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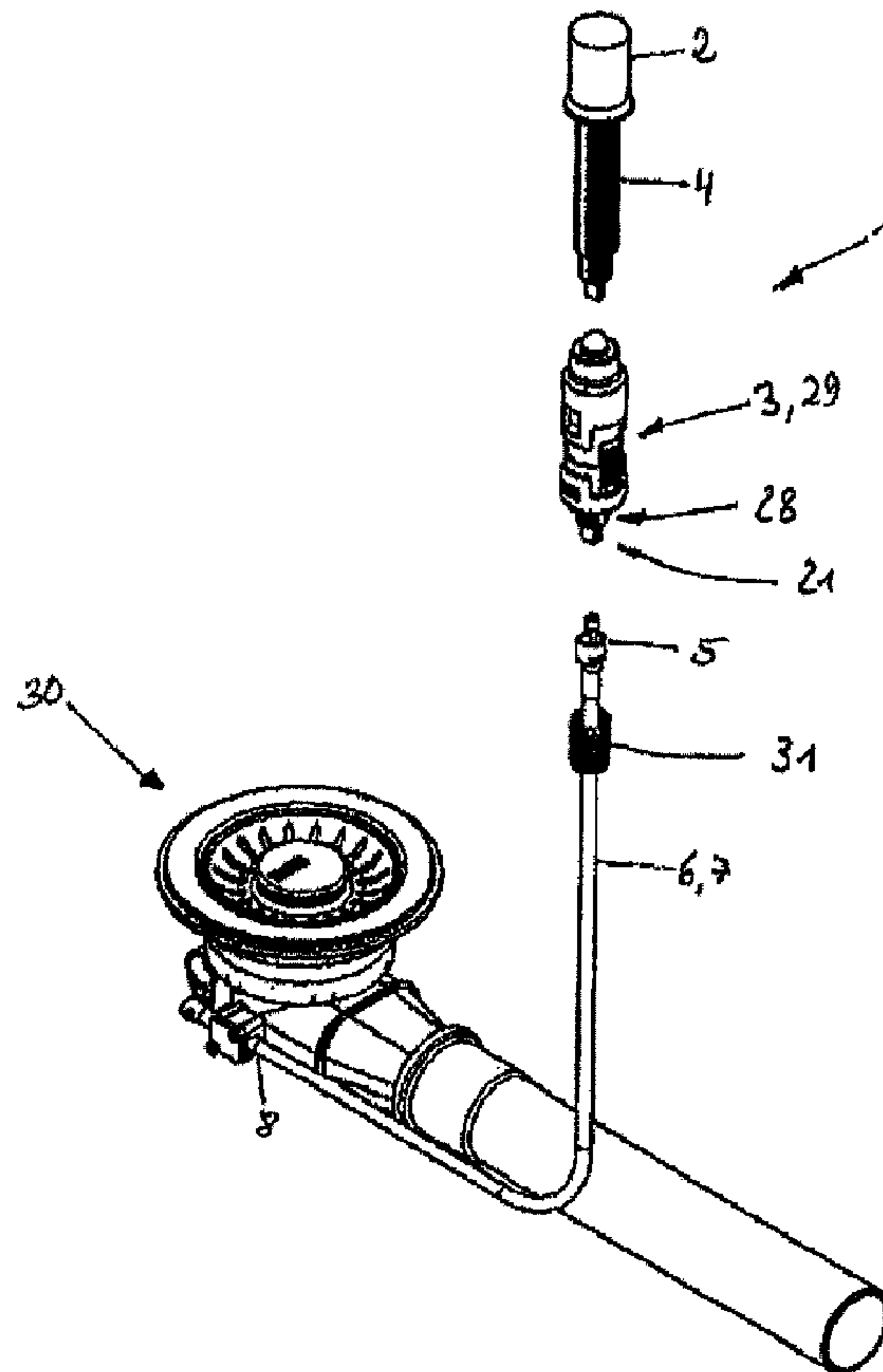
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(54) Title: REMOTE CONTROLLER UNIT AND A LATCH MECHANISM FOR A REMOTE CONTROLLER UNIT



(57) Abrégé/Abstract:

The invention relates to a remote controller unit (1) for opening and closing a valve of a drain fitting (30) of a sink, in particular a kitchen sink, comprising a force transmission element (6) and a control element (2), wherein the force transmission element (6)

(57) **Abrégé(suite)/Abstract(continued):**

transfers a pressing force exerted on a control element (2) to a valve, wherein a latching mechanism (3) is arranged between the control element (2) and the force transmission element (6), wherein the latch mechanism (3) is detachably connected to the control element (2) and the force transmission element (6). The invention also relates to a latch mechanism (3) for a remote controller unit (1).

Abstract

The invention relates to a remote controller unit (1) for opening and closing a valve of a drain fitting (30) of a sink, in particular a kitchen sink, comprising a force transmission element (6) and a control element (2), wherein the force transmission element (6) transfers a pressing force exerted on a control element (2) to a valve, wherein a latching mechanism (3) is arranged between the control element (2) and the force transmission element (6), wherein the latch mechanism (3) is detachably connected to the control element (2) and the force transmission element (6). The invention also relates to a latch mechanism (3) for a remote controller unit (1).

(Fig. 3)

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Remote Controller Unit and a
Latch Mechanism for a Remote Controller Unit

Description

The invention relates to a remote controller unit for opening and closing a valve of a drain fitting of a kitchen sink according to the preamble of claim 1 and to a latch mechanism for a remote controller unit according to the preamble of claim 12.

