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**(54) INSTALLATION MEANS AND METHOD FOR INSTALLING AND ADJUSTING A COVER OF AN INSPECTION MANHOLE**

INSTALLATIONSMITTEL UND VERFAHREN ZUR INSTALLATION UND EINSTELLUNG EINES DECKELS EINES INSPEKTIONSSCHACHTES

MOYENS D'INSTALLATION ET PROCÉDÉ D'INSTALLATION ET DE RÉGLAGE D'UN COUVERCLE D'UN REGARD DE VISITE

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## Description

**[0001]** The present invention relates to installation means for installing a cover holder so as to be adjustable in height and inclination in order to keep a carriageway cover on top of an inspection shaft of an inspection manhole, comprising at least three threaded rods for adjusting the height and the inclination of the cover holder with respect to the inspection shaft.

**[0002]** The present invention also relates to a method for installing a cover holder in order to keep a carriageway cover on top of an inspection shaft of an inspection manhole.

**[0003]** In addition, the present invention relates to a method for adjusting an inspection manhole, in which a cover holder of a carriageway cover is installed on top of an inspection shaft by means of fastening means.

**[0004]** In locations where pipes, such as for example sewage pipes, are arranged below ground, inspection manholes are usually provided in order to give easy access to these pipes. Such inspection manholes usually comprise a vertically arranged inspection shaft which is connected to the subterranean pipes. Generally, such an inspection shaft is a precast concrete element. With older inspection manholes, this shaft also used to be built from bricks. Usually, a cover plate is arranged on top of a concrete inspection shaft, having a (usually eccentric) opening, in order to allow an inspection hole to be connected to the inspection shaft in an eccentric manner. Usually, one or more (generally concrete) collars and/or one or more (generally concrete) adapters are arranged on this (eccentric) opening in order to bridge the difference in level between the cover plate and the ground level (often a carriageway). A cover holder with an access hatch is in turn fitted to the collars. The cover holder and the cover are usually made from cast iron. The inspection shaft and pipes situated below ground are made accessible by removing or pivoting the cover. Via this inspection manhole, people and/or tools can be brought into the underground pipes for inspection and/or maintenance purposes, etc.

**[0005]** The present invention more specifically relates to such inspection manholes in which the cover is a carriageway cover which is arranged in the plane of a carriageway. Such covers are subject to different variable loads from, inter alia, the traffic which travels on the carriageway. Such carriageway covers and their positioning usually have to be able to withstand up to 40 tonnes.

**[0006]** With such inspection manholes, it is not easy to install the cover holder at the correct height and at the correct inclination and to maintain this height and inclination in the long term after they have been set. When the carriageway is being resurfaced, it is not easy to re-adjust the height and the inclination of such cover holders.

**[0007]** In order to adjust the height and inclination of such a cover holder with respect to the inspection shaft as well as possible, so that a carriageway cover which is held therein extends as well as possible in the plane

of the carriageway, concrete collars of different sizes are usually used in practice. If desired, these collars may already be provided with an inclination. Despite this, there will usually be some tolerance between the position into which the cover holder can be arranged by means of these collars and the desired position in order to accommodate the carriageway cover in the plane of the carriageway, due to the limited number of sizes in which such collars are produced and placed in situ. In practice, this tolerance will usually be bridged by means of wedges and/or grit and/or mortar.

When such a carriageway cover is accommodated in a carriageway with an upper layer made of asphalt, the bottom layer of this asphalt and this asphalt itself are usually applied up to a certain distance from the inspection shaft, so that a relatively large hole around the inspection shaft remains open. The carriageway cover is then arranged on top of the inspection shaft by means of collars and any other means and brought to the desired height with respect to the asphalt which has already been laid. Thereafter, the opening between the asphalt and the carriageway cover is filled with concrete up to a certain height from the upper layer of the asphalt and asphalt is laid on top of the concrete next to the asphalt which has already been laid and the carriageway cover. Laying this piece of asphalt is usually not easy and, in practice, often results in bumps in the top surface. Due to different degrees of expansion of the asphalt, the concrete and surrounding lower layers for the asphalt, these bumps become more pronounced over the years and the asphalt around the carriageway cover will start to crumble. When the height and the inclination are set to the desired position using all kinds of other materials, these supports often give way due to the varying weights up to 40 tonnes, leading to subsidence of the carriageway cover.

If it is then desired to reposition the position of the carriageway cover, a large hole has to be made again around the carriageway cover, usually by manually hacking this part out. After the carriageway cover has been repositioned, this hole has to be filled again separately.

In fact, all these operations during installation of a carriageway cover or repositioning of the carriageway cover or resurfacing of the road are very time-consuming. Moreover, the concrete used takes a long period of time to cure, resulting in these works disrupting traffic for, on average, three weeks, including the curing time for the concrete.

**[0008]** Several alternative solutions have already been proposed in order to simplify and/or enable more accurate positioning and repositioning of carriageway covers, but these have not been applied in practice due to various drawbacks.

**[0009]** Systems with specific adapter elements which largely have the same drawbacks as the above-described solution which is applied most often in practice and uses different kinds of collars, are known, for example, from US 5,513,926 A, from CA 2,151,069 C and from WO 98/35107 A.

**[0010]** US 5,165,819 A describes a system by means of which the height of a carriageway cover is adjustable in steps. This system comprises trapezoidal coupling elements on the cover holder which are inserted in slots in a mounting ring in order to install the cover holder on top of the inspection shaft. The slots are arranged at equal distances from one another. This solution is a solution which has the same drawbacks that are associated with the use of collars and have been described in general above. In order to fit a carriageway cover at an inclination with respect to the inspection shaft, a different cover holder has to be used. In this case, an additional drawback is the fact that with larger intermediate distances between the inspection shaft and the cover to be fitted, additional collars will be required in order to be able to bridge the intermediate distance between the inspection shaft and the cover holder.

**[0011]** Another solution which makes stepped adjustment of the height of a carriageway cover possible is described in US 2002/0136604 A1. In this case, supports for installing the cover holder are arranged in a mounting ring at different heights in a stepped manner and pins in the cover holder which are at a fixed level can be supported thereon. The height of the cover holder is adjusted by resting these pins on different supports. This solution has similar drawbacks to the previous solutions, with the additional drawback that the inclination is not adjustable without additional means.

**[0012]** In Figs 26 and 27, CA 2 778 146 A1 describes a system in which the adjustability by means of support elements of this kind, which are supported by a mounting ring and on which the cover holder is supported, can be carried out with greater accuracy. In this case, the separate support elements are spacer blocks which can be shortened to the desired level. If a different level is required, the spacer blocks can either be shortened further or new or additional spacer blocks can be used to reach the desired level. Measuring and adjusting the spacer blocks is a relatively laborious process. If new blocks are required during readjustment, these have to be available. If the height of the blocks needs to be adjusted, the necessary tools have to be available.

**[0013]** By means of the embodiment from Figs 28 and 29 of CA 2 778 146 A1, the height and the inclination of the cover holder can be adjusted in a less complicated manner. This is achieved by means of adjusting screws which are used to laterally fix the position of the cover holder with respect to a mounting ring in which the cover holder is telescopically movable. With loads of up to 40 tonnes, it is difficult to maintain the position of the cover holder using such lateral adjusting screws and the cover holder descends relatively quickly, and the position therefore has to be readjusted frequently with this solution. A similar solution with adjusting screws and similar drawbacks is known from NL 7 503 223 A.

**[0014]** The idea from CA 2 778 146 A1, as illustrated in Figs 30 and 31, to place the cover holder telescopically in the correct position with respect to a mounting ring and

maintain and fasten it in the correct position without adjusting means is a relatively laborious solution which is difficult to realise in practice. In addition, when the cover holder is screwed to the mounting ring, it is provided with screw holes in some places, following which it is impossible to change the height or the inclination even to the slightest degree, for example if the road is resurfaced and deviates from the previous road surface.

**[0015]** Accurate adjustability of the height, in which case this height is also frequently readjustable, is possible using a cover holder which is provided with an internal or external screw thread and is telescopically fitted with respect to a mounting ring which is provided with a corresponding external or internal screw thread. Such systems are described, for example, in CA 2,582,187 A and WO 98/27285 A1. However, with such systems, additional elements are required to be able to adjust the inclination of the cover holder to the inclination of the road surface.

**[0016]** The only proposed solution in which both the height and the inclination of a carriageway cover can be accurately set several times is a system in which a cover holder is telescopically fittable in a mounting ring and can be moved in the height direction with respect to the mounting ring by means of vertically arranged threaded rods. Such systems are known, for example, from CA 2 778 146 A1 (see Figs 1 to 21), US 2004/071508 and US 6,371,687 B1. A drawback of the solutions from these patent publications is that the threaded rods are in this case arranged on the outer side of both the cover holder and the mounting ring and are cast in during the laying of the carriageway surface. If it subsequently becomes necessary to set or adjust the height and the inclination again, the adjustment means have to be hacked out again without damaging them. This work is particularly laborious and is difficult to carry out without damaging the adjustment means.

