Nov. 16, 1965 J. F. DRIVER ETAL 3,217,619

MANHOLE STRUCTURE

Filed Sept. 15, 1961 2 Sheets-Sheet 1

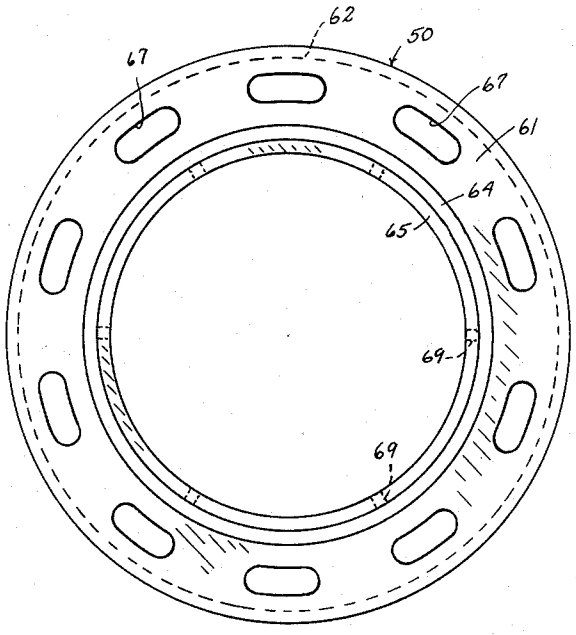


Fig. 1

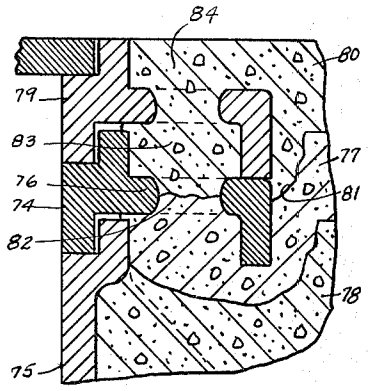


Fig. 3

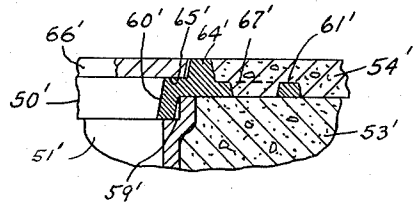


Fig. 3a

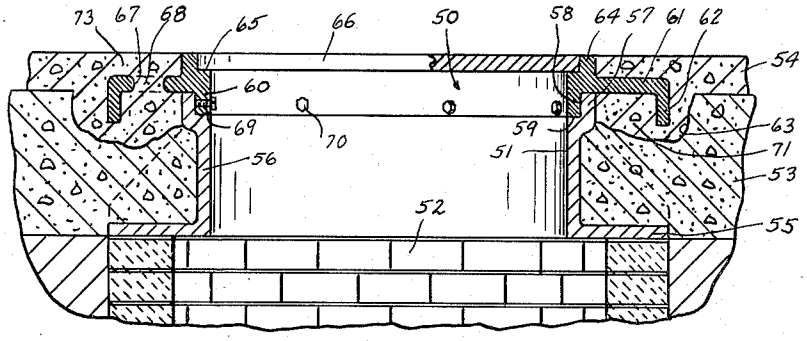


Fig. 2

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MANHOLE STRUCTURE

Filed Sept. 15, 1961 2 Sheets-Sheet 2

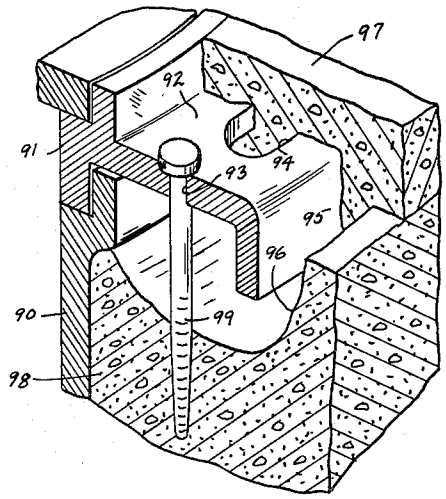


Fig. 4

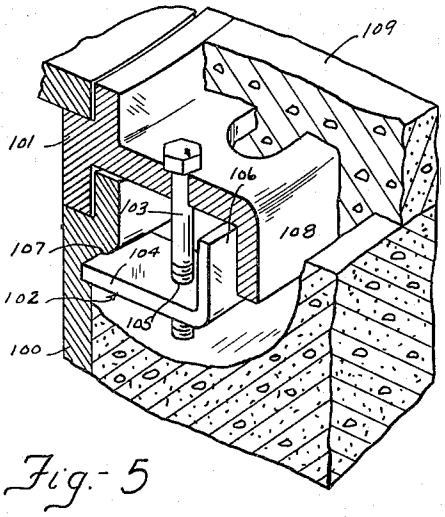


Fig. 5

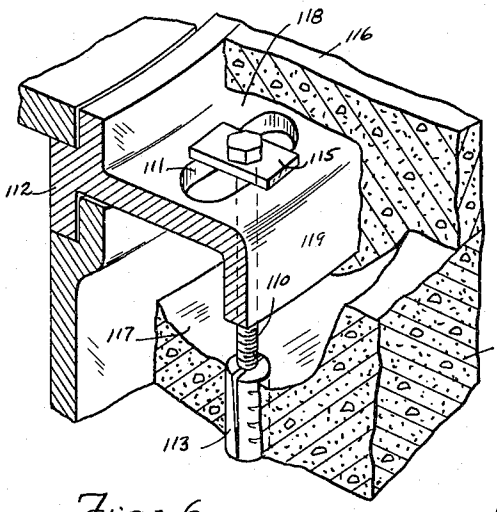


Fig. 6

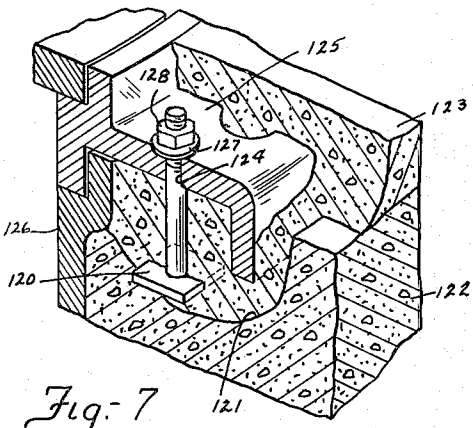


Fig. 7

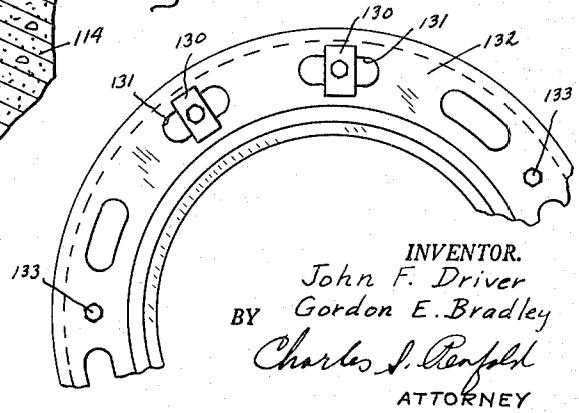


Fig. 8

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United States Patent Office 3,217,619 Patented Nov. 16, 1965

3,217,619

MANHOLE STRUCTURE

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Filed Sept. 15, 1961, Ser. No. 138,514
7 Claims. (Cl. 94—34)

The invention relates generally to certain roadbed construction and more particularly is directed to improvements in manhole structure adapted for use in conjunction with such construction.

The subject application is a continuation-in-part of our application, Serial No. 7,264, filed February 8, 1960 and now abandoned.

It is recognized that manhole structure or assemblies currently in use comprise a supporting member and a cover therefor. The supporting member includes a radial base flange which is covered by a layer of paving material, such as gravel, cement, asphalt or brick, to anchor the member in place on a suitable foundation so that an axial tubular portion of the member extends vertically upwardly through the paving material with its upper end disposed substantially flush with the upper surface of the material. The cover is mounted on an internal seat providing on the supporting member so that the cover will nest in the member and also lie substantially flush with the upper surface of the paving material.

