(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 085 129 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.03.2001 Bulletin 2001/12

(51) Int Cl.[7]: **E01B 31/00**

(21) Application number: **00810811.0**

(22) Date of filing: **08.09.2000**

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

(30) Priority: **14.09.1999 CH 168099**

(71) Applicant: **Rossi, Piergiorgio**
6512 Giubiasco (CH)

(72) Inventor: **Rossi, Piergiorgio**
6512 Giubiasco (CH)

(74) Representative:
Fiammenghi-Domenighetti, Delfina
Fiammenghi-Fiammenghi,
Via San Gottardo 15
6900 Lugano (CH)

(54) Device for lubrication of the fixing means of the rails of a track

(57) A device (1) for lubrication of the fixing means (8) of the rails (9) of a track (10) is described, said fixing means (8) being arranged on the opposite sides of each rail (9) and having a part (8s) projecting upwards, which device comprises:

- a body (2) containing lubricating fluid;
- one or more bearing members (3,4) which support said body (2) and are capable of moving in contact with the rail (9) when they are pushed by means of propulsion (7);
- two tubes (5,6) extending down at one end into the lubricating fluid contained in said body (2) and terminating at the other end in an ejection nozzle (5u, 6u) which is directed downwards at an angle (α) in relation to the vertical, each of said two tubes (5,6) forming part of a hydraulic system (11) provided with a mechanical pump (12) of the positive-displacement type which conveys the lubricating fluid to said ejection nozzles (5u,6u) and is actuated by a striker member (13), which is articulated on the body (2) and is directed towards the bearing plane (γ) of the rail (9), when the same striker member (13) pushes against said projecting part (8s) of the fixing means (8) on account of the translation of the device (1) along the rail (9).

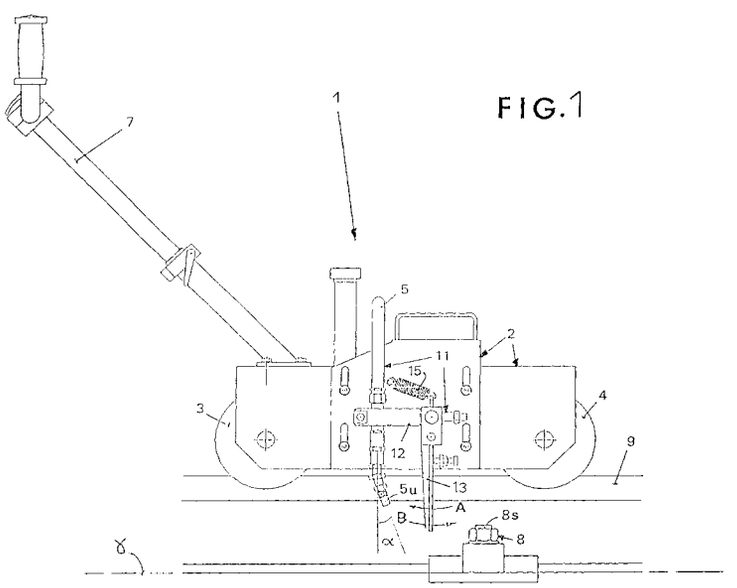


FIG.1

EP 1 085 129 A2

Description

[0001] The present invention relates to the field of technology comprising means which are used for the lubrication of metal members for the purpose of protecting them against corrosion and prolonging their serviceability. In particular, the device according to the invention concerns the specific sector of lubrication of the plurality of elements provided with a projecting part which are arranged at regular intervals along a linear member for which they serve as anchoring, connection and/or jointing means.

[0002] A typical case in which the abovementioned device can be advantageously used is that of lubrication of the fixing means, such as bolts with or without ring nuts, washers or other small parts, which serve for fixing railway tracks on their support sleepers.