**[0017]** This problem is overcome by means of a solution in which the threaded rods are arranged on the inside of the mounting ring and the cover holder, as described in DE 42 30 006 A1 and DE 199 32 166 A1. However, the problem with the solution as described in DE 42 30 006 A1 is that by positioning the threaded rods in this way, the passage opening is greatly constricted. This solution can therefore not be applied for the existing sizes of carriageway covers. In order to retain an acceptable passage opening, a suitable cover holder has to be provided and suitable carriageway covers of a larger diameter than the existing carriageway covers. A great drawback in this case is that, due to the increased amount of material used, the carriageway covers become very heavy, so that they are not so easy to manipulate, both with regard to positioning and if the carriageway cover has to be opened in order to reach the inspection shaft. In addition, due to the increased amount of material used, the cost price of this solution greatly exceeds the cost price of standard carriageway covers. The installation means as described in DE 199 32 166 A1 and illustrated

in figure 2 thereof, comprise the features of the preamble of claim 1, which make them useful with cover holders for carriageway covers which are commercially available and for existing inspection manholes. These installation means can still further be improved. It is an object of the present invention to ensure that cover holders in order to keep a carriageway cover so as to be adjustable in height and in inclination in a secured and more reliable manner on top of an inspection shaft of an inspection manhole can be fitted even more easily, in which case the height and the inclination of such a cover holder is easily adjustable and easily readjustable and in which case this is also possible for cover holders for carriageway covers which are commercially available and for existing inspection manholes.

**[0018]** This object of the invention is achieved by providing installation means for installing a cover holder so as to be adjustable in height and in inclination in order to keep a carriageway cover on top of an inspection shaft of an inspection manhole, comprising at least three threaded rods for adjusting the height and the inclination of the cover holder with respect to the inspection shaft, with the installation means being adapted to arrange the threaded rods so as to be adjustable in height with respect to the inspection shaft and fixed in height under the cover holder, in order to allow the cover holder to rest on top of a first end of the threaded rods, wherein the installation means comprise a nut for each threaded rod which can be rotatably fitted on the corresponding threaded rod, comprise at least one slide-blocking element for each threaded rod in order to prevent the nut from sliding with respect to the threaded rod and comprise at least one rotation-blocking element for each threaded rod to prevent the threaded rod from rotating.

**[0019]** By allowing the cover holder to rest on top of a first end of the threaded rods, the threaded rods can be fitted under the edge of the cover holder which defines the passage opening, and without further narrowing the passage opening. In this case, it is also possible to protect the threaded rods towards the outside the cover holder, if it is not desired to incorporate these into the materials to be applied around the cover holder in order to construct a carriageway. The threaded rods may then be accessible from the inner side of the cover holder for adjustment, so that the height and the inclination of the cover holder can be accurately adjusted several times.

**[0020]** The height of the cover holder is not varied with respect to fixed-height threaded rods in order thus to adjust the height of the cover holder with respect to the inspection shaft, but the height of the threaded rods with respect to the inspection shaft is varied and the cover holder is able to rest on top of a first end of the threaded rods. This ensures that the position of the cover holder with respect to the inspection shaft set by means of the threaded rods can be kept stable for a long time and also under varying loads of up to 40 tonnes using limited means. If the height of the cover holder with respect to the threaded rods were to be varied and the threaded

rods were to rest on a base at a fixed height, it would be less simple to prevent the cover holder from subsiding under varying loads of up to 40 tonnes.

**[0021]** Using at least three threaded rods, it is possible to adjust both the height and the inclination of a cover holder. Such threaded rods are preferably made from stainless steel in order to be able to absorb the loads applied and to be used as an adjustment means for setting and adjusting the height and the inclination of the cover holder in the long term.

Taking into account the dimensions of current carriageway covers and corresponding cover holders, preferably at least four threaded rods are incorporated into the installation means in order to be able to realise the currently prescribed passage openings and to be able to absorb the varying loads in a robust manner.

**[0022]** Preferably, the installation means according to the present invention furthermore comprise a mounting ring, for fitting on top of the inspection shaft, this mounting ring comprising fastening means to which the threaded rods are attachable so as to be vertically displaceable, in order to arrange these so as to be vertically displaceable with respect to the inspection shaft and in which the cover holder is fittable in the mounting ring so as to be at least partly telescopic in order to install it above the inspection shaft. Such a mounting ring is a simple aid for arranging the installation means in situ, which will in addition also protect the threaded rods towards the outside so that they, being the adjustment means for adjusting the height and the inclination of the cover holder, will not become embedded in the materials from which the carriageway is being constructed which an inspection manhole, in which these installation means are accommodated, adjoins.

**[0023]** Such a mounting ring preferably has a shape which substantially corresponds to the shape of the cover holder and the carriageway cover. When the carriageway cover is mainly circular, then this mounting ring is preferably also mainly circular. When the carriageway cover is mainly rectangular, then this mounting ring is preferably also mainly rectangular.

Such a mounting ring is preferably made from concrete.

**[0024]** In a particular embodiment, the mounting ring comprises a bush for each threaded rod to allow the corresponding threaded rod to at least partly extend therein with its second end. When a threaded rod is then vertically displaced with respect to the inspection shaft, it will then extend to a greater or lesser degree into this bush. If such a mounting ring is made of concrete, such a bush may for example be made from metal and may be cast into the concrete when the mounting ring is being cast. To this end, the bush preferably comprises anchoring elements to keep the bush fixed in the concrete. Such anchoring elements may, for example, be configured as one or more flanges which extend into the concrete with respect to the periphery of the bush.

**[0025]** In an embodiment comprising said bushes in a mounting ring, each such bush may, for example, com-

prise a blocking guide which extends in the height direction of the bush and each threaded rod may comprise said rotation-blocking element at its second end is fittable in the blocking guide of the corresponding bush in a guiding manner to prevent the threaded rod from rotating with respect to the bush.

**[0026]** More specifically, the bush may to this end be designed, for example, substantially in the shape of a beam, in which case the blocking guide is designed as an internal rib of the bush. Such an embodiment of the blocking guide is particularly easily achievable.

**[0027]** In a particularly preferred embodiment, the mounting ring may comprise a step on its inner wall, in which case said bushes end in said step, and in which case at least some of said slide-blocking elements are arranged on this step above the corresponding bushes.

**[0028]** More specifically, the slide-blocking elements may in this case comprise a washer for each threaded rod which can be arranged around the threaded rod, between the nut and the step, and comprise a bracket which can be positioned around the threaded rod and above the nut and can be fastened to the washer and the step. Providing such a washer is particularly preferred if the mounting ring is made of concrete in order to be able to pass on the forces occurring between the corresponding threaded rod, the corresponding nut and the mounting ring. This washer does not necessarily have to be in the form of a classic round washer, but may be configured as a plate-like element of any conceivable shape which is provided with an opening through which the threaded rod can extend and extends over the edge of the step in order to be able to engage this step. The part which extends over the edge of the step is preferably sufficiently large to be able to fasten the bracket to said washer and the step.

**[0029]** In order to be able to achieve a good transmission of forces between the threaded rods and the cover holder at different set inclinations of the cover holder with respect to the inspection shaft, the first end of each threaded rod is preferably spherical and the installation means preferably comprise a cup element for each threaded rod, which cup element is fittable below the cover holder or forms part thereof, in which case each cup element comprises a concave shape which can support the spherical end of the corresponding threaded rod herein in order to support the cover holder on top of this end of the threaded rod. The curvature of the spherical end preferably has a smaller diameter at each corresponding point than the curvature of the concave cup in order to allow optimum transmission of forces, without the spherical end becoming stuck in the concave cup. Such a cup element is preferably made from stainless steel.

**[0030]** Still more preferably, the first end of each threaded rod in such embodiments comprises a bore, in which case each cup element comprises a corresponding bore having a larger diameter than the bore in the corresponding threaded rod and in which case the installation

means comprise a screw for each threaded rod with a screw head which has a larger diameter than the bore in the cup element, so that this screw is fittable with play in the bore in the corresponding cup element and is screwable into the bore of the threaded rod. In this way, the threaded rods cannot sink with respect to the cover holder and the set height and inclination of the cover holder are ensured for a long time.

**[0031]** The object of the present invention is also achieved by providing an inspection manhole, comprising an inspection shaft, a cover holder and fastening means for fastening the cover holder on top of the inspection shaft, in which case these fastening means are configured as installation means according to the present invention as described above.

**[0032]** In addition, the object of the present invention is also achieved by providing a method for installing a cover holder in order to keep a carriageway cover on top of an inspection shaft of an inspection manhole, in which the cover holder is installed on top of the inspection shaft by means of above-described installation means according to the present invention.

**[0033]** In such a preferred method, the cover holder is first fitted on top of the inspection shaft by means of the installation means, in which case the threaded rods are in a position in which they are raisable with respect to the inspection shaft. Subsequently, the cover holder is jacked up with respect to the inspection shaft by means of a jack until it reaches the desired height and the threaded rods are then raised until the cover holder rests on top of the first end of the threaded rods and the jack can be removed. By using a jack, the threaded rods are not subjected to unnecessary loads during the vertical displacement of the cover holder, but are only subjected to loads when setting the correct height and inclination of the cover holder.

**[0034]** Finally, the object of the present invention is also achieved by providing such a method wherein an inspection manhole, in which a cover holder of a carriageway cover is fitted on top of an inspection shaft by means of fastening means, is adjusted by:

- detaching the cover holder;
- removing at least some of the fastening means;
- installing the cover holder on top of the inspection shaft by means of installation means according to the present invention.

**[0035]** The present invention will now be explained in more detail by means of the following detailed description of an embodiment of installation means, an inspection manhole and methods according to the present invention. The object of this description is solely to give illustrative examples and to indicate further advantages and particulars of these installation means, inspection manhole and methods, and can therefore not be interpreted as a limitation of the area of application of the invention or of the patent rights defined in the claims.