It is known in the state of the art to provide sinks, for example, kitchen sinks with a remote controller unit so that the operator can open and close the drain without having to touch the stopper attached to the drain. This is particularly advantageous when the sink is filled with dirty or very hot water, because then the operator does not have to reach with his or her hand into the water in order to induce the stopper to open.

Remote controllers known in the prior art include, for example, devices comprising a Bowden cable in which by pulling on the control element a valve in the drain fitting is opened and by pressing on the control element the valve is then closed again.

The disadvantage of such designs, however, is that the remote controller unit, once it is pulled, slips back into its depressed starting position so that a secure closure of the valve is not always ensured.

To improve the functional reliability of such remoter controller units, a force transmission arrangement for actuating devices employed, for example, in wash basins, sink units, bath tubs, shower drains, etc. is known from DE 10 2010 011 146 A1 in which a force transmission element is proposed that is designed with a switching device and a latch mechanism as a permanently interconnected component.

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However, good serviceability is not guaranteed due to the permanent connection of the force transmission element to the switching device. In the event of damage the entire remote controller unit must be replaced, which is cumbersome and entails costs. The same applies analogously with respect to retrofitting.

Therefore, the object of the present invention is to provide a remote controller unit for opening and closing a valve of a drain fitting and a latch mechanism for such a remote controller unit which makes possible improved serviceability and easy retrofitting in the known pull-push mechanism.

According to the present invention, a remote controller unit is provided for opening and closing a valve of a drain fitting of a sink, in particular a kitchen sink, which comprises a force transmission element and a control element, wherein the force transmission element transfers a pressing force exerted on the control element to the valve, wherein a latch mechanism is arranged between the control element and the force transmission element, wherein the latch mechanism is detachably connected at least to the force transmission element, and preferably also to the control element. The detachable connection makes the remote controller unit according to the invention especially maintenance-friendly and it allows for quick replacement of the latch mechanism -if necessary, together with the control element - in a simple manner. The fact that the latch mechanism in the event of a defect can simply be removed from the remote controller unit and replaced by a new one represents a potential cost savings, since in such case it is not necessary to switch out the entire remote controller unit, or at least not the force transmission element.

According to a preferred embodiment, the latch mechanism, in particular in combination with the control element is designed as a retrofitable module. Here too, costs can be saved since in order to expand a remote controller unit to include a latch mechanism that improves functional reliability, it is necessary only to insert the latch mechanism

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(optionally in combination with the control element) into the already existing remote controller unit.

According to another preferred embodiment, the latch mechanism can be engaged in a first detent position and in a second detent position. Providing detent positions makes it possible to further enhance the functional reliability of the remote controller unit, since engagement in the first and second detent positions results in respective, clearly defined positions which prevent the valve or the stopper to the drain fitting from slipping back. This principle is known, for example, from ball point pens where it is applied for moving the stylus back and forth or locking it in position.

According to still another preferred embodiment adjustment to the first detent position is achieved by pressing once on the control element and to the second detent position by pressing on the control element a second time. The control element may appropriately be in the form of a push button or the like.

Preferably, pressing once causes the valve to close, and pressing a second time causes the valve to open. This makes for a remote controller unit that is especially easy to operate.

According to still another preferred embodiment, the latch mechanism includes a housing, on the outer circumference of which is provided at least one first detent and at least one second detent spaced axially apart from said first detent.

It is especially preferred if the housing includes a first end to which a sliding nut can be attached which is designed to be detachably connected to the control element and to cooperate with the at least one first detent, and a second end to which a cover can be attached, which is designed to be detachably connected to the control element and to cooperate with the at least one second detent.

Preferably, the latch mechanism includes a first spring and a second spring.

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According to still another preferred embodiment the latch mechanism comprises a first gear wheel that functions as an actuator, and a second gear wheel that meshes with the first gear wheel and which functions as a jumper.

Preferably, the force transmission element is flexible, designed in particular, as a Bowden cable. Providing a flexible force transmission element allows for greater freedom when installing the remote controller unit.

Also provided according to the invention is a latch mechanism for a remote controller unit for opening and closing a valve of a drain fitting in a sink, in particular, a kitchen sink, wherein the latch mechanism is designed as a retrofitable module. This makes it possible to improve the functional reliability of an already existing remote controller unit without having to replace the entire remote controller unit, which entails a considerable savings in cost. Furthermore, the design according to the invention improves the serviceability, as previously described above.

According to a preferred embodiment, the module comprises a housing with at least one first detent and at least one second detent which is spaced axially apart from the at least one first detent, a sliding nut attachable at an upper end of the housing and provided with a threaded portion and at least one opening for cooperating with the at least one detent, as well as a cover attachable to a lower end of the housing and provided with a threaded portion and at least one opening for cooperating with the at least one second detent.

According to another preferred embodiment, the module also includes a first spring and a second spring.

According to still a further preferred embodiment, the module also includes a first gear wheel that acts as an actuator, and a second gear wheel which acts as a jumper and which meshes with the first gear wheel.

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An embodiment of the invention is described in greater detail below with reference to the appended drawings. In the drawings:

- Fig. 1 is a perspective view of a remote controller unit according to the prior art;
- Fig. 2 is an exploded view of a latch mechanism according to an embodiment of the invention;
- Fig. 3 is a perspective view of the remote controller unit shown in Fig. 1 which is retrofitted with the latch mechanism shown in Fig. 2;
- Fig. 4 is a perspective view of a remote controller unit according to an embodiment of the invention;
- Fig. 5 is a sectional view through a latch mechanism according to an embodiment in a first detent position; and
- Fig. 6 is a sectional view through the latch mechanism shown in Fig. 5 according to an embodiment in a second detent position.