[0003] As is known, such bolts are arranged, with their heads projecting upwards, at regular intervals along the entire length of the tracks and are fixed on both bearing sides of each of the two parallel elements (the rails) which form a track. It is periodically necessary to carry out lubrication of the parts of said bolts, such as the head and the threaded shaft, to avoid oxidation reducing the reliability of their fixing with the passing of time and rendering their removal by means of unscrewing problematic and extremely difficult.

[0004] Indeed, the «welding» effect caused by the simultaneous oxidation of the bolt and of the member into which it is screwed is so great that it is often necessary to use expensive, complex equipment specifically designed for the purpose of unscrewing highly oxidized bolts.

[0005] According to the state of the art, the abovementioned lubrication is performed manually by an operative who, while walking along a track, uses a brush to take a lubricating fluid from a bucket containing it and apply it to said bolts.

[0006] It is clear how onerous and time-consuming the operation is: even with the greatest goodwill, a single operative will, in one hour of work, only manage to lubricate the bolts of a track over a section no longer than 400/500 m.

[0007] It is clear how urgent the need is to devise a faster, more reliable system: to this end, the inventor of the present invention has designed a device which, mounted on a rail, can run along the latter, pushed by an operative or by other means, and automatically effect the lubrication of all the fixing bolts that it encounters as it travels along.

[0008] Said device, which in fact forms the subject of the present invention, is described in the precharacterizing clause of the appended Claim 1 and is characterized by the characterizing part of the same claim.

[0009] A preferred exemplary embodiment of the device according to the invention will now be described in greater detail with reference to the appended drawings, in which:

Figure 1 shows a side view of said exemplary embodiment of a device according to the invention;
Figure 2 shows a rear view of the device;
Figure 3 shows a cross section of the body of the device in the part which contains the lubricating fluid, and
Figure 4 shows an enlarged partial cross section of that part of the hydraulic system associated with its positive-displacement mechanical pump.

[0010] Referring first to Figure 1, it can be seen how, in the example in question, the device 1 according to the invention comprises primarily a body 2, also constituting its bearing structure, which contains lubricating fluid 18 in a suitable tank 17 in its interior (see Figure 3).

[0011] Said body is supported by bearing members consisting of two small wheels 3, 4 made of insulating material, although they can also consist of one or more sliding blocks (not shown).

[0012] Said bearing members have a groove 14 which, in the case shown, extends over the entire external contact surface of the small wheels 3, 4 and has a shape which is complementary to that of the rail 8, as can be seen in Figure 2.

[0013] As a result, when the device 1 is supported on a rail 8, it remains to a certain extent «clamped» on the rail, and the possibility of it being derailed is prevented.

[0014] As can be seen in Figure 3, the ends of two tubes 5, 6, which are preferably each provided with a unidirectional valve 21 which prevents the fluid flowing back from the tubes 5, 6 to the tank 17, extend down into said tank 17 containing the lubricating fluid 18.

[0015] Said tubes 5, 6 are bent in a U shape and their other end is terminated by an ejection nozzle 5u, 6u which is directed downwards, that is to say towards the fixing means 8 to be lubricated, with an appropriate inclination α in relation to the vertical, the purposes of which will be defined in the course of the description.

[0016] Each of said two tubes 5, 6 forms part, together with said tank 17, of a hydraulic system 11 provided with a mechanical pump 12 of the positive-displacement type, the pressure piston 19 of which is connected to a striker member, a simple mechanical arm 13 in this case, which is articulated on the body 2 and is directed downwards, that is to say towards the bearing plane of the rail 9.

[0017] Said arm 13 is shaped and dimensioned in such a manner that, during the translation of the device 1 along a rail 9, its free end 131 strikes against those parts 8s of the fixing means 8 of the rail 9 which project upwards in relation to said bearing plane γ, rotating (see arrow A) on account of the impact so as to overcome the obstacle without causing the translation movement of the device 1 to stop or to decelerate appreciably. A counter-spring 15 fixed to the other end of the arm 13 then returns it to its starting position by making it counter-rotate (see arrow B).