The subject invention is primarily adapted for use with a conventional manhole structure of the above character in those instances where a new layer of paving material is to be laid or superimposed upon an old layer that is no longer in condition with satisfactory use. The general practice under such circumstances is to dig and pry out old manhole structure and then rebuild or recondition the old foundation to elevate the latter so that the structure can be remounted on the remade foundation at a proper height so that the upper surface of the new layer can be brought up to a level therewith. This procedure entails considerable time, effort and expense and in some instances when the manhole structure is being removed the mansonry enclosure or foundation upon which it rests becomes damaged to such an extent that it has to be practically rebuilt, thereby adding to the costs and slowing up the progress of the work.

Also, when the supporting member or ring of a conventional manhole structure is removed it ofttimes becomes difficult to rebuild the old foundation to a sufficient size and height so that the member will be at the proper level when the paving material is laid.

Attention is further directed to the fact that it is not uncommon to apply anywhere from one to three layers of paving material over the original layer so that it becomes necessary to remove and remount the supporting member each time a new layer of paving material is laid.

With the foregoing in mind, the principal object of the subject invention is to provide an accessory whereby all of the disadvantages encountered with respect to removing and remounting of an old manhole structure are substantially eliminated. In other words, the supporting member of the old structure can be left in its

original place and the manhole cover can be used with the accessory.

More particularly, the invention includes, among other things, an annular supporting element which can be readily mounted on the supporting member or mounting of an old manhole structure so that its upper surface will be even with the upper surface of the new layer of paving material.

An important object of the invention is to provide a supporting element or mounting which preferably comprises an inner annular portion adapted for disposition in the old supporting member on its internal seat to constitute an axial continuation thereof and an outer annular portion of a larger diameter which is adapted to bear upon the tubular portion of the old supporting member to constitute a continuation thereof.

A specific object is to provide an organization whereby a manhole cover is resiliently mounted in order to substantially eliminate rattle or vibration.

A significant object of the invention is to provide a setup whereby one or a plurality of corresponding supporting elements or elements of different axial dimensions may be utilized, depending on the thickness and the number of layers of paving material to be laid.

A further important object of the invention is to provide a fitting which has a relatively large lateral extending surrounding portion or flange provided with openings which assist in anchoring and stabilizing the position of the fittting with respect to a mounting and/or layers of paving material.

A specific but significant object of the invention is to provide various means which may be extended through the openings above referred to and/or in holes provided in the fittting to additionally assist in anchoring the fitting in place.

Another object of the invention is to provide the lateral extending portion or flange with a depending portion.

Other attributes of the invention reside in providing a structure which offers advantages with respect to installation, efficiency, cost and durability as compared to the conventional procedure of removing and reinstalling an original manhole structure or assembly.

Additional objects and advantages of the invention will become apparent after the description hereinafter set forth is considered in conjunction with the drawings annexed hereto.

In the drawings:

FIGURE 1 illustrates a top view of a fittting adapted for use with the structure shown in FIGURE 2;

FIGURE 2 is a vertical section showing the fitting installed in paving material and on a mounting and foundation therefor;

FIGURE 3 is an enlarged partial vertical section depicting the use of a pair of corresponding fittings operatively connected and supported on a mounting in layers of paving material;

FIGURE 3*a* is a partial vertical section of an installation utilizing a modified form of fitting;

FIGURES 4, 5, 6 and 7 are enlarged partial sections exemplifying different ways of installing or anchoring a fitting in place; and

FIGURE 8 is a partial top view of a fitting showing an additional way of securing the same in place.

Referring to the structure exemplified in FIGURES 1 and 2, there is shown a fitting generally designated **50** which is mounted on a tubular mounting **51** carried by a foundation **52**, with lower and upper layers **53** and **54** of paving material disposed about the mounting and fitting.

