March 21, 1933. W. S. SHERMAN 1,902,731

LOCKING COVER

Filed Nov. 15, 1930 2 Sheets-Sheet 1

FIG. 1.

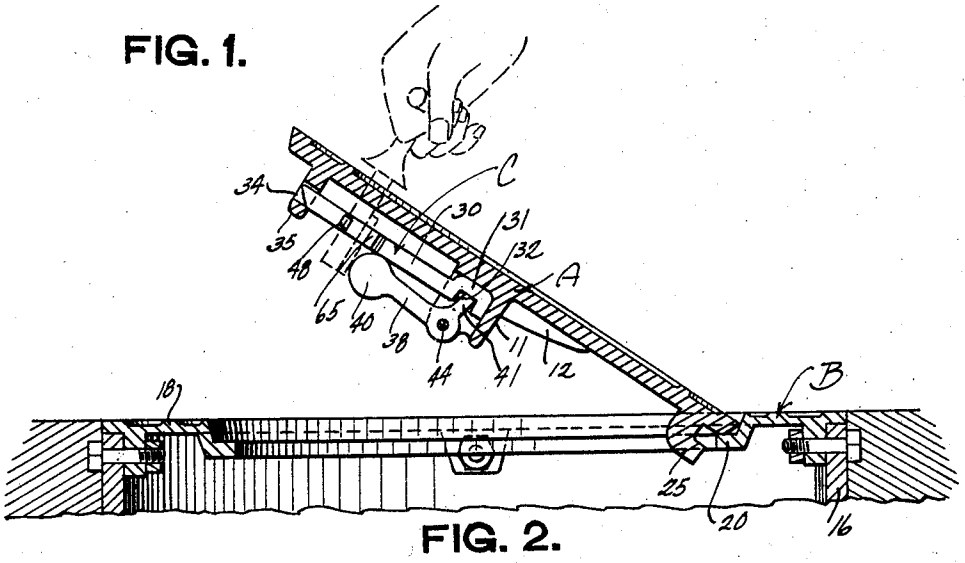
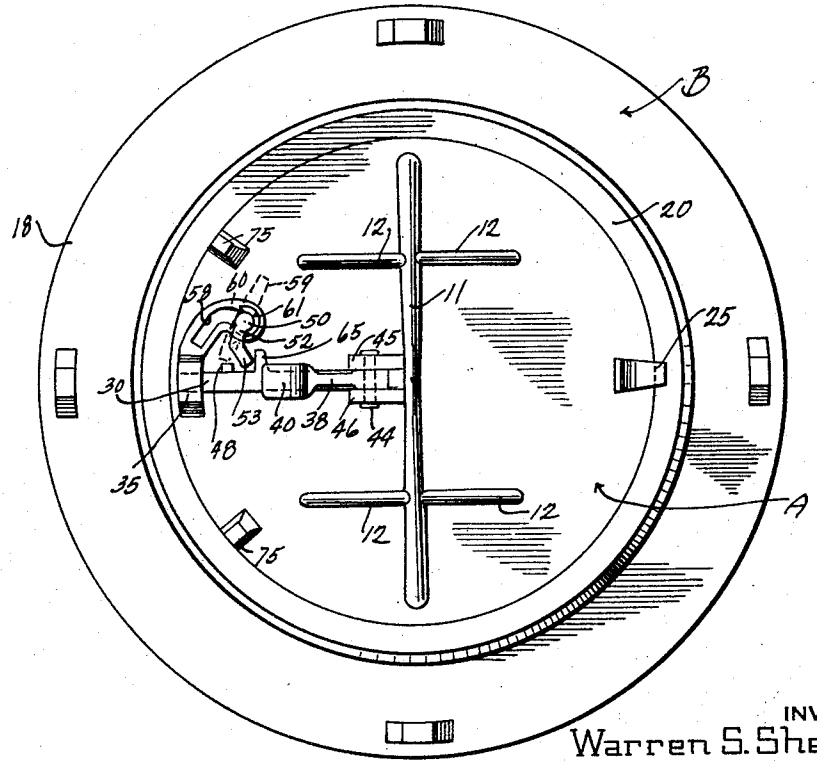


FIG. 2.



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Filed Nov. 15, 1930 2 Sheets-Sheet 2

FIG. 3.

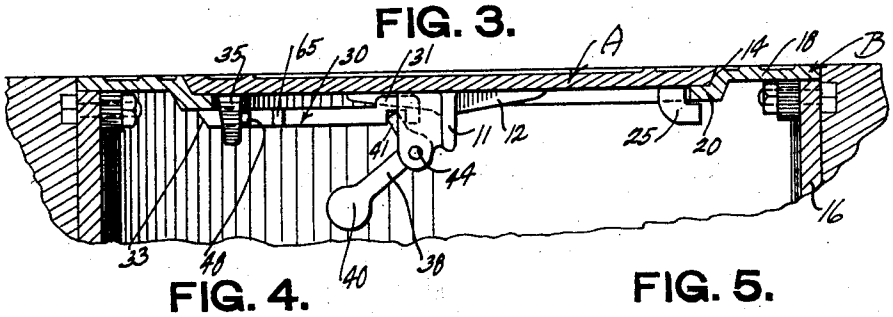


FIG. 4.

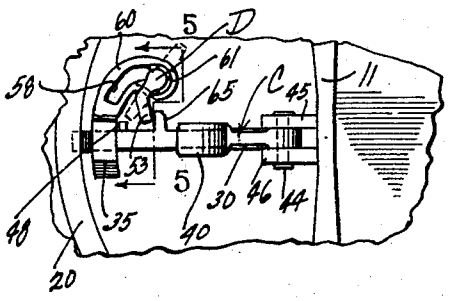


FIG. 5.

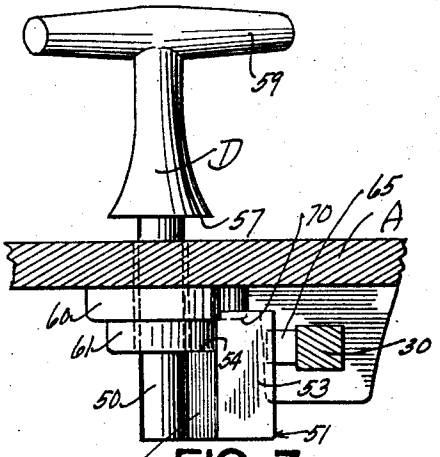


FIG. 6.

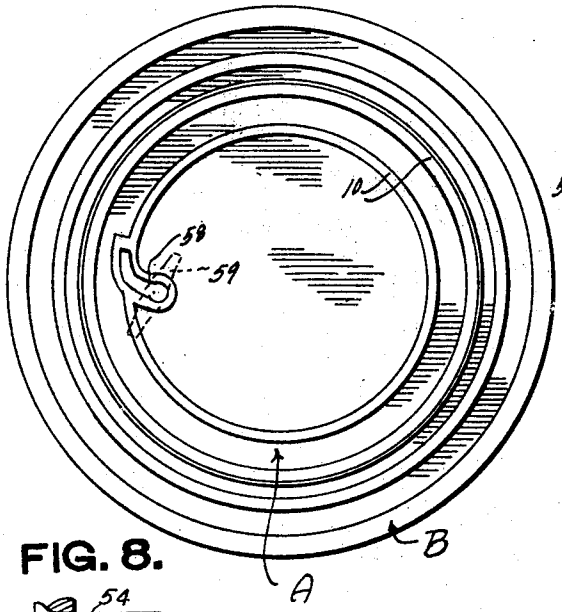


FIG. 7.

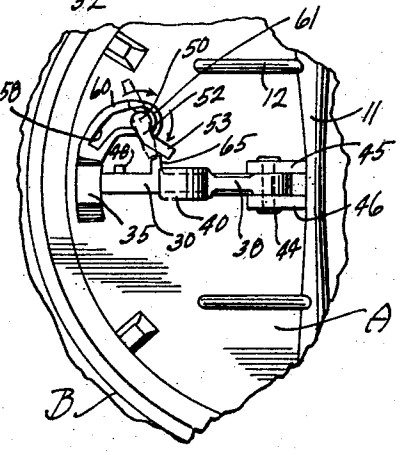
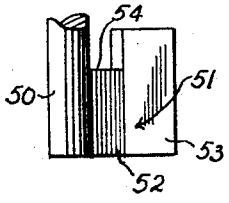


FIG. 8.



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UNITED STATES PATENT OFFICE

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LOCKING COVER

Application filed November 15, 1930. Serial No. 496,008.

This invention relates to improvements in locks particularly well adapted for the locking of heavy covers, such as man-hole, meter box and valve covers, and has particular reference to such type of covers as shown in my Patents #1,553,639 and #1,580,541; embodying more practical improvements and features of lock construction thereover.

A further and important object of this invention is the provision of a counter weight operated locking bolt structure for man-hole covers and the like having an improved preferably detachable key-handle associated therewith.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a sectional view taken diametrically through a cover and its supporting frame showing the cover in slightly elevated relation to the frame, and the facility with which it is removed and held by the key-handle structure holding the bolt unlatched.

Figure 2 is a bottom plan view of the cover upon its frame, with the bolt held by the key in unlatched position ready for detachment of the cover.

Figure 3 is a diametrical cross sectional view showing the cover locked upon its frame.

Figure 4 is a bottom plan view of the locking mechanism, showing the relation of the key to the cover and bolt at a time during assemblage of the cover upon its frame, and more particularly showing how the key is held against accidental detachment from the cover when it is used as a handle.

Figure 5 is a cross sectional view taken substantially on the line 5—5 of Figure 4.

Figure 6 is a top view showing the cover in position upon its frame, and showing in dotted lines the relation in which the handle is positioned when inserted with the bolt retracted.

Figure 7 is a bottom plan view showing how the key may be used to push the bolt into locking or latching position in event the counterweight is insufficient to overcome the resistance of the bolt to movement in its supports.

Figure 8 is a fragmentary side elevation of the lower portion of the bit end of the key.

In the drawings, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may designate a cover of the man-hole type, for detachable support upon a frame B; improved latch and locking mechanism C being provided to prevent accidental detachment or unauthorized detachment of the cover from the frame. An improved handle-key D is provided both to serve as a key in unlatching the bolt and a handle in lifting the cover A.

The cover A is of the cast metal circular disc type, having the upper surface thereof suitably provided with outer and inner circular reinforcing ribs 10 if desired. The under surface of the body of the cover A has reinforcement thereon in the nature of a main rib 11 extending substantially entirely across the entire width of the cover, diametrically. This rib increases in depth from the ends towards the central portion, as shown in Figure 3 and elsewhere. Laterally extending right angled reinforcing ribs 12 are provided in opposed pairs near the ends of the main rib 11. The body of the cover A is peripherally beveled at 14, that is, convergently from the top surface to the bottom surface.

The frame B includes the body casing 16, which may be of any nature, dependent entirely upon the use to which the improved cover lock construction is applied. The frame additionally includes the annular top wall 18 which at the inner margin thereof is flanged downwardly and inwardly to provide a peripheral retaining seat 20 for receiving the cover A in such manner that the top surface of the latter may lie substantially flush with the top surface of the wall 18. This flange 20 has a beveled surface facing the opening in which the cover rests,

for receiving the bevel edge 14 of the cover A, as is shown in Figure 3 of the drawings.

The under surface of the body of the cover is provided with an L-shaped retaining lug 25 near an outer margin thereof, defining an outwardly facing recess which receives a portion of the horizontal seat flange 20 therein, as shown in Figure 3, with the lower end of the lug 25 resting beneath the flange 20, to prevent an accidental upward movement of the cover, at this location, from the flange 20. The improved latch C is adapted to operate at a diametrically opposed location on the bottom of the cover A with respect to the retaining lug 25, as will be subsequently mentioned.

The latching mechanism C preferably includes an elongated slidable bolt 30, having its inner end of an inverted U-shape, as shown in Figure 3 of the drawings at 31, providing a downwardly facing socket or opening 32. The bolt 30 at its outer end is beveled at 33, and said outer end is slidable within an opening 34 of a depending bearing lug 35 which is formed integral with the cover A, as shown in Figure 1 of the drawings; the opening 34 being positioned so that the outer end of the bolt 30 may slide to a retaining position beneath the flange 20 of the frame B, at a location diametrically opposed from the retaining lug 25, in order to hold the cover A in a locked position upon the top wall 18 of the frame B.

Means is provided to normally urge and move the bolt 30 to a locking or latching position. This means preferably comprises a bell crank lever affair, including a weighted arm 38, the outer end of which is provided with a weight 40. A second arm 41 is integral with and normal to the arm 38. The weighted lever at the juncture of its arms 38 and 41 is pivoted at 44 between two depending lugs or flanges 45 and 46, which are integral with the cover A and are integral with and connected to the midway portion of the rib 11. The inner end of the bolt 30 slides and is retained between the flanges 45 and 46, and the arm portion 41 operates in the downwardly facing opening 32 of the bolt 30; the weighted end 40 of the lever lying beneath the bolt 30 and obviously acting to urge the outer end of the bolt 30 into a latching or locking position. The maximum position of extension to which the weighted lever may move the bolt 30 is determined by abutment of a right angled stop lug 48 against the inner side of the bearing lug 35, as is shown in Figure 3 of the drawings while the maximum position of retraction may be determined by the abutment of the weight 40 of the lever with the under surface of the bolt 30.

The key-handle member D preferably includes a shank portion 50, to the lower end of which the bit 51 is connected. The bit 51, as is shown in Figures 4, 7, and 2 of the drawings, includes the inner portion connected directly to the stem or shank 50, designated at 52, which is truly radial to the stem 50, and which has connected at the outer longitudinal edge thereof a bit portion 53 at an obtuse angle with respect to the plane of the portion 52. The portion 53 extends upwardly above the top edge of the portion 52, to define a recess 54 between the stem 50 and the facing edge of the bit portion 53, as shown in Figure 8, which receives depending retaining flanges 60 and 61 which is integral with the bottom of the cover A, for purposes to be subsequently described. The stem of the shank 50 about midway of its ends is provided with a downwardly facing shoulder 57 adapted to limit the maximum inserted movement of the key in the keyhole 58 of the cover. At its upper end the shank of the key is provided with a handle 59 which may be of the T-shaped type.

The keyhole slot 58 is disposed in the cover to one side of the bolt 30, preferably adjacent an end of the bearing lug 35. It comprises a stem receiving portion which receives the lower end of the stem or shank 50 of the key, and an elongated slot extending therefrom which is tangential rather than radial to the stem receiving and larger portion of the keyhole slot 58. On the under surface of the cover A there is provided a depending flange 60 surrounding the keyhole slot 58, and immediately at the end of the slot 58 where the stem of the key is received there is provided a depending reduced retaining flange 61 of segmental formation, which fits in the recess of the key D when the latter is drawn upwardly to serve as a handle for lifting the cover, and thus preventing accidental detachment of the parts after retraction of the bolt.

As is shown in Figure 3 of the drawings, the bell crank lever type of weight urges the bolt 30 into a locking and latching position beneath the frame whereon the cover A is received. If it is desired to remove the cover the key D is inserted at its bit end into the slot 58, and the key is turned to the position shown in Figure 2, which moves the portion 53 of the bit against the laterally extending lug 65 which is fixed with the bolt 30, as shown in Figure 2, and thus the bolt is retracted until the weight 40 of the lever comes into contact with the under side of the bolt, and the cover may be lifted from its frame. In this position of parts it is to be particularly noted that the segment 61 of the flange cover is now positioned in the recess 54, and merely by lifting upwardly upon the key D, the same serves as a handle for lifting and carrying the cover. Inasmuch as the retaining flange 61 lies in the recess 54, there will be no ac-

cidental slipping of the key in its key slot, and in this position the handle is located, as shown in dotted lines in Figure 2, in the most desirable location for suspending and holding the weight of the cover.

Should the bolt 30 become stuck so that the actuating weight cannot move it to latching position, the bit 51 of the key is so shaped that the key may be turned in an opposite direction from the bolt unlatching direction, as shown in Figure 7, so that the rear surface of the bit portion 50 will ride against the inner surface of the bolt lug 65, and upon further turning of the key in the direction shown by the arrows in Figure 7 it is obvious that the bit will have a cam-like engagement against the lug 65 for urging the bolt to a locking or latching position.

When the key K is serving as a handle for supporting the cover, as shown in Figure 5, it is to be noted that the recess 54 is of sufficient depth that the upper end of the bit portion 53 lies in the way of the annular flange 60 surrounding the keyhole slot 58, so that there will be no possibility of turning of the key to a position where the bit will align with the slot 58. This locking relation is designated at 70 in Figure 5 of the drawings.

The cover A is provided with centering lugs 75 arranged substantially equi-distant at opposite sides of the bolt 30, which cooperate with the retaining lug 25 in centering and preventing displacement of the cover from its frame.

Various changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a cover lock, the combination of a cover having an elongated keyhole and a depending flange about said keyhole, said flange having an outer face substantially perpendicular to the cover throughout the length of said flange, and a locking bolt carried by said cover, said locking bolt including a portion engageable with a key for retracting said bolt, whereby said flange provides a substantially perpendicular stop for the bit of a key to prevent unintentional removal of said key, the bit of said key being provided with a recess allowing insertion, operation and partial retraction of the key so as to receive said flange in said recess and thus stop said key from removal by abutment of its bit against said substantially perpendicular flange.

2. In a cover lock, the combination of a cover having an elongated keyhole, said cover also having a wall, associated with said keyhole, upon the under side of said cover, said wall having a substantially perpendicular face substantially equal in length to the length of a key bit, and a locking bolt carried by said cover, said locking bolt including a portion engageable with a key for retracting said bolt, whereby said wall provides a substantially perpendicular stop for the bit of a key to prevent unintentional removal of said key, the bit of said key being provided with a recess allowing insertion, operation and partial retraction of the key so as to receive said wall in said recess and thus stop said key from removal by abutment of its bit against said substantially perpendicular wall.

WARREN S. SHERMAN.