[0018] On account of the rotation A of the arm 13 con-

nected to it, the pressure piston 19 of the abovementioned pump 12 (see Figure 4) takes into a chamber 20 a predetermined quantity of lubricating fluid 18 from the tank 17 by means of the respective tube 5 and then, on account of the counter-rotation B, conveys it to the associated nozzle 5n in which the tube 5 terminates towards the outside. (The arrows C show the directions of motion of the pressure piston 19.) According to need, the hydraulic systems can be dimensioned in such a manner that the lubricating fluid 18, leaving the nozzles 5u, 6u at a predetermined pressure, is atomized to the appropriate degree by the latter, increasing its capacity to penetrate even the narrow gaps of the fixing means which is usually a captive bolt 8 as represented in the drawings.

[0019] It is clear that, depending on the geometry of the system and the speed of translation of the device 1 according to the invention, the pumping and ejection operation takes place with a certain advance in relation to the moment at which the ejection nozzle 5u, 6u passes through the vertical of the fixing means 8. The inventor has consequently made provision for the nozzles 5u, 6u, or the terminal length of the tubes 5, 6 connected thereto, to be orientated so as to achieve a predetermined inclination α in relation to the vertical, as can be seen in Fig. 1, which makes it possible to direct the jet towards the point where the fixing means 8 to be lubricated is situated at the moment when ejection of the fluid takes place.

[0020] To this end, it is possible to employ one of the known systems, such as, for example, the use of a number of articulated parts to form the terminal length of the tubes 5, 6 ending in the nozzles 5u, 6u.

[0021] In order to operate, the device 1 according to the invention must, as mentioned, be made to move on its bearing members 3, 4 along the rail 9, the fixing means 8 of which are to be lubricated. To this end, the inventor has made provision to equip the device 1 with handlebars 7 which can be held and manoeuvred with ease by an operative following the course of the rail 9 on foot. This is considered to be the most practical and economical system but, in other embodiments, the device can be made to move by a railway carriage or by a locomotive connected to it by an appropriate frame (not shown because it is easy to imagine and to put into effect), or can generate its own motion by means of a DC electric motor powered by batteries, which is secured with these on the body 2 of the device 1. (This case is not shown either for reasons similar to those in the preceding case.)

[0022] The examples described and mentioned thus far clearly do not represent all the embodiments an expert in the field can produce in various ways while remaining within the scope of the teachings contained in the appended claims.

[0023] The device according to the invention affords an effective means of easily carrying out the periodic lubrication of sections of railway line, reducing the effort and the danger involved for the operatives performing the work, appreciably increasing the functionality and the reliability of the result, and moreover allowing a considerable saving on the quantity of lubricating fluid used.

Claims

1. Device (1) for lubrication of the fixing means (8) of the rails (9) of a track (10), said fixing means (8) being arranged on the opposite sides of each rail (9) and having a part (8s) projecting upwards in relation to the fixing plane (γ), characterized in that it comprises:

   - a body (2) containing lubricating fluid in its interior;
   - one or more bearing members (3, 4) which support said body (2) and are capable of moving in contact with the rail (9) when they are pushed by means of propulsion (7);
   - two tubes (5, 6) extending down at one end into the lubricating fluid contained within said body (2) and terminating at the other end in an ejection nozzle (5u, 6u) which is directed downwards at an angle (α) in relation to the vertical, each of said two tubes (5, 6) forming part of a hydraulic system (11) provided with a mechanical pump (12) of the positive-displacement type which conveys the lubricating fluid (18) to said ejection nozzles (5u, 6u) and is actuated by a striker member (13), which is articulated on the body (2) and is directed towards the bearing plane (γ) of the rail (9), when the same striker member (13) pushes against said projecting part (8s) of the fixing means (8) on account of the translation of the device (1) along the rail (9).

2. Device according to Claim 1, in which said bearing members consist of at least two small wheels (3, 4), over the entire extent of the outermost surface of which a groove (14) is formed, the shape of which is complementary to that of the rail (9) on which said small wheels (3, 4) are supported.

3. Device according to Claim 1, in which said bearing members consist of one or more blocks resting on a rail (9) by means of grooves which extend over the entire contact surface and have a shape which is complementary to that of the rail (9).

4. Device according to one of the preceding claims, in which said means of propulsion which are capable of moving said bearing members (3, 4) move by pushing them consist of manually operable handlebars (7) connected to the device (1).

5. Device according to one of Claims 1 to 3, in which said means of propulsion which are capable of moving said bearing members move by pushing them consist of a frame which is capable of connecting the device to a carriage or to a railway locomotive.

6. Device according to Claim 2, in which said means of propulsion consist of an electric motor mounted integrally on said body (2) and powered by batteries fixed to the body (2).

7. Device according to one of the preceding claims, in which said striker member which projects downwards and actuates said mechanical pump (12) is an arm (13) connected to its pressure piston (19) and articulated on the body (2) of the device (1), which arm is shaped and dimensioned in such a manner that, during the translation of the device (1), the free end (13) of the arm strikes against said projecting part (8s) of the fixing means (8), being made to rotate by said part, and, after having passed said part, the arm returns to its starting position by counter-rotating by virtue of the action of a counter-spring (15), said rotation and counter-rotation bringing about respectively the intake of lubricating fluid contained in the body (2) and its ejection through said nozzles (5u, 6u).

