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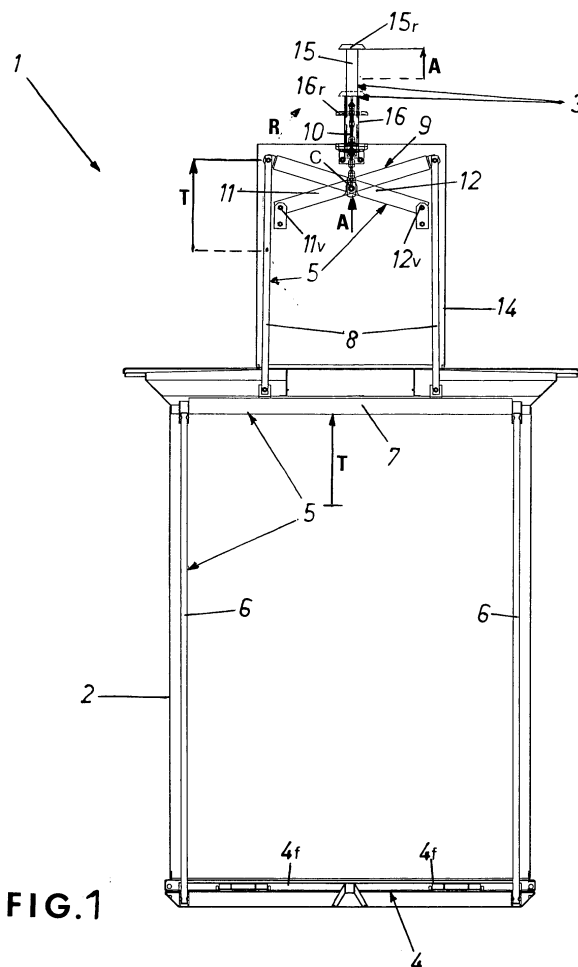
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(54) **Container for waste**

(57) Container (1) for waste, comprising a casing (2) having a coupling device (3) which, when it travels along a preset path (A), causes the parts (4f) forming the base (4) of said casing (2) to open or close, said coupling device (3) being connected to said base (4) by means of connection and transmission members (6,7,8) forming a kinematic chain (5). In the container (1) of the invention, a step-up device (9) capable of reducing to a preset extent the length of said path (A) required to cause the parts (4f) forming said base (4) to open or close completely, is installed in said kinematic chain (5).



**FIG.1**

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## Description

**[0001]** The present invention relates to containers for urban waste. As is known, such containers may be entirely buried underground, in which case they have a waste disposal chute which projects from the ground.

**[0002]** A coupling device is secured to the top of this chute, this device being made in such a way that it can be used to remove the container from the ground, open the base to unload the contents onto a vehicle, close the base again and replace the container in its underground position.

**[0003]** Various devices with associated actuation mechanisms exist for carrying out the above operations - the best known being that patented by Kingshofer - in which the base is opened and closed by vertically sliding, in both directions, a device having a gripping member and a linear shaft connected to the transmission members (chains, beams, etc.) which move the parts (usually two) of which the base of the container is composed. This shaft slides coaxially inside a guide tube along a certain section, and outside the tube for the rest of the length of the required path which, in the case of current construction standards, is 50 cm.

**[0004]** However, with the above arrangement there are significant drawbacks: first of all, it is practically impossible to pull in perfect alignment with the vertical axis, on the gripping member of the device which travels the abovementioned paths in the directions of opening and closing. A degree of misalignment due to human factors (the operator positions the lifting means by centring them visually) is thus inevitable, giving rise to friction and bending stresses, both on said shaft and on said guide tube, which cause them to suffer considerable wear and which, with the passage of time, may seriously damage them or cause them to jam. Secondly, the abovementioned section of path along which the device for opening and closing the base moves outside the guide tube involves the connection element (a rope or, more frequently, a chain) coming out of said tube, and it is very difficult to reinsert it into said guide tube sometimes resulting in jamming, seizing up, slipping and, in any case, a loss of time and major operational complications. The problem is exacerbated when the container has to be rotated even partially for emptying. In this case, the chain becomes twisted, complicating the operations even further.