More particularly, the mounting **51** includes a large radially extending flange **55** which is seated on the foundation, a cylindrical portion or wall **56** and an upper enlarged extremity which comprises an offset relatively short axially extending cylindrical portion or wall **57** joined to the wall **56** to define an annular recess **58** substantially aligned with the wall **56**. The recess forms a seat **59** for the fitting **50**. When the lower layer **53** of paving material is laid the mounting **51** is substantially surrounded, with the upper surface of the material being flush with the upper marginal end of the mounting. Due to the difference in the cross-sectional dimensions of the wall **56**, flange **55** and the upper enlarged extremity of the mounting the original or lower layer of paving material, when tamped, will intimately bear against the mounting and assist in firmly holding the mounting in place.

The fitting **50** preferably comprises a cylindrical portion or wall **60**, which seats in the recess **58** of the mounting and substantially constitutes a continuation of the wall **56** thereof. The fitting also includes a relatively large annular surrounding portion or plate **61** extending radially outwardly from the wall **60**. The portion **61** is preferably provided with an annular depending flange or wall **62** which is concentric to the wall **60** and preferably of a length to surround or encircle the upper enlarged extremity of the mounting for disposition in a cavity or trench **63** which is dug or chiseled out of the lower layer for cementing or anchoring therein by the upper layer. This depending flange, among other things, serves to provide a support for the outer periphery of the fitting and thereby stabilize its position. The surrounding radial portion **61** is also preferably provided with an upturned axially extending tubular portion **64** which substantially constitutes a continuation of the wall **57** of the fitting and is offset from the wall **60** to form a seat **65** for a cover **66**. The depending flange **62** terminates substantially on a level with the seat **59** of the mounting but, if desired, may be made longer or shorter than shown and the surrounding portion **61** may be made smaller or larger depending on the size of the mounting and/or pit or area adapted to be serviced in the foundation. It will be noted that the arrangement may be such that the upper surface of the portion **61** is slightly below the seat **65** but may be on the same level or thereabove.

The surrounding portion **61** of the fitting is further preferably provided with a plurality of circumferentially extending circumferentially spaced transverse openings **67** so that the upper layer of paving material may flow upwardly and/or downwardly therethrough while being laid to provide means **68** extending therethrough which serves to unite or bond portions thereof below and above said surrounding portion. The organization assists in providing a firm mounting, base or homogenous mass within which the fitting is molded.

The wall **60** may be provided with radially extending threaded apertures **69** which receive set screws **70** for manipulation against the wall **57** of the fitting to additionally assist in securing the fitting to the mounting.

The fitting is preferably installed by chiseling or digging out the cavity or trench **63** and removing all loose fragments of the old or bottom layer of material **53** to a depth sufficient to accommodate the depending flange **62**, after which the cavity is wetted and then partially filled to form a bed **71** for the portions **61** and **62** and so that the material will ooze or flow upwardly through the openings **67** to provide the means **68** when the fitting is

tamped into position. Thereafter, additional material **73** is tamped or conditioned upon the portion **61** and about the portion **62** and for merging with the layer **54** which is being laid. In some instances the bed **71** may be sufficient to cause materail to flow upwardly through the openings and in other instances substantially none or very little will enter the openings.

As exemplified in FIGURE 3, a fitting **74**, like the fitting **50**, is depicted as being supported on a mounting **75** and having a radial portion **76** and a depending flange embedded in a second layer of paving material **77** laid upon a bottom or first layer **78**. Another fitting **79**, like the fitting **74**, is superimposed or supported in a nested relation to the fitting **74**, with a third or top layer **80** of material embedding or molding in the fitting **79**. The fitting **79** is preferably installed by chiseling or digging a cavity **81** in the second layer and removing a portion of the material in the openings of the fitting **74** to a depth indicated by the line **82**, after which the cavity is wetted, whereupon material is placed in the cavity to partially fill the openings and provide a bed **83**. The fitting **79** is then placed on the fitting **74** and bed to cause material to flow upwardly through or partially into the openings of this fitting after which additional material **84** of the layer is placed upon the radial portion and about the depending portion of the fitting to firmly lock the latter in relation to the fitting **74**.