FIG.1

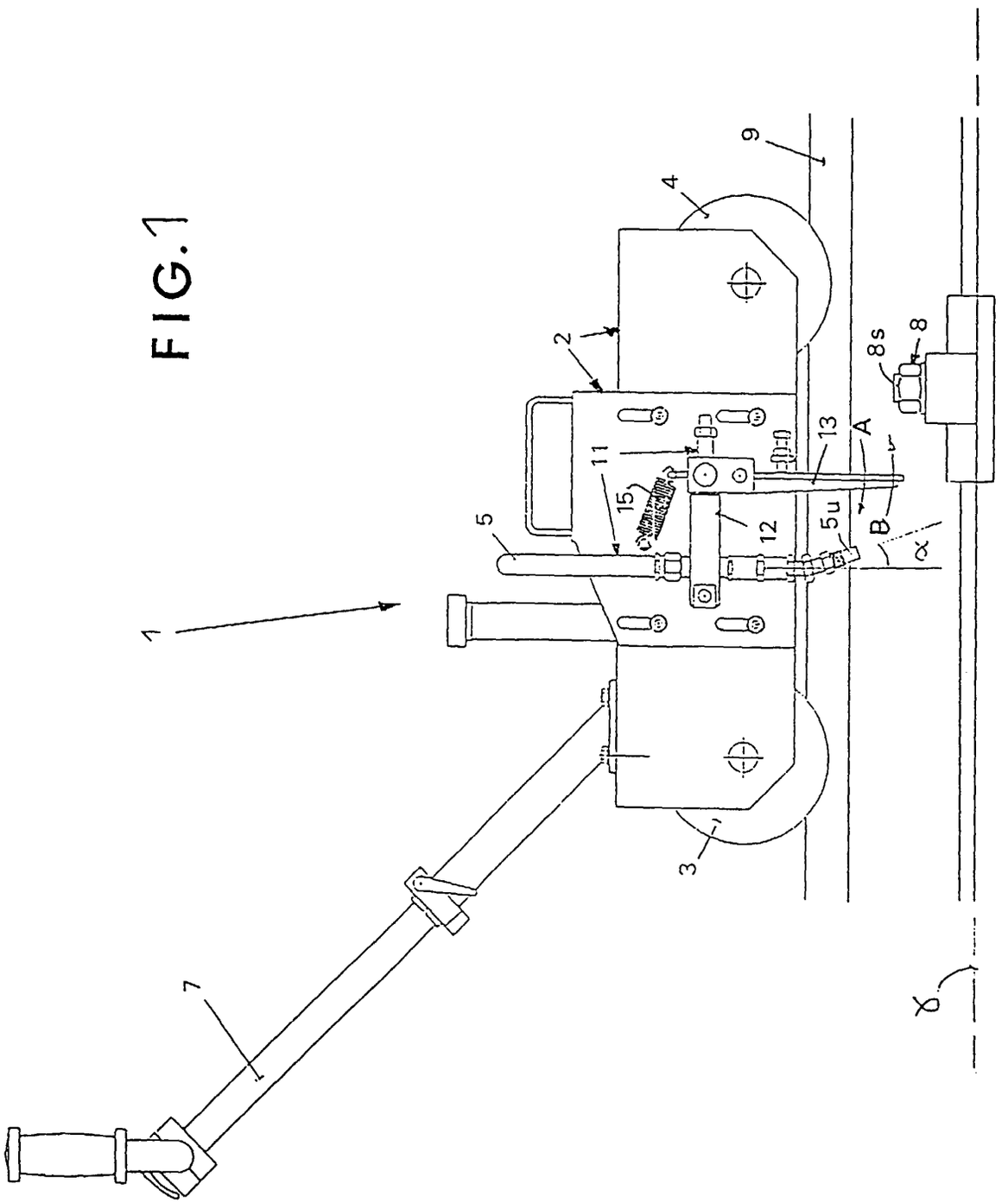
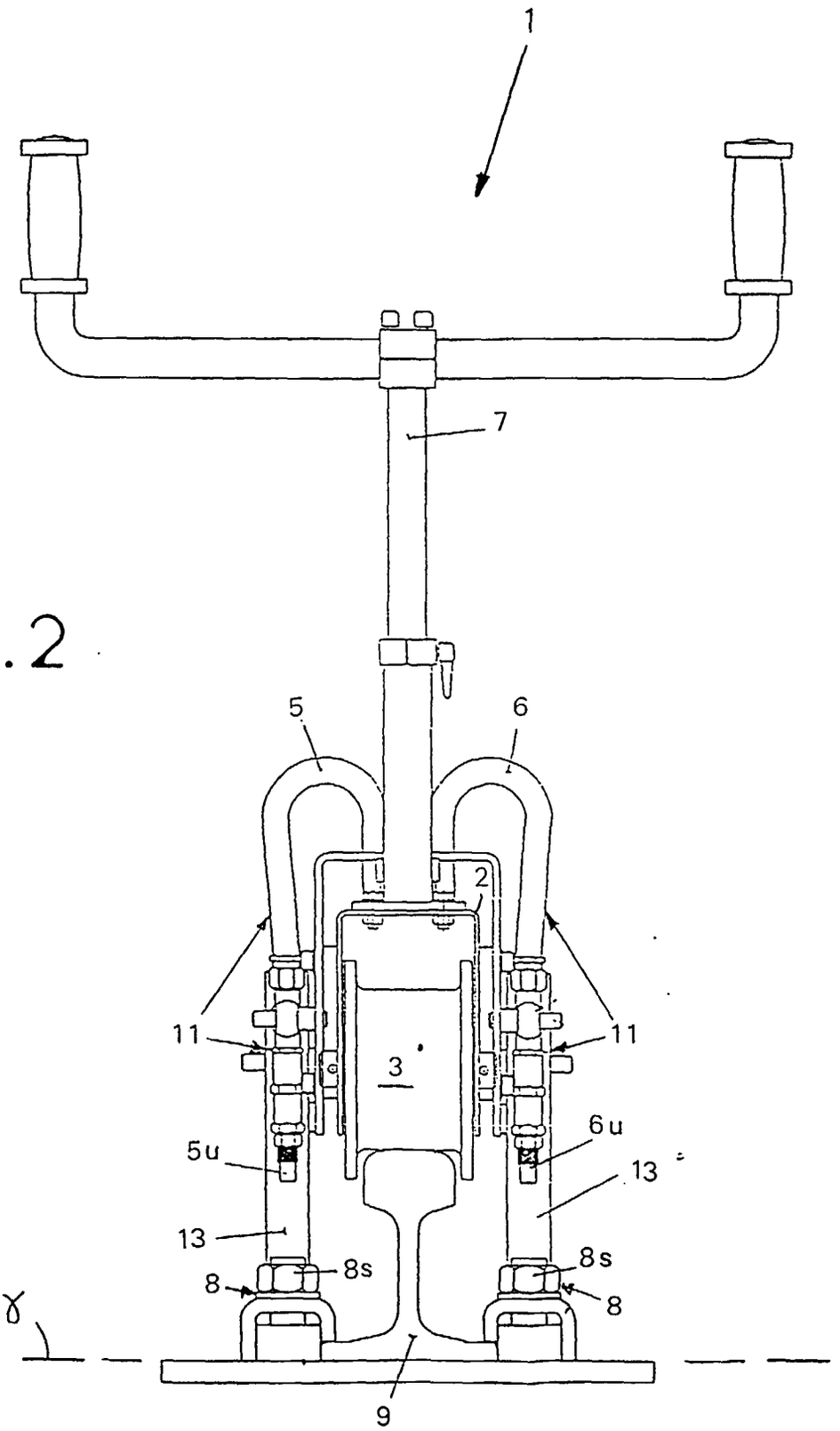


