April 9, 1935. J. W. LOVATT 1,997,528

LOCK

Filed Oct. 5, 1934 2 Sheets-Sheet 1

Fig. 1.

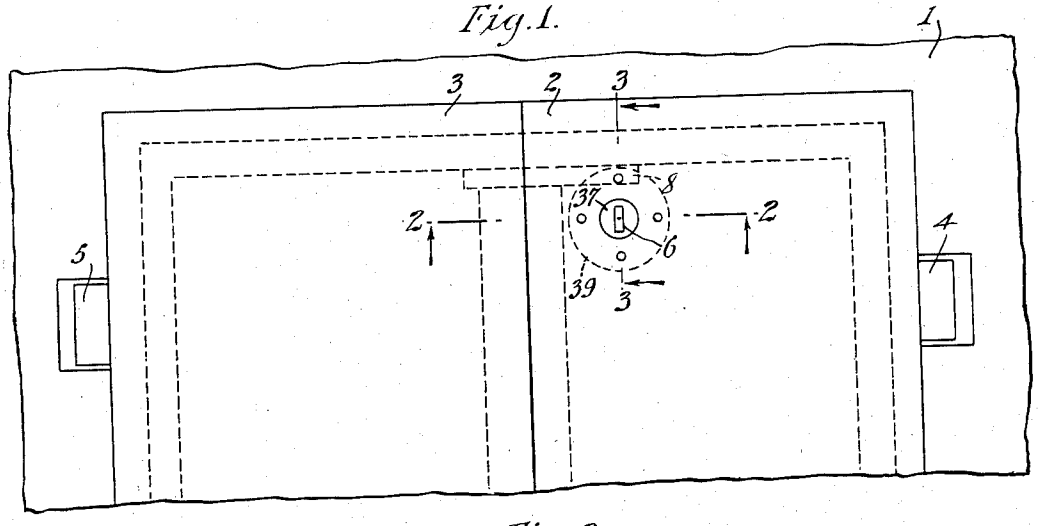


Fig. 2.

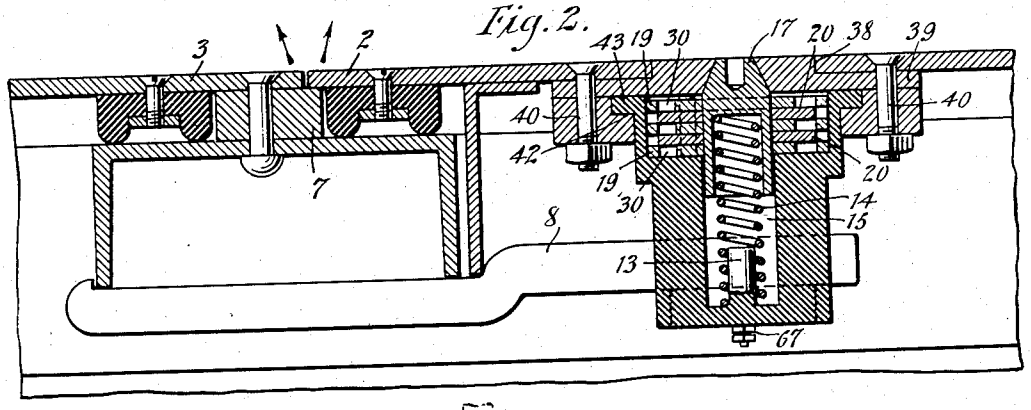
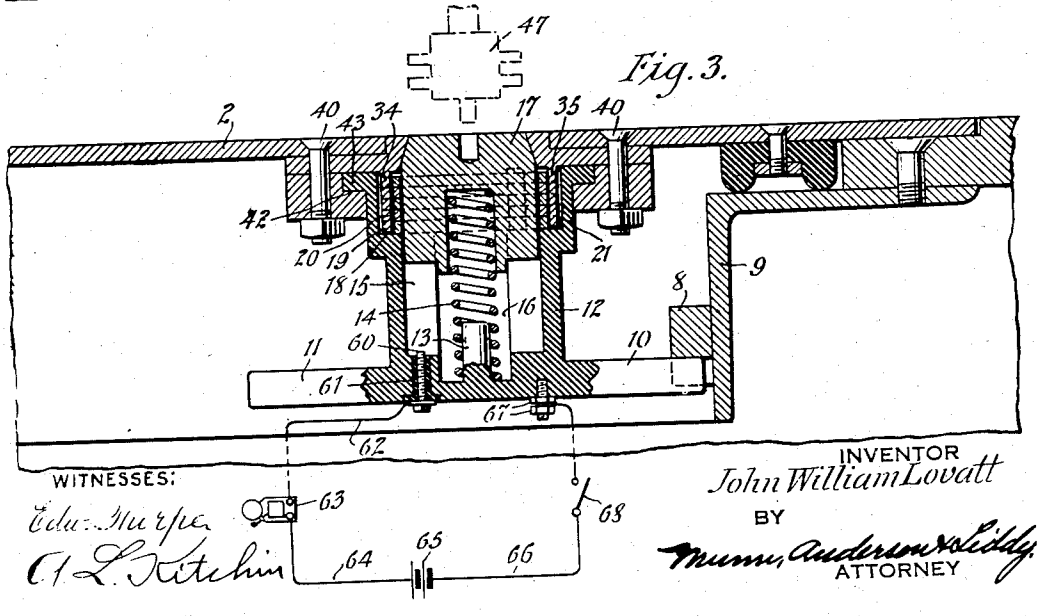