Figure 1 is a perspective view of a remote controller unit 1 for a kitchen sink according to the prior art. The remote controller unit 1 includes a control element 2 that is attached by way of a connecting piece 4 to a first end 5 of a flexible force transmission element 6 in the form of a Bowden cable 7. In the embodiment shown, the force transmission element 5 is screwed onto threaded portions (not shown in the figure) of the connecting piece 4. In addition, the force transmission element 6 is connected to a second end 8 with a valve of a drain fitting 30 in the form of an eccentric valve. The valve of the drain fitting 30 is closed by means of the Bowden cable 7 by pulling the control element 2, whereas the opening of the valve is ensured by subsequently

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pressing the control element 2, thereby allowing, for example, water to drain from the kitchen sink.

Figure 2 is an exploded view of a latch mechanism 3 according to an embodiment which is designed to be retrofitted in the remote controller unit 1 shown in Fig. 1. The latch mechanism 3 comprises a housing 9, on the outer circumference 10 of which are two detents 11, 11' disposed radially opposite one another. Also provided on the outer circumference 10 of the housing 9 are two second detents 12, 12', which are also disposed radially opposite one another, and spaced axially apart from the first detents 11, 11'. In addition, the latch mechanism 3 includes a sliding nut 13 attachable to a first, upper end 14 of the housing 9. The sliding nut 13 includes a threaded portion 15 provided in the form of an internal thread which can be screwed to a threaded portion of the connecting piece 4 shown in Fig. 1. Further, the sliding nut 13 includes openings 16, 16' in which the first detents 11, 11' engage when the latch mechanism is in the assembled state. In addition, the latch mechanism 3 includes a first gear wheel 17 which acts as an actuator or pressure sleeve, and a second gear wheel 18 which meshes with the first gear wheel 17 in the assembled state of the latch mechanism 3 and which acts as a jumper or feed sleeve, analogous to the latch mechanism in a ball-point pen. Further, the latch mechanism 3 includes a first spring 19 and a second spring 20, a cable pull mount 21 and a cover 22 which is attachable to a second lower end 23 of the housing 9. The cover 22 includes openings 24, 24' in which the second detents 12, 12' engage when the latch mechanism 3 is in the assembled state. In addition, the cover 22 includes a threaded portion 28 with which the former can be connected to a force transmission element 6 (see Fig. 1). The inside circumference of the housing 9 is designed with a plurality of grooves of various lengths not visible in the figure, which grooves function as detent grooves in which the second gear wheel 18 or the feed sleeve may engage in a first detent position in which the valve of a drain fitting 30, as shown in Fig. 1, is closed, and in a second detent position in which the valve is opened.

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Figure 3 is a perspective view of the remote controller unit 1 shown in Fig. 1, which is retrofitted with the latch mechanism 3 shown in Fig. 2. The latch mechanism 3 is designed as a module 29 and can easily be screwed onto the connecting piece 4 and connected to the first end 5 of the Bowden cable 7 to form a detachable connection, in that the end 5 of the Bowden cable 7 is attached at reference numeral 21 and in that the connection is subsequently secured by means of a type of threaded sleeve 31 which is screwed onto the threaded portion 28.

Figure 4 is a perspective view of a remote controller unit 1 according to an embodiment which has been retrofitted with the latch mechanism 3 in the form of module 29 in the manner described in connection with Fig. 3.

Figure 5 is a sectional view through a latch mechanism 3 according to an embodiment in a first detent position in which the valve of a drain fitting 30 as shown, for example, in Fig. 1 is opened so that, for example, water entered into a sink fitted with a remote controller unit 1 is able to immediately drain off again. As is evident here, the first detents 11, 11' rest flush against a lower end 25, 25' of the openings 16, 16' of the sliding nut 13. The respective teeth of the first gear wheel 17 and of the second lower gear wheel 18 are maximally engaged over their entire surface.

Figure 6 is a sectional view through the latch mechanism 3 shown in Fig. 5 according to an embodiment in a second latch position in which the valve of a drain fitting 30 (see Fig. 1) is closed so that water that has entered the sink fitted with a remote controller unit 1 cannot drain off and is collected. As is evident here, the second spring 10 of the latch mechanism is compressed in this position and the first detents 11, 11' rest flush against an upper end 16, 16' of the sliding nut 13. The respective teeth of the first gear wheel 17 and of the second gear wheel 18 are not engaged or are only minimally engaged over their entire surface. The end section 27 of the cable pull mount 21 protrudes from the cover 22 that encircles the housing 9.

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The latch mechanism 3 according to the embodiment of the invention causes the valve of the drain fitting 30 (see Fig. 1) to open and close, in each case by pressing the control button 2 (see Fig. 1). With a first press of the control button 2 by an operator (see Fig. 1) the teeth of the first gear wheel 17 move on the beveled faces of the second gear wheel 18, thereby creating a rotational movement with the second gear wheel 18 rotating downwardly. The downward acting force component is transferred via the first spring 19 to the cable pull mount 21 and forces the latter downwardly as well, which in turn causes the force transmission element 8 connected to the cable pull mount 21 to open the valve of the drain fitting 30. As a result of the rotational movement, the second gear wheel 18 arrives simultaneously at a position in which it engages a first detent groove provided on the inside of the housing 9. Thus, a fixation is achieved in a first detent position in which the valve is closed (see Fig. 6). With a second press of the control button 2 by the operator, a pressing force is again exerted on the second gear wheel 18, which again causes a rotational movement of the second gear wheel 18 thereby moving the second gear wheel 18 into a position in which it engages a further second detent groove provided on the inside of the housing 9, said detent groove being of a length different from the first detent groove, and resulting in a fixation in a second detent position in which the cable pull mount 21 is in a retracted position, as a result of which the valve is opened again by the force transmission element 6. The second spring 20 which acts on the cable pull mount 21 in such a way that the latter is forced upward, ensures that the second gear wheel 18 remains in its respective detent position and the cable pull mount 21 remains in its upper or lower position as a result of the first spring 19.