**[0005]** As stated above, these drawbacks are mainly due to the length of the path that the device for opening and closing the base has to travel. To overcome them, the inventor of the subject of the present application believes that, since there is an actual kinematic chain between this device and the parts making up the base of the container, the solution consists in installing in the appropriate manner a step-up device capable of reducing to a desired extent the length of the abovementioned path required to cause the base to open and close completely.

**[0006]** The subject of the present invention is therefore

a container for waste as described in the attached Claim 1. A more detailed description of a preferred embodiment will now be provided, with reference to the attached drawings, in which:

- Figure 1 is a front view in longitudinal section of said embodiment of a container according to the invention, with the base open;
- Figure 2 is a side view in longitudinal section of the container in the same position as in Figure 1.
- Figure 3 is a front view in longitudinal section of the container of the previous figures, with the base closed;
- Figure 4 is a side view in longitudinal section of the container in the same position as in Figure 3.

**[0007]** Referring first to Figure 1, where it can be seen that the container 1 of the invention is composed essentially of a casing 2, having a base 4 formed of two parts 4f hinged to it in a known manner. At the top of said casing is attached a waste disposal chute 14 which has a coupling device 3 composed of a movable body 15 with an associated gripping edge 15r, able to slide coaxially inside a guide tube 16 secured to the chute 14, and thus into the container 1. The guide tube 16 also has projecting gripping edges 16r. The system described above is the very one patented by the abovementioned company Kingshofer.

**[0008]** By gripping the gripping edges 16r of the guide tube 16 using an appropriate device (not shown in the drawings) it is possible to lift the container 1, with the base 4 closed, removing it from its underground chamber. To this end said movable body 15 of the coupling device 3 is first moved vertically upwards to support the base 4 by means of a kinematic chain 5 with which the container 1 is equipped, which ends in transmission bars 6 connected to the base 4, and is then allowed to drop into the associated guide tube 16 to allow the base 4 to open, thus unloading the waste housed in the container 1. As stated above, with prior art embodiments, the path travelled by the movable body 15 reaches 50 cm, and is the source of the abovementioned drawbacks.

**[0009]** In the container 1 of the invention, a step-up device 9 is inserted in said kinematic chain 5, which is of a type known per se, and this device reduces the length of the path said movable body 15 has to travel in order to move the base 4.

**[0010]** In the preferred embodiment described herein, said kinematic chain 5 comprises two or more transmission bars (four in the present case) connected, at opposite ends, to the parts 4f forming the base and to a cross-bar 7 fastened to the ends of two (or more) arms 8 secured to the free ends of two bars 11, 12 pivoted together at the centre C and fastened at their other ends 11v, 12v to the casing 2 so that they can rotate with respect to said casing.

**[0011]** The movable body 15 of the coupling device 3 is connected via a chain 10 to said point C of pivoting of

the bars 11, 12 of the cross 9 and said chain 10 is linked to said point in such a way as not to prevent the relative rotation of said bars 11, 12 about it.

**[0012]** By vertically raising said movable body 15 of the coupling device 3 by a path A, the bars 11, 12 rotate about their ends 11v, 12v, and their rotation R gives rise to a path of lifting T of the ends of the arms 8 connected to them, which path, when all the component parts are opportunely dimensioned, for simple geometrical reasons, may be much greater in length than the path A of the movable body 15 of the coupling device 3.

**[0013]** The inventor provides that the cross 9, which acts like an actual step-up device, be made in such a way that the maximum length of said path T does not exceed 20 cm. This limited path actually makes it possible to align the abovementioned section of path along which the movable body 15 has to move outside the guide tube 16, and reduce the effects of the moments which act on the movable body 15 and the guide tube 16 as a result of pulling actions which are not perfectly aligned with their axes.

**[0014]** In the inventor's opinion, the embodiment of the step-up device in the form of a cross 9 as described above is preferable to other embodiments in the form of gears, racks and the like, since first of all it does not occupy the area of the chute 14 through which waste is introduced, and secondly it is more simple, inexpensive and reliable.

