Jan. 20, 1970 R. M. POPE 3,490,637

UTILITY MARKER BOX

Filed June 24, 1968

Fig. 1.

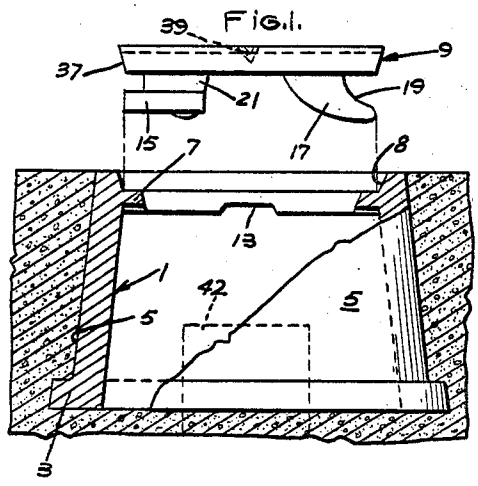


Fig. 2

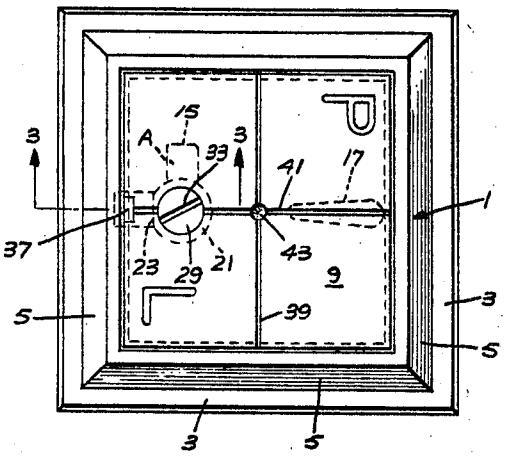


Fig. 3

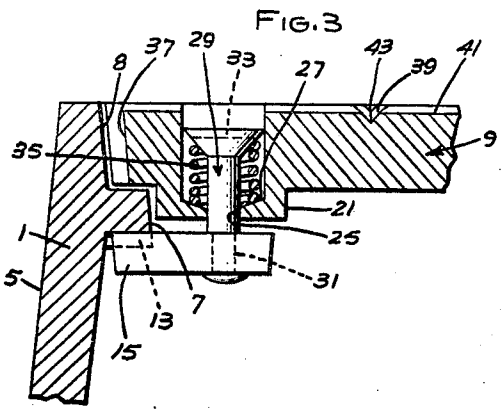
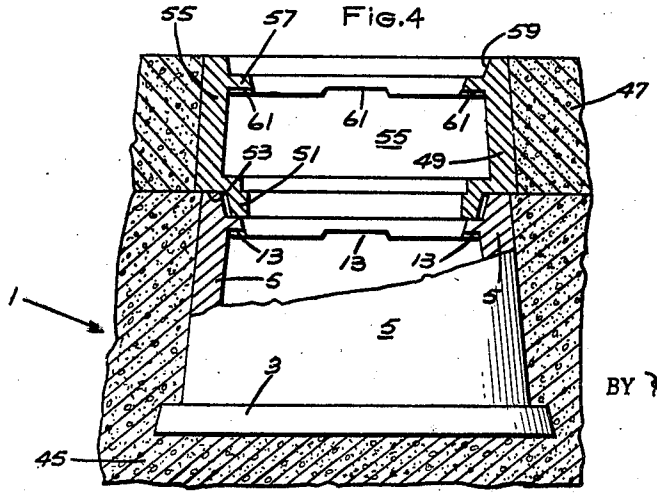


Fig. 4



INVENTOR.
ROBERT M. POPE,
BY Hood, Sturt, Quick & Lundy
ATTORNEYS.

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3,490,637

UTILITY MARKER BOX

Robert M. Pope, 3511 S. Boots St., Marion, Ind. 46952

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U.S. Cl. 220—3.4 3 Claims

ABSTRACT OF THE DISCLOSURE

A marker box for housing, protecting and indicating the position of pipeline valves, risers and fittings, surveyor's stakes, pins, bench marks, highway monuments and the like, which are disposed below the grade level of the ground or pavement. The box has a removable cover disposed in a recess in the top of the box and held in place by a spring biased latch to prevent its accidental removal. The cover is provided with permanent markings to indicate the nature of the housed item and the approximate centerlines thereof. An extension collar is provided, the bottom part of which fits into the recess at the top of the box and the top of which is recessed to receive the box cover and latch. The box and collar are shaped so as to minimize shifting thereof by forces resulting from changing soil conditions, and are made of ferrous material to facilitate finding the box with detection instruments.

