above the bracket 16 and comprises a double-acting hydraulic actuator 18, which is connected, by means of a kinematic chain that comprises in succession a lever 19, a linkage 20 and a crank 21, to a rotation shaft 22 of the fork 17.

[0019] In practice, the hydraulic actuator 18 determines, by way of its movement, two limit operating configurations for the device 10: a closed one, in which the reel 12 is adjacent to the rear end 13 of the tank 14, and an open one, in which the reel 12 is rotated substantially through 180 sexagesimal degrees with respect to a vertical axis that coincides with the axis of the rotation shaft

22.

[0020] As shown in Figure 6, the hydraulic actuator 18, the linkage 20 and the crank 21, when the device 10 is in the closed configuration, are arranged substantially within the longitudinal dimensions of the lever 19.

[0021] The lever 19 is articulated, at a central portion, as will become better apparent hereinafter, to the bracket 16 and is articulated at its ends to the actuator 18 and to the linkage 20.

[0022] When the device 10 is arranged in the closed configuration, a stem 23 of the actuator 18 is inside a body 24 of the actuator, and the actuator 18 is arranged substantially at right angles to the longitudinal extension of the lever 19 and substantially parallel to the crank 21.

[0023] The head of the stem 23 of the actuator 18 is articulated to the bracket 16 and the body 24 of the actuator is articulated to one end of the lever 19.

[0024] The lever 19 is shaped so as to be substantially longitudinally elongated and has a central portion from which a transverse tab 25 protrudes for articulation to the bracket 16 and an arc-like end portion 26 for articulation to the linkage 20.

[0025] When the device 10 is arranged in the closed configuration, the end portion 26 of the lever 19 is arranged so as to partially surround the rotation shaft 22 and the axes about which the lever 19 is articulated to the bracket 16, the crank 21 is articulated to the bracket 16 and the linkage 20 is articulated to the lever 19 are substantially aligned.

[0026] In practice, the actuator 18, the lever 19, the linkage 20 and the crank 21 are arranged on a plate 27 above the bracket 16, with the crank 21 keyed to the upper end of the rotation shaft 22.

[0027] As regards operation, as shown in Figure 7, when the device 10 is arranged in the closed configuration, with the stem 23 fully retracted into the body 24, the fork 17 that supports the reel 12 is arranged adjacent to the rear end 13 of the tank 14.

[0028] By actuating the extension of the stem 23 of the actuator 18, the lever 19 begins to rotate, consequently turning the crank 21.

[0029] The kinematic chain constituted by the lever 19, the linkage 20 and the crank 21 constitutes an angular movement amplifier for the rotation shaft 22.

[0030] A rotation through 90 sexagesimal degrees of the lever 19 in fact is matched by a rotation through 180 sexagesimal degrees for the crank 21.

[0031] Therefore, when the device 10 is in the open configuration, the bracket 16 is turned through 180 sexagesimal degrees.

[0032] The device 10, as shown in Figure 7, has minimal dimensions both when it is arranged in the closed configuration and when it is arranged in the open configuration.

[0033] In practice it has been found that the present invention has achieved the intended aim and objects.

[0034] A device has in fact been provided which has a particularly simple structure and allows the controlled

opening of the support for the hose winding reel with an angular stroke of up to 180 sexagesimal degrees.

[0035] The device is compact both in the closed configuration and in the open configuration and has a low cost.

[0036] The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0037] The technical details may be replaced with other technically equivalent elements.

[0038] The materials, so long as they are compatible with the contingent use, as well as the dimensions, may be any according to requirements.

[0039] The disclosures in Italian Patent Application No. PD2002A000071 from which this application claims priority are incorporated herein by reference.

[0040] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. A device particularly for moving an oscillating support for hose winding reels, of the type that comprises a bracket (16) that is rigidly coupled to a tank (14) and to which a fork (17) is articulated about a substantially vertical axis, the hose winding reel (12) being coupled to said fork (17) so that it can rotate about a horizontal axis, said device being **characterized in that** it comprises a double-acting hydraulic actuator (18) that is articulated to said bracket (16) and is connected, by means of a kinematic chain that comprises a lever (19) with lever systems and crank systems, to a rotation shaft (22) of said fork (17), said actuator (18) determining two limit operating configurations for said device, one of said configurations being closed, with the reel (12) adjacent to said tank (14), and one of said configurations being open, with the reel (12) rotated substantially through 180 sexagesimal degrees, said actuator (18), said lever systems and said crank systems being substantially comprised within the longitudinal dimensions of said lever (19) when said device (10) is arranged in the closed configuration.
2. The device according to claim 1, **characterized in that** said lever systems and crank systems comprise a linkage (20) and a crank (21) arranged in succession to said lever (19).
3. The device according to claim 2, **characterized in that** said lever (19) is articulated to said bracket (16) at its central portion and to said actuator (18) and

said linkage (20) at its ends.

