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Discharge fitting for a flushing cistern

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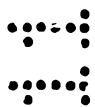
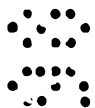
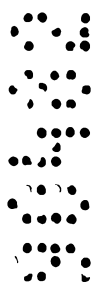
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Abstract

Discharge fitting for a flushing cistern

In the case of a discharge fitting for a flushing cistern, comprising a bottom valve, an overflow pipe with a bottom valve closing element, a lifting device to open the bottom valve and a device to retain the bottom valve in the open position during the discharging process, for a compact construction it is suggested to arrange the lifting device essentially in the overflow pipe and to provide a snap-in device, controlled by a float, to keep open the bottom valve during the discharging process.



AUSTRALIA

Patents Act 1990

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SANITAERARMATUREN GMBH

ORIGINAL

COMPLETE SPECIFICATION
STANDARD PATENT

Invention Title:

Discharge fitting for a flushing cistern

The following statement is a full description of this invention
including the best method of performing it known to us:-

Title of the Invention

Discharge fitting for a flushing cistern

Technical Field

- 5 The invention concerns a discharge fitting for a flushing cistern, comprising a bottom valve, an overflow pipe with a bottom valve closing element, a lifting device to open the bottom valve and a device to retain the bottom valve in the open position during the discharging process.

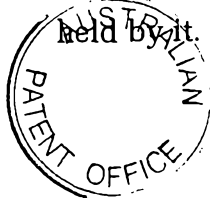
10 Background to the Invention

- Such devices are known wherein, as a rule, after a manually activated opening the overflow pipe with the bottom valve closing element is held in the open position by a float during the discharging process. In this case the lifting mechanism, as a rule, is provided on the outside, around the overflow
15 pipe.

An advantage of the invention is to produce a compact lifting device for a discharge valve, which can be activated by a push button.

Summary of the Invention

- 20 The invention may provide a discharge fitting for a flushing cistern, comprising
a bottom valve,
an overflow pipe with a bottom valve closing element,
a lifting device to open the bottom valve and a device to retain the
25 bottom valve in the open position during the discharging process,
characterised in that the lifting device is arranged essentially in the overflow pipe and that a snap-in device, controlled by a float, is provided to keep open the bottom valve during the discharging process, and
characterised in that the bottom valve has a collar with a larger
30 diameter which protrudes into the flushing cistern and has water inlet slots, on the face of which collar a bottom plate with a guide bush for the overflow pipe is provided, while on that face of the bottom valve closing element which is averted from the bottom valve a snap-in catch is formed parallel to the central axis of the overflow pipe, which catch in the open position of the
35 bottom valve engages the snap-in device provided on the bottom plate and is



Other features of the invention are: the space-saving arrangement of the lifting device, which makes a movement of the overflow pipe feasible, which is basically tilting-moment free and has consequently low friction, for the activation of the bottom valve. Moreover, the lifting device, provided

5 essentially in the overflow pipe, will not be exposed continuously to flushing water, so that an undesirable calcification will be avoided to a great extent. In addition, the construction according to the invention makes any rotated position of the discharge fitting in the flushing cistern possible. It can be adapted to suit various flushing cisterns by a simple lengthening of the

10 overflow pipe and of the holding tube together with the rod.

Brief Description of the Drawings

An embodiment of the invention is illustrated in the drawing and is described in detail in the following. They show in:

15 Fig. 1 - a schematically illustrated flushing cistern with the discharge fitting, longitudinally sectioned, wherein the discharge valve is situated in the closed position and the flushing cistern is filled with water;

Fig. 2 - the flushing cistern shown in Fig. 1 with a pushed in push button and opened bottom valve;

20 Fig. 3 - a portion of the overflow pipe illustrated in Fig. 2, in enlarged illustration;

Fig. 4 - the flushing cistern illustrated in Fig. 2, with the lifting device returned;

25 Fig. 5 - the overflow pipe shown in Fig. 1, with the bottom valve closing element, in enlarged illustration;

Fig. 6 - the bottom valve shown in Fig. 1, in enlarged illustration;

Fig. 7 - top view of the bottom valve shown in Fig. 6;

Fig. 8 - the lifting device shown in Fig. 1 without the push button, in enlarged illustration;

30 Fig. 9 - the support body of the lifting mechanism shown in Fig. 8;

Fig. 10 - the support body shown in Fig. 9, rotated by 90°;



Fig.11 - the support body shown in Fig.9, in the sectioning plane XI;

Fig.12 - the push rod shown in Fig.8 in enlarged illustration, in the sectioning plane XII of Fig.13;

Fig.13 - the push rod shown in Fig.12, in side view, rotated by 90° ;

Fig.14 - the conrod-like bracket shown in Fig.8, in the sectioning plane XIV of Fig.15;

Fig.15 - the bracket shown in Fig.14, in side view, rotated by 90° ;

Fig.16 - the two-armed lever shown in Fig.8, in enlarged illustration, in side view;

Fig.17 - the lever shown in Fig.16, in the sectioning plane XVII;

Fig.18 - the claw-arm construction shown in Fig.8, in side view;

Fig.19 - the construction shown in Fig.18, in top view;

Fig.20 - the bottom plate shown in Fig.1 with guide bush, in enlarged illustration;

Fig.21 - the bottom plate shown in Fig.20, in top view;

Fig.22 - the float shown in Fig.1, rotated by 90° , in side view, in enlarged illustration;

Fig.23 - the float shown in Fig.22, in the sectioning plane XXIII;

Fig.24 - the float shown in Fig.23, in top view.

In the embodiment illustrated in the drawing a flushing cistern 1 is illustrated schematically, while the water supply device is not shown. At the bottom region of the discharge fitting a bottom valve 2 is formed, which with an outlet socket 20 passes through the bottom of the flushing cistern 1 and braces it in a sealed manner. The bottom valve 2 is constructed in the flushing cistern 1 with a collar 21 having a larger diameter, in which collar water inlet slots 210 are provided, as this can be seen in particular in Fig.6 of the drawing. In the interior of the outlet socket 20 a hub 201 is formed on two opposite situated ribs 200. A central bore 2010 is formed in the hub 201, the bore being radially extended by two slots 2011 which are diametrically opposed. Offset relative to the slots 2011 by approx. 45°, there are two diametrically opposed circular section-like cut-outs 2012 moulded in the hub 201. The hub 201 serves the purpose of supporting a lifting device 4 for an overflow pipe 3 with the closing element 31 for the bottom valve 2.

The overflow pipe 3, as this can be seen particularly in Fig.5, has a continuous inside bead 30 as a rest for the claws 40 formed on the lifting device 4. On the bottom end region of the overflow pipe 3 a flange-like widened closing element 31 is formed, on the rear side of which, parallel to the central axis of the overflow pipe 3, a snap-in catch 310 is formed at a distance from the closing element 31. Below the closing element 31 an elastic sealing ring 32 is arranged and held by a support ring 33 which can be screwed into the overflow pipe 3.

The lifting device 4 is provided basically coaxially in the overflow pipe 3, as this can be seen particularly in Figs.1, 2 and 4. The lifting device 4 is held on the one hand with its support body 43 in the bore 2010 of the hub 201, wherein for the purpose of axial securing an additional locking takes place by introducing two diametrically opposing flexible lugs 42 formed on the support body 43 into the cut-outs 2012. On this occasion first of all the region with the flexible lugs 42 is fully passed through the slots 2011 and after a rotation by approx.