The installation exemplified in FIGURE 3*a* is similar to that of FIGURE 2 and will now be described. A fitting **50'** of the installation is supported on a mounting **51'** carried by a foundation (not shown). An original layer of paving material **53'** surrounds the mounting in a conventional manner. The fitting is preferably formed or constructed to include a tapered tubular cylindrical wall portion **60'** which is received in a recess forming a seat **59'** in a manner to provide what may be termed a cam fit to prevent rattle or vibration between the fitting and mounting. The fitting also includes a radial extending annular flange or surrounding portion or plate **61'** provided with a plurality of circumferentially extending circumferentially spaced tapered openings **67'** which receive portions of new or top layer **54'** of paving material whereby to assist in anchoring the fitting in place. The fitting is preferably installed by merely removing a cover **66'** from the mounting, placing the fitting on the mounting with the flange engaging the upper surface of the original layer of material, laying the top layer **54'** and then placing the cover in a recess having a seat **65'**. The recess is formed by an upstanding wall **64'** which preferably has a tapered surface as shown so that the cover, having a bevelled periphery, will cam itself into place and prevent rattle between the fitting and cover. In some instances, the original paving material about the mounting, due to its condition, may have to be removed to provide a cavity or trench, in which event, it is filled with new material to provide a bed or base for the flange **61'**. When the latter procedure is employed some of the bed material will ooze or flow into the openings and overlay the flange, but due to the taper of its openings, the fitting will be firmly anchored after the material has hardened.

FIGURE 4 of the drawing exemplifies a mounting **90** and a fitting **91** which respectively correspond to the mountings and fittings shown in FIGURES 2 and 3, except that a surrounding portion **92** of the fitting is additionally provided with holes **93** between openings **94** (only one of the openings and one of the holes is shown). The fitting **91** has a depending flange **95** which is preferably anchored by material of a top layer **97** in a cavity **96** provided in a bottom layer **98** of paving material. In order to further assist in securing the fitting in place a plurality of fastening means **99**, preferably in the form of nails, are driven through the holes **93** and into the bottom layer after the flange **95** is embedded in the cavity by the top layer. The material of the top layer extends through the openings **94** in the same manner as in FIG-

URE 2 for bonding portions of the top layer below and above the surrounding portion **92** of the fitting.

FIGURE 4 illustrates a mounting **100**, a fitting **101**, a pressure distributing member generally designated **102**, and a plurality of fastening means **103**, preferably in the form of screws, for operating the member (only one of the fastening means is shown). Each of the members preferably includes a horizontal portion **104** provided with a threaded aperture **105** and an upturned leg or vertical portion **106**. The screws extend through holes in the fitting and connect with the threaded apertures whereby tightening of the screws will cause the portion **104** to engage a shoulder or abutment **107** on the mounting and the leg **106** to engage an under surface of the fitting. A depending flange **108** of the fitting may assist in stabilizing movement and positioning of the members when they are drawn toward the aforesaid shoulder and fitting. It will be noted that the length of the leg and the distance between the shoulder and the upper end of the mounting are substantially the same so as to more or less distribute a balanced pressure against the mounting and fitting. Material of a top layer **109** of paving material is preferably worked about the mounting, fitting and the members after the fitting has been fastened to the mounting by the members and screws.

The organization illustrated in FIGURE 6 of the drawing is similar to those shown in FIGURES 4 and 5, and includes fastening means, preferably in the form of screws **110** which extend through openings **111** in a fitting **112** for detachable connection with expansion nut assemblies **113**, the latter of which have been previously anchored in holes provided therefor in a bottom layer **114** of paving material (only one of the assemblies **113** is shown). The screws also extend through members **115** overlying the fitting and serve as washers or means bridging each opening. Material of a top layer **116** of paving material is used to provide a bed (not shown) in a cavity **117** for the fitting and embed a surrounding portion **118** and a depending portion **119** thereof. When the screws are tightened the fitting will be held firmly against the mounting and tied to the bottom layer.

The structure shown in FIGURE 7 of the drawing includes fastening means, preferably in the form of bolts having heads **120** anchored in a cavity **121** of a bottom layer **122** of paving material by a top layer **123** of paving material. The shanks of the bolts are also embedded in the cavity and extend upwardly through holes **124** in a surrounding flange or portion **125** of a fitting **126** and through washers **127** so that nuts **128** can be connected to the shanks. If desired, the heads **120** can be anchored to the bottom layer or in the cavity by allowing cement or other paving material to set before the full bed for the fitting is poured or placed in the cavity, in which event, tightening of the nuts will serve to force the fitting downwardly to firmly secure it in place.