4. The device according to one or more of the preceding claims, **characterized in that** when it is in the closed configuration said actuator (18), with a stem (23) of the actuator inside a body (24) of the actuator, is arranged substantially at right angles to the direction of longitudinal extension of said lever (19) and parallel to said crank (21).
5
10
5. The device according to claim 4, **characterized in that** in said actuator (18) the head of the stem (23) is articulated to said bracket (16) and the body (24) is articulated to one end of said lever (19).
15
6. The device according to one or more of the preceding claims, **characterized in that** said lever (19) is shaped so as to be predominantly elongated longitudinally and has a central portion, from which a transverse tab (25) protrudes for articulation to said bracket (16), and a substantially arc-like end portion (26), for articulation to said linkage (20).
20
7. The device according to one or more of the preceding claims, **characterized in that** when it is in the closed configuration said end portion (26) of said lever (19) is arranged so as to partially surround said rotation shaft (22) and the axes about which said lever (19) is articulated to said bracket (16), said crank (21) is articulated to said bracket (16) and said linkage (20) is articulated to said lever (19) are substantially aligned.
25
30
8. The device according to one or more of the preceding claims, **characterized in that** said crank (21) is keyed to the upper end of said rotation shaft (22).
35
9. The device according to one or more of the preceding claims, **characterized in that** said actuator (18), said lever (19), said linkage (20) and said crank (21) are arranged on a plate (27) that is rigidly coupled in an upper region to said bracket (16), with the crank (21) keyed to the upper end of said rotation shaft (22).
40
45
50
55