BACKGROUND OF THE INVENTION

Field of the invention

Pipelines for fluids such as water, gas, petroleum products and the like are usually buried in the earth. Frequently, a subsequently placed pavement buries them further. The lines usually are provided with shut-off valves having extended operating stems, riser pipes and the like, accessible at the grade surface, as well as other items, such as branch lines, fittings, and check valves, which are deeply buried but are marked by stakes or pins placed near the surface.

Surveyor's stakes, pins, bench marks, highway monuments and the like, represent another class of items with which the marker box may be used to advantage. Both classes of items present the problems of protecting them from damage and vandalism and of finding them when they are needed.

It is usually impossible or undesirable to have most of the items mentioned, project out of the ground or pavement, consequently the usual practice is to position them slightly below the grade level of the earth, after which they become more deeply covered by vegetation, debris, and washed-in soil, and all evidence of their location is obliterated. Even when measurements from the item to known points are recorded, it usually requires a considerable amount of probing in the soil to locate them. When a pavement has been placed over the item, the difficulty of finding it is greatly increased.

Further, the mass of such items and the materials from which they are often made do not produce strong signals on the indicators of detection equipment.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a relatively permanent marker box for protecting and indicating the location of an item which is either placed in the ground or pavement near, but below the surface thereof, or which is buried deeply and extends upwardly to a point near such surface.

Another object of the invention is to provide a marker box, having a removable cover, which may be installed in the earth or in pavement, flush with the surface thereof, and which provides a cavity below such surface into which

an item set in the earth may extend, so as to be exposed for use by removal of the cover.

A further object of the invention is to provide a relatively rugged, long-lasting and inexpensive marker box.

Yet another object of the invention is to facilitate the finding of the marker box by making it of a relatively large mass of ferrous material.

Another object of the invention is to provide a marker box having a configuration whereby it presents substantially opposed and equivalent surface areas to forces resulting from changing conditions of the medium in which it is buried, so as to minimize or prevent the shifting of the box.

Still another object of the invention is to provide a marker box having a cover which is held in place by a latch mechanism which cannot be dislodged from latching engagement by vibration, impact or other ordinary environmental forces.

Yet another object of the invention is to provide an extension collar for the box, which has its lower end formed to fit into the recess of the box, and is formed at its upper end to receive the box cover and latching means.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevation, partly in section, showing the marker box buried flush in the earth and showing the cover;

FIG. 2 is a plan view of the marker box with its cover in place, and showing the permanent markings on the cover;

FIG. 3 is an enlarged, cross-sectional, fragmentary view of the box and cover, taken substantially on the line 3—3 of FIG. 2 and showing the structure of the latching mechanism; and

FIG. 4 is an elevation, partly in section, showing the marker box and an extension collar assembled, the box being set flush in an original pavement and the collar being set in an over-pavement.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In all of the figures of the drawings, the numeral **1** indicates the marker box comprising a substantially square base flange **3** extending outwardly from the bottom ends of four (4) upwardly extending converging flat walls **5**, which form a frustum of a hollow pyramid. An inwardly extending flange **7** is disposed in parallel, spaced relation with respect to, and below the top ends of the walls. The flange **7** and the upper ends of the walls define a recess **8** adapted to receive a cover **9**, which is square and of a size to close the box opening. The depth of the recess and the thickness of the cover are substantially equal so that the top of the cover **9** is flush with the top of the box.

The bottom side of the inwardly extending flange **7** is provided with downwardly open notches **13**, at about the midpoint of the span of each wall, to receive the latch-bolt **15** of the cover **9**. The four notches **13** permit the cover to be installed on the box in any one of four rotative positions.

As shown in FIG. 1, a projection **17** extends downwardly from the bottom of the cover **9** and then outwardly, at right angles to the adjacent edge of the cover, at about the midpoint thereof. The projection and the bottom face of the cover define a notch **19** of such

dimensions as to receive the flange 7 as the cover is inserted in the recess. This is done by tilting the cover so that the side adjacent to the projection 17 is tilted downwardly to first contact the top of the flange 7 and by thereafter concurrently lowering the opposite side and moving the entire cover 9 toward the part of the range to be engaged by the projection 17.

