

Assembly for roadway manhole comprising a frame, a cover and a kit allowing the hinged mounting of the cover on the frame.

The present invention generally relates to roadway manholes.

A roadway manhole comprises a frame embedded in the ground or roadway, a cover that is able to occupy a position that closes the opening of the frame and in which the cover fits inside this frame, resting on a peripheral seating rib rigidly connected to the frame and protruding into the opening thereof.

This type of manhole is thus of the type according to which the cover rests on the peripheral seating rib of the frame without being hinged thereto.

The frame of such a manhole can be rectangular and the cover can be constituted by one or more leaves, for example rectangular in shape, that fit inside the frame in the closed position thereof, or by at least two leaves in the shape of right-angled triangles that fit in the rectangular frame juxtaposed to each other in their frame closing position.

In certain circumstances, it might be necessary to replace the entire roadway manhole, frame and cover with an assembly according to which the cover is mounted hinged on the corresponding side of the frame to facilitate access to the roadway manhole through the frame opening.

To this end, it is then necessary to remove the frame from the ground in order to replace it with a frame equipped with hinging elements to which hinging elements on the cover will be coupled in order to allow the cover to pivot between its two positions, lowered to close the frame and raised to open the frame.

Such a solution requires manpower both to remove the frame from the ground and bed the new frame provided with these hinging elements in the ground, and is also costly, due not only to the manpower but also to the use of a new frame with hinging elements. This solution also has the drawback of blocking the roadway for an extended period due to the setting time of the mortar used to bed the new frame in the roadway.

The present invention aims to overcome the above drawbacks by proposing a solution that makes it possible to convert a frame not originally

provided with hinging elements into a frame capable of receiving a cover to seal this frame in a hinged manner.

To this end, according to the invention, the assembly for a roadway manhole comprising a frame and a cover that can occupy a position in which it closes the opening of the frame by resting on at least two seating faces rigidly connected to the frame and protruding into the opening thereof, is characterized in that the frame comprises a part added to one of the two seating faces that is provided with at least one hinging element that can be coupled to a corresponding hinging element on the cover to allow the cover to be hinged to the added part.

According to a variant embodiment, the added part is removably fastened to the seating face of the frame by fastening screws.

According to other variant embodiments, the added part is fastened by welding, bonding, nailing or pinning to the seating face of the frame.

The added part also comprises another element for hinging one end of a strut for holding the cover in its open position.

The added part also comprises another hinging element that can be coupled to a hinging element on the end of a power cylinder to assist in opening the frame.

Preferably, the added part is in the form of an angle one of the flanges of which, resting on and fastened to the seating face of the frame, comprises at least the hinging element that can be coupled to the corresponding hinging element on the cover, and the other flange of which, located in the opening of the frame, comprises each other hinging element that can be coupled to the hinging element on the end of the power cylinder and to the end of the strut.

The flange of the added part in the form of an angle is fastened to the seating face of the frame by fastening screws passing through preferably oblong holes perpendicular to the corresponding side of the frame and anchored in threaded holes in this seating face.

The cover comprises one or more leaves, each rectangular or right-angled triangular in shape, that can fit into the rectangular frame, each leaf comprising on its inner face at least the hinging element located in the vicinity of

the corresponding straight edge of the leaf and able to be coupled to the hinging element of the added part fastened to the corresponding straight portion of the seating face extending along the corresponding wall of the frame.

Advantageously, the hinging elements are constituted by clevises that can be coupled to each other by hinge pins.

The invention also relates to a roadway manhole, characterized in that it comprises an assembly as defined above.

Finally, the invention relates to a method making it possible to hinge a cover to a frame bedded in the ground of a roadway manhole, characterized in that it consists of adding to an inner seating face of the frame a part provided with at least one hinging element and coupling the hinging element on the added part to a hinging element on the cover using a hinge pin.

The method also consists of coupling by means of a hinge pin another hinging element of the added part to a hinging element on the end of a power cylinder to assist in opening the cover, and coupling by means of a hinge pin a further hinging element on the added part to the end of a strut for holding the cover in its open position.

Preferably, the added part is formed by an angle one of the flanges of which, resting on and fastened to the seating face of the frame, comprises at least the hinging element that can be coupled to the corresponding hinging element on the cover, and the other flange of which, located in the opening of the frame, comprises each other hinging element that can be coupled to the hinging element on the end of the power cylinder and to the end of the strut.

Advantageously, the hinging elements are constituted by clevises.

The invention will be more clearly understood and further aims, features, details and advantages thereof will become clearer in the explanatory description below, with reference to the attached drawings, given solely by way of example, illustrating an embodiment of the invention, in which:

- Figure 1 is a perspective view of a frame and cover assembly for a roadway manhole according to the invention;
- Figure 2 is a cross-sectional view along the line II-II in Figure 1;

- Figure 3 is a perspective view partially showing the assembly in Figure 1 on a roadway manhole shaft and showing a single leaf of the cover in the raised position;

- Figure 4 is an enlarged view of the circled section IV in Figure 3;

- Figure 5 is a perspective bottom view of the assembly in Figure 1;

- Figure 6 is a perspective view of the added part with hinging elements according to the invention; and

- Figure 7 is a perspective view of one of the side walls of the frame to which the added part in Figure 6 can be fastened.

The invention will be described with reference to a roadway manhole the frame of which has a generally rectangular shape and the cover for sealing the opening in this frame of which is constituted by two rectangular plates or leaves, but it can of course equally apply to a rectangular frame the cover of which is constituted by at least two leaves each in the form of a right-angled triangle and juxtaposed to each other in the position in which they close the opening in this frame by fitting inside it. The invention can also apply to a previously bedded frame with a single cover leaf or more than two cover leaves, depending on the dimensions of the opening of the frame.

With reference to the figures, reference sign 1 denotes a roadway manhole comprising an inspection shaft 2 embedded in the ground and an assembly with a rectangular frame 3 and a cover 4 that can occupy a lowered position to seal the opening O of the frame 3 by fitting into it as shown in Figure 1.

The frame 3 is arranged on the inspection shaft and is also embedded or bedded in the ground or roadway so that the upper peripheral edge thereof is flush with the ground or roadway.

The frame 3 comprises four side walls 5 that are assembled to each other using fastening bolts 6 and two of the parallel side walls are constituted by two wall portions 5a butt assembled using fastening bolts, not shown.

In the present description, the frame 3 is made of several cast elements assembled together.

However, the frame 3 can also be produced in a single cast unit, several cast elements assembled together by welding, or made from fabricated steel.

The cover 4 is constituted by two rectangular leaves 7 arranged side by side that fit into the frame 3 in the position in which they seal the opening O of this frame.

The frame 3 comprises two inner faces 8 rigidly connected to two of the parallel side walls 5 of the frame 3, protruding into the opening O thereof and acting as a seat for the two leaves 7 when they are in the position in which they seal the opening O of the frame 3.

As can be seen in the figures, each of the seating faces 8 can be constituted by two straight upper faces 10 in a single plane of a generally parallelepipedal section 11 of each of the two parallel walls 5 constituted by the two butt assembled side wall portions 5a, each side wall portion 5a comprising a half-section 11a. Of course, in the case of a one-piece frame 3, each seating face 8 will only comprise one upper face 10 of each of the two parallel walls 5 of this frame that extends along each wall 5.

A device 12 is provided to lock the two leaves 7 in the position in which they seal the opening O of the frame 3.

The locking device 12 comprises a bolt 13 rigidly connected to one of the leaves 7 and cooperating with a keeper 14 on one of the walls 5 of the frame 3, for example one of the portions 5a of the corresponding wall 5, which bolt 13 can be manoeuvred by a tool 15 passing through an orifice 16 in the leaf 7 in order to disengage the bolt 13 from the keeper 14 against the return force of a helical spring 17 mounted concentrically on the bolt 13.

Such a locking device is already known per se and needs no further description. In addition, other types of locking devices known per se can be used.

The other leaf 7 that does not comprise the locking device 12 comprises, on the side intended to be juxtaposed to the corresponding side of the leaf 7 with the locking device 12 in the position in which the opening O of the frame 3 is sealed, a tab 18 extending underneath the leaf 7 with the locking device 12 to prevent the leaf 7 with the tab 18 from being raised when the other leaf 7 is locked to the frame 3 by the locking device 12. However, instead of constituting a master leaf 7 locked to the frame 3 and a slave leaf 7, the leaves 7 can be locked to the frame 3 independently of each other.

The upper face of the web of each leaf 7 is also provided with at least one bar 19 accessible from the outside and housed in a recess 20 in the leaf to allow the insertion of a hooked end of a tool 21 making it possible to remove each leaf 7 from the frame 3 once the locking device 12 has been unlocked.

As explained at the beginning of the present description, it may become necessary to mount in a hinged manner two leaves 7 on the frame 3 originally designed to receive leaves simply placed on the facing seating faces 10.

The present invention proposes a solution that makes it possible to hinge the two leaves 7 to the frame 3 without removing the frame 3 from the roadway and, as a result, keeping the frame as it is.

To this end, according to the invention, a part 30 is provided, preferably constituted by an angle with flanges 31, 32 perpendicular to each other, which is added to one of the two seating faces 8 of the frame 3.

As shown, the part 30 is added to the two seating faces 10 extending one from the other of the two wall portions 5a of the wall 5 facing the parallel wall 5 one of the portions 5a of which comprises the keeper 14 for locking the corresponding leaf 7 to the frame 3.

As can be seen more clearly in Figure 6, the angle part 30 comprises on its flange 31 four hinging elements 33, preferably in the form of clevises, evenly spaced along the flange 31 and protruding perpendicular to it.

Each hinge clevis 33 comprises two parallel side walls 34 extending transverse to the longitudinal direction of the flange 31 and a wall or web 35 connecting the two side walls 34 extending parallel to the longitudinal direction of the flange 31 and being substantially flush with the end edge of the flange 31. Thus, each hinge clevis 33 has a substantially U-shaped cross-section.

The two side walls 34 of each hinge clevis 33 respectively comprise two drilled holes 36 for a hinge pin 37 to pass through, as will be seen more clearly below.

The angle part 30 also comprises two hinge clevises 38 rigidly connected to the other flange 32 and spaced apart along this flange, each clevis 38 acting as a hinge for a power cylinder, as will be seen below. The number of cylinder

fastening clevises 38 can depend on the weight of the leaves 7 and the degree of assistance required.

Each hinge clevis 38 comprises two parallel walls 39 rigidly connected to the flange 32 and perpendicular to it, each wall 39 comprising two drilled holes 40 for a hinge pin 41 to pass through, as will be seen below.

The hinge clevises 33 and 38 are arranged symmetrically relative to the median transverse plane of the angle part 30.

The flange 31 of the angle part 30 comprises several drilled holes in the form of oblong holes 31a, for example four in number, extending in a transverse direction to the longitudinal direction of the flange 31.

The drilled holes 31a can also be arranged symmetrically relative to the median transverse plane of the angle part 30.

The drilled holes 31a allow screws 42 to pass through, ensuring fastening of the flange 31 of the angle part 30 to the two seating faces 10 of the two portions 5a of the corresponding wall 5.

Thus, each of the seating faces 10 comprises two threaded holes 43 produced in the corresponding portion 11a of the inner section 11 of the wall 5 in a direction perpendicular to the upper seating face 10.

The length of the angle part 30 is slightly less than the length of the side wall 5 comprising the two seating faces 10 to which the angle part 30 can be fastened, in order to allow the angle part 30 to be inserted between the other two parallel walls in a single unit 5.

Thus, the angle part 30 can be removably fastened to the two seating faces 10 of the frame 3 using fastening screws 42.

According to a variant embodiment, the angle part 30 can be fastened by welding to the two seating faces 10 of the frame 3, but it can also be fastened by bonding, nailing or pinning.

Each leaf 7 comprises two hinging elements 44, more clearly visible in Figure 4, rigidly connected to the inner face of the leaf 7 and able to be coupled respectively to two of the hinging elements in the form of clevises 33 on the angle part 30 by means of the hinge pins 37 to allow the leaf 7 to be mounted hinged on the frame 3.

Each hinging element 44 is in the form of a clevis comprising two parallel walls 45 protruding from the inner face of the leaf 7, perpendicular to it, which can be engaged between the two side walls 34 of the corresponding hinge clevis 33 on the angle part 30.

The two side walls 45 are connected to each other by a wall forming a web 46, also perpendicular to the inner face of the leaf 7, while being at a distance from the corresponding edge 7a of the leaf 7, the facing edges of the two side walls 45 of the hinging element 44 being located substantially in the same plane as this edge and perpendicular to the leaf 7.

The two side walls 45 of a hinging element 44 respectively comprise two orifices 47 with dimensions greater than the diameter of the hinge pin 37 to allow the leaf 7 to pivot freely, without jamming, between its lowered position in which it closes the opening O of the frame 1 and its raised position in which it clears this opening and in which the leaf extends substantially perpendicular to the plane passing through the upper edges of the side walls 5 of the frame 3.

The two hinging elements in the form of clevises 44 on one leaf 7 can be mounted in a hinged manner on the hinging elements in the form of clevises 33 on the angle part 30 located on the same side relative to the transverse median plane of the angle part 30.

The roadway manhole can also be provided with a power cylinder 50 to assist in opening each leaf 7 mounted hinged on the frame 3. Each power cylinder 50 comprises a body 51 the end of which comprises a clevis 52 mounted hinged on a clevis 53 rigidly connected to the inner face of the leaf 7 by means of a hinge pin 54 extending in a direction parallel to the inner face of the leaf 7 and to the side wall 5 of the frame 3 to which the leaf is hinged.

The power cylinder 50 has its rod 55 thereof, the end of which comprises a clevis 56 that can be housed between two side walls 39 of a clevis 38 on the angle part 30 while being mounted hinged between its side walls 39 by means of the hinge pin 41 passing through the two clevises 38 and 56.

The roadway manhole can also be provided with a strut 60 placed between each leaf 7 and the frame 3 to hold the leaf 7 in the raised position in which it clears the opening O of the frame 3 and to prevent it from tipping towards

the position in which it closes this opening, for example in the event of strong winds, and/or to avoid the untimely closing of the leaf 7 by a third party while another person is working in the chamber 2.

One of the ends of the strut 60 is mounted hinged on the angle part 30 and rigidly connected to the corresponding side wall 5 of the frame 3 by means of a clevis 61 the two side walls 62 of which are rigidly connected to the flange 32 perpendicular to that of the angle part 30.

A hinge pin 63 passes through the clevis 61 and an opening 64 in the lower end portion of the strut 60, which opening 64 is configured to contribute to the locking of the leaf 7 in its raised position as shown in Figures 3 and 4 and to disengage the strut 60 from this locked position by pulling upwards on it from the raised position of the leaf 7.

The end portion of the strut 60 opposite the end hinged on the angle part 30 passes through an aperture 65 in a lug 66 rigidly connected to the inner face of the leaf 7 and perpendicular thereto.

The free end of the strut 60 passing through the aperture 65 comprises a right-angled elbow portion 67 arranged above and close to the lug 66 when the leaf 7 is in the raised position, likewise to prevent the leaf 7 from tipping towards the position in which it closes the opening O of the frame 3.

To release each leaf 7 from its raised position, the operator pulls upwards on the strut 60 to disengage the right-angled elbow portion 67 above the lug 66 through the aperture 65 with the opening 64 configured to allow the disengagement of the strut 60 to a position allowing the leaf 7 to tip towards the position in which it seals the opening O of the frame 3.

Each power cylinder 50 and each strut 60 is already known per se and need no further description.

It must be noted that the hinge clevis 61 on the strut 60 is not shown in Figure 6 for simplicity.

In addition, other securing means can be used, such as for example a self-locking sliding arm, known per se, one end of which can be fastened in a hinged manner to the angle part 30.

Each leaf 7 comprises two pairs of parallel channels 70 starting from the edge 7a of the leaf 7 over a length slightly greater than the width of the side walls 34 of the hinge clevises 33, the channels 70 passing through the thickness of the web 7b of the leaf 7.

Each pair of channels 70 allows two side walls 34 of a hinge clevis 33 to pass through these two channels when the corresponding leaf 7 is in the position in which it seals the opening O of the frame 3, as can be seen more clearly in Figure 1, which shows that the wall forming the web 35 of each hinge clevis 33 is facing and close to the corresponding wall 5 of the frame 3.

The cylindrical hinge pins 37, 41, 54 and 63 are held in their respective clevises 33, 38, 53, 61 by one end thereof comprising a stop head and the opposite ends thereof comprising pins, but they can be constituted by bolts like the one connecting the end of the strut 60 to the clevis 61 of the angle part 30 (see Figure 5).

When it is necessary to replace an existing roadway manhole, frame and cover assembly according to which the frame bedded in the ground is closed by the two-leaf cover resting in the frame without being hinged thereto, with an assembly according to which the two leaves must be mounted hinged to one side of the frame, all that is required is simply to drill the threaded holes 43 in the seating faces 10 extending along the corresponding side wall 5 of the existing frame embedded in the ground and then install the angle part 30 between the two side walls 5 perpendicular to the wall 5 adjacent to the seating face by placing the flange 31 of the part 30 against the seating faces 10. Then, the operator secures the flange 31 to the seating faces 10 using the fastening screws 42 inserted into the threaded holes 43 through the drilled holes 31a in the form of oblong holes in order to adjust the position of the angle part 30 in relation to the wall 5. After tightening the screws 42, the operator holds one leaf 7 in such a way as to arrange its two hinging elements in the form of clevises 44 respectively in the two hinging elements in the form of clevises 33 of the angle part 30 and then inserts the hinge pins 37 through these clevises to hinge the leaf 7 to the frame. The operator proceeds in the same manner for the second leaf 7 in order to hinge it to the frame.

If required, the operator can also mount the power cylinder for assisting opening 50 by assembling its respective clevises 52, 56 between the clevis 53 on each corresponding leaf 7 and the clevis 38 on the angle part 30 using the hinge pins 54 and 41. In addition, if it is also necessary to equip each leaf 7 with a strut 60 to hold the leaf in the raised position, all that is required is simply to engage the strut 60 through the aperture 65 in the lug 66 on the leaf 7 and mount the end thereof opposite the elbow end 67 in a hinged manner in the clevis 61 of the angle part 30 using the hinge pin 63.

In the closed position of the leaves 7 they are resting on the one hand on the flange 31 of the angle part 30 and on the other hand on the facing seating face 8, normally maintaining the position in which the leaves are flush with the upper edges of the walls 5 of the frame 3. However, if necessary, it is possible to fasten another angle part to the facing seating face 8 in order to compensate for the thickness of the angle part 30 with clevises and maintain this flush position of the leaves.

The above invention considerably reduces the installation costs of a roadway manhole with a frame and cover hinged to the frame as a replacement for a roadway manhole with a frame and cover not hinged to this frame, as the existing frame bedded in the ground is reused without having to be removed, and all that is required for example is to drill some threaded holes to fasten the added part 30 provided with the hinging elements allowing the hinged mounting of the cover, each leaf of which replacing the existing leaf is already equipped with hinging elements for existing manhole covers of the type where the cover is hinged to the frame. In addition, the installation time of a roadway manhole with a frame and cover hinged thereto is greatly reduced compared to the situation in which an existing frame would have to be removed from the ground to replace it with a specific frame provided with cover hinging elements.

The invention described above thus constitutes a hinging kit to be fastened to a standard frame for the hinged mounting of a cover on the frame.

CLAIMS

1. Assembly for a roadway manhole comprising a frame (3), a cover (4) that can occupy a position in which it closes the opening of the frame (3) by resting on at least two facing seating faces (8) rigidly connected to the frame (3) and protruding into the opening thereof, characterized in that the frame (3) comprises a part (30) added to one of the two seating faces (8) that is provided with at least one hinging element (33) that can be coupled to a corresponding hinging element (44) on the cover (4) to allow the cover to be hinged to the added part (30).

2. Assembly according to claim 1, characterized in that the added part (30) is removably fastened to the seating face (8) of the frame (3) using fastening screws (42).

3. Assembly according to claim 1, characterized in that the added part (30) is fastened by welding, bonding, nailing or pinning to the seating face (8) of the frame (3).

4. Assembly according to one of claims 1 to 3, characterized in that the added part (30) also comprises another hinging element (61) for one end of a strut (60) for holding the cover (3) in its open position.

5. Assembly according to one of claims 1 to 4, characterized in that the added part (30) further comprises another hinging element (38) that can be coupled to a hinging element (56) on the end of a power cylinder (50) to assist in opening the cover (3).

6. Assembly according to one of claims 1 to 5, characterized in that the added part (30) is in the form of an angle, one (31) of the flanges (31, 32) of which, resting on and fastened to the seating face (8) of the frame (3), comprises at least the hinging element (33) that can be coupled to the corresponding hinging element (44) on the cover (4), and the other flange (32) of which, located in the opening of the frame (3), comprises each other hinging element (38, 61) that can be coupled to the hinging element (56) on the end of the power cylinder (50) and to the end of the strut (60).

7. Assembly according to claim 6 when considered in combination with claim 2, characterized in that the flange (31) of the added part (30) in the form of an angle is fastened to the seating face (8) of the frame (3) by the fastening screws (42) passing through oblong holes (31a) perpendicular to the corresponding side of the frame (3) and anchored in threaded holes (43) in the seating face (8).

8. Assembly according to one of claims 1 to 7, characterized in that the cover (4) comprises one or more leaves (7), each rectangular or right-angled triangular in shape, that can fit into the rectangular frame (3), each leaf (7) comprising on its inner face at least the hinging element (44) located in the vicinity of the corresponding straight edge (7a) of the leaf (7) and able to be coupled to the hinging element (33) of the added part (30) fastened to the corresponding straight portion (10) of the seating face (8) of the frame (3) extending along the corresponding wall (5).

9. Assembly according to one of claims 1 to 8, characterized in that the hinging elements (33, 38, 44, 53, 56) are constituted by clevises that can be coupled to each other by hinge pins (37, 41, 54, 63).

10. Roadway manhole, characterized in that it comprises an assembly as defined in any one of claims 1 to 9 and according to which the frame (3) is embedded in the ground.

11. Method making it possible to hinge a cover (4) to a frame (3) bedded in the ground of a roadway manhole, characterized in that it consists of adding to an inner seating face (8) of the frame (3) a part (30) provided with at least one hinging element (33) and coupling the hinging element (33) on the added part (30) to a hinging element (44) on the cover (4) using a hinge pin (37).

12. Method according to claim 11, characterized in that it also consists of coupling by means of a hinge pin (41) another hinging element (38) of the added part (30) to a hinging element (56) on the end of a power cylinder (50) to assist in opening the cover (4), and coupling by means of a hinge pin (63) a further hinging element (61) on the added part (30) to the end of a strut (60) for holding the cover (4) in its open position.

13. Method according to claim 11 or 12, characterized in that the added part (30) is formed by an angle, one flange (31) of which, resting on and fastened to the seating face (8) of the frame (3), comprises at least the hinging element (33) that can be coupled to the corresponding hinging element (44) on the cover (4), and the other flange (32) of which, located in the opening of the frame (3), comprises each other hinging element (38, 61) that can be coupled to the hinging element (56) on the end of the power cylinder (50) and to the end of the strut (60).

14. Method according to one of claims 11 to 13, characterized in that the aforementioned hinging elements are constituted by clevises.