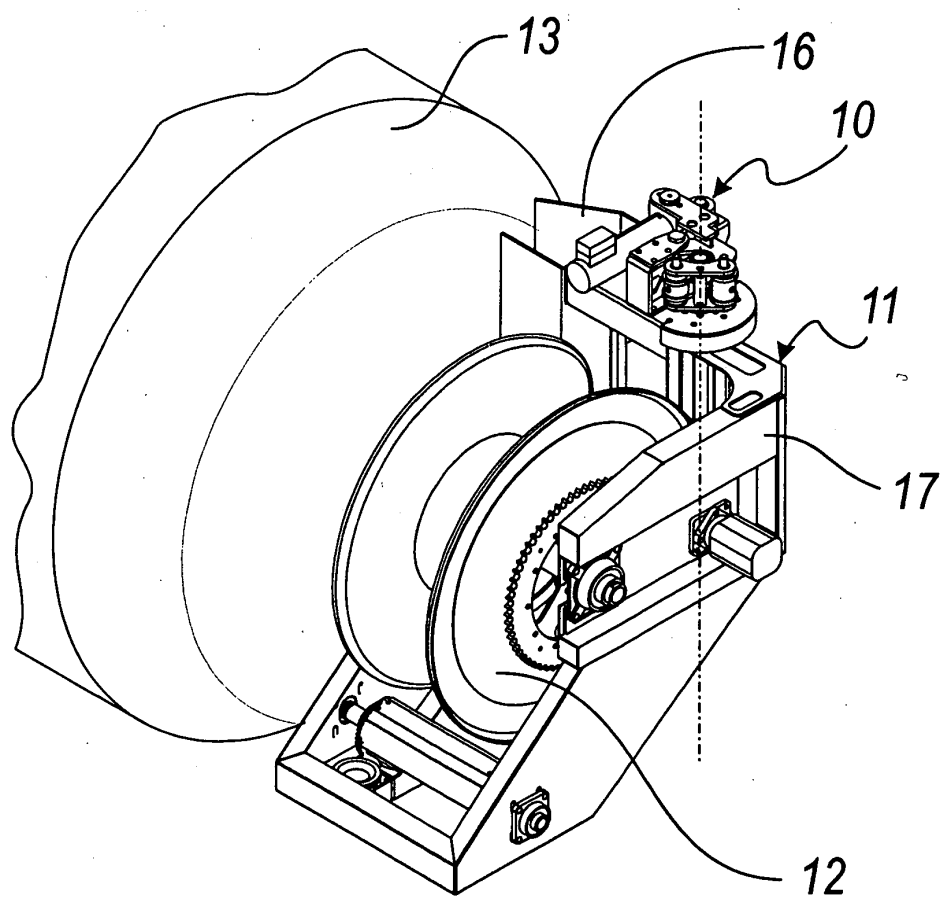