Fig. 3.



WITNESSES:

Edw. Murphy

C. L. Kitchin

INVENTOR

John William Lovatt

BY

Munn, Anderson & Liddy.

ATTORNEY

April 9, 1935. J. W. LOVATT 1,997,528

LOCK

Filed Oct. 5, 1934 2 Sheets-Sheet 2

Fig. 4.

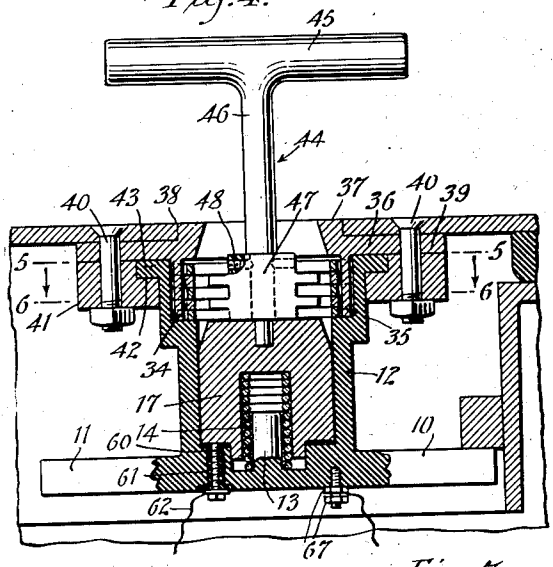


Fig. 5.

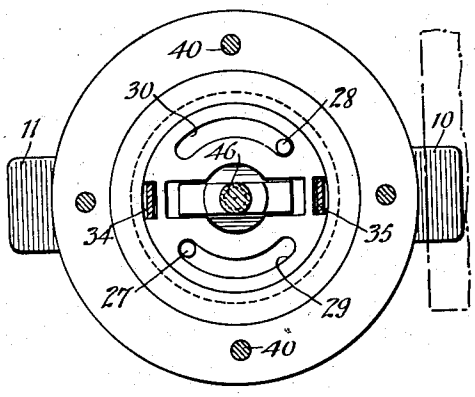


Fig. 6.

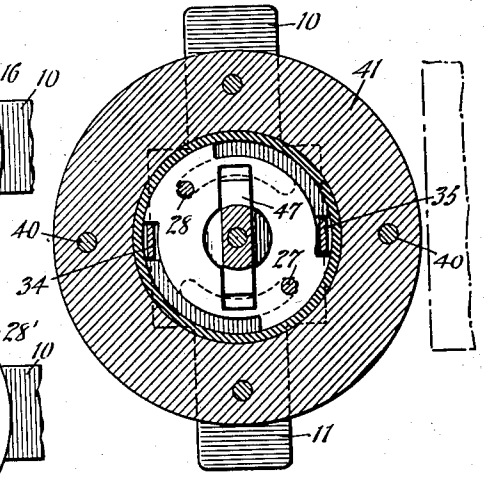


Fig. 7.

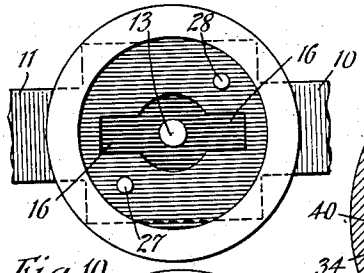


Fig. 8.

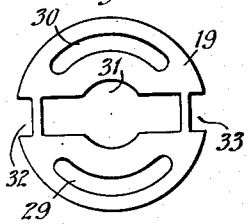


Fig. 9.