**[0036]** In this detailed description, reference numerals are used to refer to the attached drawings, in which:

- Fig. 1 shows an inspection manhole in perspective;
- Fig. 2 shows an embodiment of installation means according to the present invention with a cover holder and carriageway cover installed thereon in cross section;
- Fig. 3 shows the cover holder and the carriageway cover from Fig. 2, in which the cup elements of the installation means from Fig. 2 are attached to the cover holder, in perspective view;
- Fig. 4 shows a bush, washer, nut, bracket and threaded rod of the installation means from Fig. 2 in perspective view;
- Fig. 5 shows a threaded rod of the installation means from Fig. 2 in perspective view;
- Fig. 6 shows the threaded rod from Fig. 5 in top view;
- Fig. 7 shows a cup element of the installation means from Fig. 2 in perspective, with a holding element fitted thereon;
- Fig. 8 shows the installation means from Fig. 2 in perspective, without the cup elements;
- Figs 9 to 12 diagrammatically show in partial view and partial cross section in successive steps how a carriageway incorporating a carriageway cover of an inspection manhole can be laid according to the invention, and with an inspection manhole according to the present invention.

**[0037]** The illustrated inspection manholes (1) in each case comprise an inspection shaft (2) which is connected to sewage pipes (23) which extend underground (see Figs 1 and 9-12). Over this inspection shaft (2), a cover plate (7) is fitted which comprises an eccentric opening on which a mounting ring (6) with installation means according to the present invention is provided. A cover holder (5) is fitted in this mounting ring (6) so as to be telescopically displaceable. In the cover holder (5), a carriageway cover (3) is held.

**[0038]** In the illustrated embodiment, the inspection shaft (2), the mounting ring (6) and the cover holder (5) are substantially cylindrical and the carriageway cover (3) is essentially circular. Of course, these elements could also be of a different shape.

In this case, the inspection shaft (2) and the mounting ring (6) are prefab concrete elements. These could optionally also be made from other suitable materials.

In this case, the cover holder (5) and the cover (3) are made from cast iron. These could optionally also be made from other suitable materials.

**[0039]** In order to fit the cover holder (5) so as to be adjustable in height and in inclination with respect to the mounting ring (6), four threaded rods (4) are provided which are arranged at equal distances from each other under the cover holder (5).

The inner wall of the mounting ring (6) is stepped. The inner wall of the mounting ring (6) is essentially formed

in two cylindrical parts, in which case the lower part of the mounting ring (6) has a smaller inner diameter than the upper part of the mounting ring (6). The mounting ring (6) comprises an essentially horizontal step (24) between both parts (lower and upper).

Four metal bushes (8) end in this step from the underside of which in each case one threaded rod (4) extends partly into the former. The bushes (8) are hollow and have a square cross section along essentially their entire length. At the bottom, these bushes (8) comprise a metal flange (13) which is welded to the sleeve of the bush (8). These bushes (8) are cast into the concrete of the mounting ring (6) and are anchored therein by means of this flange (13). A stick (26) is welded onto the underside of each threaded rod (4) and extends radially with respect to the axis of the threaded rod (4), as can be seen in Figs 5 and 6. When the threaded rod (4) is fitted in the corresponding bush (8), this stick (26) extends as far as an inner rib of the bush (8) as a rotation-blocking element (26). In this way, the threaded rod (4) can be vertically adjusted in the corresponding bush (8), but cannot be rotated in this bush (8).

After such a threaded rod (4) has been fitted in the bush (8), a metal washer (10) is welded onto the top of the bush (8). A nut (11) is fitted on this washer (10), around the threaded rod (4). A metal bracket (9) is in turn fitted on the washer (10) and the nut (11). In the washer (10) and the bracket (9), an opening is provided with a slightly larger diameter than the diameter of the threaded rod (4), so that the threaded rod (4) can extend freely there-through. The bracket (9) is then fastened to the washer (10) by means of bolts (20). Both the bracket (9) and the washer (10) comprise bores which are adapted to this end. In this way, the nut (11) extends between the washer (10) and the bracket (9), as can be seen in Fig. 4. In this way, the nut (11) cannot be vertically displaced. By rotating the nut (11), the corresponding threaded rod (4) can then be vertically displaced in the bush (8) and thus with respect to the mounting ring (6).

**[0040]** In order for the cover holder (5) to be able to rest on the threaded rods (4) in an optimum manner at any inclination to which the cover holder (5) is set with respect to the mounting ring (6), the upper end (14) of the threaded rods (4) is spherical, as can be seen in Figs 4 and 5. Four corresponding stainless-steel cup elements (16) are in turn fastened to the underside of the cover holder (5) by means of bolts (10), as can clearly be seen in Fig. 3. The cover holder (5) and the cover (3) may be standard elements. In this case, bores will first be made in the cover holder (5) so as to be able to fasten these cup elements (16) thereto. The underside of these cup elements (16) comprise concave cups having a concave shape which corresponds to the spherical shape of the upper ends (14) of the threaded rods (4), as can be seen in Fig. 2, so that the threaded rods (4) can be accommodated in these cups by their spherical end (14) and the occurring forces can then be transferred between the threaded rods (4) and the cup elements (16) in an opti-

mum manner.

In order to ensure that the cover holder (6) cannot slide away with respect to the threaded rods (4), each threaded rod (4) is provided with a bore (15) in its spherical end. The corresponding cup element (16) is provided with a bore of a slightly larger diameter. In this way, a screw (17) can be fitted through the bore in the cup element (16), as can be seen in Fig. 7, and can be screwed into the corresponding threaded rod (4), as can be seen in Fig. 2. In this case, the screw (17) has a screw head with a diameter which is greater than the diameter of the bore in the cup element (16). As the diameter of the bore in the cup element (16) through which the screw (17) extends is greater than the diameter of the screw thread, the screw can be displaced in this bore with some play. In this way, the cover holder (5) can be fastened to the threaded rods (4) via the cup elements (16), in which case an adjustment of the inclination of the cover holder (5) with respect to the threaded rods (4) is still possible. A holding element (18) is fastened to the cup element (16) by means of bolts (19) in order to prevent this screw (17) from becoming loose on account of, for example, vibrations.

**[0041]** In the following, a description will be given of the way in which a carriageway cover (3) can be incorporated in a carriageway comprising several layers of asphalt (28, 29) by means of the installation means according to the present invention using a method according to the present invention. Obviously, by means of the installation means according to the present invention, it is also possible to incorporate a carriageway cover (3) in other types of carriageways with the same advantages regarding adjustability in height and inclination of the cover holder (5) with respect to the inspection shaft (2) on top of which it is arranged. Only the construction of a carriageway comprising several layers of asphalt (28, 29) will be discussed in more detail here, because the installation means according to the present invention offer additional advantages with this method.

**[0042]** In order to incorporate a carriageway cover (3) in a carriageway by means of the installation means according to the present invention, the mounting ring (6) is fitted on top of the inspection shaft (2) as soon as this has been put in place. This may be effected by arranging this mounting ring (6) on a bed of mortar on the cover plate (7) on top of the inspection shaft (2).

The inspection shaft (2) may, for example, be prefabricated and have a height which is the difference between the level of the carriageway and the level of the sewage pipes (23) to which it is to be connected, minus a certain height for placing the mounting ring (6), the cover holder (5) and the cover (3). If this is not the case and the deviation is much greater than the height required for placing the mounting ring (6), the cover holder (5) and the cover (3), the mounting ring (6) could also be concreted, for example in situ on top of the cover plate (7) by means of suitable shuttering.

**[0043]** In order to allow the installation in situ to proceed

quickly, it is possible to arrange the cover holder (5) with the cover (3) on the mounting ring (6) beforehand, so that this mounting ring (6) with the cover holder (5) and the cover (3) can be installed as a unit, as illustrated in Fig. 2, on top of the inspection shaft (2).

If desired, the cover holder (5) and the cover (3) may also be fastened to the mounting ring (6) in situ by means of the other installation means. This will be the case, for example, if the fastening means at an existing inspection manhole (1) are to be replaced by the installation means according to the present invention. In that case, the existing cover holder (5) with the existing cover (3) will first of all be retrieved, at least a part of the means by which the cover holder (5) was installed on top of the inspection shaft (2) will be removed, the mounting ring (6) with the threaded rods (4) and the cup elements fitted thereon (preferably all other installation means are already fastened to the mounting ring) will be installed on top of the inspection shaft (2), holes will be drilled in the retrieved cover holder (5) and the cup elements (16) will be fastened thereto.

**[0044]** A considerable advantage with respect to the current way of working is that in this case the inspection manhole (1) is closed off immediately by the final carriageway cover (3). Materials, such as soil or stones, can no longer end up in the inspection shaft (2) during the entire duration of the construction of the superstructure.

**[0045]** After the installation of the cover holder (5) in the mounting ring (6), the threaded rods (4) are preferably initially at such a level that the cover holder (5) and the carriageway cover (3) are situated just below the layers of asphalt (28, 29) to be laid. The slots are filled, the caissons are made and the road metal foundations (27) are laid. Once it has been laid, the road metal (27) around the mounting ring (6) is permanent. It does not have to be loosened again in order to adjust the carriageway cover (3). With this construction, no foundation materials (27) end up in the inspection shaft (2). The inspection shaft (2) does remain accessible at all times by opening the carriageway cover (3).

**[0046]** The centre of the carriageway cover (3) is determined and subsequently the bottom layer of asphalt (28) and the top layer of asphalt (29) are laid on top of the carriageway cover (3), as can be seen in Fig. 9. The person laying the asphalt (29) therefore does not have to take the carriageway cover (3) into account. The machine can be driven across the carriageway cover (3). There is thus no manual labour required in the vicinity of the carriageway cover (3) which could result in bumps in the finish. Both the bottom layer (28) and the top layer (29) can be laid completely mechanically, resulting in the correct finishing thickness. This also leads to a significant improvement in the quality of the asphalt pavement.