Since first detent grooves having a first length and second detent grooves having a second length are alternately provided on the inside circumference of the housing 9, successive pressing of the control button consistently causes the valve to open and to subsequently close due to the rotational movement of the second gear wheel 18 and the resultant engagement in a respective first or second detent groove.

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Reference numerals

1	Remote controller unit
2	Control element
3	Latch mechanism
4	Connecting piece
5	First end of the force transmission element
6	Force transmission element
7	Bowden cable
8	Second end of the force transmission element
9	Housing
10	Outer circumference of the housing
11, 11'	First detent
12, 12'	Second detent
13	Sliding nut
14	First end of housing
15	Threaded portion of sliding nut
16, 16'	Openings of the sliding nut
17	First gear wheel
18	Second gear wheel
19	First spring
20	Second spring
21	Cable pull mount
22	Cover
23	Second end of housing
24, 24'	Openings of cover
25, 25'	Lower end of openings of the sliding nut
26, 26'	Upper end of openings of sliding nut
27	End section of cable pull mount
28	Threaded portion of cover
29	Module

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30 Drain fitting

31 Screw sleeve

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Claims

1. Remote controller unit (1) for opening and closing a valve of a drain fitting (30) of a sink, in particular a kitchen sink, comprising a force transmission element (6) and a control element (2), wherein the force transmission element (6) transfers a pressing force exerted on a control element (2) to a valve, wherein a latching mechanism (3) is arranged between the control element (2) and the force transmission element (6),
characterized in that
the latch mechanism (3) is detachably connected at least to the force transmission element (6) and preferably to the control element (2) and the force transmission element (6).
2. The remote controller unit (1) according to claim 1,
characterized in that the latch mechanism (3) and preferably also the control element (2) are designed a retrofittable module (29).
3. The remote controller unit (1) according to claim 1 or 2,
characterized in that
the latch mechanism (3) can be engaged in a first detent position and in a second detent position.
4. The remote controller unit (1) according to claim 3,
characterized in that
the first detent position can be adjusted by a first press of the control element (2) and the second detent position can be adjusted by a second press of the control element (2).
5. The remote controller unit (1) according to claim 4,

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- characterized in that
the first press causes the valve to close.
6. The remote controller unit (1) according to claim 4 or 5,
characterized in that
the second press causes the valve to open.
7. The remote controller unit (1) according to any of claims 1 to 6,
characterized in that
the latch mechanism (3) includes a housing (9), on the outer circumference (10)
of which is provided at least one first detent (11, 11') and at least one second
detent (12, 12') spaced axially apart from said first detent (11, 11').
8. The remote controller unit (1) according to claim 7,
characterized in that
the housing (9) includes a first end (14) to which a sliding nut (13) can be
attached and which is designed to be detachably connected to the control
element (2) and to cooperate with the at least one first detent (11, 11'), and a
second end (23) to which a cover (22) can be attached, which is designed to be
detachably connected to the control element (2) and to cooperate with the at
least one second detent (12, 12').
9. The remote controller unit (1) according to any of claims 1 to 8,
characterized in that
the latch mechanism (3) includes a first spring (19) and a second spring (20).
10. The remote controller unit (1) according to any of claims 1 to 9,
characterized in that
the latch mechanism (3) includes a first gear wheel (17) which acts as an
actuator, and a second gear wheel (18) which meshes with the first gear wheel
(17) and which acts as a jumper.

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11. The remote controller unit (1) according to any of claims 1 to 10, characterized in that the force transmission element (6) is flexible, in particular, is in the form of a Bowden cable (7).
12. Latch mechanism (3) for a remote controller unit (1) for opening and closing a valve of a drain fitting (30) of a sink, in particular, a kitchen sink, characterized in that the latch mechanism (3) is designed as a retrofittable module (29).
13. Latch mechanism (3) according to claim 12, characterized in that the module (29) comprises a housing (9) with at least one first detent (11, 11') and at least one second detent (12, 2') which is spaced axially apart from the at least one first detent (11, 11'), a sliding nut (13) attachable at a first end (14) of the housing (9) and provided with a threaded portion (15) and at least one opening (16, 16') for cooperating with the at least one detent (11, 11'), as well as a cover (22) attachable to a second end (23) of the housing (9) and provided with a threaded portion and at least one opening for cooperating with the at least one second detent (12, 12').
14. Latch mechanism (3) according to claim 12 or 13, characterized in that the module (29) further includes a first spring (19) and a second spring (20).
15. Latch mechanism (3) according to any of claims 12 to 14, characterized in that the module (29) further includes a first gear wheel (17), which acts as an actuator, and a second gear wheel (18) which acts as a jumper and which meshes with the said first gear wheel (17).

