Sept. 18, 1928. 1,684,983

H. W. CLARK

BOX OR CASING COVER WITH FASTENER

Filed Nov. 26, 1927

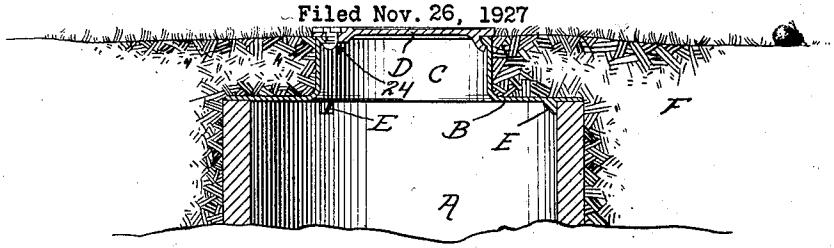


Fig. 1.

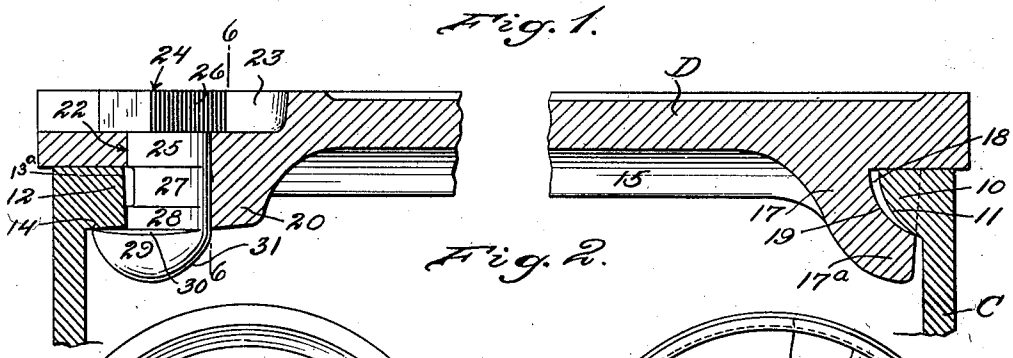


Fig. 2.

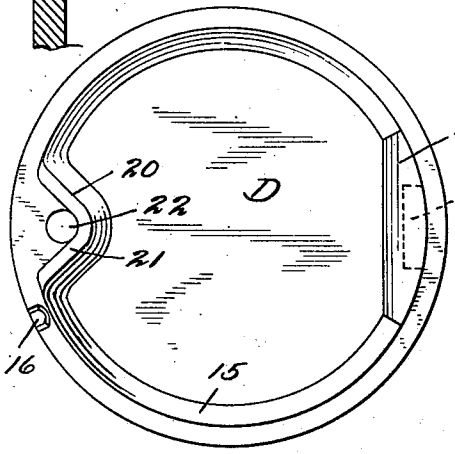


Fig. 3.

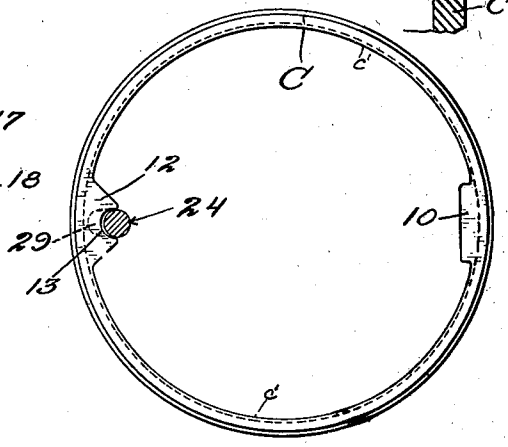


Fig. 4.

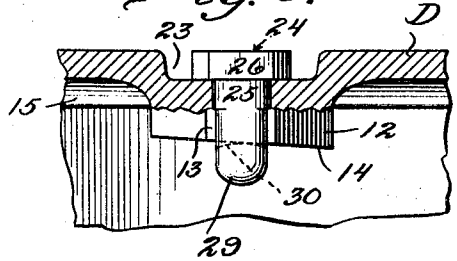


Fig. 6.

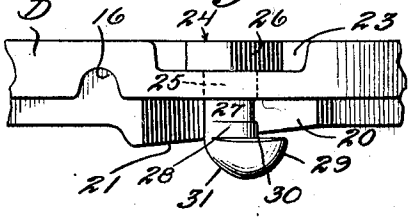


Fig. 5.

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UNITED STATES PATENT OFFICE.

HORACE W. CLARK, OF MATTOON, ILLINOIS.

BOX OR CASING COVER WITH FASTENER.

Application filed November 26, 1927. Serial No. 235,931.

My invention relates to boxes or casings for housing meters, valves or other appliances used in connection with water, gas, electric or other similar systems of distribution, such boxes or casings being generally embedded in the ground, and has for its object the provision of a lid equipped with improved means for fastening the same in place so as to prevent access to and tampering with whatever device is located within the casing and also to protect such devices from injury as for example such as might result from traffic above the casing.

The invention relates particularly to an improvement in the lid applied to the neck of the box cover, or top proper, and the means for fastening the same whereby the operation of fastening or releasing the lid will be facilitated, accidental detachment of the fastening bolt when in unlocked position prevented, and a cleaning action on the coacting surfaces effected, the last named feature being of benefit in removing any corrosion which might interfere with the movement of the parts.

Reference is had to my prior Patent No. 989,695 granted to me on April 18th, 1911, the subject matter of the present application being a specific improvement on the general features disclosed therein.

Another important object of the present invention is to provide a casing lid and securing means therefor so constructed that the securing element may be readily placed in or removed from assembled relation to the lid by proper manipulation, the securing element being furthermore of peculiar formation in several respects whereby to avoid binding and shearing during insertion or removal and to exert a pressure against the hinged side when in effective position so that the lid will be held securely in place by the single fastener.

Another specific object is to improve the hinge-like connection of the lid with the casing so that movement of the lid to open or closed position, as the case may be, may be effected without any great effort and without binding of the parts.

An additional object is to provide a structure of this character which will be simple and inexpensive to manufacture, easy to install and operate, positive in action, efficient and durable in service, and a general improvement in the art.

To the attainment of the foregoing and other objects and advantages, the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawing in which:

Figure 1 is a fragmentary vertical section through the top of a casing or box equipped with my lid and its securing means,

Figure 2 is a vertical cross section through the lid and a small portion of the upper end of the casing, this view showing the hinging means and the fastening means in greater detail,

Figure 3 is a bottom plan view of the lid or cover,

Figure 4 is a plan view of the upper end of the casing with the cover removed but with the bolt shown in section,

Figure 5 is a fragmentary edge elevation of the cover and bolt with the latter in partly turned position, and

Figure 6 is a detail vertical section taken on substantially the line 6—6 of Figure 2 showing the bolt in locked position.

Referring more particularly to the drawing the letter A designates a casing which may be a meter box or the like and which may be constructed of brick, metal or other similar material and designed to house a meter, valve or other appliance (not shown), there being no limitation as to what is located within the casing or box. This casing is provided with a top B which fits thereupon and which has an upwardly projecting neck C upon which my lid D is designed to be secured. The top B may be centered by a plurality of lugs E engaging the inner wall of the casing. The intention is that the casing A, the cover B and all of the neck C, with the exception of its upper end, shall lie beneath the surface of the ground F. This last statement is of course true only when the box is installed in certain localities, it being clear that if box is installed in a pavement the box and parts mentioned would be embedded in the pavement with top surface of lid D level with surface of the pavement.

At one side of the inner surface of the upper end of the neck C is provided an inwardly projecting lug 10 which has its underside 11 curved and preferably at least substantially arcuate in cross section. The top surface of this lug is preferably flush with the neck to provide additional bearing surface for supporting the lid. At a diamet-

rically opposite point is provided an inwardly extending ledge 12 having an arcuate notch 13 at its innermost point and having its underside 14 beveled laterally as clearly shown in Figure 6 and beveled backwardly as indicated in Figure 2. By use of the word "laterally" it is meant that the inclination of the underside of the ledge is at substantially right angles to a radial line drawn from the center of the neck through the notch 13. The arcuate wall 13ª of the notch 13 slopes upwardly and outwardly, as indicated in Figure 2, for the purpose of permitting full surface contact of the hook 29 with the ledge, and also to provide a clearance for the bolt 24 when the lid D, which carries said bolt, is raised from closed position.

The lid D comprises a preferably circular body of plate-like form provided at its underside with a depending circumferential bead 15 which telescopes loosely within the neck and which serves as a reinforcement and guide for bolt engagement, also providing a seal. Outwardly of this bead the lid is represented as having a notch 16 therein into which may be inserted the point of a suitable implement for prying it up after release of the securing means to be hereinafter described. This is an unimportant detail as it is disclosed in the above mentioned patent. At one side the bead 15 is enlarged to form a thickened portion 17 merging thereinto, the thickened portion being formed with a recess 18 leading to its outer periphery and adapted to receive the lug 10 on the neck. The recess of this portion has the effect of defining a hook member 17ª, at least when considered in cross-section and it will be so referred to hereinafter. The bottom wall 19 of this recess is curved, the curvature being preferably different from that of the undersurface 11 of the lug so that the edge of the hook defined by recessing the thickened portion will have a bearing against the lug to exert a shearing or scraping action thereon when the lid is swung into open or closed position, this being of material advantage inasmuch as any corrosion or accumulation of foreign matter will be removed. The difference in curvature of the surfaces 11 and 19 provides a slight initial space between them and it will be apparent that wear is thus provided for as the shearing edge may wear down considerably before the surfaces 11 and 19 will come into engagement throughout.

At a point diametrically opposite the thickened portion 17 the bead 15 merges into a V-shaped flange 20 which has its undersurface 21 inclined laterally in the same respect as the undersurface 14 of the ledge 12, but having an additional incline in an opposing direction, and at the vertex of the V the lid is formed with a circular hole 22 which is preferably drilled so as to be true and smooth. At an area opposite this flange 20 the top of the lid is recessed at 23 for a purpose to be described.

The securing means is here disclosed as comprising a bolt designated as a whole by the numeral 24, this bolt having a cylindrical shank 25 coaxial with its angular head 26 and fitting snugly within the hole 22. The angular head 26 is located within the above described recess 23 and is preferably flush with the top of the lid. It is immaterial whether the head be square, hexagonal or of any other shape provided it be of such form as to be readily engageable by a socket wrench for effecting turning movement from one position to another. Such a wrench is illustrated in the above mentioned patent. Immediately adjacent the shank 25 the bolt is cut away to form a reduced portion 27 which is located principally at one side, and beyond this reduced portion there is provided a cam surface 28 which is substantially oval in shape as indicated in Figure 4, this cam portion being adapted to enter and cooperate, with a cleaning effect, with the notch 13 in the ledge 12. The bolt terminates at its lower end in what may be described as a hook 29 adapted to engage beneath the surface 14 of the ledge 12 when the lid is in secured position, or to engage beneath the surface 21 of the flange 20 when in released position. As the top surface of hook portion 29 is inclined in opposite directions as shown at 30 so as to fit properly in engagement with the inclined undersurface of ledge 12, when in secured position and also with the double inclined undersurface 21 of flange 20 when in released position, it is apparent that when the bolt is turned to engage the hook with either of these surfaces the edge of the hook will scrape along them and remove any accumulation of dirt or other foreign matter as well as corrosion, thereby cleaning the surfaces and preventing them from ever becoming caked. The engagement of the double inclined plane 30 of hook 29 with the corresponding double inclined plane of lid 21, maintains the bolt body perpendicular in its line of travel and prevents bolt from pushing away from the lug 20. The preferred material from which the bolt is made is manganese-bronze which is comparatively soft and when the bolt is turned to force the hook beneath the ledge or the flange a small amount of the bronze will be ground off and spread upon and over these inclined surfaces and will form an actual coating thereon of material incapable of corrosion under ordinary influences. However, this abrading action would occur only initially and would not be of such a continuous nature as to cause undue wearing away of the hook. Furthermore the degree of extension and inclination of the bottom surfaces of the ledge and flange are so related to the distance between the shank 25 and top surface of the hook that when the bolt is rotated to bring the hook beneath the

ledge or the flange a movement through an arc of 120° will be sufficient. Clearly, then, there is an adequate allowance for wear for the reason that when wear does occur the bolt is capable of being turned to a progressively greater extent up to an arc of 240°.

When the lid is to be applied and secured, it is placed upon the neck in such position that the lug 10 will be received within the recess 18, or in other words engage the hook 17ª. At such a time the bolt 24 must of course be in such position that its hook 29 will be in non-obstructing relation to the ledge 12. After the lid is in place the bolt is turned by suitable means to bring the hook beneath the ledge as shown in Figure 2 and when this is done it is apparent that the leverage occasioned by friction of top surface of hook portion 29 against the lower backwardly inclined surface 14 of ledge 12 will force the lid bodily toward that side of the neck provided with the lug 10. This causes a very snug engagement between the lug and hook 17ª, these elements constituting the hinge connection upon which the lid may pivot when swung into open position after release of the securing bolt. Releasing of the lid is effected in the reverse manner to that described and it is preferable that the bolt be turned sufficiently that the hook thereon will engage closely with the double inclined bottom surface 21 of the flange 20 so that the bolt will be held firmly in a vertical position with proper clearance space between portions 27 and 28 of bolt 24 and notch 13 in ledge 12, and prevented from dropping out of the hole of the lid. There is, however, probably very little danger of detchment of the bolt from the inasmuch as it has a snug fit therein and as the hook and other portions are of such shape as to require a positive manipulation to effect withdrawal of the bolt. When the bolt is initially assembled with respect to the lid the hook is necessarily inserted first while the bolt is in canted position, subsequently to which it is forced into place, a light tap with a hammer being generally sufficient. The reduced portion 27 above described is provided for the purpose of enabling the bolt to be inserted without any excessive shearing action by the edges of the hole in the lid, the upper edge of enlarged portion 28 coming into slight contact with walls of hole 22 protects the hook 29 from damage and said upper edge is slightly sheared in its forcible entry thus insuring a secure fit. In actual practice I have also discovered that the underside of the hook must be somewhat flattened as at 31 as clearly indicated in Figure 2 to facilitate installation. In case the bolt ever becomes excessively worn it may be replaced and in such an event removal is effected by turning it to bring the hook out of engagement with the ledge 20 and then pulling and pushing upwardly upon it while working it laterally. If this be done with care it may be withdrawn from the lid without the use of tools.

From the foregoing description and a study of the drawing it will be apparent that I have thus provided a very simply constructed lid and fastening means therefor which will be very secure in holding action. Whatever is contained within the casing will be effectually protected against the ingress of dirt and also against injury as well as tampering. The lid is easy to apply and remove and on account of the automatic self-cleaning of the various surfaces as above mentioned there should be no difficulty in moving the parts even though the lid has been undisturbed for a long period of time. It is believed that the construction, operation and advantages will be readily apparent to one skilled in the art without further explanation.

While I have shown and described the preferred embodiment of the invention, it should be understood that the disclosure is merely an exemplification of the principles involved as the right is reserved to make all such changes in the details of construction as will widen the field of utility and increase the adaptability of the device provided such changes constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. A cover for a protective casing, the cover having an upstanding neck formed at one side with an inwardly projecting lug and at its other side with a ledge, a lid fitting upon the neck and having a recessed portion defining a hook engaging upon said lug and cooperating therewith to constitute a hinge connection, and a bolt rotatably engaged through the lid and having a hook at its lower end engageable beneath said ledge, an intermediate portion of the bolt being formed with a cam engageable with said ledge for the purpose of cleaning contact surfaces in its operation.

2. A protective casing element having an inwardly extending lug at one side, the lug having a curved lower surface, an inwardly extending ledge carried by the casing diametrically opposite the lug, the ledge having a notch therein, a lid having a recessed portion defining a hook receiving said lug, and a bolt member rotatable through the lid and having a hook thereon engageable beneath the ledge and further having a cam portion coacting with the notch for the purpose of cleaning contact surfaces in process of operation, the bottom wall of the recess defining the hook being curved differently from the curvature of the bottom of the lug and the material at the edge of the recess or hook being engageable with the curved surface of the lug to exert a scraping action thereon

when the lid is swung with respect to the casing element.

3. A cover for a protective casing, the cover having an upstanding neck formed at one side with an inwardly projecting lug and at its other side with a ledge, a lid fitting upon the neck and having a recessed portion engaging upon said lug and cooperating therewith to constitute a hinge connection, and a bolt rotatably engaged through the lid and having a hook at its lower end engageable beneath said ledge, an intermediate portion of the bolt being formed with a cam engageable with said ledge for the purpose of cleaning contact surfaces in process of operation, the ledge having an inclined bottom surface and the top of the hook being correspondingly inclined whereby the surface thereof will have scraping engagement with said inclined undersurface of the ledge.

4. A cover for a protective casing, the cover having an upstanding neck formed at one side with an inwardly projecting lug and at its other side with a ledge, a lid fitting upon the neck and having a recessed portion engaging upon said lug and cooperating therewith to constitute a hinge connection, and a bolt rotatably engaged through the lid and having a hook at its lower end engageable beneath said ledge, an intermediate portion of the bolt being formed with a cam engageable with said ledge for the purpose of cleaning contact surfaces in process of operation; the ledge having an inclined bottom surface and the top of the hook being correspondingly inclined whereby the surface thereof will have scraping engagement with said inclined undersurface of the ledge, the bolt being of non-corrodible material of softer nature than that of the ledge whereby a portion of the material of the bolt will be abraded off and onto the undersurface of the lug to form a non-corrodible coating thereon.

5. In a protective structure, a casing element having an inwardly extending lug and having an inwardly extending ledge diametrically opposite the lug, the ledge having a notch therein, a lid having a recess at one edge portion receiving said lug, the lid having its underside provided with a flange opposite the ledge and formed with a hole at the edge of the flange, and a bolt rotatably mounted within said hole and having a hook engageable selectively beneath the ledge or the flange, and a cam portion on said bolt coacting with the wall of the notch.

6. In a protective structure, a casing element having an inwardly extending lug and having an inwardly extending ledge diametrically opposite the lug, the ledge having a notch therein, a lid having a recess at one edge portion receiving said lug, the lid having its underside provided with a flange opposite the ledge and formed with a hole at the edge of flange, and a bolt rotatably mounted within said hole and having a hook engageable selectively beneath the ledge or the flange, and a cam portion on said bolt coacting with the wall of the notch, said hole in the lid and the portion of the bolt engaged therethrough being cylindrical, and the bolt having an intermediate portion above the cam reduced whereby it may be canted to effect passage through the hole in either direction.

7. In a protective structure, a casing element having an inwardly extending lug and having an inwardly extending ledge diametrically opposite the lug, the ledge having a notch therein, a lid having a hook at one edge portion receiving said lug, the lid having its underside provided with a flange opposite the ledge and formed with a hole at the edge of the flange, and a bolt rotatably mounted within said hole and having a hook engageable selectively beneath the ledge or the flange, and a cam portion on said bolt coacting with the wall of the notch, the bottom surfaces of the ledge and flange being inclined whereby the bolt may be held frictionally and vertically in selectively operative or ineffective position.

8. In a protective structure, a casing element having an inwardly extending lug and an inwardly extending ledge diametrically opposite the lug, the ledge having a notch therein, a lid having a hook at one edge portion engaging said lug, the lid having its underside provided with a flange opposite the ledge and formed with a hole at the edge of the flange, and a bolt rotatably mounted within said hole and having a hook engageable selectively beneath the ledge or the flange, the construction of the upper contact surface of hook comprising one or more inclined surfaces to properly engage on corresponding inclined surface of the ledge or flange, thus holding the bolt in a rigid and vertical position and free from the notch in the ledge when in a released or unlocked position.

9. A cover for a protective casing, the cover having an upstanding neck provided with an inwardly projecting circumferential flange provided with an arcuate notch having its wall sloping upwardly and outwardly, and a beveled portion beneath said flange surrounding the lower opening of said notch, a lid fitting upon the neck and having a depending portion defining a hook engageable with said flange and cooperating therewith to constitute a hinged connection, and a bolt rotatably engaged through said lid and having a hook at its lower end engageable with the beveled portion beneath said flange, an intermediate portion of the bolt being formed with a cam engageable with said flange to maintain said bolt in proper position whereby to cleanse contact surfaces in its operation.

In testimony whereof I affix my signature.

HORACE W. CLARK.