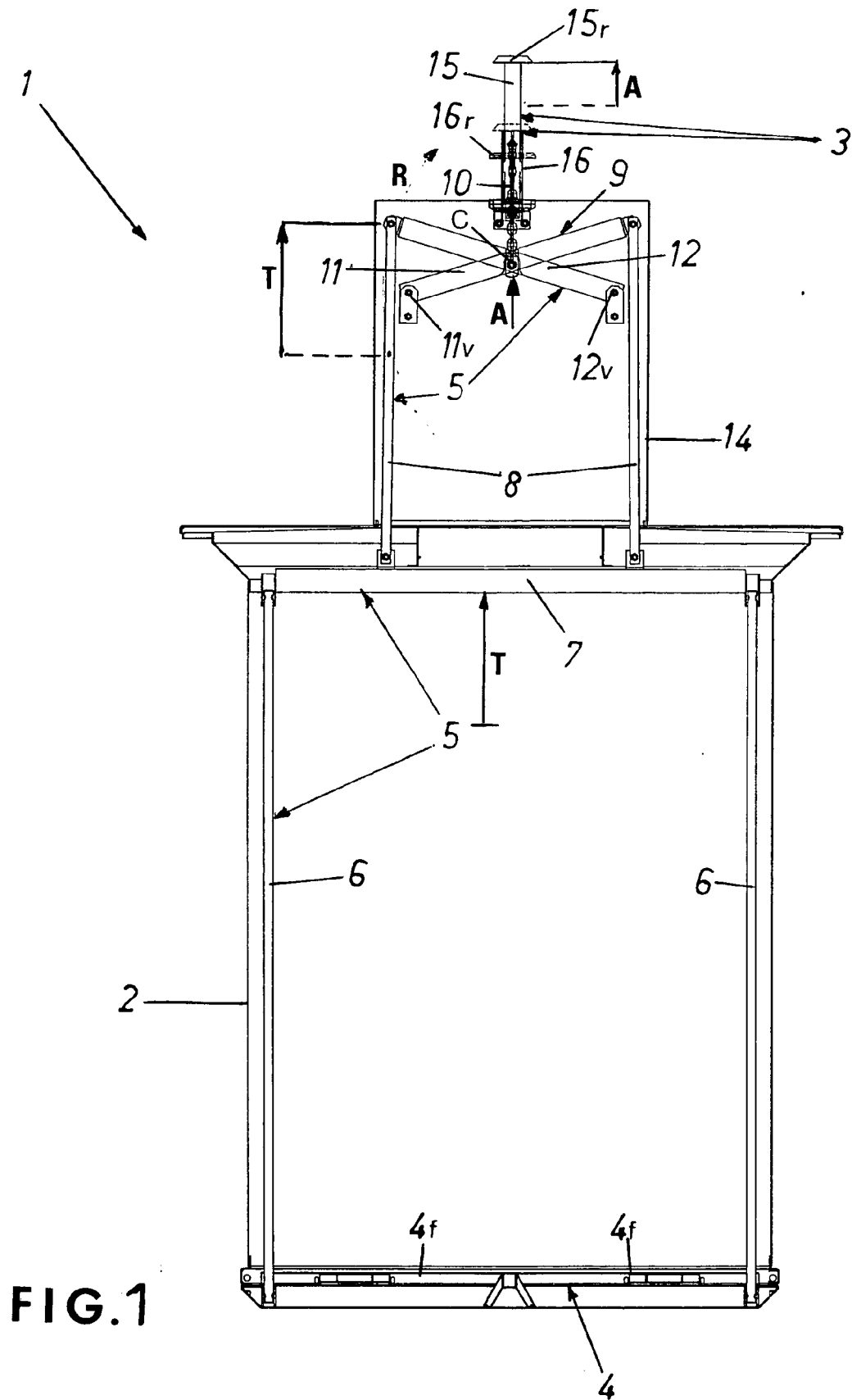
**[0015]** The container according to the invention therefore achieves the objective pursued by the inventor.

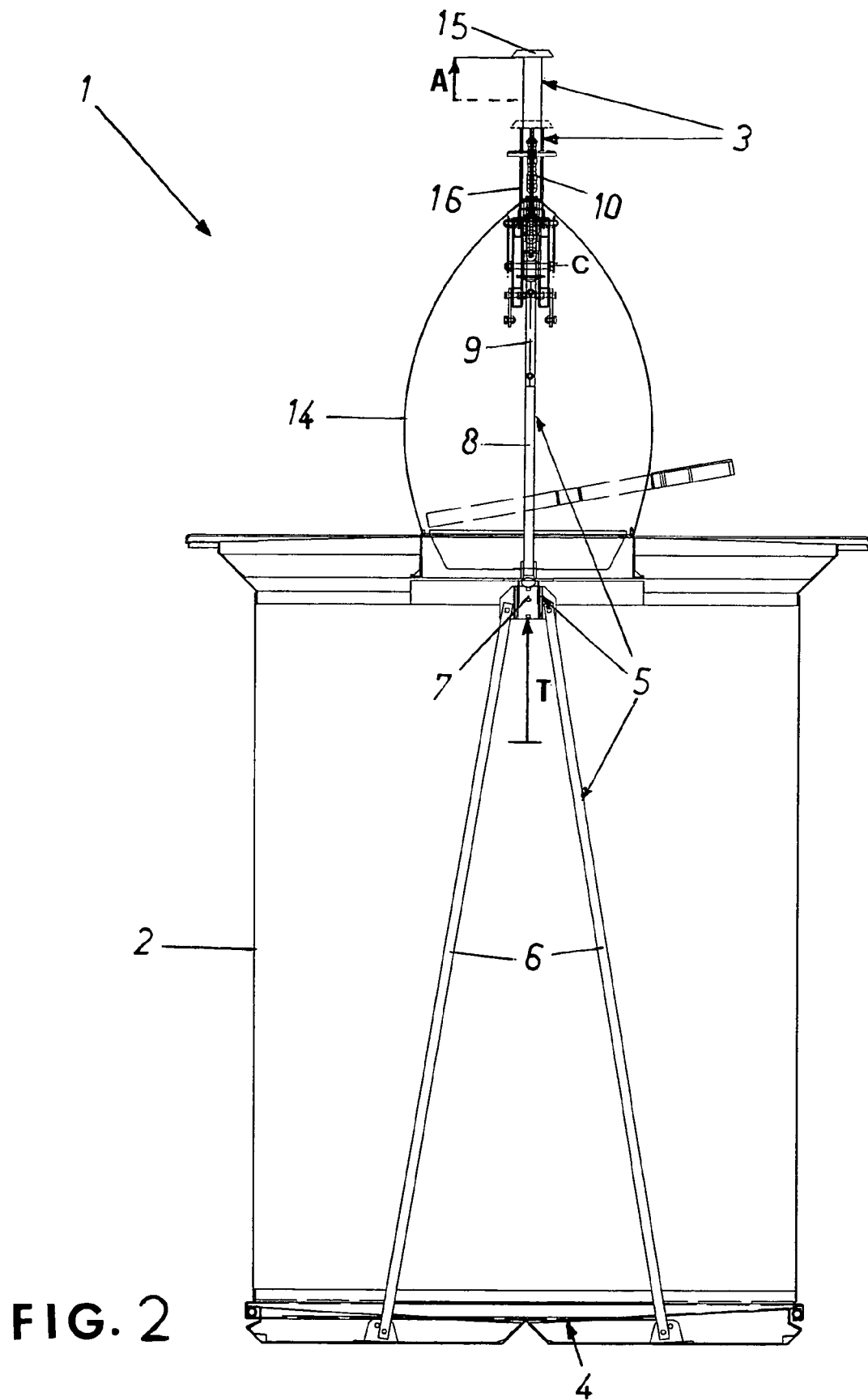
**[0016]** Note that in all the drawings the paths and rotations of the parts shown are those for closing the base 4. The base can be opened, obviously, by moving along paths and rotating in the opposite direction.

gether at the centre (C), both bars having one end (11v, 12v) attached to the casing (2) so as to be able to rotate and the other end connected to said tie rods (8), and the coupling device (3) is connected via said chain (10) to the cross (9) at the abovementioned point (C) of pivoting of the bars (11, 12) in such a way as not to prevent their relative rotation about this point.

## Claims

1. Container (1) for waste, comprising a casing (2) having a coupling device (3) which, when it travels along a preset path (A), causes the parts (4f) forming the base (4) of said casing (2) to open or close, said coupling device being connected to said base by means of connection and transmission members (6, 7, 8) forming a kinematic chain (5), **characterized in that** a step-up device (9) capable of reducing to a preset extent the length of said path (A) required to cause the parts (4f) forming said base (4) to open or close completely, is installed in said kinematic chain (5).
2. Container according to Claim 1, in which said kinematic chain (5) comprises two or more transmission bars (6) connected, at opposite ends, to the parts (4f) forming the base (4) and to a crossbar (7) fastened to the ends of two or more arms (8) connected mechanically to a chain (10) at the end of said coupling device (3) and said step-up device consists of a cross (9) formed of two bars (11, 12) pivoted to-





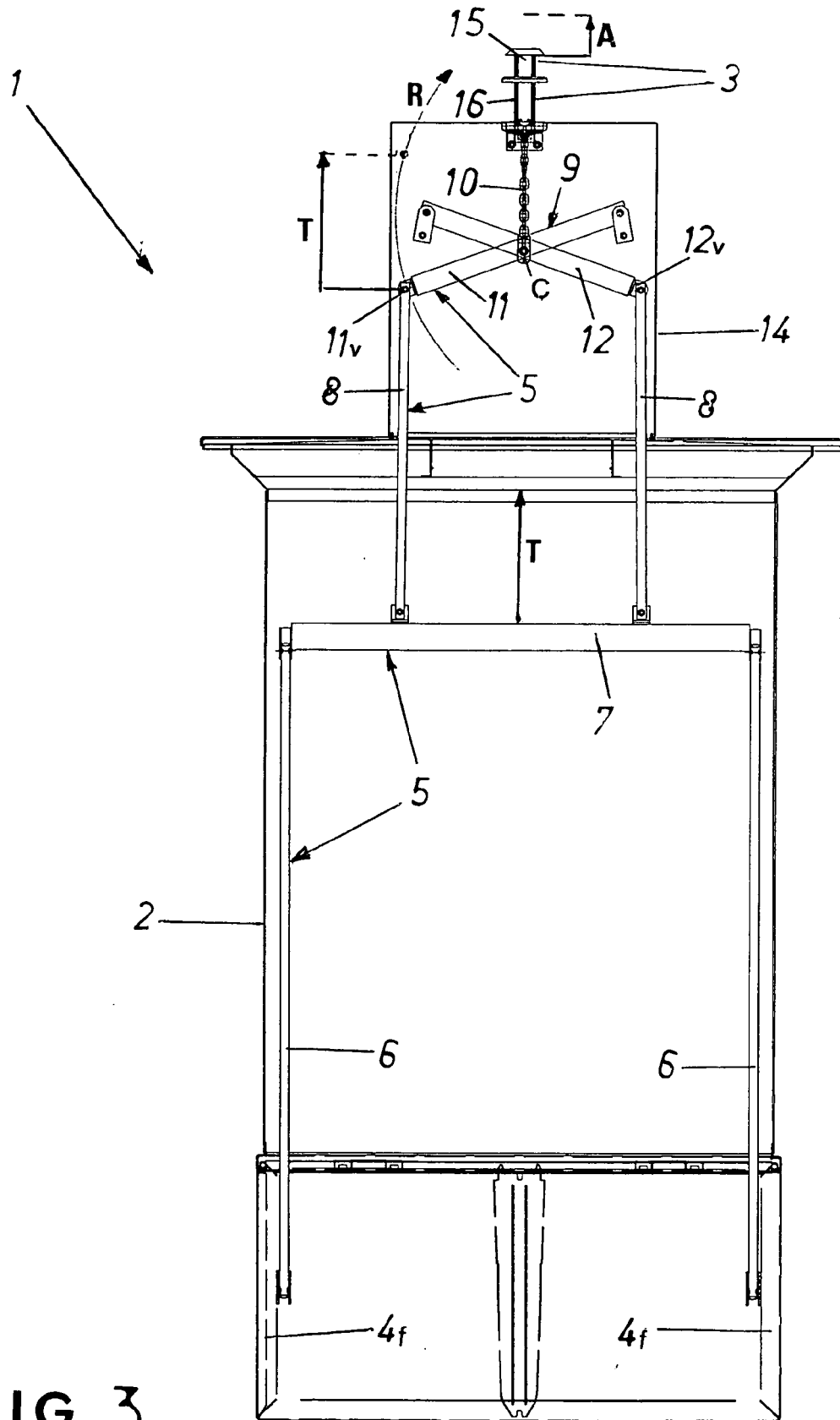


FIG. 3

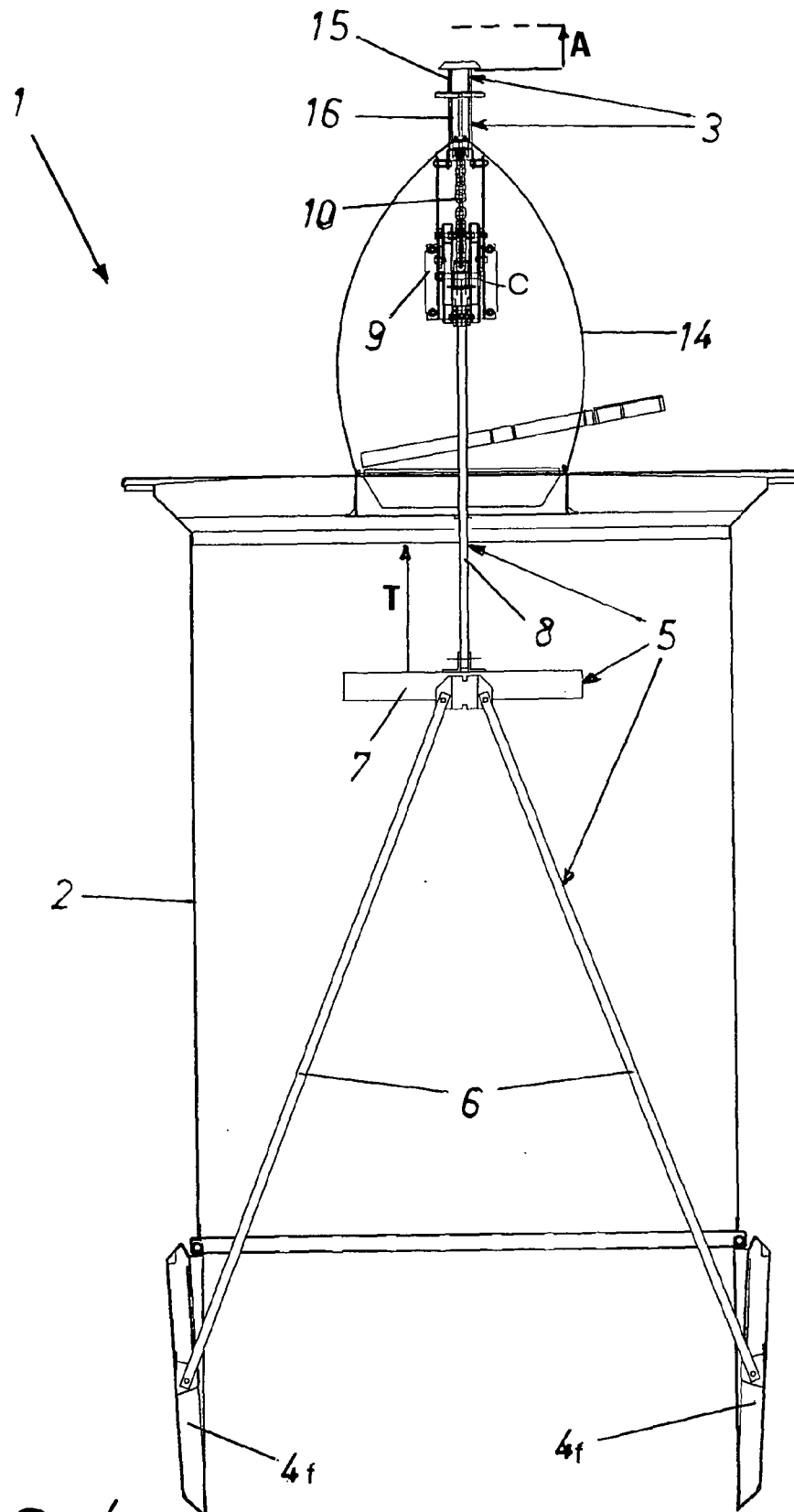


FIG. 4



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Application Number  
EP 05 40 5690

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                    |                                                                                                                                                                  |                                                                                                                                                                                                                                                                                       |                                         |
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| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                                                                  | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                         |

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 05 40 5690

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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23-02-2006

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