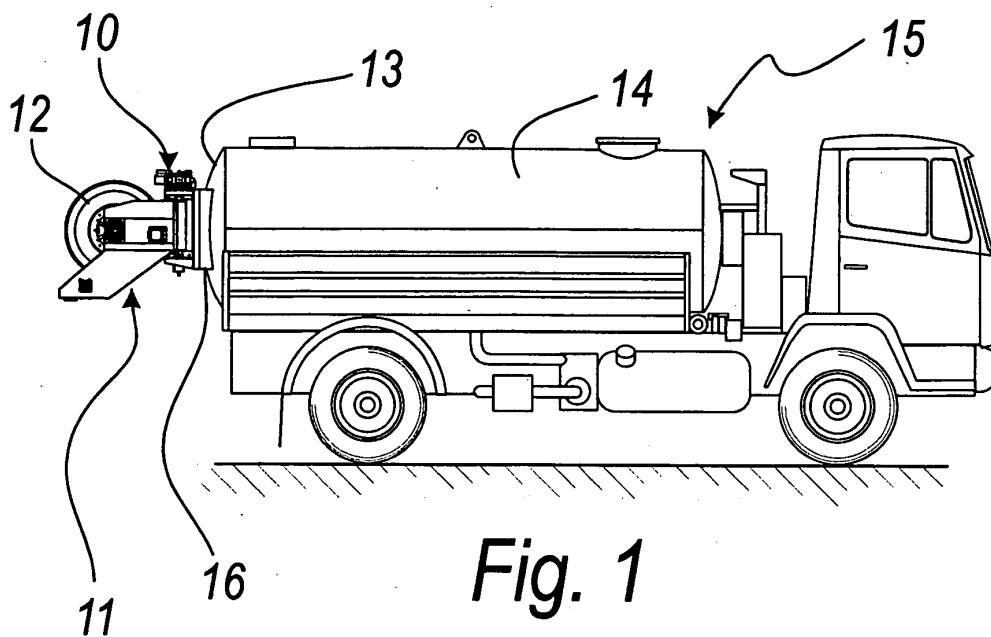
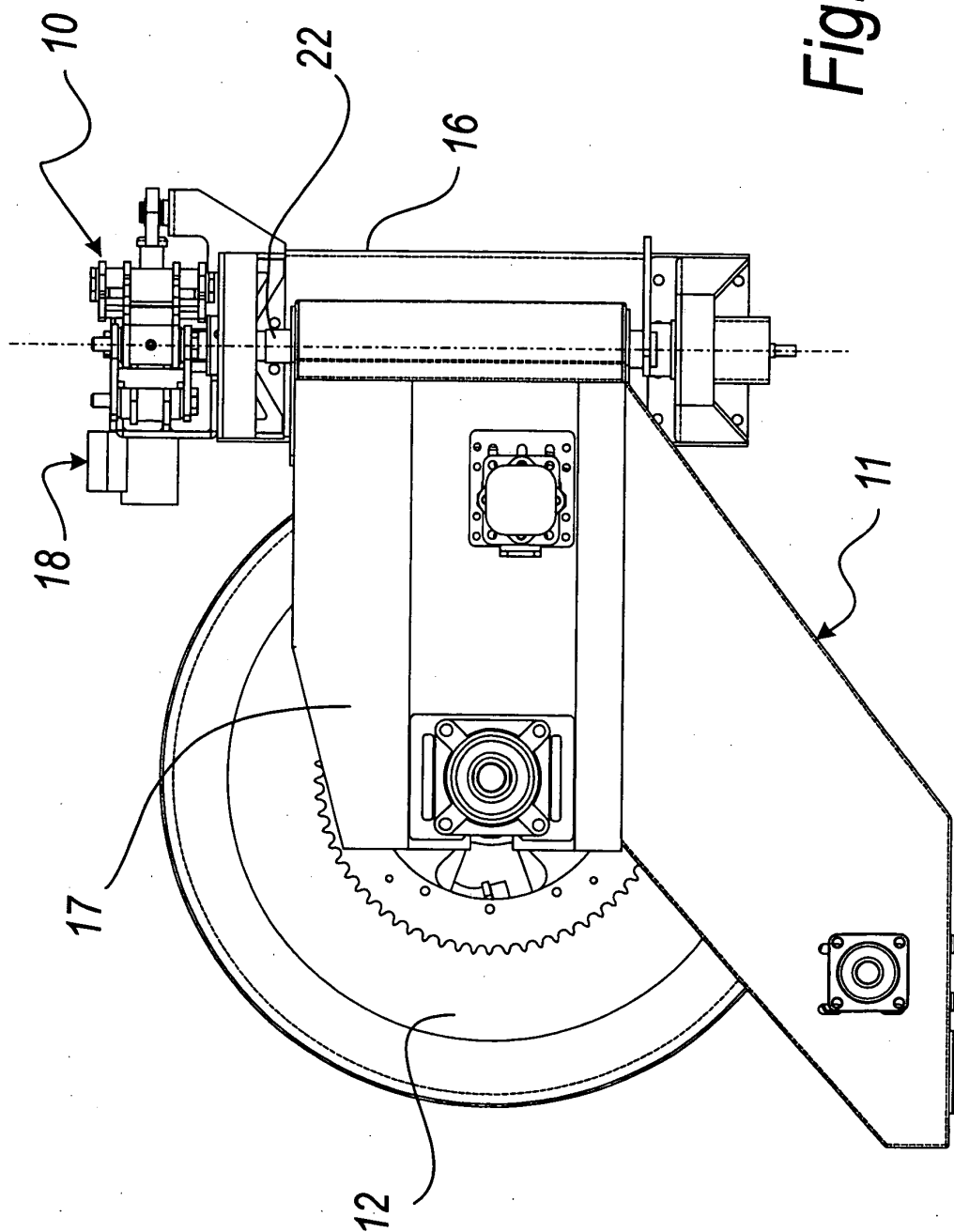