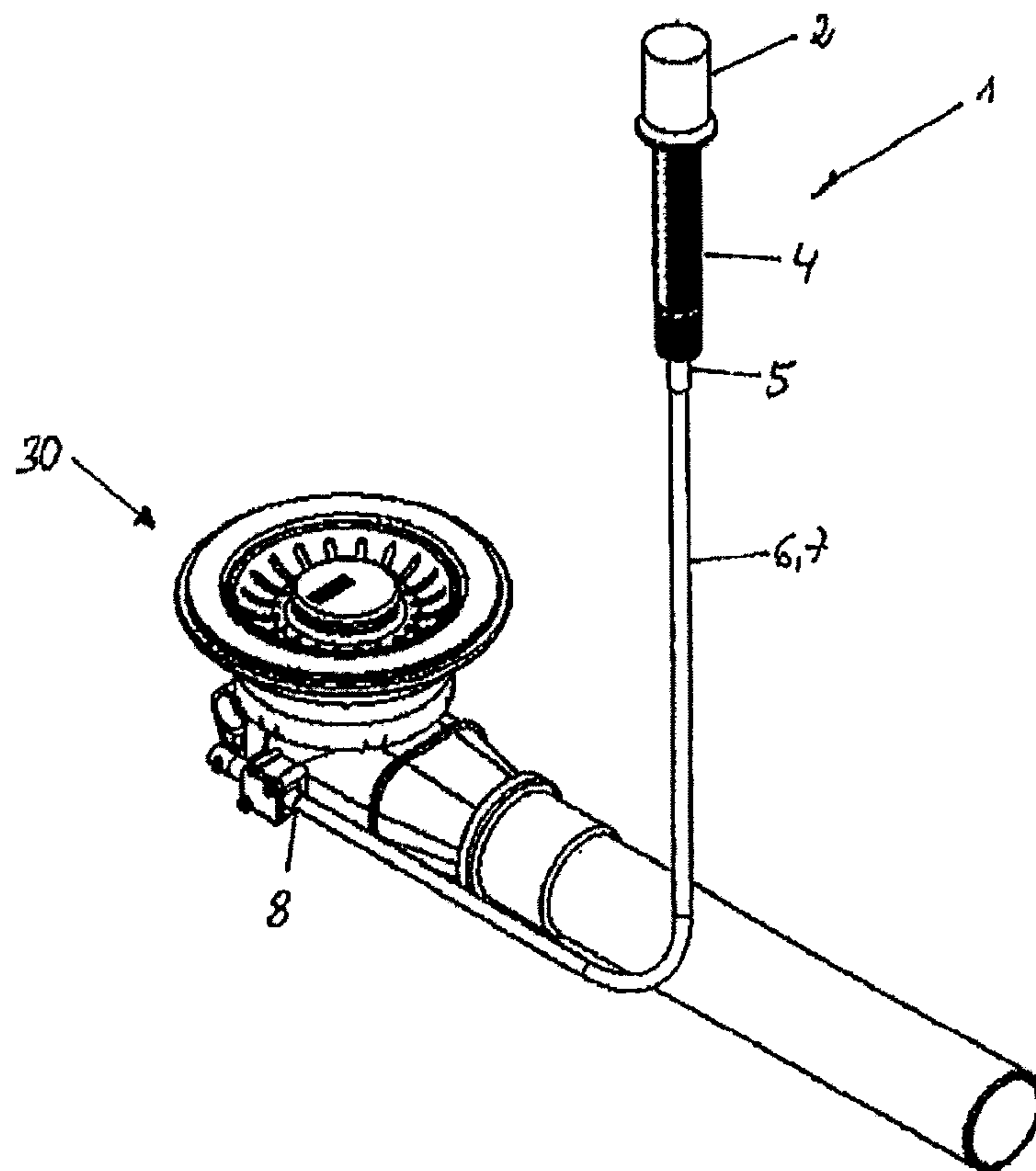


Fig. 1

Prior Art