45° the lugs 42 are locked in the cut-outs 2012. On the opposite situated side of the support body 43 a sleeve 430 is formed, in which a pipe 44 is provided, which by means of a thread acts as a tie rod, while on the opposite end of the pipe a guide housing 410 for a push-button 41 is provided for the activation of the lifting device 4. The push-button 41, which can be axially displaced in the guide housing 410, is connected with a push rod 45 which can be axially displaced in the support body 43 by means of a rod 411.

The push rod 45 is pressed by a spring 450 in the direction of the rod 411 and, as this can be seen particularly from Figs.12 and 13, has laterally protruding stop lugs 452 and is guided with a guide-head 453 in the pipe 44. The spring 450 is accommodated on the one hand by a protrusion 454 on the push rod 45 and is resting on the support body 43 on the other. For a good mounting of the rod 411 the guide head 453 has a depression 4530 on its face. In addition, the push rod 45 has a transverse bore 451, into which on both sides a conrod-like bracket 47 with a spigot 472, having axial securing, can be snapped in. At the other end of the bracket 47 an eyelet bearing 470 is formed with a radial slot 471. The eyelet bearings 470 are snapped onto a spigot 460 of the levers 46. The levers 46 have a two-armed construction and with their pivot bearings are snapped onto a spigot 432 each in such a manner that they can pivot, as this can be seen particularly from Fig.10 of the drawing. At the other end of both levers 46 a protrusion 401 of a claw 40, on which protrusions an eyelet 470 having a radial slot 471 is formed, is snapped onto both spigots 460, as this can be seen particularly from Fig.1 and Figs.18 to 19. The two claws 40 are made integrally and joined by means of two roughly annular spring elements 402. So that no damages would occur in the lifting device 4 resulting from an impact-like activation of the push-button 41, a flat spring construction 473 is provided additionally on the conrod-like bracket 47 between the eyelet bearing 470 and the spigot 472, by which the impact-like activations are absorbed without getting damaged.

In an appropriate manner the lifting device 4 can be pre-assembled as a sub-assembly, as this is illustrated in Fig.8. In this case cut-outs 433 are provided in the support body 43 attaching the brackets 47 and a cut-out 434 for the purpose of accommodating the spring elements 402.

At the bottom region of the support body 43 a plate-shaped disc 48 is formed, which interacts with the inside wall of the support ring 33 in such a manner that in the open position of the overflow pipe 3 the water inlet is closed from below or choked so strongly that the mechanism of the lifting device 4 will not be acted upon by the flushing water. In addition, the support body 43 has protective ribs 435 to protect the lifting mechanism during the mounting or dismantling of the overflow pipe 3.

Concentric with the overflow pipe 3 a snap-in device 5 for the overflow pipe 3 is provided on the collar 21 in the open position of the bottom valve 2. On this occasion a bottom plate 51 with a guide bush 510 for the overflow pipe 3 is provided, which overflow pipe is surrounded on the outside by an annular jacket 52 of a cap. In the annular jacket 52 an approximately semi-circular float 50 is provided in bearings 511 on the bottom plate 51, as this can be seen in particular in Figs.22 to 24. The float 50 is held pivotably in the bearings 511 by means of the pivot pins 501. On the inside the float 50 has a latch 500, which is so arranged and constructed that in the position of upward flow, as this is shown in Figs.1, 2 and 4, it retains the snap-in catch 310 in the open position of the bottom valve 2 and in the horizontal position releases the snap-in catch 310.

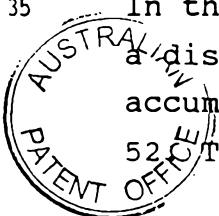
To prevent a rotation relative to each other, on the external jacket of the overflow pipe 3 radially protruding ribs 34 are formed, which engage the corresponding recesses 514[sic] on the guide bush 510 and thus assure a rotation-free axial movement of the overflow pipe 3.

The discharge fitting for a flushing cistern described above operates as follows:

5 The flushing cistern 1 is filled with water up to a level 10 via a float-controlled valve (not illustrated).

When a flushing process is initiated, the user presses the push-button 41 into the position shown in Fig.2. By virtue of this the push rod 45 is pushed into the support body 43 against the force of the spring 450, so that both brackets 47 will pivot both levers 46 about the spigots 432, by virtue of which the protrusions 401 with the claws 40 are axially displaced and consequently come to rest on the inner bead 30 and lift the overflow pipe with the bottom valve closing element 31 off the bottom valve 2 and release the water stored in the flushing cistern. On this occasion the snap-in catch 310 moves through an opening 512 in the bottom 51 towards the latch 500 of the float, where it snaps in against the lifting force of the float 50. In this case an accelerated restoration of the float 50 into its snapped-in position takes place by lateral ribs formed below the snap-in catch 310, which ribs abut against the underside of the latch 500. The snap-in catch 310 is held in this snapped-in position by the latch 500 until the water stored between the annular jacket 52 and the guide bush 501[sic] flows away, so that the float 50 returns to the horizontal position and the latch 500 releases the snap-in catch 310. Afterwards, due to gravity, the bottom valve 2 will be closed again by the overflow pipe 3 with the closing element 31. Subsequently, the water will be brought into the flushing cistern 1 by the float valve (not illustrated in the drawing) to the filling level 10 again, so that a new flushing process can be initiated by activating the push-button 41.

35 In the region of the bottom plate 51, in the annular jacket 52 a discharge slot 520 is provided for the discharge of the water accumulated between the guide bush 510 and the annular jacket 52. To adjust the discharged quantity per unit of time an



adjustable choke in the shape of a rotary valve 513 is provided on the discharge slot 520. By changing the cross-section of the discharge slot 520, a change can be achieved in the time of the closing of the bottom valve 2, so that the quantity of flushing water to be discharged or the quantity of water to remain in the flushing cistern can be determined.

Instead of the lever arrangement for the reversal of the setting movement by means of the push-button 41 shown in the embodiment, the reversal of the effective direction can be carried out by means of a pneumatic or hydraulic device and transferred to the claws. Instead of the claws internal teeth in the overflow pipe can also be formed, which can be engaged by one or several gears for the purpose activation.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A discharge fitting for a flushing cistern, comprising
a bottom valve,
an overflow pipe with a bottom valve closing element,
5 a lifting device to open the bottom valve and a device to retain the
bottom valve in the open position during the discharging process,
characterised in that the lifting device is arranged essentially in the
overflow pipe and that a snap-in device, controlled by a float, is provided to
keep open the bottom valve during the discharging process, and
10 characterised in that the bottom valve has a collar with a larger
diameter which protrudes into the flushing cistern and has water inlet slots,
on the face of which collar a bottom plate with a guide bush for the overflow
pipe is provided, while on that face of the bottom valve closing element
which is averted from the bottom valve a snap-in catch is formed parallel to
15 the central axis of the overflow pipe, which catch in the open position of the
bottom valve engages the snap-in device provided on the bottom plate and is
held by it.
2. A discharge fitting according to claim 1, characterised in that the lifting
20 device is held concentrically in the outlet socket of the bottom valve and it
has two claws situated opposite each other, which claws can engage an inside
bead of the overflow pipe, wherein for the activation of the flushing a push-
button is provided on the upper side of the flushing cistern and the setting
movement of the push-button is reversed by the lifting device into the
25 effective direction.
3. A discharge fitting according to claim 2, characterised in that on the
bottom plate a semi-circular float, unilaterally mounted around the overflow
pipe, is provided as snap-in device, on which float a latch is formed, which
30 accommodates the snap-in catch in the open position of the bottom valve,
while the float is so arranged that when it immerses into the flushing water it
occupies an inclined position due to the lifting force and engages the latch
behind the snap-in catch when the overflow pipe is raised, whereas during
the rising from the flushing water due to the gravity the float returns to the
35 horizontal position and releases the snap-in catch, so that the bottom valve
falls back into the closed position by virtue of the gravity.



4. A discharge fitting according to any one of the claims 2 and 3, characterised in that in the outlet socket a hub, held on ribs is formed, the hub having a central bore with radially opposed slots, which slots widen the bore, while opposite situated circular section-like cut-outs are provided
 5 which are offset relative to the slots by approx. 45°, and that the lifting device has an extension on which opposite situated flexible lugs are formed, and this extension can be pushed through the bore and the slots and following a rotation by approx. 45° the lugs can be snapped into the cut-outs, so that a detachable axial securing is formed.

10

5. A discharge fitting according to claim 4, characterised in that the lifting device in that end region which is situated opposite the extension has a sleeve through which the setting movement for the bottom valve is introduced.

15

6. A discharge fitting according to claim 5, characterised in that to the sleeve a pipe, acting as a tie rod, is connected, and at the other end of the pipe, in the cover region of the flushing cistern, a guide housing is provided for a push-button.

20

7. A discharge fitting according to claim 5 or 6, characterised in that concentrically with the sleeve a guide for a push rod is provided for the introduction of the setting movement, which push rod is pressed by a spring supported in the lifting device against the face of a rod connected with the
 25 push-button.

8. A discharge fitting according to claim 7, characterised in that the reversing of the setting movement is carried out with the aid of two opposite situated two-armed levers which can pivot, axially secured, on spigots
 30 provided on a support body of the lifting device, which levers are connected on the one hand with the push rod via a conrod-like bracket and with an end region of protrusions of the claws on the other.

9. A discharge fitting according to claim 8, characterised in that the two
 35 claws are made integrally, wherein the two claws are joined by means of radially acting annular spring elements.



10. A discharge fitting according to claim 8 or 9, characterised in that the levers have spigots at their end regions, onto which spigots a bracket or claw, each having an eyelet bearing with radial slot, can be snapped on in a hinged
5 manner.

11. A discharge fitting according to any one of claims 7 to 10, characterised in that the brackets are hinged to the push rod in a transverse bore, each bracket with a spigot having axial securing, while for the axial securing
10 corresponding cut-outs are provided in the support body.

12. A discharge fitting according to claim 11, characterised in that the brackets have a flat spring construction in the region between the spigots and the eyelet bearings, these spring constructions absorbing the hard activating
15 impacts without getting damaged.

13. A discharge fitting according to any one of claims 7 to 12, characterised in that the push rod is provided with radially protruding stop lugs which limit an axial restoring by the spring, wherein in the top end region a larger
20 cylindrical guide head and in the bottom end a protrusion to accommodate the spring is provided.

14. A discharge fitting according to at least one of claims 6 to 13, characterised in that the push rod with the guide head is guided in the pipe
25 and on its face has a depression in which the face of the rod is supported.

15. A discharge fitting according to at least one of claims 6 to 14, characterised in that in the bottom region of the lifting device a plate-shaped disc and in the bottom region of the overflow pipe a support ring with a
30 reducing inside diameter is provided, wherein the plate-shaped disc is so arranged and its outside diameter is so designed that in the case of an open bottom valve the overflow pipe is essentially closed by the plate-shaped disc in the region of the support ring and during the discharging process basically no flushing water can rise in the overflow pipe.

35



16. A discharge fitting according to at least one of claims 1 to 15,
characterised in that together with the bottom plate an annular jacket is
provided on the collar concentrically with the guide bush, while in the
annular jacket a discharge slot is provided in the region of the bottom plate
5 for the water accumulated in the annular space formed by the annular jacket
and the guide bush, the flow-through cross-section of the discharge slot being
adjustable by a choke constructed as a rotary valve.
17. A discharge fitting substantially as described herein with reference to
10 the drawings.

Dated this eleventh day of January 2002

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SANITARARMATUREN GMBH
Patent Attorneys for the Applicant:

F B RICE & CO



Fig.1

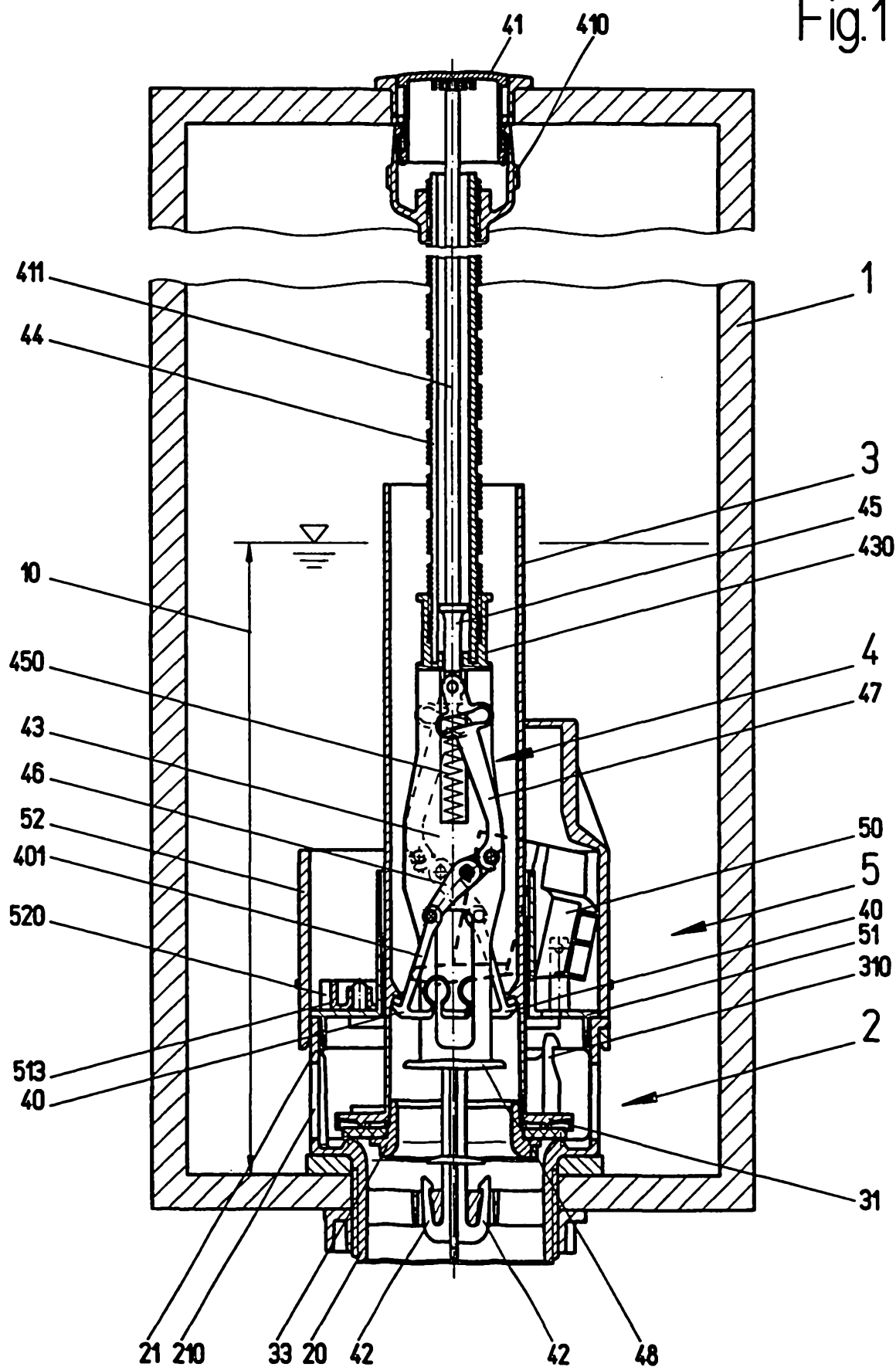


Fig. 2

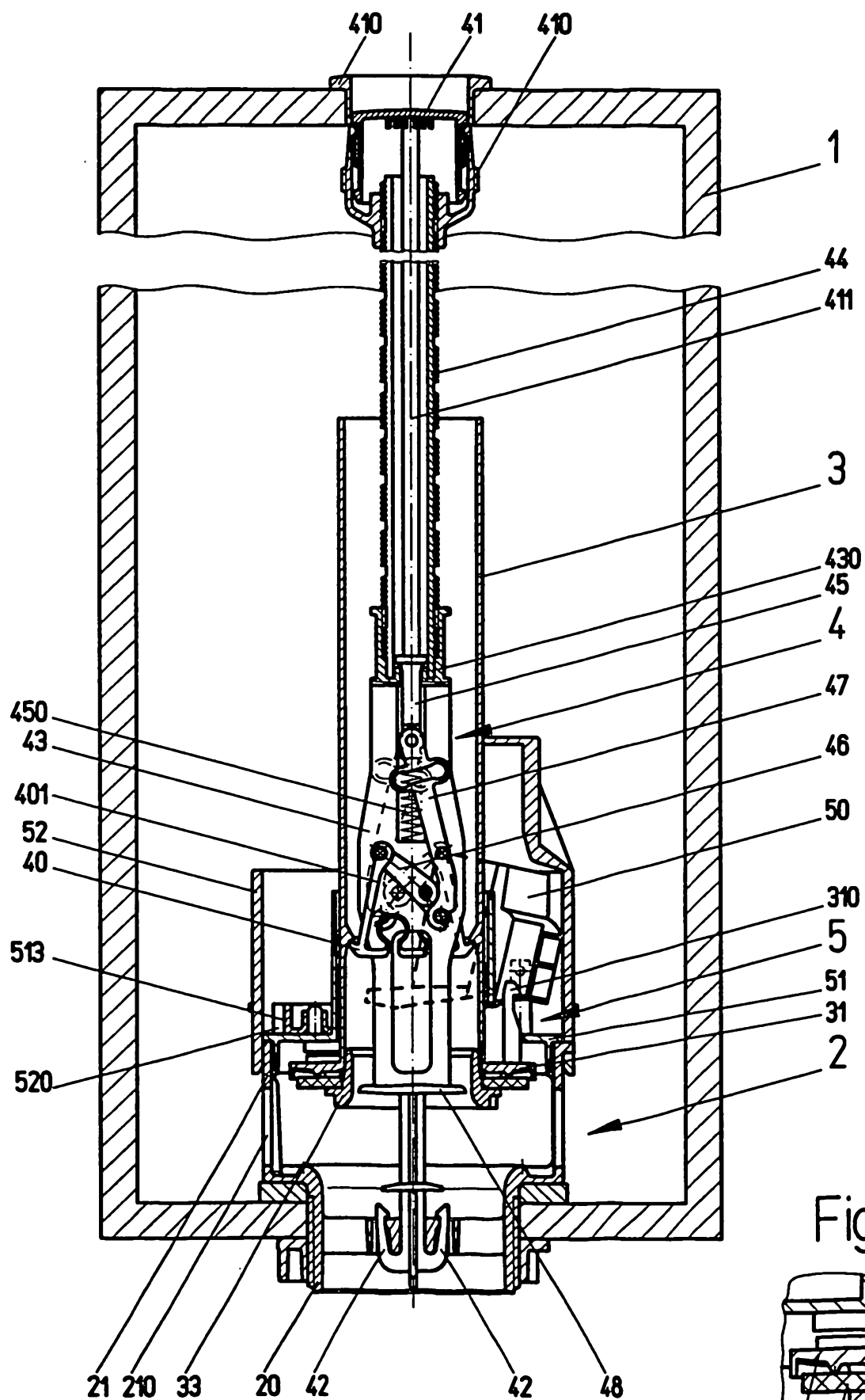
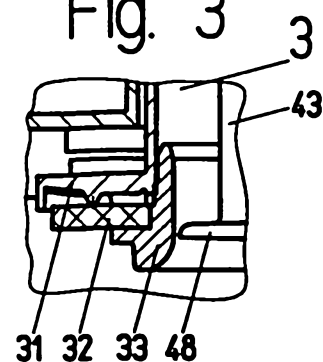


Fig. 3



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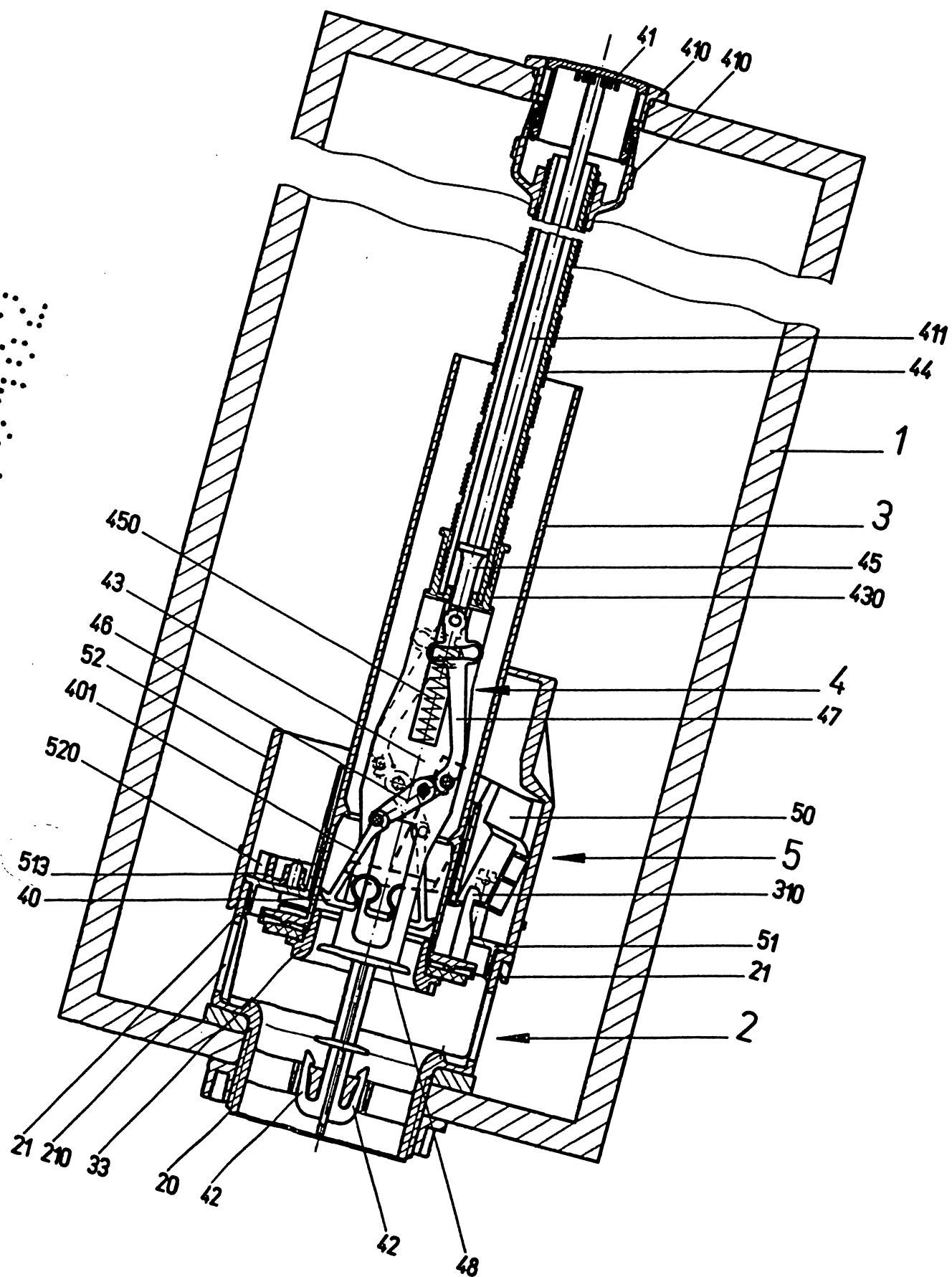
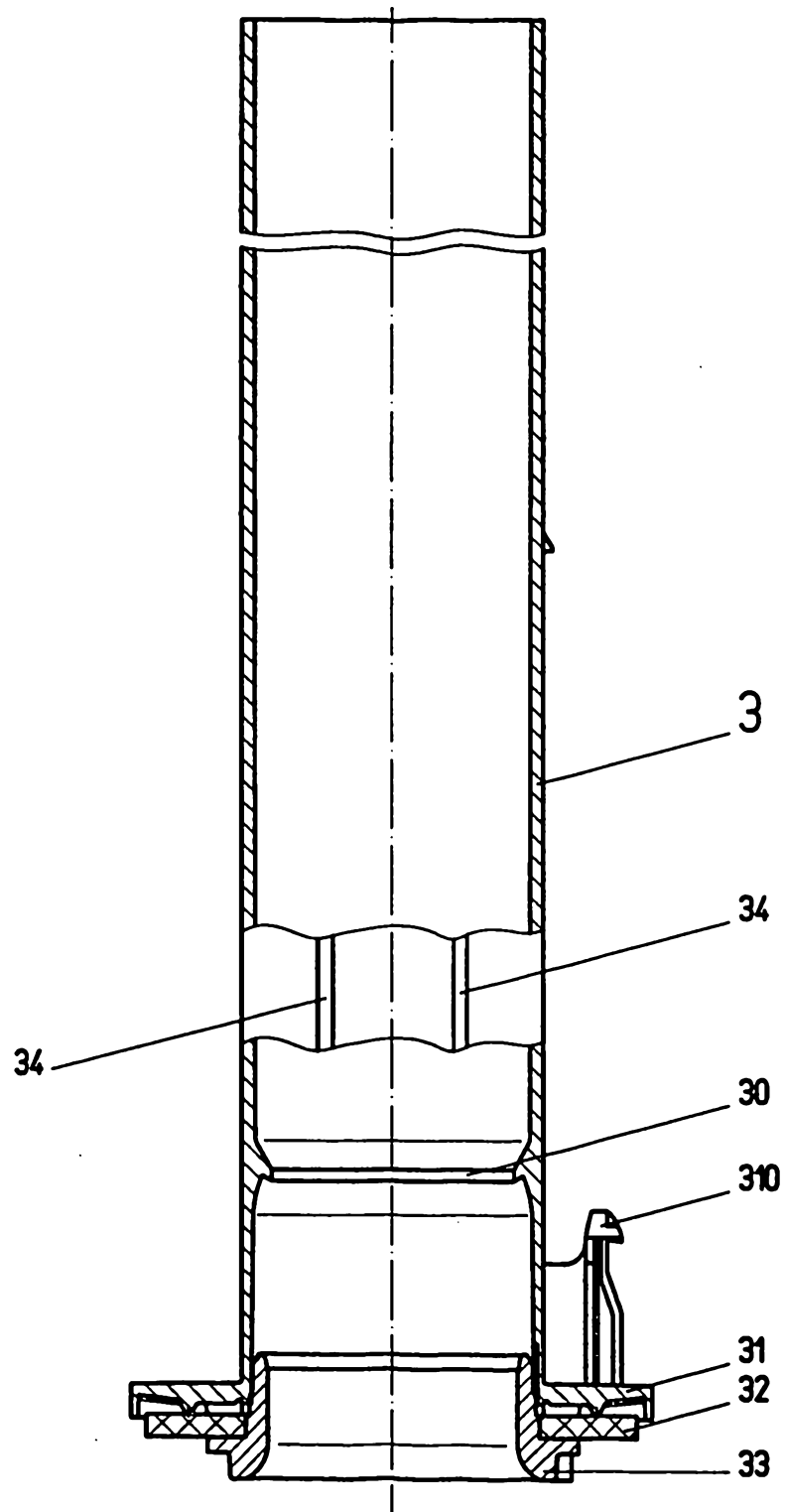