A boss, FIG. 1, 2 and 3, indicated by numeral 21, is formed on the lower side of the cover 9 and adjacent to the side opposite to that bearing the projection 17. When the cover 9 is installed in the recess 8, the projection 17 terminates at a level slightly above the top of the adjacent notch 13. The boss 21 is generally cylindrical but has the side nearest the adjacent edge of the cover flattened parallel to said edge. The boss 21 is disposed opposite to the projection 17. A stepped diameter bore 25 extends through the boss 21 as shown.

A headed stud 29, having a reduced diameter shank 31 at its lower end, is received by the bore 25, while the reduced portion enters the bolt 15 and is brazed or otherwise fixed thereto, so that the bolt and stud will move together. The head of the stud 29 is provided with a screwdriver slot 33 or other means, to facilitate axial depression and rotation of the stud 29 and bolt 15.

A helical compression spring 35 in the larger portion of the bore 25 surrounds the stud 29. The ends of the spring 35 are preferably squared and seat against the head of the stud 29 and the bottom 27 of the larger portion of the bore 25. The spring 35, in its normally expanded condition, holds the bolt 15 in contact with the bottom of the boss 21.

When it is desired to install the cover 9 on the marker box or on an extension collar which will be described below, the bolt 15 should be rotated so that it does not project beyond the edge of the cover. The cover is installed in the recess 8 in the manner described above, which causes the engagement of the flange 7 with the notch 19 and projection 17. When the cover is fully seated in the recess 8, the stud 29 and bolt 15 are depressed axially, far enough to position the bolt below the flange 7, after which the stud 29 and bolt 15 are rotated to position the bolt 15 under the flange 7. Upon releasing the stud 29, the spring 35 will move the bolt 15 into contact with the flange 7, so that further rotation of the stud 29 will align the bolt 15 with the associated notch 13, whereupon the spring 35 will seat the bolt 15 therein. Accidental dislodgement of the cover 9 from the box is prevented by the spring 35 which holds the bolt 15 in the notch 13 so as to prevent it from turning out of latching engagement, and by the seating of the cover 9 in the recess 8 which prevents shifting of the cover in a manner to disengage the flange 7 from the bolt 15 and notch 19.

To remove the cover 9, the stud 29 and bolt 15 must be depressed to move the bolt 15 out of the notch 13 and rotated to move the bolt 15 away from the flange 7. Thereafter, the cover 9 must be tilted by lifting the side which is adjacent to the bolt 15, and then translated toward said side to disengage the projection 17 from the flange 7. The cover 9 may then be lifted out of the recess 8.

If desired, a vertically extending groove 37 may be formed in the edge of the cover 9, adjacent to the stud 29, to permit the entry of a screwdriver or other tool to facilitate the above described tilting of the cover 9 prior to its removal.

In order to indicate upon the top of the cover 9, the transverse center lines of the box, two (2) perpendicular V-grooves 39, 41 are formed therein. The intersection of the grooves 39, 41 designate the vertical centerline of the box. To enhance the visibility of the center, a conical depression 43, which is deeper than the grooves 39, 41 may be formed in the cover 9. By carefully orienting the box so that the grooves 39, 41 are disposed parallel with pipe line, and by filling or marking out the inapplicable portions of the grooves 39, 41, information can be recorded directly upon the box as to the direction in which the line runs, whether a second line branches from it and in what direction, whether the main line terminates in a T having two (2) branch lines attached, and the like. Again, by accurately locating the depression 43 over a marker stake, pin, bench mark, valve stem and the like, the depression may serve to guide the positioning of a transit, thus saving the time required to clear all debris, dirt and vegetation from the cover and removing the cover to expose the item housed in the box. To depict the relation between the box and an item housed therein, FIG. 1 shows a surveyor's stake 42 which has been driven into the earth and the free end of which extends into the cavity of the box so as to be exposed upon removal of the cover, although the end of the stake is actually below grade level.

The cover 9 may also bear other markings or indicia, such as the raised letters P and L shown in FIG. 2, to indicate the nature of the item being enclosed by the box. In the example shown, the letters indicate that it is a pipe line.

All of the parts of the box and cover 9 are preferably of cast iron; except the stud 29 and spring 35 which are preferably made of corrosion resistant materials. Brass has been found generally suitable for the stud 19 and stainless steel for the spring 35. The base 3, walls 1 and flange 7 are preferably cast as one piece as are the cover 9, projection 17 and boss 21. The latchbolt 15 may also be a casting. Thus all of the parts of the box and cover are highly durable.