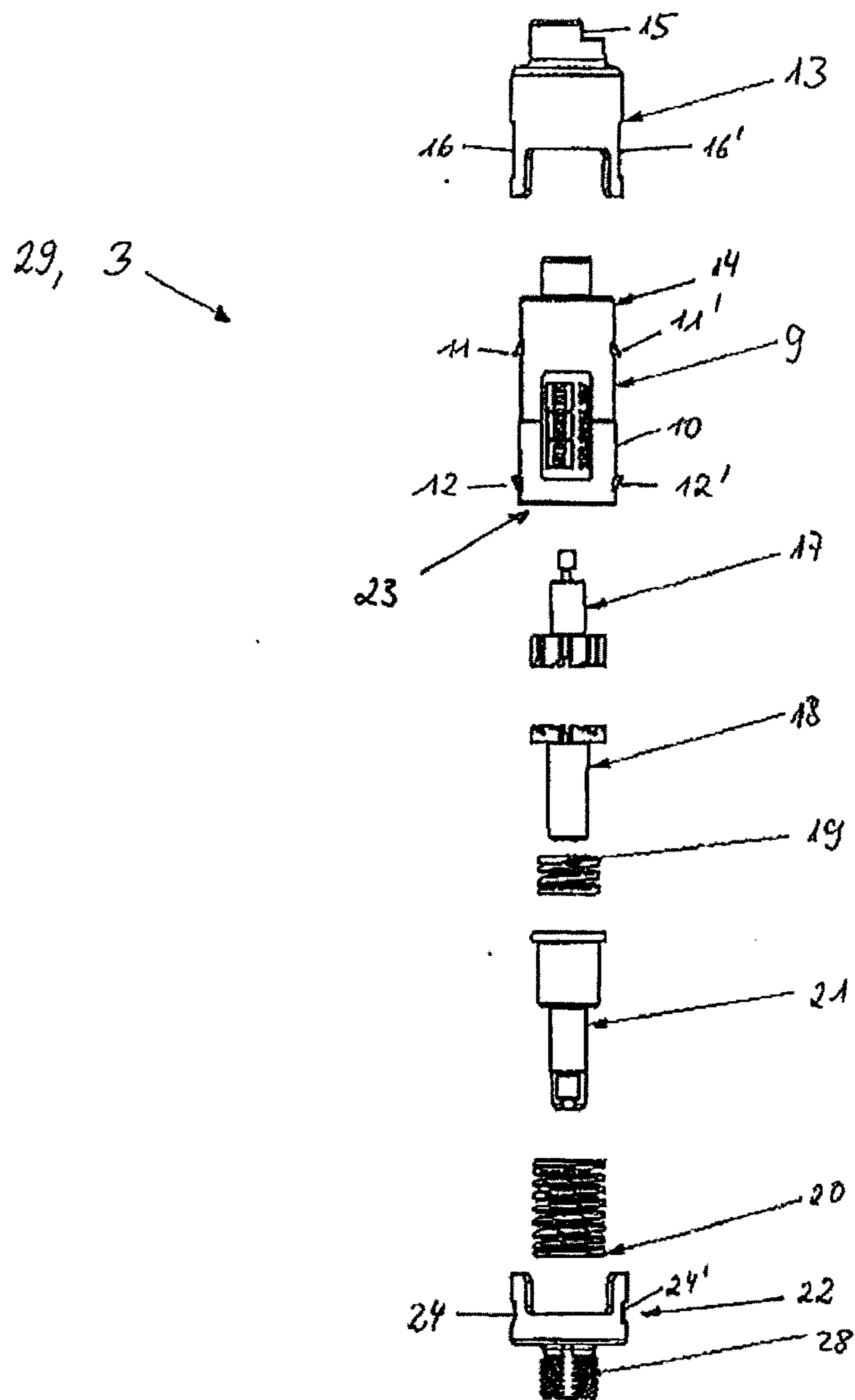


Fig. 2