Fig. 5



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Fig. 6

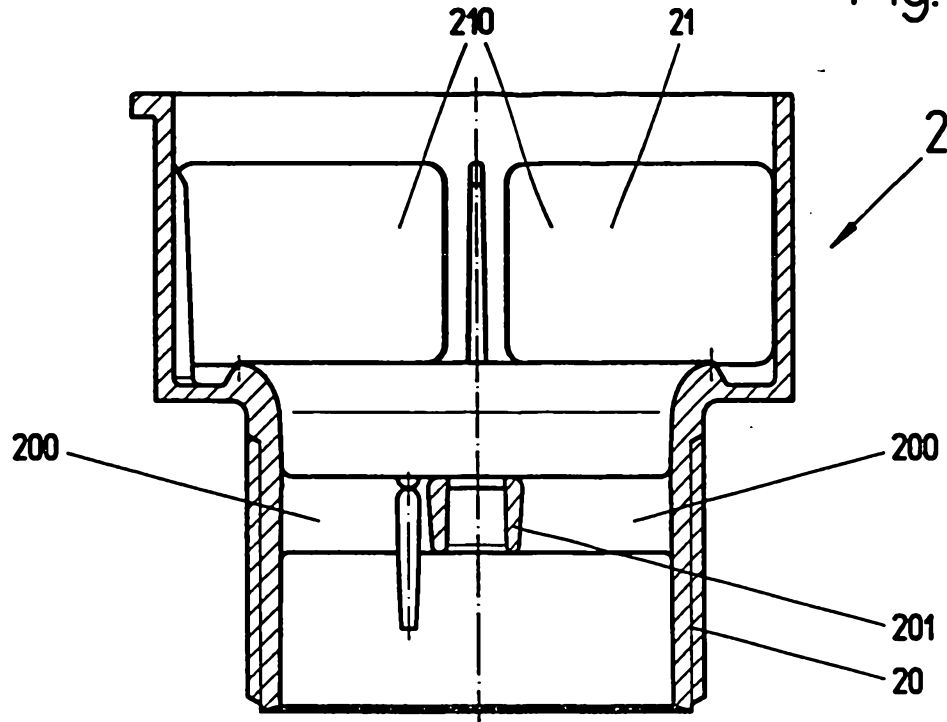
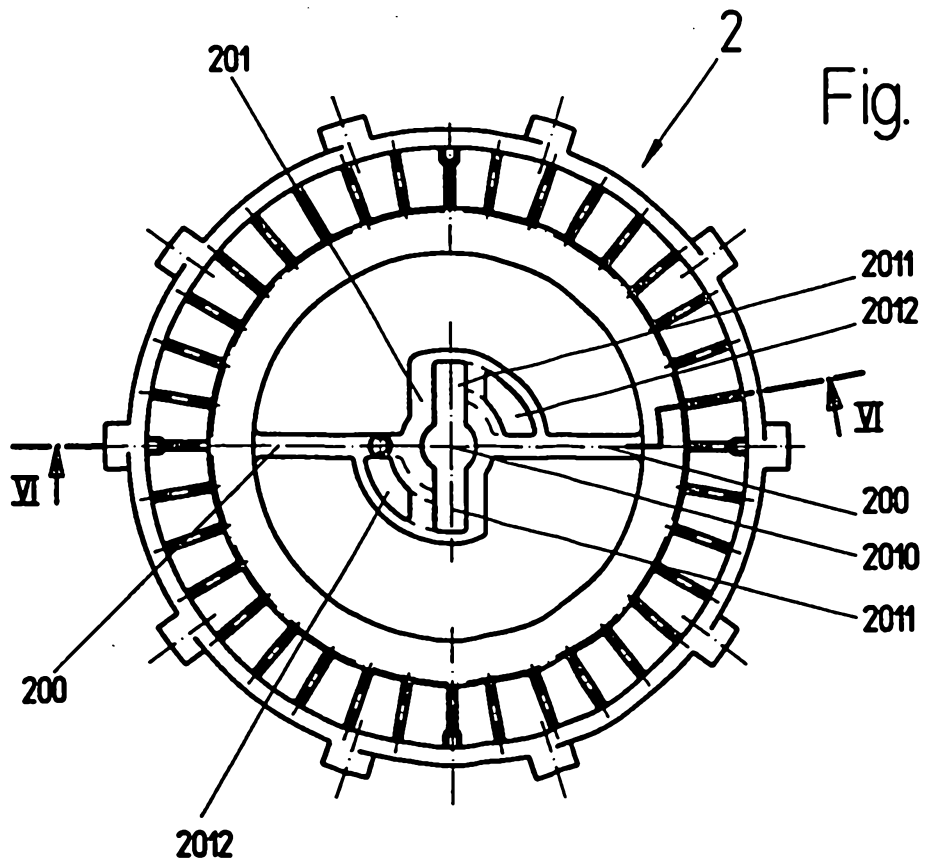
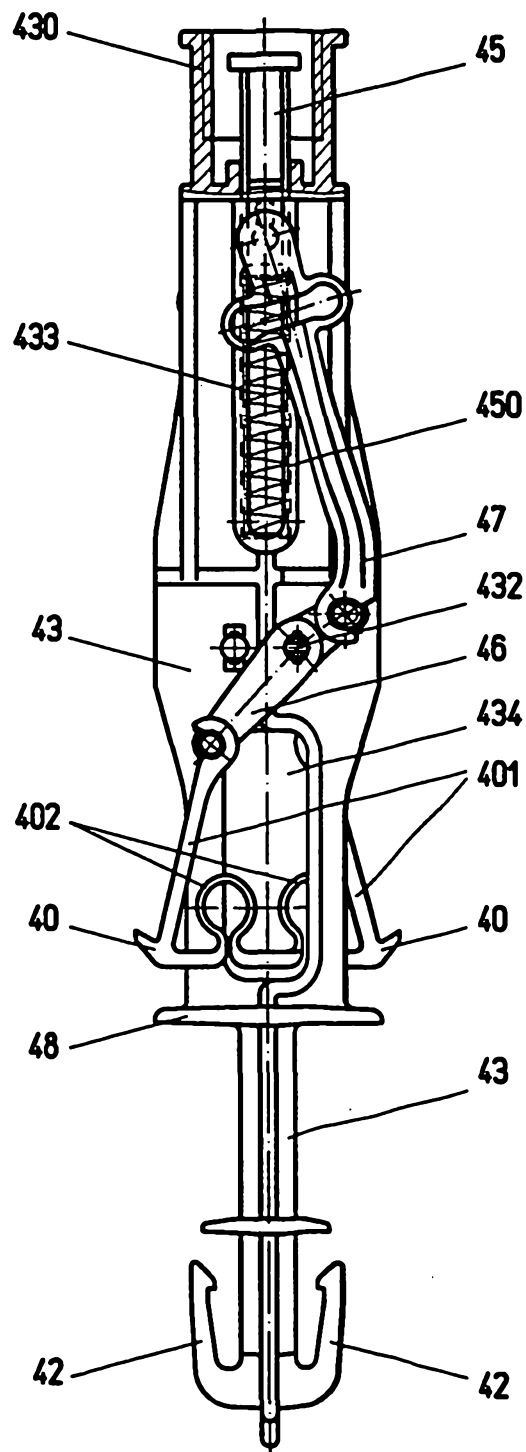


Fig. 7



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Fig. 8



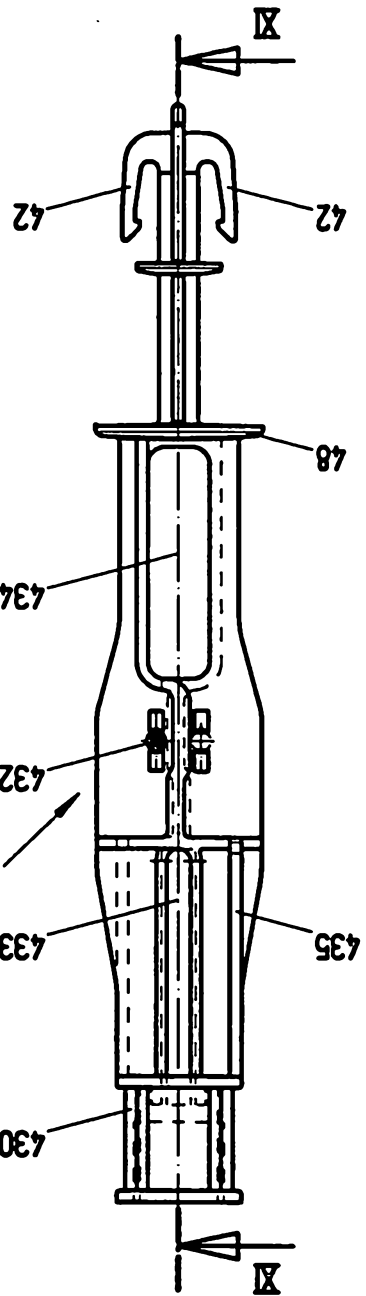


Fig. 9

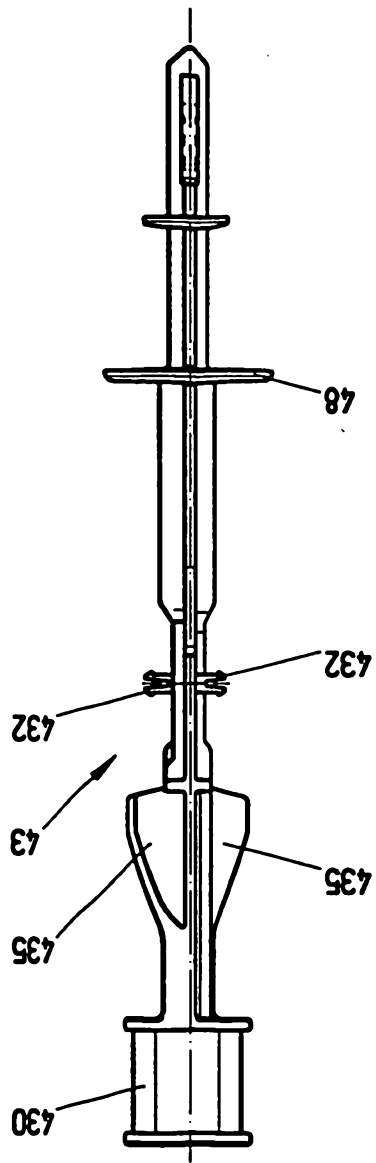


Fig. 10

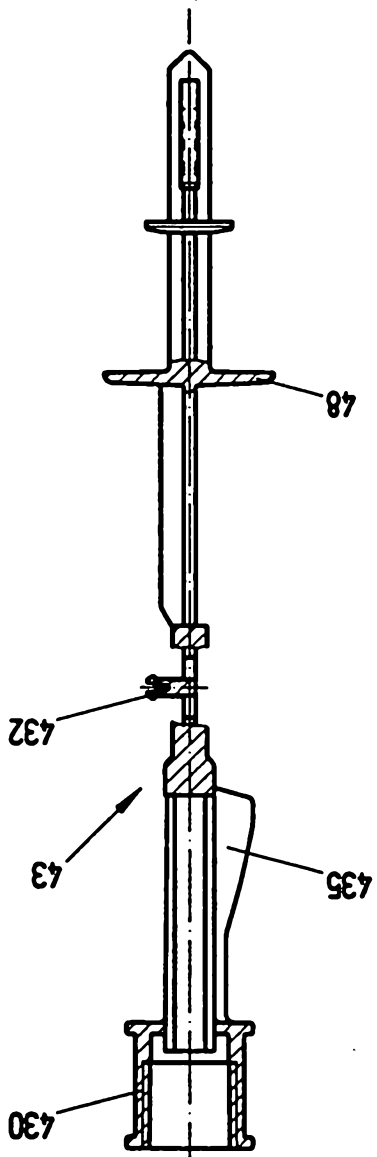


Fig. 11

Fig. 12

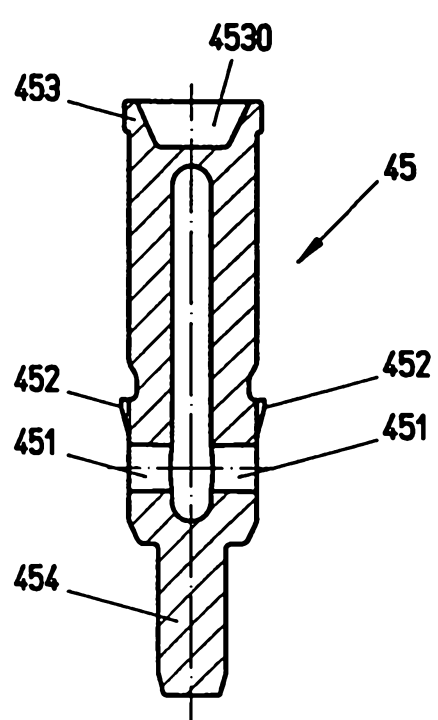


Fig. 13

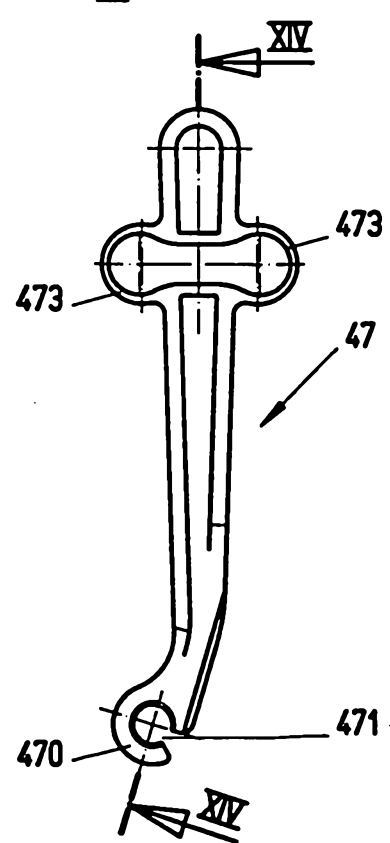
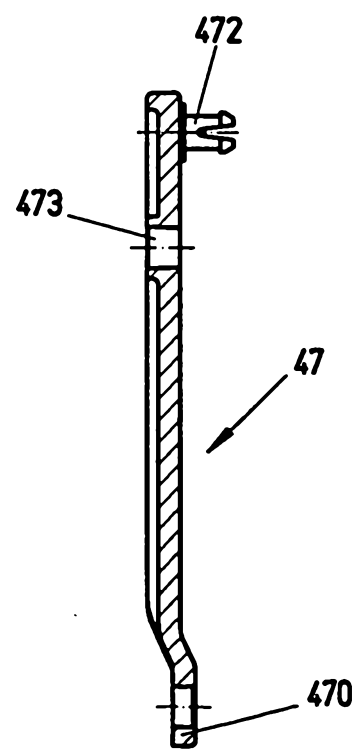
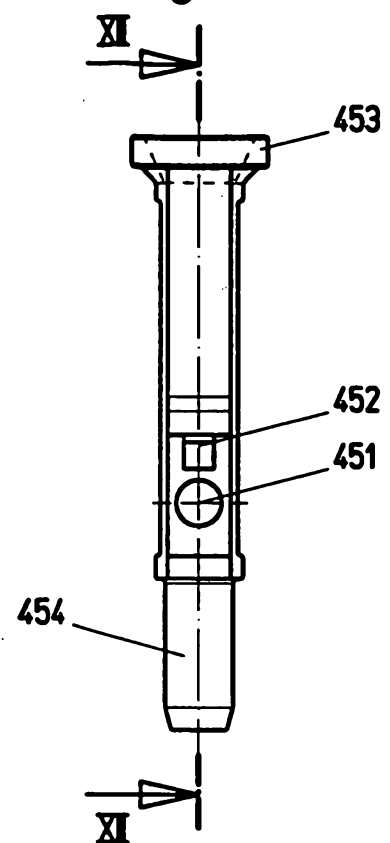


Fig. 14

Fig. 15

Fig. 16

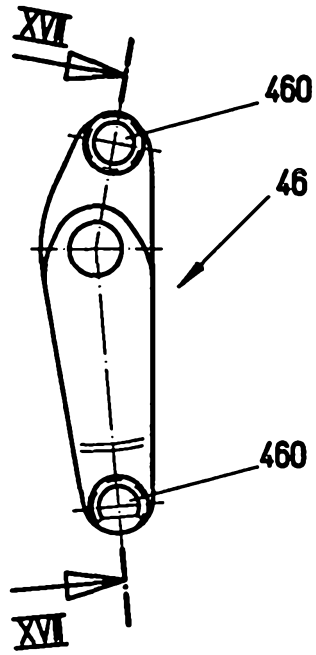


Fig. 17

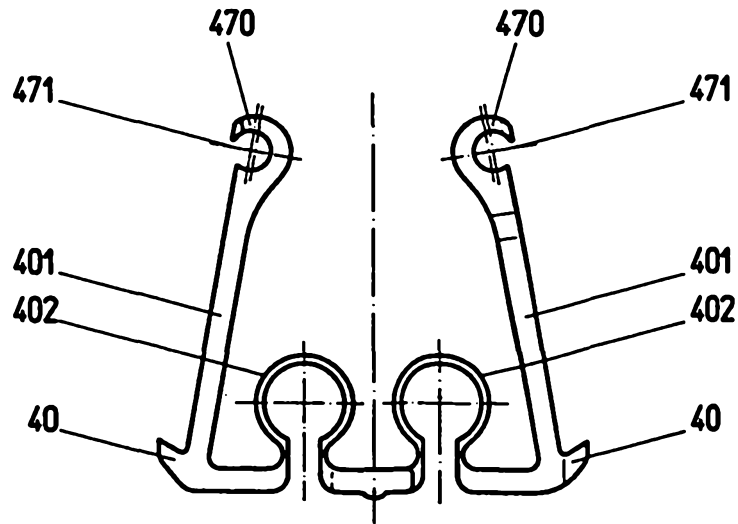
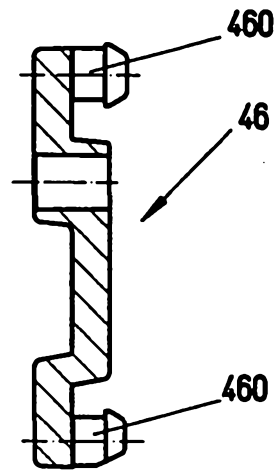