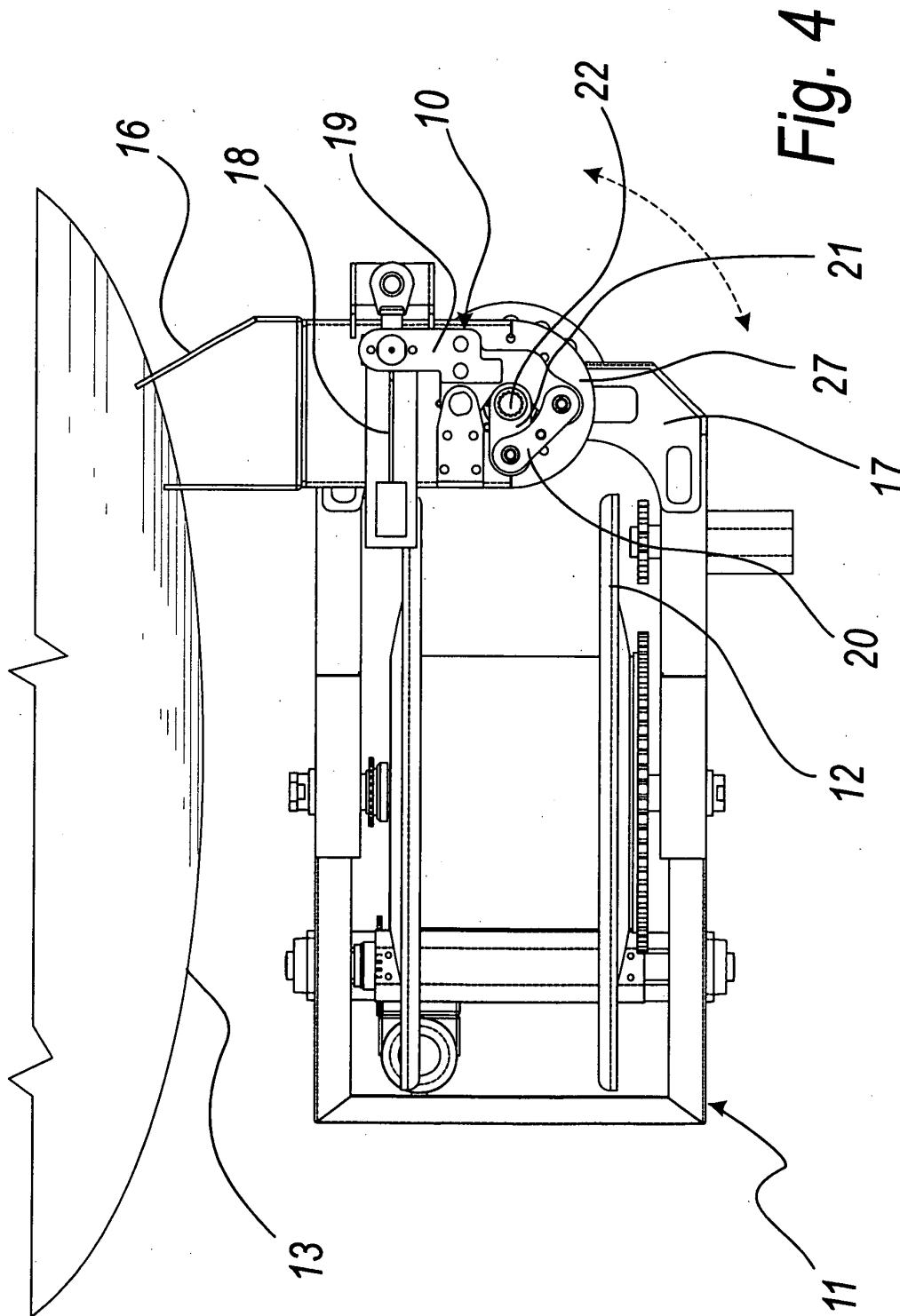


Fig. 2





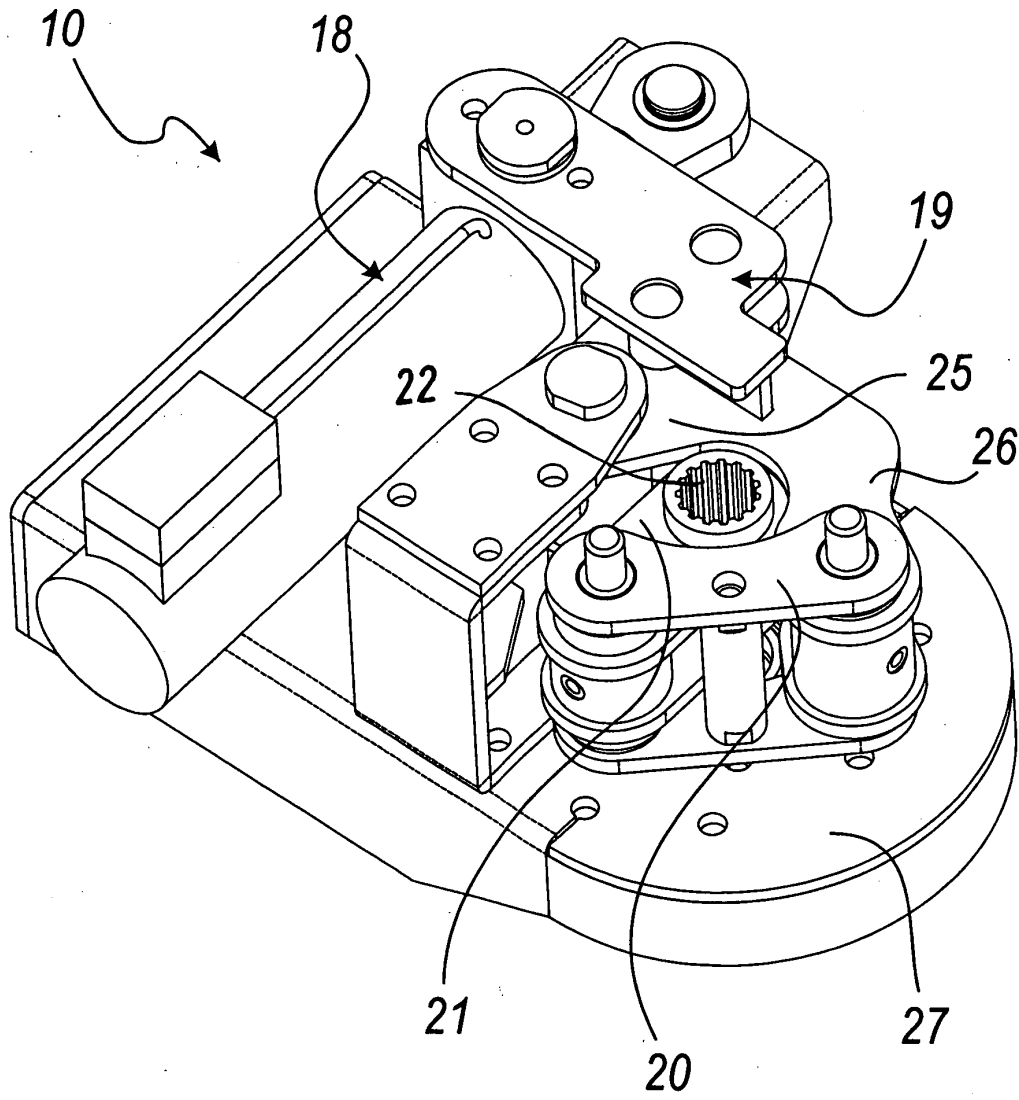


Fig. 5