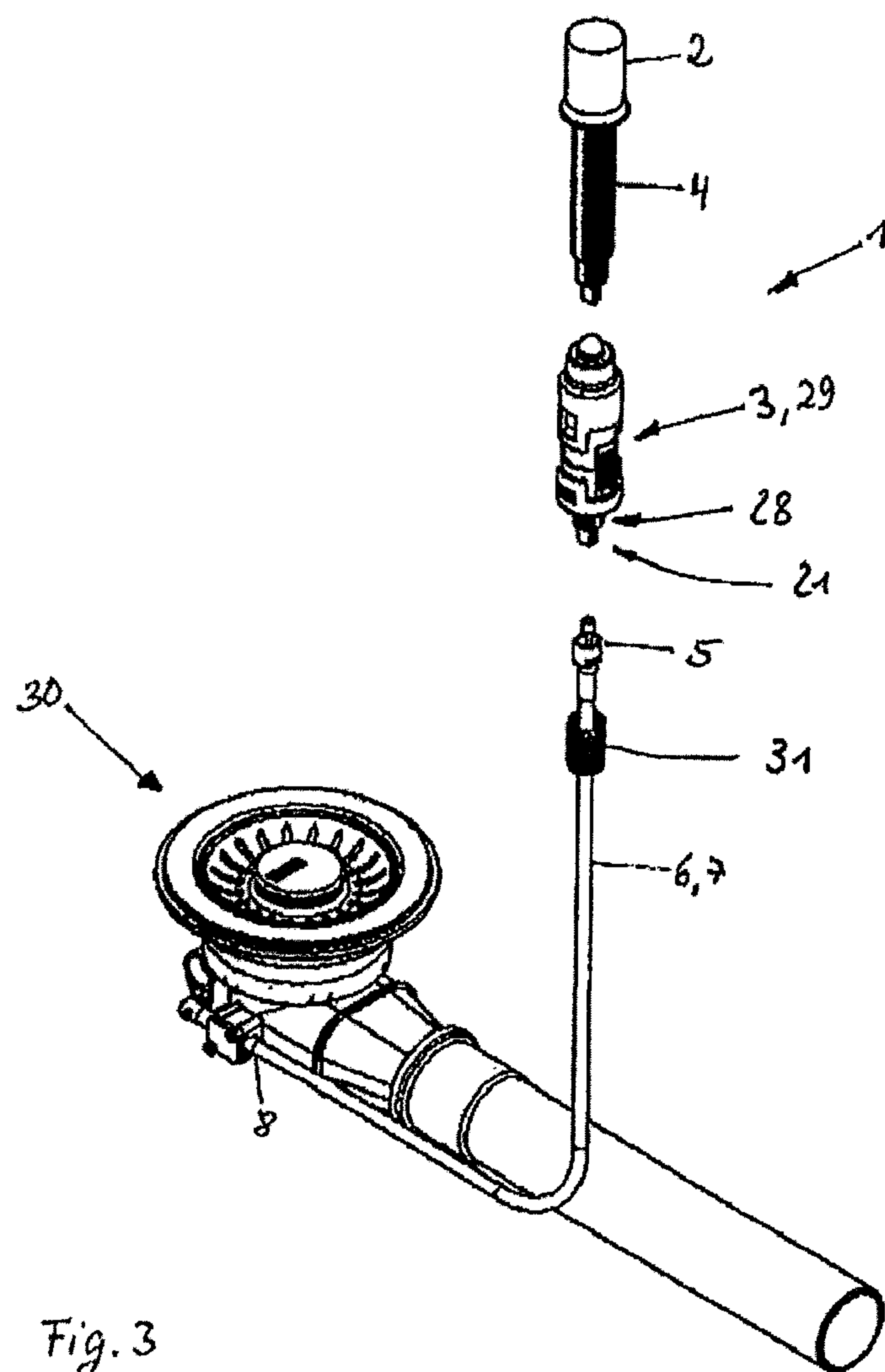
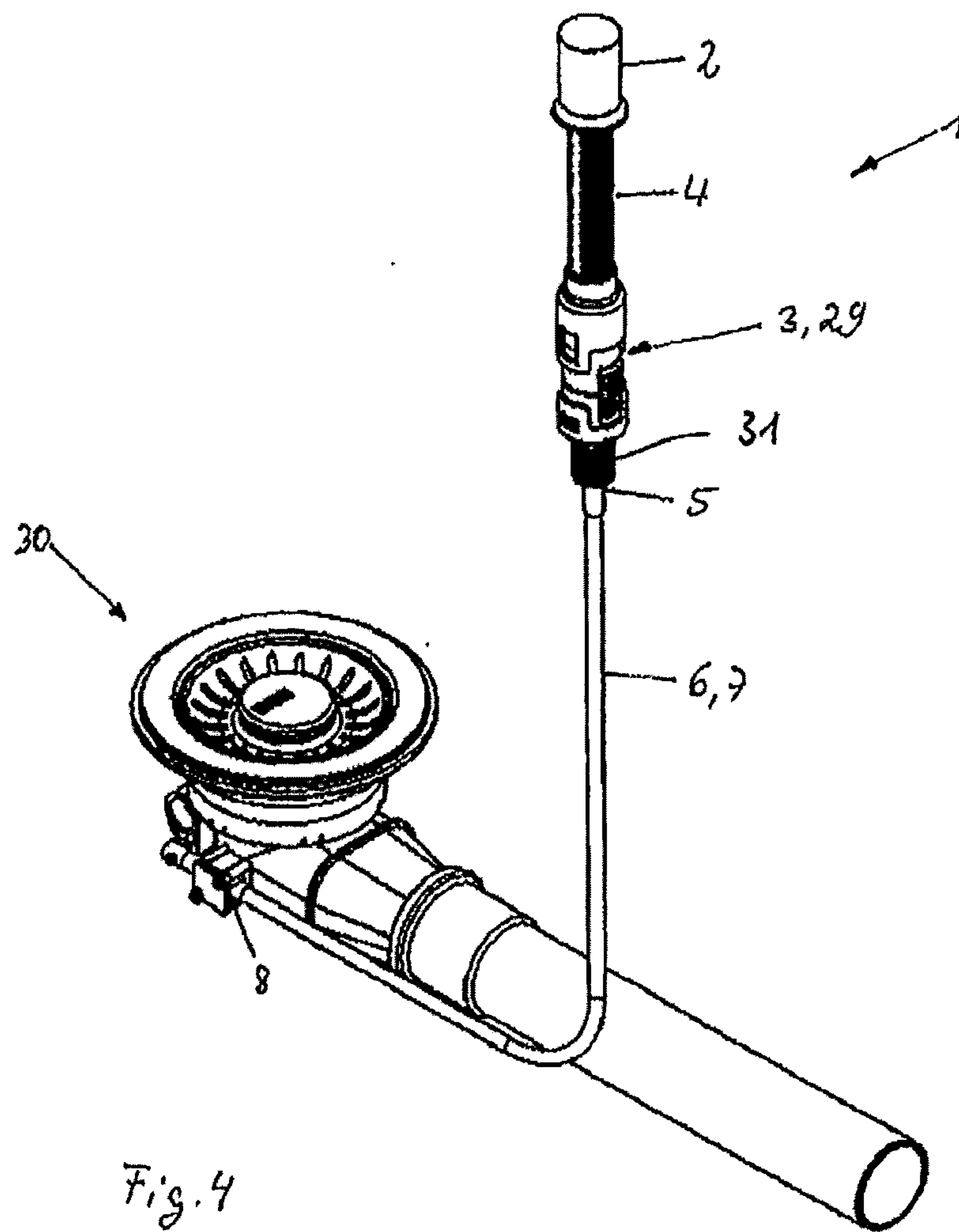