Fig. 18

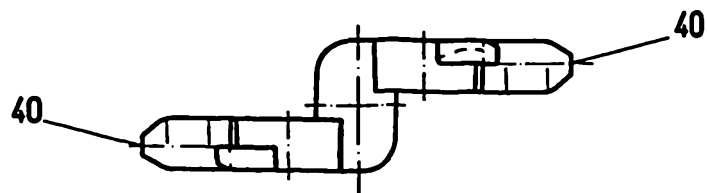


Fig. 19

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Fig. 20

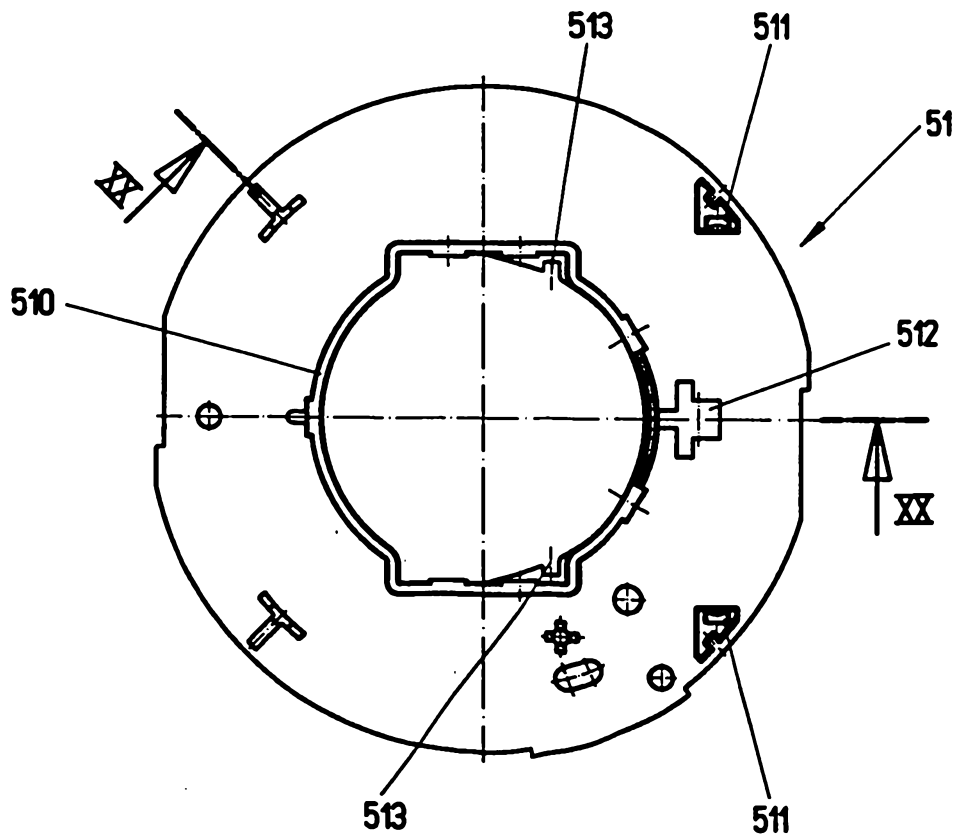
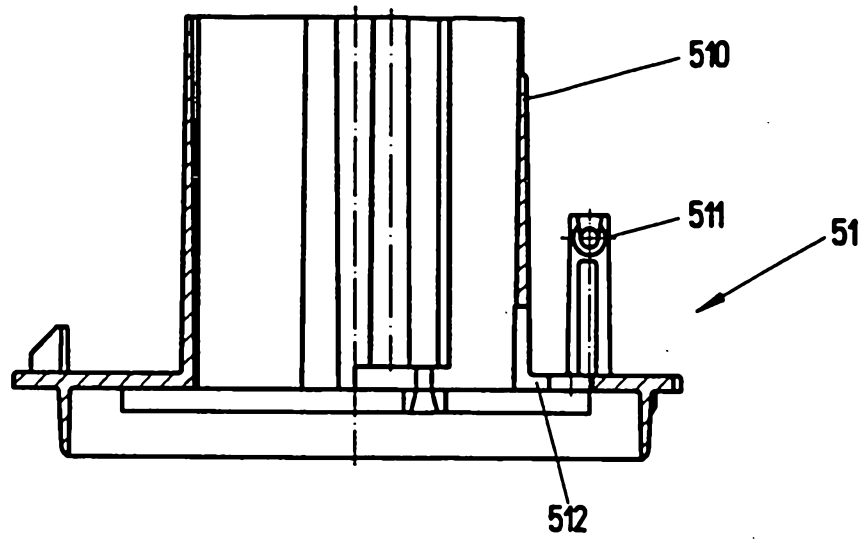


Fig. 21

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Fig. 22

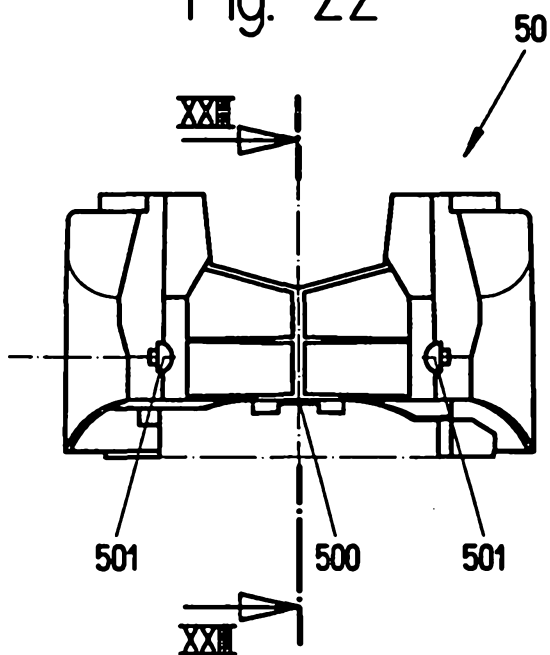


Fig. 23

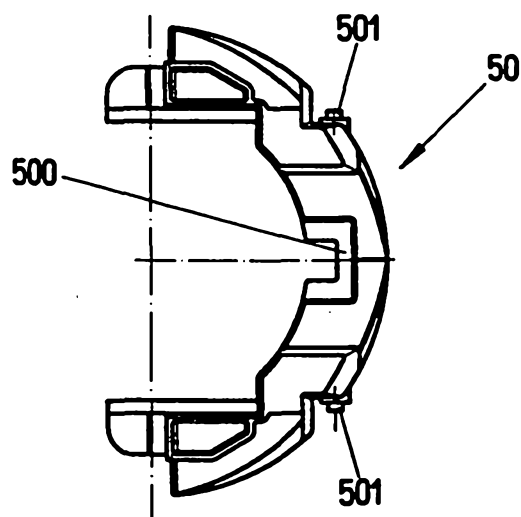
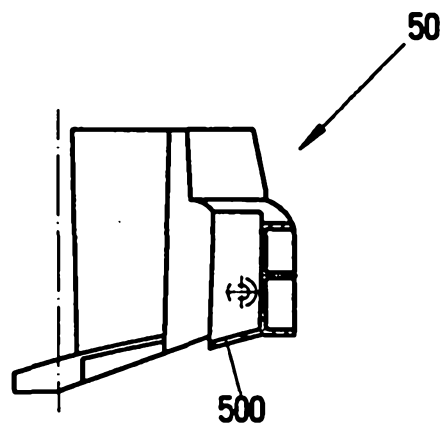


Fig. 24