The arrangement exemplified in FIGURE 8, includes fastening means **130**, like those shown in FIGURE 6, which extend through certain openings **131** in a fitting **132** with additional screw fastening means **133** extending through apertures in the fitting for connection with a bottom layer or means embedded therein or in a cavity thereof. The apertures in the fitting, including a mounting, and layers of paving material, are not shown in FIGURE 8.

In all of the arrangements exemplified in FIGURES 4 through 8, the fasteners provide means in addition to the material of the top and/or bottom layer which extends through the openings in the fittings and join or bond the material above and below the surrounding portions of the fittings. In other words, the fastening means and the material in the openings provide dual means serving to hold the fittings firmly in place.

In view of the foregoing, it will be manifest that the invention enjoys the merits of simplicity, wide adaptability, reliability, and freedom from trouble or expense for maintenance.

Having thus described our invention, it is obvious that various modifications may be made in the same without departing from the spirit of the invention, and, therefore, we do not wish to be understood as limiting ourselves to the exact forms, constructions, arrangements, and combinations of parts herein shown and described.

We claim:

1. A member adapted for disposition relative to a tubular mounting of a utility installation in paving material, said member being of a one-piece construction and comprising a tubular portion and also a plate adapted for disposition in paving material, said tubular portion having an upper offset extremity provided with an inner surface and a lower inset extremity provided with an upper surface whereby said surfaces define an internal recess adapted to receive a cover, said plate projecting laterally outward an extent which is appreciably greater than the wall thickness of said tubular portion and so that said lower extremity projects below said plate for disposition in an internal recess of a mounting for locating the member in relation thereto, said plate having a substantially uniform thickness with upper and lower substantially parallel surfaces, and being provided with a plurality of relatively large elongated openings extending therethrough which are disposed intermediate its width generally about said tubular portion, said openings adjacent said upper surface of said plate being larger than adjacent said lower surface of said plate whereby to assist in anchoring said member in paving material when the latter is received in said openings.

2. The member defined in claim **1**, in which said tubular portion and plate ane annular in shape, and said openings are substantially identical in shape and substantially equally spaced circumferentially about said tubular portion.

3. The member defined in claim **1**, in which said lower extremity is provided with an external surface which is inclined downwardly and inwardly toward the longitudinal axis of the member for engagement with a mounting whereby to assist in providing a tight fit between the member and mounting.

4. The member defined in claim **1**, in which said upper extremity projects above said plate and the latter is adapted for disposition between a lower base portion of material and an upper layer of material overlies said plate.

5. The member defined in claim **1**, in which said plate is provided with a portion which is located outwardly with reference to at least one of said openings and extends downwardly in spaced relation with reference to said lower extremity of said tubular portion.

6. In combination: a foundation, a tubular mounting carried by said foundation, said mounting being provided with an internal recess, a member of a one-piece construction comprising a tubular portion and a plate, said tubular portion having an upper offset extremity provided with an inner surface and a lower inset extremity provided with an upper surface whereby said surfaces define an internal recess for receiving a cover, said plate projecting laterally outward an extent which is appreciably greater than the wall thickness of said tubular portion and so that said lower extremity projects below said plate and into said internal recess of said mounting for locating said member in relation thereto, said plate having a substantially uniform thickness with upper and lower substantially parallel surfaces and being provided with a plurality of relatively large elongate openings extending therethrough which are disposed intermediate its width generally about said tubular portion, said openings adjacent said upper surface of said plate being larger than adjacent said lower surface of said plate, and paving material disposed about said mounting and supporting

said plate over an area which is greater than any engaging area between said member and said mounting, said paving material including portions disposed in said openings whereby to assist in anchoring said member in place.

7. The combination defined in claim 6, including a plurality of elongate means extending through at least some of the openings, said elongate means having lower ends respectively anchored in the paving material below said plate and upper ends respectively disposed above said plate, and means respectively connected to said upper ends of said elongate means for applying pressure against said plate whereby to additionally assist in anchoring said member in place.

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