FIG.2



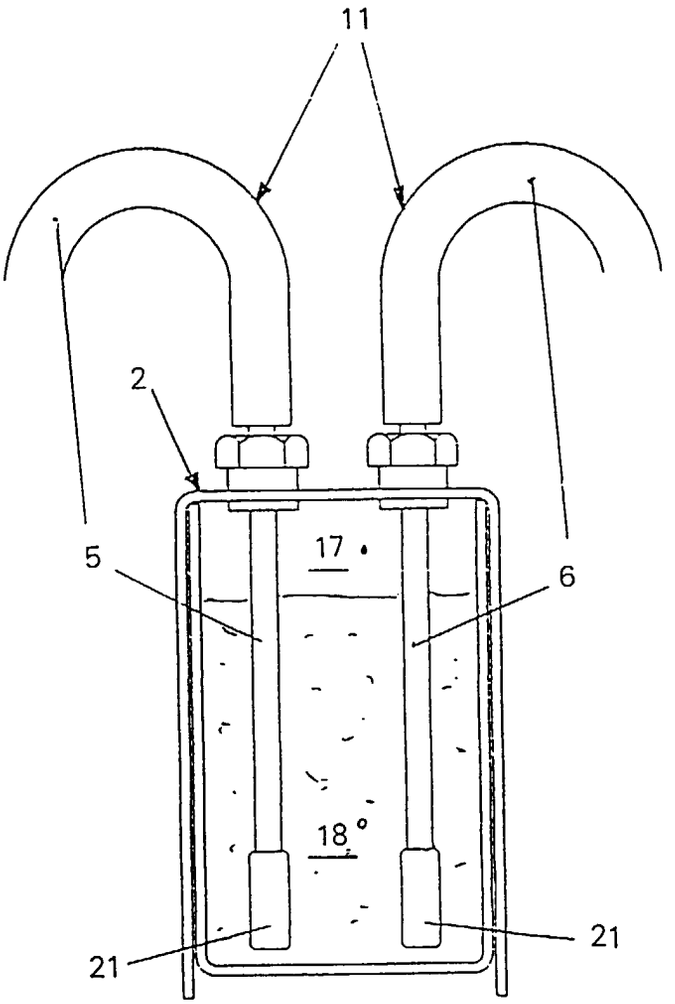


FIG.3

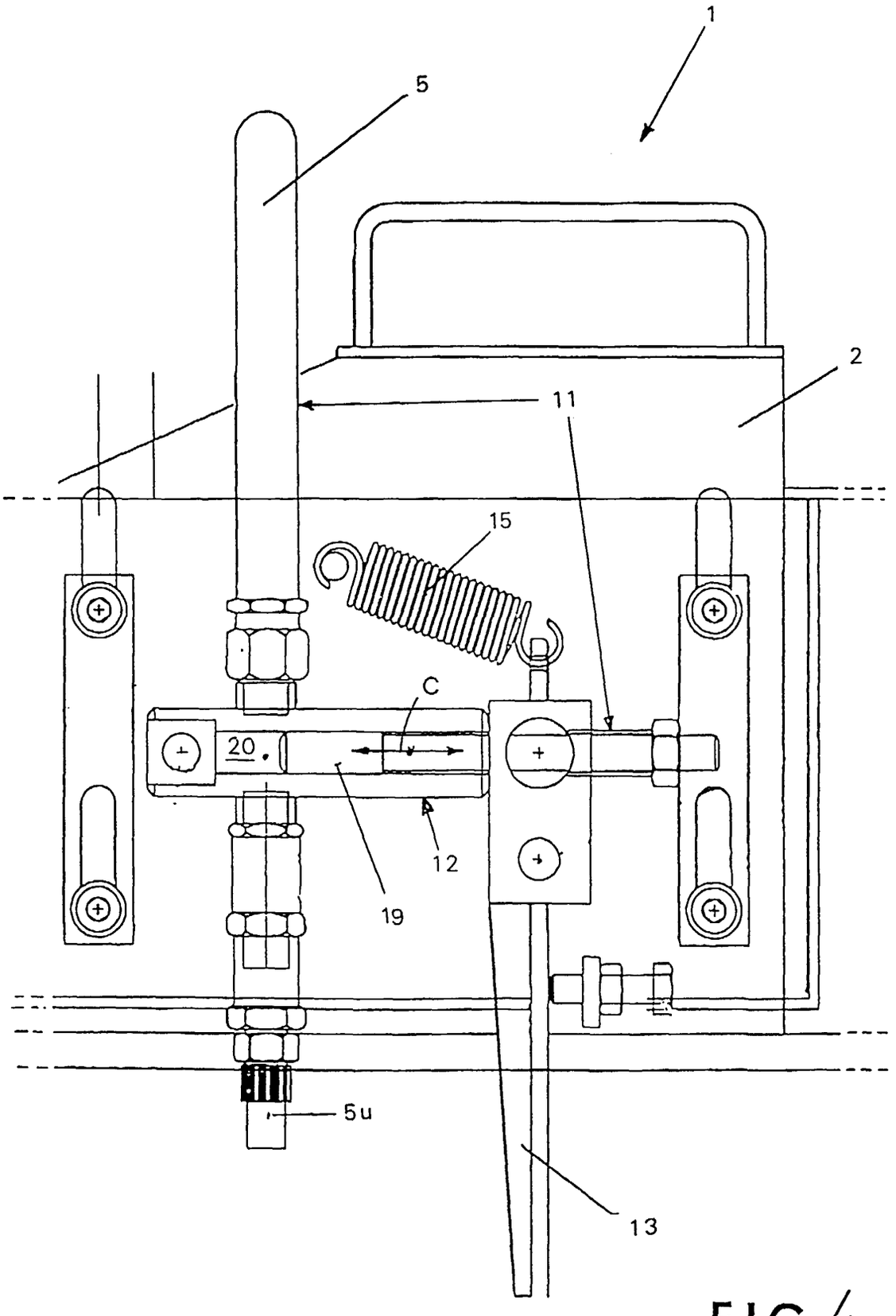


FIG.4