**[0047]** Subsequently, the diameter of the carriageway cover (3) is plotted and a bore is used to drill an opening which is made approximately 5 centimetres larger than the carriageway cover (3), so that the drilled opening ends on top of the mounting ring (6), as can be seen in

Fig. 10. In contrast to what has hitherto been customary, the opening which is made for adjusting the height and the inclination of the carriageway cover (3) with respect to the carriageway can be kept quite small. There is no longer an opening next to the mounting ring (6) which has to be filled. The foundation of the carriageway around the mounting ring (6) is no longer loosened and does not have to be replaced by rich concrete, as a result of which there will be no differences in curing. The mounting ring (6) itself is also bevelled with a bevelled edge (25) at the top (see Fig. 2) in order to further minimize possible differences in expansion.

[0048] Then, the cover is opened and the cover holder (5) is raised with respect to the mounting ring (6) by means of a hydraulic jack until it is at the desired height and at the desired inclination. Thereafter, the nuts (11) are tightened until the threaded rods (4) are fixed under the cover holder (5). In this position, the threaded rods (4) are fixed to the mounting ring (6). The jack can then be removed again. This situation can be seen in Fig. 11.

[0049] Subsequently, the opening between the layers of asphalt (28, 29) and the cover holder (5) is filled with liquid asphalt (30), as can be seen in Fig. 12. This liquid asphalt (30) bonds perfectly to the surrounding asphalt pavement (28, 29). Subsequent crumbling is thus prevented as the joint to be filled was kept to a minimum.

[0050] Readjustment of the height and the inclination of the carriageway covers (3) can be carried out at any point in time later and with minimal loss of time.

This may be carried out, for example, if a further compaction of the asphalt and/or the foundation has taken place after x number of years. In this case, the liquid asphalt (30) is drilled out or hacked away, the height and/or the inclination of the carriageway cover (3) is adjusted and the opening around the carriageway cover (3) is filled up again with liquid asphalt (30).

This may also be carried out, for example, if the top layer of asphalt (29) has to be replaced after x number of years. In this case, the carriageway cover (3) is first lowered. The top layer of asphalt (29) on top of the carriageway cover (3) is cut away, the top layer (29) is replaced and an opening is subsequently produced once again around the carriageway cover (3), as has been described above, the carriageway cover (3) is raised again and placed at the correct inclination and the opening next to the carriageway cover (3) is filled again with liquid asphalt (30). These operations can be carried out in a very short period of time, so traffic will no longer be disrupted for periods of up to three weeks in order to be able to carry out this kind of work, as at most half a day per cover is required.

## Claims

1. Installation means for installing a cover holder (5) so as to be adjustable in height and in inclination in order to keep a carriageway cover (3) on top of an inspection shaft (2) of an inspection manhole (1), comprising

ing at least three threaded rods (4) for adjusting the height and the inclination of the cover holder (5) with respect to the inspection shaft (2), wherein the installation means are adapted to arrange the threaded rods (4) so as to be adjustable in height with respect to the inspection shaft (2) and fixed in height under the cover holder (5), in order to allow the cover holder (5) to rest on top of a first end (14) of the threaded rods (4), wherein said installation means comprise a nut (11) for each threaded rod (4) which is rotatably fittable on the corresponding threaded rod (4), and comprise at least one slide-blocking element (9, 10) for each threaded rod (4) in order to prevent the nut (11) from sliding with respect to the threaded rod (4), said installation means being **characterized by** further comprising at least one rotation-blocking element (26) for each threaded rod (4) to prevent the threaded rod (4) from rotating.

2. Installation means according to Claim 1, **characterized in that** the installation means comprise a mounting ring (6), for fitting on top of the inspection shaft (2), this mounting ring (6) comprising fastening means to which the threaded rods (4) are attachable so as to be vertically displaceable, in order to arrange these so as to be vertically displaceable with respect to the inspection shaft (2) and in which the cover holder (5) is fittable in the mounting ring (6) so as to be at least partly telescopic in order to install it above the inspection shaft (2).

3. Installation means according to Claim 2, **characterized in that** the mounting ring (6) comprises a bush (8) for each threaded rod (4) in order to allow the corresponding threaded rod (4) to at least partly extend therein with its second end.

4. Installation means according to Claim 3, **characterized in that** each bush (8) comprises a blocking guide which extends in the height direction of the bush (8) and **in that** each threaded rod (4) comprises said rotation-blocking element (26) at its second end which is fittable in the blocking guide of the corresponding bush (8) in a guiding manner to prevent the threaded rod (4) from rotating with respect to the bush (8).

5. Installation means according to Claim 4, **characterized in that** the bush (8) is designed substantially in the shape of a beam and **in that** the blocking guide is designed as an internal rib of the bush (8).

6. Installation means according to Claim 3 and one of Claims 4 to 5, **characterized in that** the mounting ring (6) comprises a step (24) on its inner wall, **in that** the bushes (8) end in said step (24), and **in that** at least some of the slide-blocking elements (9, 10) are arranged on this step (24) above the correspond-

ing bushes (8).

7. Installation means according to Claim 6, **characterized in that** the slide-blocking elements (9, 10) comprise a washer (10) for each threaded rod (4) which is fittable around the threaded rod (4), between the nut (11) and the step (24), and comprise a bracket (9) which can be positioned around the threaded rod (4) and above the nut (11) and can be fastened to the washer (10) and the step (24).
8. Installation means according to one of the preceding claims, **characterized in that** the first end (14) of each threaded rod (4) is designed to be spherical and **in that** the installation means comprise a cup element (16) for each threaded rod (4), which cup element (16) is fittable below the cover holder (5) or forms part thereof, in which case each cup element (16) comprises a concave shape which can support the spherical end (14) of the corresponding threaded rod (4) herein in order to support the cover holder (5) on top of this end (14) of the threaded rod (4).
9. Installation means according to Claim 8, **characterized in that** the first end (14) of each threaded rod (4) comprises a bore (15), **in that** each cup element (16) comprises a corresponding bore having a larger diameter than the bore (15) in the corresponding threaded rod (4) and **in that** the installation means comprise a screw (17) for each threaded rod (4) with a screw head which has a larger diameter than the bore in the cup element, so that this screw (17) is fittable with play in the bore in the corresponding cup element (16) and is screwable into the bore (15) of the threaded rod (4).
10. Inspection manhole (1) comprising an inspection shaft (2), a cover holder (5) and fastening means for fastening the cover holder (5) on top of the inspection shaft (2), **characterized in that** the fastening means are installation means according to one of the preceding claims.
11. Method for installing a cover holder (5) in order to keep a carriageway cover (3) on top of an inspection shaft (2) of an inspection manhole (1), **characterized in that** the cover holder (5) is installed on top of the inspection shaft (2) by means of installation means according to one of Claims 1 to 9.
12. Method according to Claim 11, **characterized in that** the cover holder (5) is fitted on top of the inspection shaft (2) by means of the installation means, in which the threaded rods (4) are situated in a position in which they are raisable with respect to the inspection shaft (2), **in that** the cover holder (5) is jacked up with respect to the inspection shaft (2) by means of a jack until it reaches the desired height, and **in**

**that** the threaded rods (4) are raised until the cover holder (5) rests on top of the first end (14) of the threaded rods (4) and the jack can be removed.

- 5 13. Method according to Claim 11 or 12, **characterized in that** the threaded rods (4) are taken to a desired position with respect to the inspection shaft (2) and are fixed in said position.
- 10 14. Method according to any of claims 11 to 13, **characterised in that** an inspection manhole (1), in which a cover holder (5) of a carriageway cover (3) is fitted on top of an inspection shaft (2) by means of fastening means, is adjusted by:
- 15 a. detaching the cover holder (5);
- b. removing at least some of the fastening means;
- 20 c. installing the cover holder (5) on top of the inspection shaft (2) by means of installation means according to one of Claims 1 to 9.

#### Patentansprüche

- 25 1. Installationsmittel zur Installation einer Deckelhalterung (5) derart, dass sie in Höhe und Neigung einstellbar ist, um einen Fahrbahndeckel (3) oben auf einem Einstiegsschacht (2) eines Inspektionsschachtes (1) zu halten, umfassend wenigstens drei Gewindestangen (4) zum Einstellen der Höhe und der Neigung der Deckelhalterung (5) in Bezug auf den Einstiegsschacht (2), wobei die Installationsmittel geeignet sind, die Gewindestangen (4) so anzuordnen, dass sie in der Höhe in Bezug auf den Einstiegsschacht (2) eingestellt und in der Höhe unter der Deckelhalterung (5) fixiert werden können, um zu ermöglichen, dass die Deckelhalterung (5) oben auf einem ersten Ende (14) der Gewindestangen (4) aufliegt, wobei die Installationsmittel eine Mutter (11) für jede Gewindestange (4) umfassen, die auf drehbare Weise auf die entsprechende Gewindestange (4) aufgesetzt werden kann, und wenigstens ein rutschblockierendes Element (9, 10) für jede Gewindestange (4) umfassen, um zu verhindern, dass die Mutter (11) in Bezug auf die Gewindestange (4) verrutscht, wobei die Installationsmittel **dadurch gekennzeichnet sind**, dass sie ferner wenigstens ein verdrehblockierendes Element (26) für jede Gewindestange (4) umfassen, um zu verhindern, dass sich die Gewindestange (4) dreht.
- 30
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- 55 2. Installationsmittel nach Anspruch 1, **dadurch gekennzeichnet**, dass die Installationsmittel einen Befestigungsring (6) zum Aufsetzen oben auf den Einstiegsschacht (2) umfassen, wobei dieser Befestigungsring (6) Befestigungsmittel umfasst, an die die Gewindestangen (4) so anbringbar sind, dass

- sie vertikal verschiebbar sind, um diese so anzuordnen, dass sie in Bezug auf den Einstiegsschacht (2) vertikal verschiebbar sind, und wobei die Deckelhalterung (5) in den Befestigungsring (6) eingesetzt werden kann, um zumindest zum Teil ausziehbar zu sein, um sie über dem Einstiegsschacht (2) zu installieren.
3. Installationsmittel nach Anspruch 2, **dadurch gekennzeichnet, dass** der Befestigungsring (6) eine Buchse (8) für jede Gewindestange (4) umfasst, um zu ermöglichen, dass sich die entsprechende Gewindestange (4) mit ihrem zweiten Ende wenigstens zum Teil in dieselbe erstreckt.
  4. Installationsmittel nach Anspruch 3, **dadurch gekennzeichnet, dass** jede Buchse (8) eine Blockierführung umfasst, die sich in Höhenrichtung der Buchse (8) erstreckt, und dass jede Gewindestange (4) an ihrem zweiten Ende das verdrehblockierende Element (26) umfasst, das auf führende Weise in die Blockierführung der entsprechenden Buchse (8) eingesetzt werden kann, um zu verhindern, dass sich die Gewindestange (4) in Bezug auf die Buchse (8) dreht.
  5. Installationsmittel nach Anspruch 4, **dadurch gekennzeichnet, dass** die Buchse (8) im Wesentlichen in Form eines Stabs ausgeführt ist und dass die Blockierführung als eine innere Rippe der Buchse (8) ausgeführt ist.
  6. Installationsmittel nach Anspruch 3 und einem der Ansprüche 4 bis 5, **dadurch gekennzeichnet, dass** der Befestigungsring (6) einen Absatz (24) auf seiner Innenwand umfasst, dass die Buchsen (8) in diesen Absatz (24) münden und dass wenigstens einige der rutschblockierenden Elemente (9, 10) über den entsprechenden Buchsen (8) an diesem Absatz (24) angeordnet sind.
  7. Installationsmittel nach Anspruch 6, **dadurch gekennzeichnet, dass** die rutschblockierenden Elemente (9, 10) für jede Gewindestange (4) eine Scheibe (10) umfassen, die um die Gewindestange (4) zwischen der Mutter (11) und dem Absatz (24) angebracht werden kann, und einen Bügel (9) umfassen, der um die Gewindestange (4) und über der Mutter (11) positioniert und an der Scheibe (10) und dem Absatz (24) befestigt werden kann.
  8. Installationsmittel nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das erste Ende (14) jeder Gewindestange (4) kugelförmig ausgeführt ist und dass die Installationsmittel ein Becherelement (16) für jede Gewindestange (4) umfassen, wobei das Becherelement (16) unter der Deckelhalterung (5) eingesetzt werden kann oder ein Teil derselben bildet, in welchem Fall jedes Becherelement (16) eine konkave Form umfasst, die das kugelförmige Ende (14) der entsprechenden Gewindestange (4) darin halten kann, um die Deckelhalterung (5) oben auf diesem Ende (14) der Gewindestange (4) zu halten.
  9. Installationsmittel nach Anspruch 8, **dadurch gekennzeichnet, dass** das erste Ende (14) jeder Gewindestange (4) eine Bohrung (15) umfasst, dass jedes Becherelement (16) eine entsprechende Bohrung umfasst, die einen größeren Durchmesser als die Bohrung (15) in der entsprechenden Gewindestange (4) aufweist, und dass die Installationsmittel eine Schraube (17) für jede Gewindestange (4) mit einem Schraubenkopf umfassen, der einen größeren Durchmesser als die Bohrung in dem Becherelement aufweist, so dass diese Schraube (17) mit Spiel in die Bohrung in dem entsprechenden Becherelement (16) eingesetzt und in die Bohrung (15) der Gewindestange (4) eingeschraubt werden kann.
  10. Inspektionsschacht (1), umfassend einen Einstiegsschacht (2), eine Deckelhalterung (5) und Befestigungsmittel zum Befestigen der Deckelhalterung (5) oben auf dem Einstiegsschacht (2), **dadurch gekennzeichnet, dass** es sich bei den Befestigungsmitteln um Installationsmittel nach einem der vorhergehenden Ansprüche handelt.
  11. Verfahren zur Installation einer Deckelhalterung (5), um einen Fahrbahndeckel (3) oben auf einem Einstiegsschacht (2) eines Inspektionsschachtes (1) zu halten, **dadurch gekennzeichnet, dass** die Deckelhalterung (5) mit Hilfe von Installationsmitteln nach einem der Ansprüche 1 bis 9 oben auf dem Einstiegsschacht (2) installiert ist.
  12. Verfahren nach Anspruch 11, **dadurch gekennzeichnet, dass** die Deckelhalterung (5) mit Hilfe der Installationsmittel oben auf den Einstiegsschacht (2) gesetzt wird, wobei sich die Gewindestangen (4) in einer Position befinden, in der sie in Bezug auf den Einstiegsschacht (2) angehoben werden können, dass die Deckelhalterung (5) mit Hilfe einer Hebevorrichtung in Bezug auf den Einstiegsschacht (2) angehoben wird, bis sie die gewünschte Höhe erreicht, und dass die Gewindestangen (4) angehoben werden, bis die Deckelhalterung (5) oben auf dem ersten Ende (14) der Gewindestangen (4) aufliegt und die Hebevorrichtung entfernt werden kann.
  13. Verfahren nach Anspruch 11 oder 12, **dadurch gekennzeichnet, dass** die Gewindestangen (4) in Bezug auf den Einstiegsschacht (2) auf eine gewünschte Position gebracht und in dieser Position fixiert werden.

14. Verfahren nach einem der Ansprüche 11 bis 13, **dadurch gekennzeichnet, dass** ein Inspektionsschacht (1), in den eine Deckelhalterung (5) eines Fahrbahndeckels (3) mit Hilfe von Befestigungsmitteln oben auf einem Einstiegsschacht (2) eingesetzt ist, wie folgt eingestellt wird:

- a. durch Abnehmen der Deckelhalterung (5),
- b. durch Entfernen wenigstens einiger der Befestigungsmittel,
- c. durch Installieren der Deckelhalterung (5) oben auf dem Einstiegsschacht (2) mit Hilfe von Installationsmitteln nach einem der Ansprüche 1 bis 9.

#### Revendications

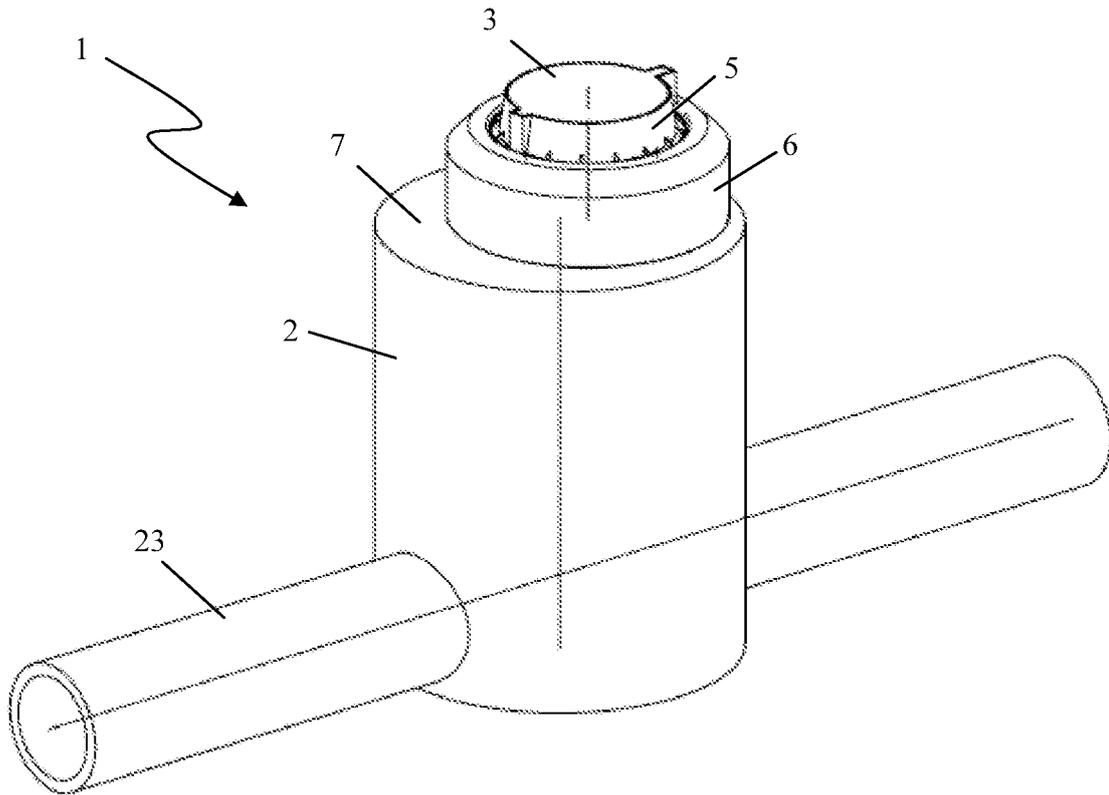
1. Moyens d'installation pour installer un support de couvercle (5) de telle manière qu'il soit réglable en hauteur et en inclinaison dans le but de maintenir un couvercle de chaussée (3) au sommet d'un puits d'inspection (2) d'un regard d'inspection (1), comprenant au moins trois tiges filetées (4) pour régler la hauteur et l'inclinaison du support de couvercle (5) par rapport au puits d'inspection (2), **caractérisés en ce que** les moyens d'installation sont aptes à agencer les tiges filetées (4) de telle manière qu'elles soient réglables en hauteur par rapport au puits d'inspection (2) et fixées en hauteur en dessous du support de couvercle (5), dans le but de permettre au support de couvercle (5) de reposer au sommet d'une première extrémité (14) des tiges filetées (4), dans lesquels lesdits moyens d'installation comprennent un écrou (11) pour chaque tige filetée (4) qui peut être agencé de façon rotative sur la tige filetée correspondante (4), et comprennent au moins un élément anti-coulissement (9, 10) pour chaque tige filetée (4) destiné à empêcher l'écrou (11) de coulisser par rapport à la tige filetée (4), lesdits moyens d'installation étant **caractérisés en ce qu'ils** comprennent en outre au moins un élément d'anti-rotation (26) pour chaque tige filetée (4) qui sert à empêcher la tige filetée (4) de tourner.

2. Moyens d'installation selon la revendication 1, **caractérisés en ce que** les moyens d'installation comprennent un anneau de montage (6), à agencer au sommet du puits d'inspection (2), cet anneau de montage (6) comprenant des moyens de fixation auxquels les tiges filetées (4) peuvent être attachées de manière à être déplaçables verticalement, dans le but d'agencer celles-ci de telle manière qu'elles soient déplaçables verticalement par rapport au puits d'inspection (2), et dans lesquels le support de couvercle (5) peut être agencé dans l'anneau de montage (6) de manière à être au moins partiellement télescopique dans le but de l'installer au-des-

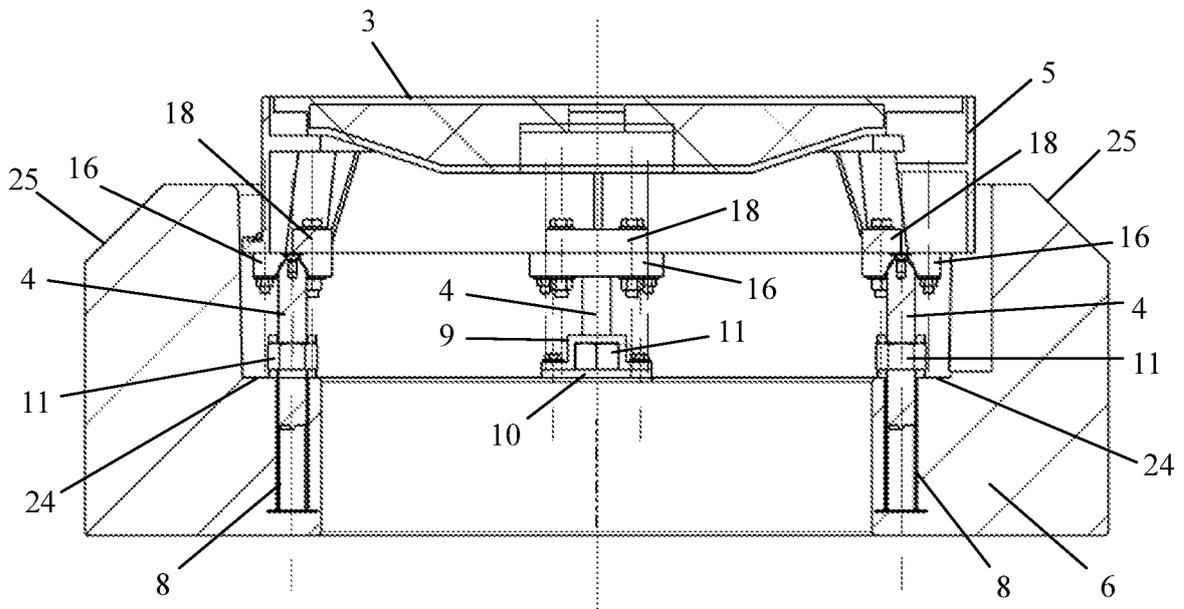
sus du puits d'inspection (2).

3. Moyens d'installation selon la revendication 2, **caractérisés en ce que** l'anneau de montage (6) comprend une douille (8) pour chaque tige filetée (4) dans le but de permettre à la tige filetée correspondante (4) de s'étendre au moins partiellement dans celle-ci avec sa seconde extrémité.
4. Moyens d'installation selon la revendication 3, **caractérisés en ce que** chaque douille (8) comprend un guide de blocage qui s'étend dans le sens de la hauteur de la douille (8), et **en ce que** chaque tige filetée (4) comprend ledit élément anti-rotation (26) à sa seconde extrémité qui peut être agencé dans le guide de blocage de la douille correspondante (8) à la manière d'un guide afin d'empêcher la tige filetée (4) de tourner par rapport à la douille (8).
5. Moyens d'installation selon la revendication 4, **caractérisés en ce que** la douille (8) est conçue sensiblement sous la forme d'une poutre, et **en ce que** le guide de blocage est conçu comme une nervure interne de la douille (8).
6. Moyens d'installation selon la revendication 3 et une des revendications 4 à 5, **caractérisés en ce que** l'anneau de montage (6) comprend un gradin (24) sur sa paroi intérieure, **en ce que** les douilles (8) se terminent dans ledit gradin (24), et **en ce qu'au** moins plusieurs des éléments anti-coulissement (9, 10) sont agencés sur ce gradin (24) au-dessus des douilles correspondantes (8).
7. Moyens d'installation selon la revendication 6, **caractérisés en ce que** les éléments anti-coulissement (9, 10) comprennent un rondelle (10) pour chaque tige filetée (4) qui peut être agencée autour de la tige filetée (4), entre l'écrou (11) et le gradin (24), et comprennent une console (9) qui peut être positionnée autour de la tige filetée (4) et au-dessus de l'écrou (11) et qui peut être attachée à la rondelle (10) et au gradin (24).
8. Moyens d'installation selon l'une des revendications précédentes, **caractérisés en ce que** la première extrémité (14) de chaque tige filetée (4) est conçue de manière à être sphérique, et **en ce que** les moyens d'installation comprennent un élément de coupelle (16) pour chaque tige filetée (4), ledit élément de coupelle (16) pouvant être agencé en dessous du support de couvercle (5) ou faire partie de celui-ci, auquel cas chaque élément de coupelle (16) présente une forme concave qui est capable de supporter l'extrémité sphérique (14) de la tige filetée correspondante (4) dans celle-ci dans le but de supporter le support de couvercle (5) au sommet de cette extrémité (14) de la tige filetée (4).