In order to eliminate the necessity for removing the box when the road or other paving in which it is buried is to be recovered or when the grade level is to be otherwise elevated, a collar 49 is provided, which can be mounted on the box in place of the cover, as shown in FIG. 4.

The four walls 55, of the collar 49 are flat and converge upwardly to define a frustum of a hollow pyramid. A flange 51 depends from the bottom ends of the walls and is sized so that it will enter the recess 8 at the top of the marker box and rest on its flange 7, while a surrounding flange 53, which is essentially defined by the bottom ends of the walls 55, rests in part on the top ends of the box walls.

A flange 57 defines a recess 59 which is in all respects the same as recess 8 of the box, and the bottom surface of flange 57 is provided with notches 61, like notches 13 of the box, for receiving the cover latchbolt 15.

Thus, instead of disturbing the original marker box to meet the conditions which are outlined above, all that is necessary is to mount an extension collar 49 directly in the recess of the box and transfer the cover 9 from the box to the recess 59 in the top of the collar.

While the specific dimensions of the marker box and collars may be varied considerably to meet the requirements of various installations, the following are given as exemplary of a working embodiment. The base 3 of this marker box is six inches square, the over-all height is three and one-half inches, the outside top edges of the walls define a four and five-eighths inch square and the depth of recess 8 and thickness of the cover is three-eighths of an inch. The cover is about four inches square. The height of the collar is about two inches, not including the height of flange 51, which is not effective since it occupies the recess 8.

While there have been described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of the invention.

What is claimed is:

1. A marker box which is adapted to be embedded in material with its upper end substantially flush with the

surface of such material, said box comprising: four walls joined together to form a frustum of a hollow pyramid, a flange joined with, and extending outwardly from the base end of said walls, said base and walls presenting opposed and substantially equivalent surface areas to said material and to forces generated as the result of changes in the condition of said material, so that said box remains substantially in the position in which it was initially placed, an inwardly directed flange extending from the inner sides of said walls at a level below the top ends thereof, and forming therewith an upwardly open recess, a cover conforming substantially, in shape and size, to said recess, so as to enter it and rest upon said inwardly directed flange, said cover including retaining means mounted thereon for engagement with said inwardly directed flange to hold said cover in said recess, said means including a projection which extends downwardly from the bottom side of the cover and then outwardly to define, with said cover, a laterally open notch to receive the inwardly directed flange, said flange and projection coacting to prevent vertical separation of said cover from said box, said retaining means including a rotatable latchbolt disposed adjacent to the lower side of the cover, the lower side of said inwardly directed flange defining a downwardly open notch adapted to receive said latchbolt, said latchbolt being mounted for reciprocation along its axis of rotation, for engagement with said notch, when said latchbolt occupies said position, and yieldable means for holding said latchbolt in engagement with said notch.

2. The structure defined by claim 1, wherein the structure for mounting and rotating said latchbolt includes: (a) a stepped diameter bore passing through said cover, adjacent one edge thereof, (b) a compression spring disposed in said bore, (c) a headed stud received by said bore and spring and being secured to said latchbolt, the ends of said spring bearing on the head of the stud and

the bottom of the larger diameter portion of said bore, (d) said latchbolt being held into engagement with said notch by the force of said spring, when the latter is in a partially compressed condition.

3. The structure of claim 2, including an extension collar having the same number of walls as said box, said collar being in the form of a frustum of a hollow pyramid, said collar having a flange extending inwardly from the walls thereof at a level spaced from the upper ends thereof, and forming with said walls, a recess having substantially the same dimensions and configuration as the recess of said box, a flange joined to and extending downwardly from said collar, said flange having dimensions and a configuration such that it will fit into the recess of the box and rest upon the inwardly directed flange thereof while the bottom of the collar rests upon the top ends of the box walls.

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JOSEPH R. LECLAIR, Primary Examiner

J. R. GARRETT, Assistant Examiner

U.S. Cl. X.R.

220—3.8, 3.94, 55

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,490,637 Dated January 20, 1970

Inventor(s) Robert M. Pope

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

SPECIFICATION

Column 3, line 6, "range" should be --flange--;
Column 4, line 26, "19" should be --29--.

SIGNED AND
SEALED
JUN 30 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents