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ADJUSTABLE MANHOLE FRAME
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ABSTRACT OF THE DISCLOSURE

An adjustable manhole frame includes abutment members extending laterally from its side wall and a plurality of adjustment bolts with load bearing lower end portions are threaded through a separate support engaging abutment members for adjusting the level of the manhole frame.

This invention relates generally to manhole frames utilized for access purposes to underground utility lines and the like, and more particularly to an adjustable manhole frame which is movable in a vertical direction to accommodate various changes in the grade levels adjacent a manhole.

Because of the deterioration of road surfaces, it often becomes necessary to add additional paving material to an existing road surface. Since the additional paving material may be an inch or more in thickness, an existing manhole frame and cover will be at a lower level than the new road surface. The difference in surface levels is discomfoting to drivers and is remedied by disengaging the manhole frame from its existing foundation and fixing it in a position flush with the new road surface. This is an expensive and burdensome operation to perform. Therefore, it is desirable to have a manhole frame which is adjustable to accommodate the changes in road levels. With an adjustable frame, the burden of digging out the existing frame is avoided.

Prior adjustable manhole frames have had certain disadvantages. Their construction was complex in that the frames were double-walled or included various compartments. This added to the weight of the frames and consequently made them more expensive. Also, there was a corrosion problem with prior adjustable frames. After being exposed to adverse underground conditions, the adjustment portion of prior frames would become corroded if not properly protected with grease or other corrosion preventive substance. It is the primary object of the present invention to overcome these and other faults of the prior art.

The present invention comprises a manhole frame including an abutment portion, a support member whereby an upward force may be applied to the abutment portion, and an adjustment means connected to the support member for varying the level of the frame. It is contemplated that the support member and adjustment means may be separate from the frame so that they can be inserted in the device only when adjustment becomes necessary. Since it is not necessary to associate the adjustment means with the frame until such time as the road surface is repaved, the invention alleviates the corrosion problem encountered with adjustable manhole frames of the prior art.

In some instances it may neither be necessary nor feasible to use a frame which is adjustable. Accordingly, the present invention is constructed so that various parts may be deleted and the frame used by itself without the adjustment feature. This preferred arrangement has obvious advantages over prior adjustable constructions which have been characterized by a heavy frame including integral walls forming a number of bolt compartments which are unnecessary if the frame is intended to be stationary rather than adjustable. For example, the structure

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of this invention is lighter, easier to install and less expensive than prior constructions.

Other objects and advantages and a fuller understanding of the invention may be had by referring to the following detailed description taken in conjunction with the accompanying drawing in which:

FIGURE 1 is a side elevational view in cross-section of the invention; and

FIGURE 2 is a top plan view of the invention taken along the line 2-2 of FIG. 1.

Referring to the drawings, and particularly to FIGURE 1, a manhole 10 is defined by road base material 12. A bearing ring 14 is situated atop the road base material 12 and has substantially the same inner diameter as the manhole 10. The bearing ring 14 may be provided with a plurality of recesses 16, which receive the ends of bolts 18. Alternatively, the recesses 16 may be omitted and the bolts 18 may then bear on the flat upper surface of the bearing ring 14.

A cylindrical manhole frame 20 is positioned over the bearing ring 14. The manhole frame 20 is formed with an inwardly directed lip 24 near its upper end in order to provide support for a manhole cover 26. As shown, the lip 24 extends around the inner wall of the manhole frame 20. A cylindrical sheath 22 surrounds the manhole frame 20 and bearing ring 14. The inner diameter of the sheath 22 is substantially the same as the outer diameters of the bearing ring 14 and manhole frame 20.

One of the principal reasons for utilizing the sheath 22 is to reduce the frictional forces that would arise between the manhole frame 20 and the surrounding road material 34. If the manhole frame 20 were in direct contact with the road material 34, the frictional forces between the two would increase the difficulty of adjusting the manhole frame 20. A suitable lubricant may be provided between the sheath 22 and manhole frame 20 to further ease adjustment. The sheath 22 also enhances the stability of the structure by preventing lateral movement of the frame 20.

In accordance with the invention, the bolts 18 used to adjust the manhole frame 20 to road level are carried by a ring 30 having a plurality of threaded bores 32 which receive the bolts. The ring 30 engages the undersides of a plurality of lugs 28 attached to the inside wall of the manhole frame 20. In the illustrated construction, four inwardly projecting lugs 28 which are spaced 90° apart are formed integral with the wall of the frame 20.

In use, the cover 26 is removed to expose the inner structure of the invention. A wrench is then used to rotate the bolts 18, the ends of which engage the bearing ring 14. Since the bolts 18 are threadably engaged through the ring 30, rotation of the bolts in one direction serves to raise the ring 30. As the ring 30 is raised, it bears against the lugs 28 to lift the manhole frame 20 to the desired level.

The adjusted position of the manhole frame 20 is indicated by the dotted lines shown in FIGURE 1. The height to which the frame 20 may be raised is limited only by the length of the bolts 18. If desired, the manhole frame 20 may be lowered by merely turning bolts 18 outwardly from the bearing ring 14.

As discussed above, it may be desirable to use the manhole frame 20 itself in installations where an adjustable frame is neither necessary nor feasible. To this end, it is possible to eliminate the bolts 18, the ring 30, the bearing ring 14, and the sheath 22.

Since the adjustment portion of the present invention is detachable, it may be desirable initially to install only the manhole frame 20, the bearing ring 14 and the surrounding sheath 22. The adjustment assembly consisting of the ring 30 and the bolts 18 can be placed in the frame 20 at a later time when it becomes necessary to raise the level of the frame. When used in this manner, the bolts

18 and the ring 30 will not be exposed to corrosion between the time of installing the frame 20 and the time when it is adjusted to a new grade level.

In order that the ring 30 may be easily inserted within the manhole frame 20, the outer diameter of the ring 30 should be less than the inner diameter of the manhole frame lip 24. Also, it is preferable that the four lugs 28 be symmetrically positioned, as shown in FIG. 2, to facilitate placement of the ring 30 beneath the lugs. The ring 30 may be inserted in the manhole frame by placing a portion of the ring underneath two of the lugs 28 and then lowering the rest of the ring below the other two lugs. With the ring 30 in position beneath the four lugs 28, the bolts 18 may be inserted in the bores 32 and the manhole frame 20 raised to the desired level. After installation of the ring 30 and bolts 18, the assembly will remain within the structure to support the manhole frame 20 at its adjusted height.

Alternatively, the ring 30 may be provided with a plurality of slots which will enable it to pass beneath the lugs 28. These slots are located near the outer edge of the ring 30 in positions corresponding to the positions of the lugs 28 and are adapted to receive the lugs 28. As the ring 30 is lowered within the manhole frame 20 and each slot is lined up with its corresponding lug 28, the lugs 28 will be received by the slots and the ring 30 will then be permitted to pass beneath the lugs 28. After the ring 30 has passed beneath the lugs 28, it may be rotated so that the slots will not line up with the lugs 28. Then, the bolts 18 may be inserted in the bores 32 and the ring 30 raised to engage the lugs 28.

Many modifications and variations of the invention will be apparent to those skilled in the art in view of the foregoing detailed disclosure. Therefore, it is to be understood that, within the scope of the appended claims, the invention can be practiced otherwise than as specifically shown and described.

What is claimed is:

1. An adjustable structure of the type described comprising in combination:

- (a) a frame;
- (b) said frame including an abutment portion secured thereto;
- (c) a support separate from said frame and engageable with said abutment portion, and
- (d) adjustment means carried by said support for moving said support against said abutment portion in an axial direction relative to said frame.

2. An adjustable manhole frame construction comprising:

- (a) a frame having side wall structure and upper and lower ends;
- (b) said frame including abutment structure extending laterally from said side wall structure, said abutment structure being located between the upper and lower ends of said frame;
- (c) support structure separate from said frame;
- (d) said support structure being disposed between the lower end of said frame and said abutment structure and engageable with said abutment structure;
- (e) a plurality of adjustment members carried by and extending through said support structure;
- (f) said adjustment members having load bearing end

portions below said support structure engageable against a fixed surface; and,

(g) said adjustment members being movable to raise said support structure against said abutment structure and thereby elevate said frame.

3. The construction as claimed in claim 2 wherein said abutment structure extends inwardly of said frame and wherein said support structure is disposed within said frame.

4. The construction as claimed in claim 2 wherein said adjustment members are bolts threaded through said support structure.

5. The construction as claimed in claim 2 wherein said frame is cylindrical.

6. The construction as claimed in claim 5 wherein said support structure is a ring.

7. An adjustable manhole frame construction comprising:

- (a) a movable frame having a side wall and upper and lower ends;
- (b) said frame including spaced projections extending inwardly from said side wall and disposed between said ends;
- (c) a support member within said frame, said support member being disposed between said projections and the lower end of said frame and engageable with the undersurfaces of said projections;
- (d) a plurality of bolts threaded through said support member;
- (e) said bolts having load bearing lower end portions engageable with a fixed surface; and,
- (f) said bolts being movable through said support member to raise it against said projections and elevate said frame.

8. The construction as claimed in claim 7 wherein said frame is cylindrical and said support member is a ring.

9. The construction as claimed in claim 8 wherein said projections are spaced 90° apart.

10. An adjustable structure of the type described comprising in combination:

- (a) a cylindrical frame having an inwardly projecting lip near one end thereof for supporting a cover;
- (b) said frame including a plurality of projections spaced 90° apart around the inside of said frame;
- (c) a ring separate from said frame disposed within said frame and engageable with said projections, the outer diameter of said ring being less than the inner diameter of said lip; and,
- (d) a plurality of bolts threadedly engaged through said ring and extending axially of said frame for moving said ring against said projections in an axial direction relative to said frame.

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