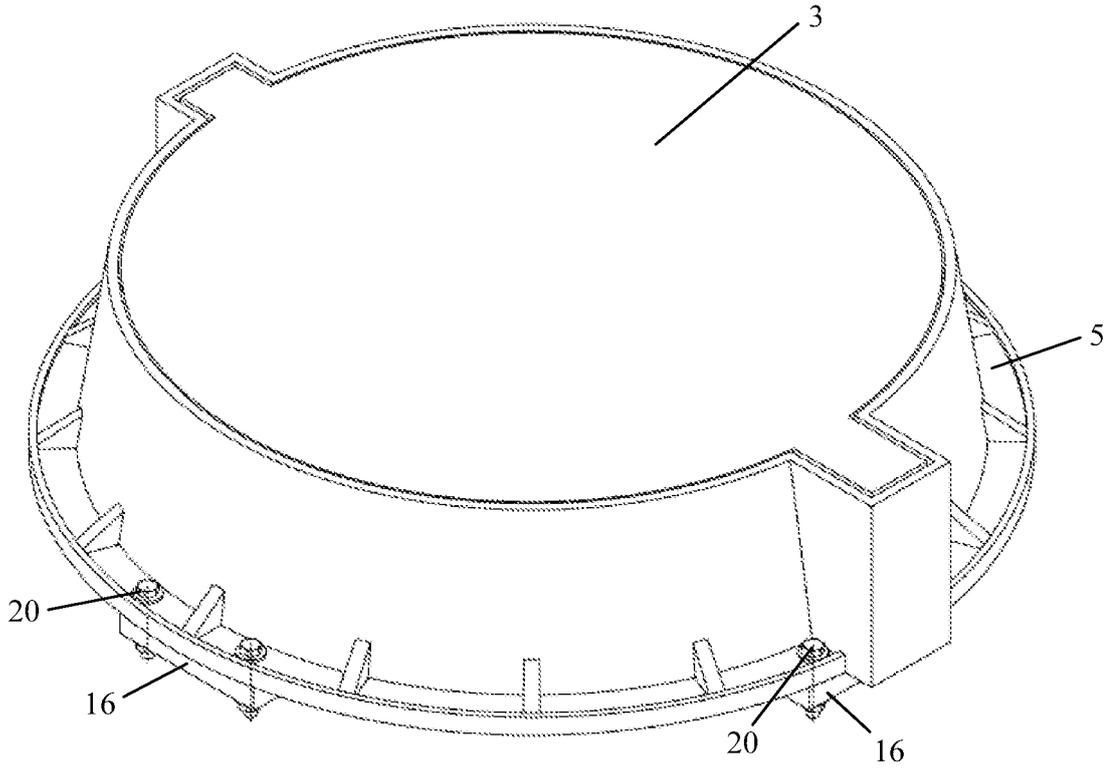
9. Moyens d'installation selon la revendication 8, **caractérisés en ce que** la première extrémité (14) de chaque tige filetée (4) comprend un alésage (15), **en ce que** chaque élément de coupelle (16) comprend un alésage correspondant dont le diamètre est plus grand que celui de l'alésage (15) dans la tige filetée correspondante (4), et **en ce que** les moyens d'installation comprennent une vis (17) pour chaque tige filetée (4) qui présente une tête de vis dont le diamètre est plus grand que celui de l'alésage dans l'élément de coupelle, de telle sorte que cette vis (17) puisse être agencée avec du jeu dans l'alésage dans l'élément de coupelle correspondant (16) et puisse être vissée dans l'alésage (15) de la tige filetée (4). 5 10 15
10. Regard d'inspection (1) comprenant un puits d'inspection (2), un support de couvercle (5) et des moyens de fixation pour attacher le support de couvercle (5) au sommet du puits d'inspection (2), **caractérisé en ce que** les moyens de fixation sont des moyens d'installation selon l'une des revendications précédentes. 20
11. Procédé pour installer un support de couvercle (5) dans le but de maintenir un couvercle de chaussée (3) au sommet d'un puits d'inspection (2) d'un regard d'inspection (1), **caractérisé en ce que** le support de couvercle (5) est installé au sommet du puits d'inspection (2) à l'aide de moyens d'installation selon une des revendications 1 à 9. 25 30
12. Procédé selon la revendication 11, **caractérisé en ce que** le support de couvercle (5) est agencé au sommet du puits d'inspection (2) à l'aide des moyens d'installation, dans lequel les tiges filetées (4) sont situées dans une position dans laquelle elles peuvent être levées par rapport au puits d'inspection (2), **en ce que** le support de couvercle (5) est soulevé par rapport au puits d'inspection (2) à l'aide d'un vérin jusqu'à ce qu'il atteigne la hauteur souhaitée, et **en ce que** les tiges filetées (4) sont élevées jusqu'à ce que le support de couvercle (5) repose au sommet de la première extrémité (14) des tiges filetées (4) et que le vérin puisse être enlevé. 35 40 45
13. Procédé selon la revendication 11 ou 12, **caractérisé en ce que** les tiges filetées (4) sont prises à une position souhaitée par rapport au puits d'inspection (2) et sont fixées dans ladite position. 50
14. Procédé selon l'une quelconque des revendications 11 à 13, **caractérisé en ce qu'**un regard d'inspection (1), dans lequel un support de couvercle (5) d'un couvercle de chaussée (3) est agencé au sommet d'un puits d'inspection (2) à l'aide de moyens de fixation, est ajusté en: 55
- a. détachant le support de couvercle (5);
  - b. enlevant au moins plusieurs des moyens de fixation; et
  - c. installant le support de couvercle (5) au sommet du puits d'inspection (2) à l'aide de moyens d'installation selon une des revendications 1 à 9.



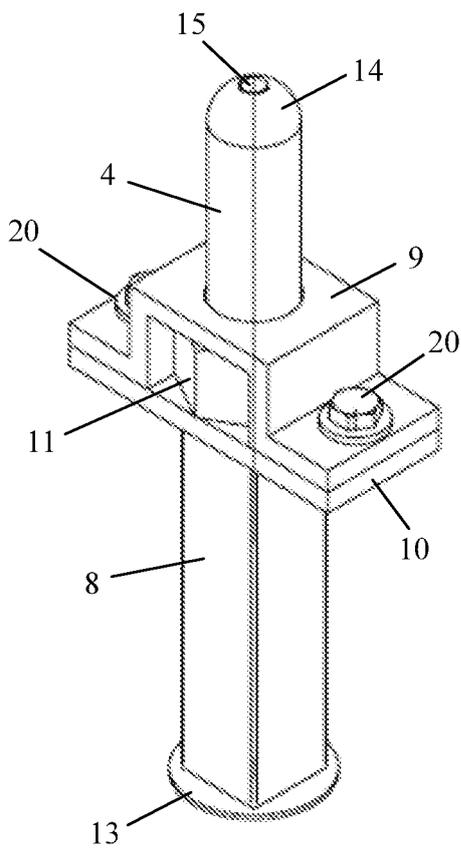
**Fig. 1**



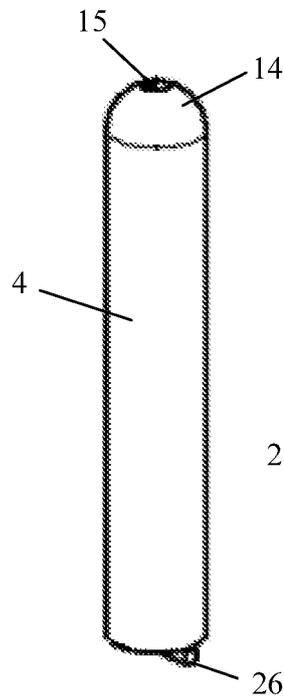
**Fig. 2**



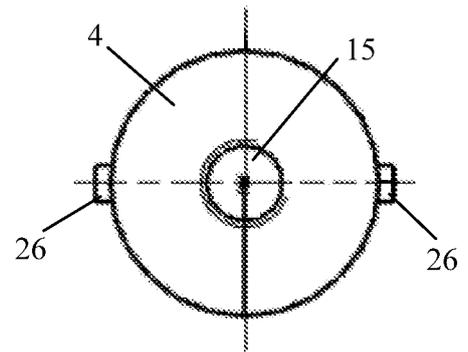
**Fig. 3**



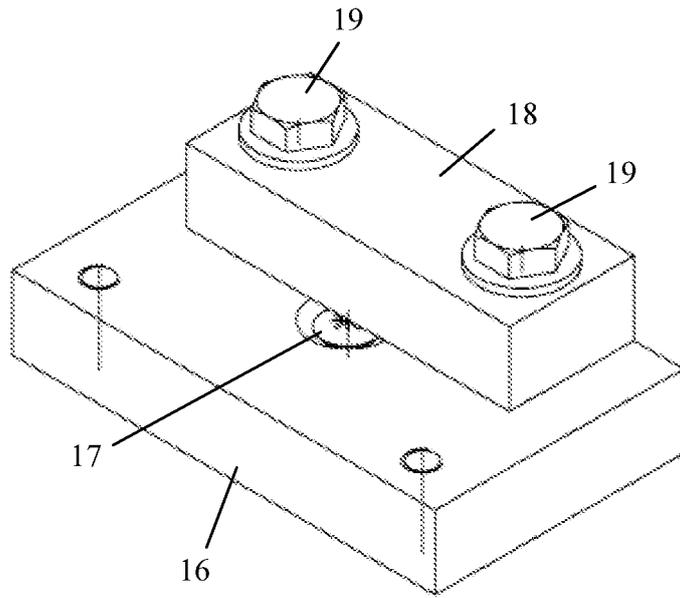
**Fig. 4**



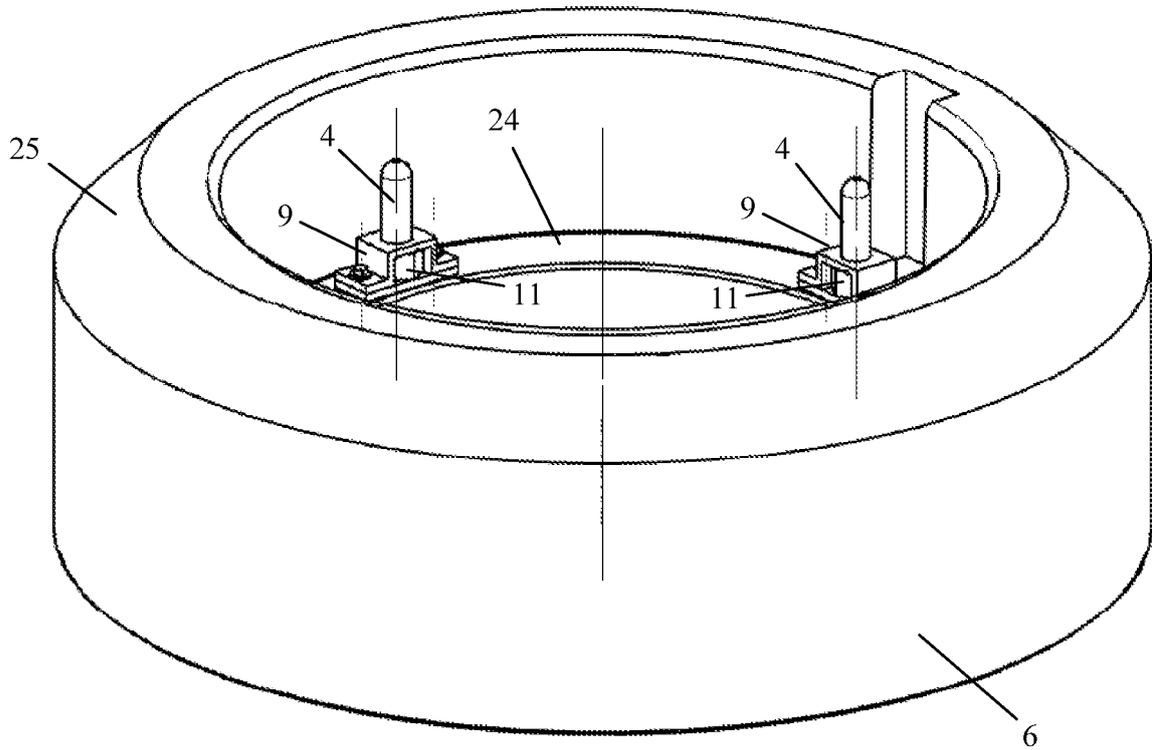
**Fig. 5**



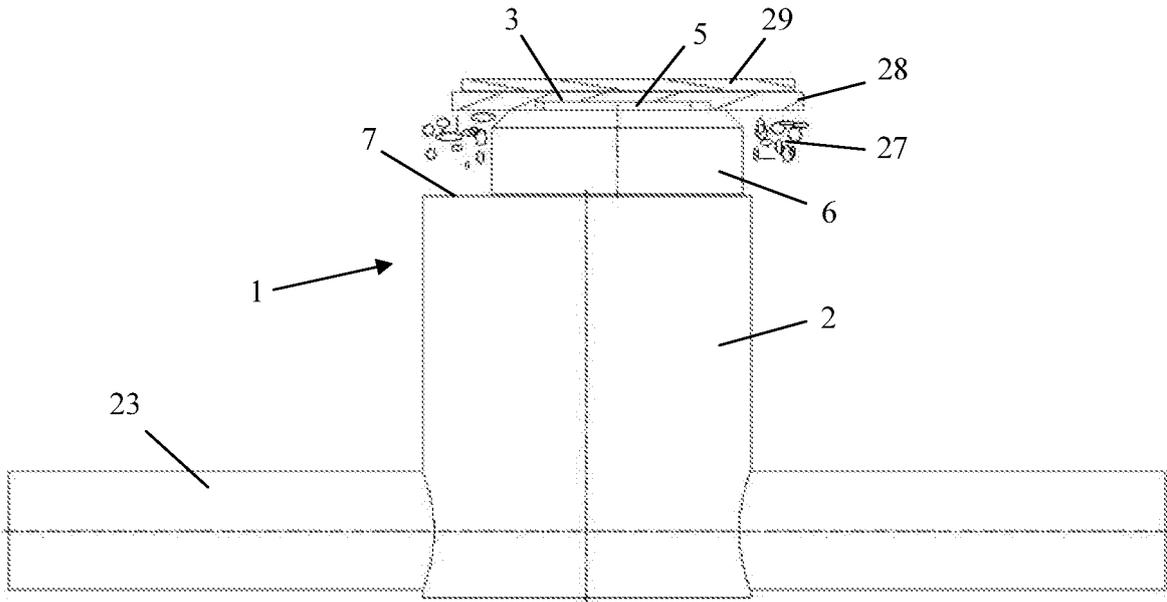
**Fig. 6**



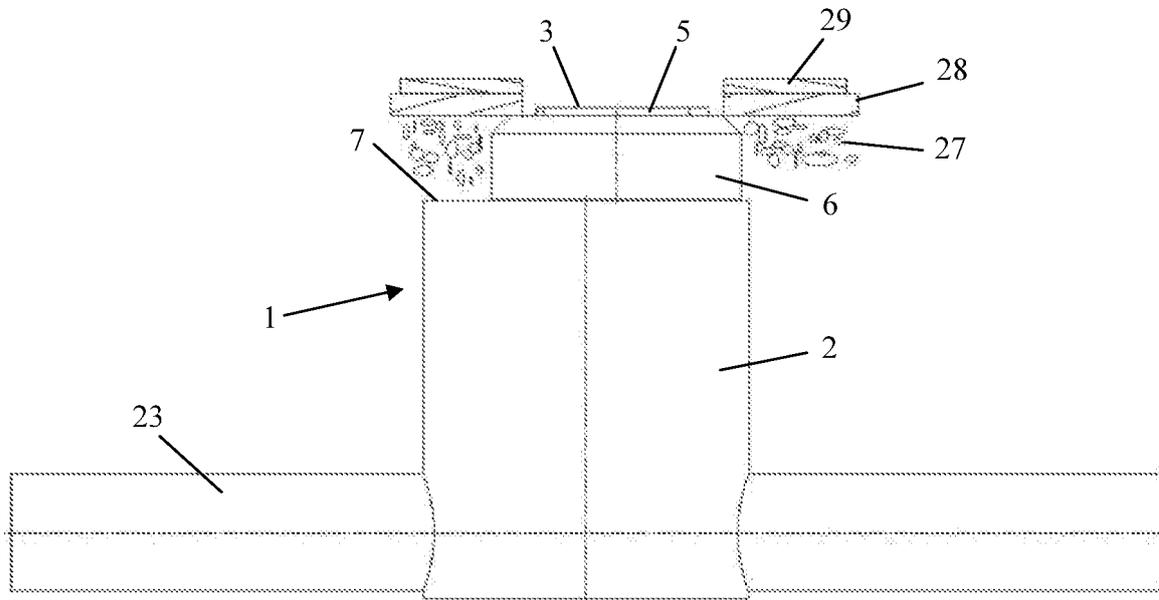
**Fig. 7**



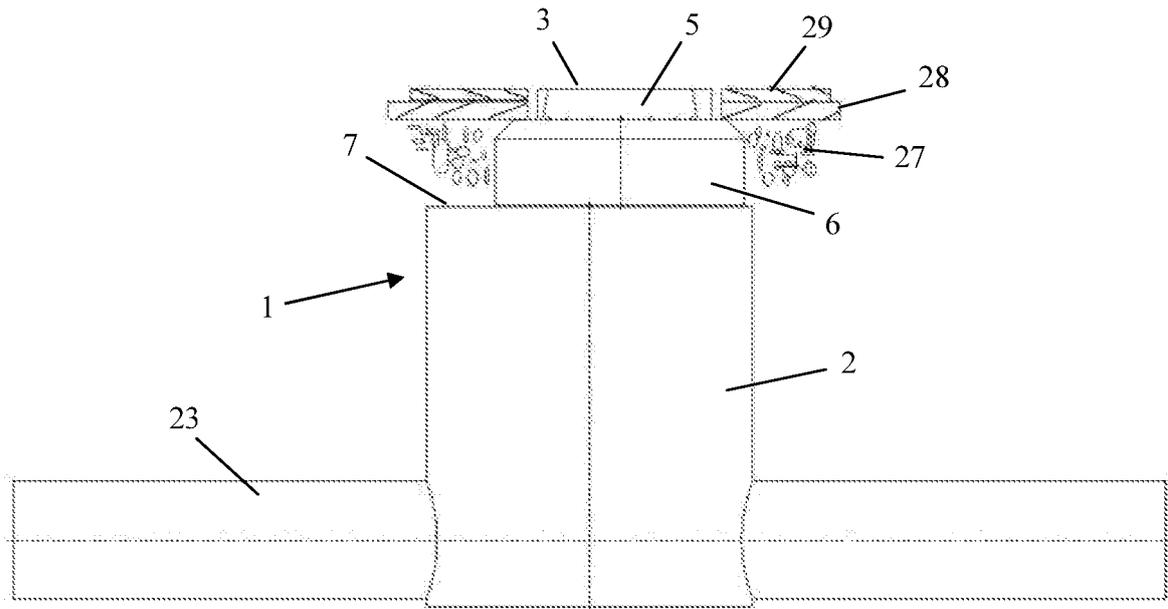
**Fig. 8**



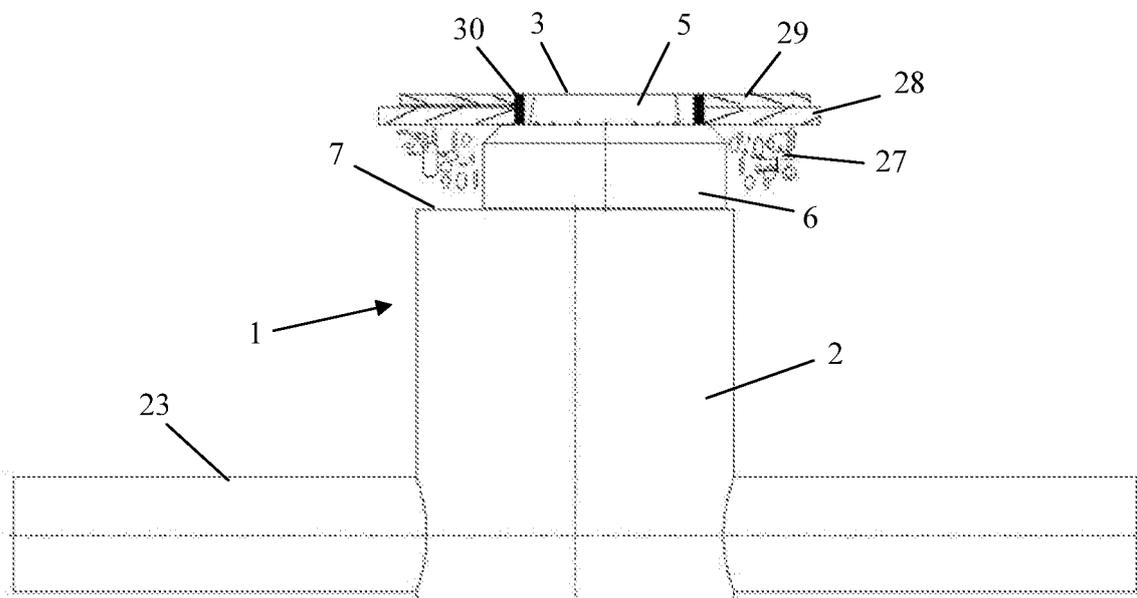
**Fig. 9**



**Fig. 10**



**Fig. 11**



**Fig. 12**

**REFERENCES CITED IN THE DESCRIPTION**

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