Fig. 3



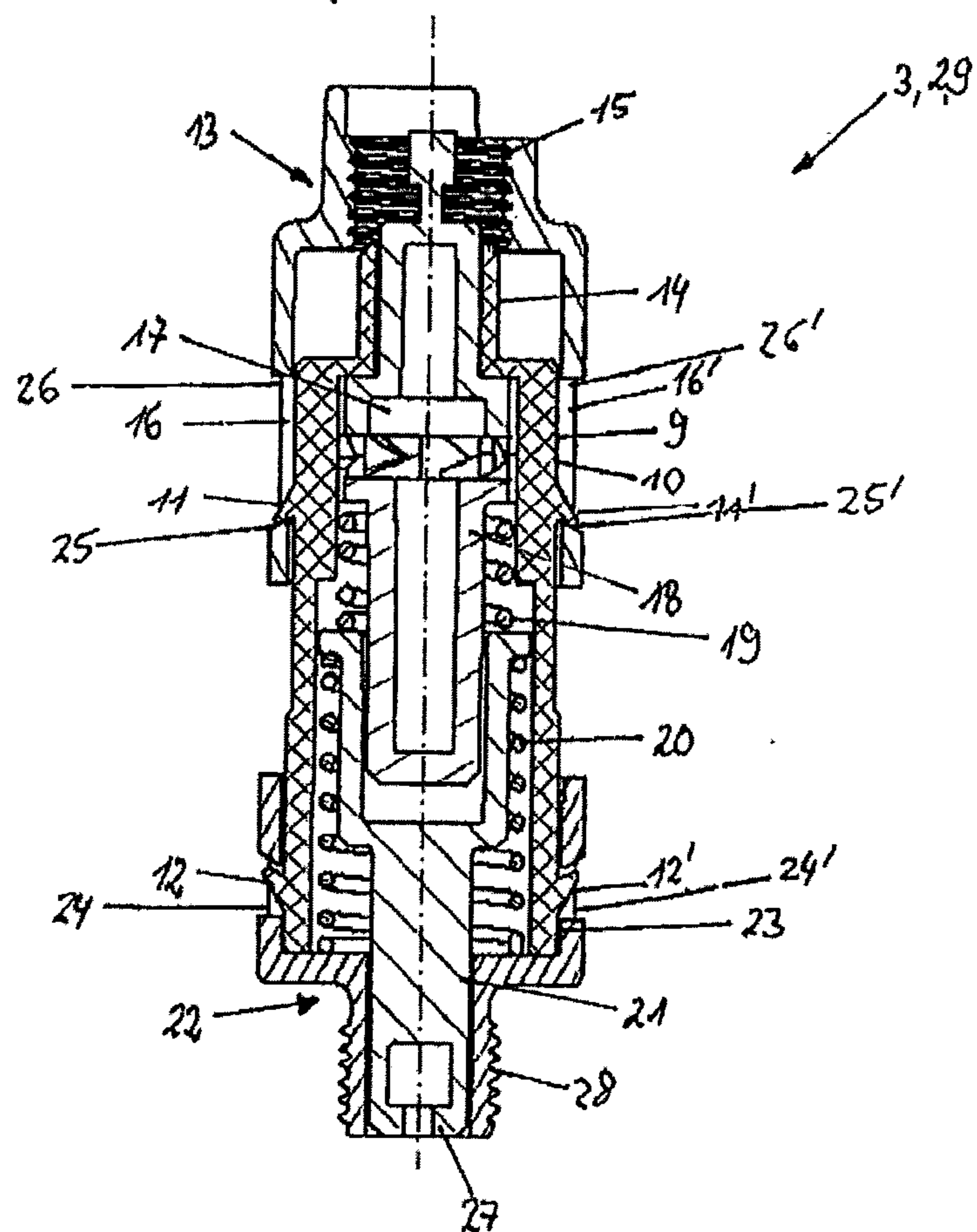


Fig. 5

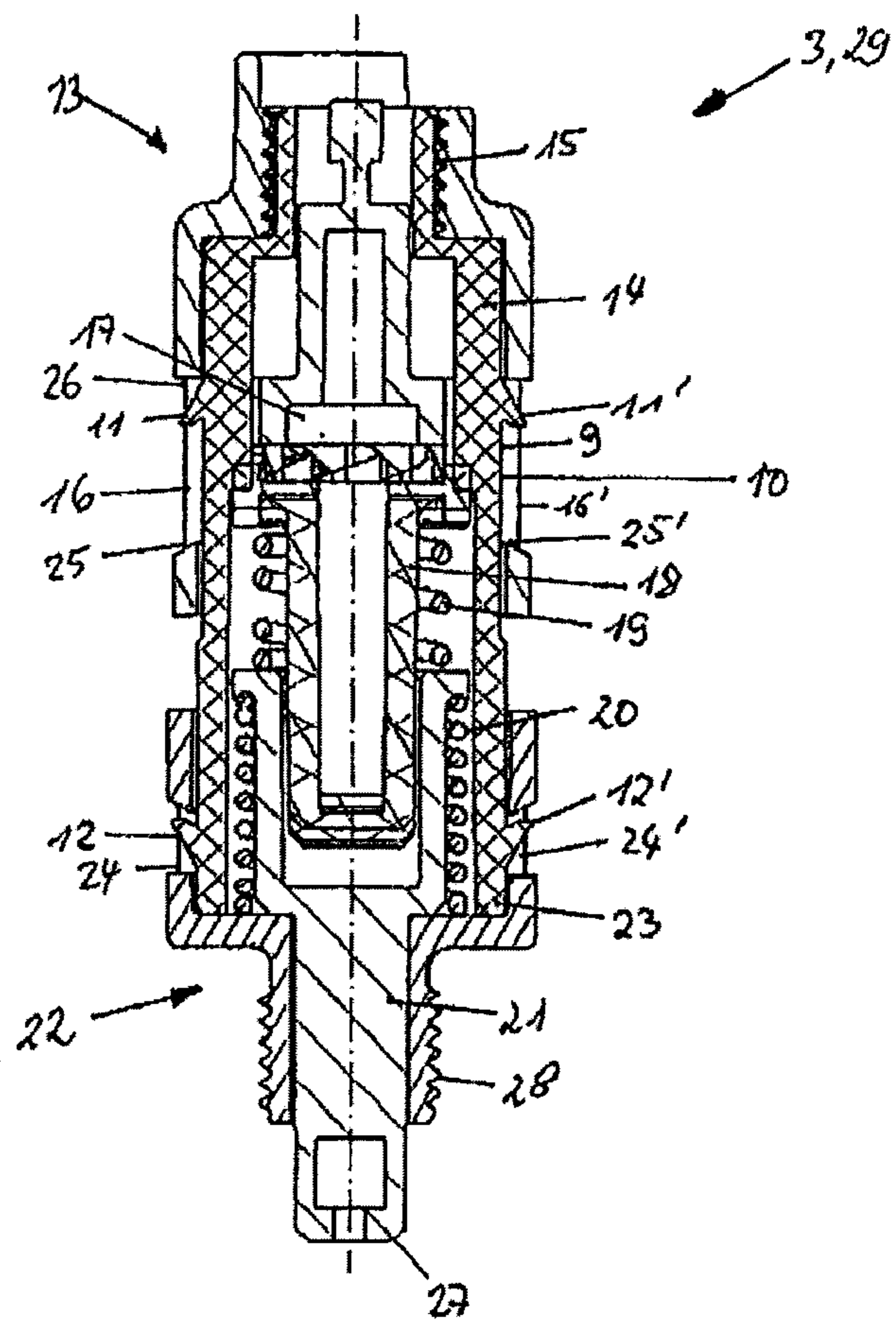


Fig. 6