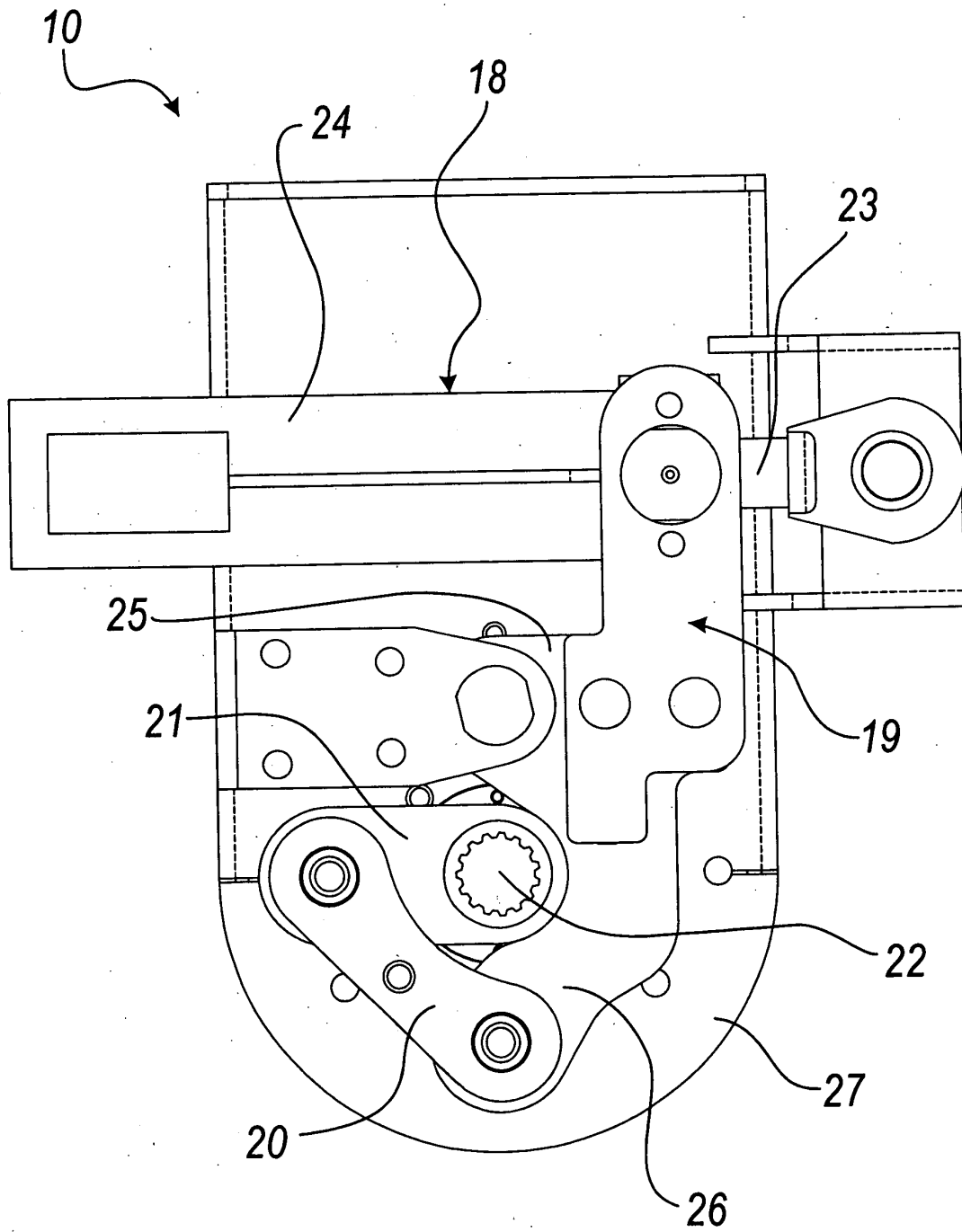


Fig. 6

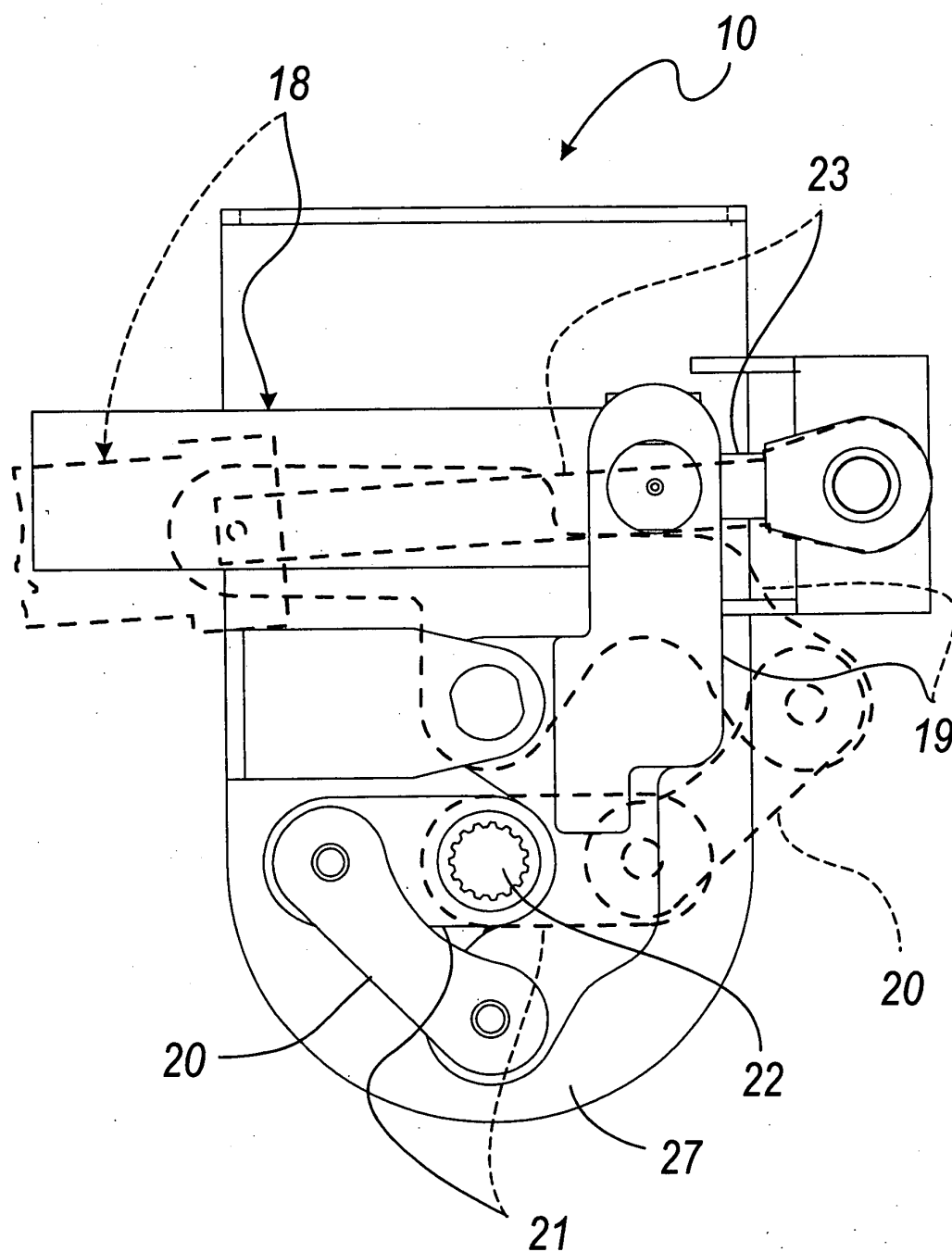


Fig. 7