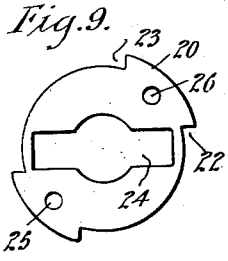


Fig. 10.

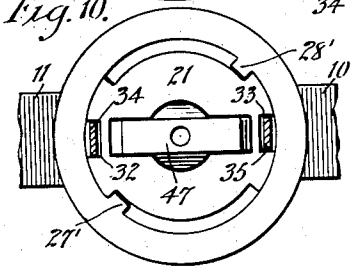
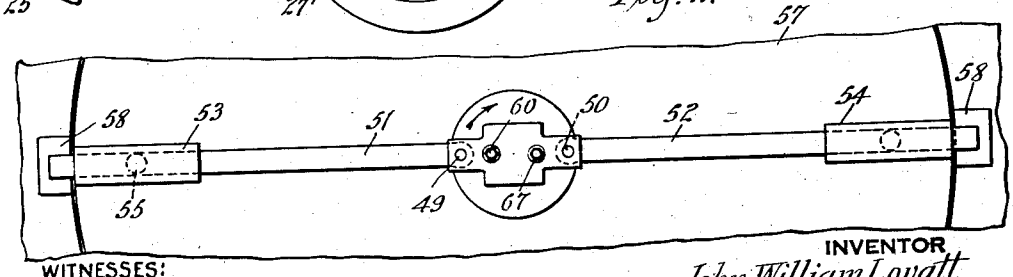


Fig. 11.



WITNESSES:

Edw. Thorpe

A. L. Kitchin

INVENTOR

John William Lovatt

BY

Munn, Anderson & Liddy

ATTORNEY

Patented Apr. 9, 1935

1,997,528

UNITED STATES PATENT OFFICE

1,997,528

LOCK

John William Lovatt, Paterson, N. J.

Application October 5, 1934, Serial No. 747,096

7 Claims. (Cl. 70—14)

This invention relates to locks which may be used in various places as, for instance, on vertical or horizontal doors, but adapted particularly for use on substantially horizontal doors used as sidewalk doors, the structure being such that it presents an effective locking mechanism, and at the same time substantially seals itself against the entrance of water or other foreign matter.

Another object of the present invention is to provide a lock which is particularly adapted to sidewalk doors and the like, the structure including a key which acts in the double capacity of a key and as a handle for the door when the key is in use.

An additional object of the invention is to provide a lock which may be readily set to present different combinations, with a key for actuating the lock formed according to a particular combination, there being an independent key or keyhead for each combination.

A still further object, more specifically, is to provide a lock for sidewalk doors and the like, wherein a suitable locking mechanism is provided which will include a reciprocating plunger positioned so that it may be moved out of the way before the key can function, the parts being so arranged that the plunger will automatically move back into its former position when the key has been removed, and in its normal position present a sealing plug for sealing the keyhole against the entrance of water, snow or the like.

In the accompanying drawings—

Figure 1 is a fragmentary top plan view of a sidewalk door with part of the sidewalk shown, the door having a lock embodying the invention applied thereto;

Figure 2 is a sectional view through Figure 1 on the line 2—2, the same being on an enlarged scale;

Figure 3 is a sectional view through Figure 1 on the line 3—3, the same being on an enlarged scale;

Figure 4 is a view of the locking mechanism as illustrated in Figure 3 but with a key inserted ready to be turned for unlocking the mechanism;

Figure 5 is a fragmentary sectional view through Figure 4 on the line 5—5;

Figure 6 is a sectional view through Figure 4 on the line 6—6;

Figure 7 is a top plan view of the lock casing shown in Figure 4, the locking extensions or bolts being broken away;

Figure 8 is a plan view of one of the combination discs shown in Figure 4;

Figure 9 is a top plan view of a second form of locking disc shown in Figure 4;

Figure 10 is a view similar to Figure 5 but showing a slightly modified structure wherein lugs extending from the casing are used instead of pins;

Figure 11 is a fragmentary bottom plan view of a manhole cover and surrounding parts, the same being shown in connection with a slightly modified embodiment of the invention to that shown in Figure 1.

Referring to the accompanying drawings by numerals, 1 indicates a pavement or other surface, and 2 and 3 indicate pavement or sidewalk doors having suitable hinges 4 and 5. These hinges, doors and associated parts are the same as disclosed in my co-pending application for patent Serial Number 721,377, filed April 19, 1934, and therefore will need no further description except in their relation to the particular lock disclosed.

As shown in Figure 1 the lock 6 is carried by one of the doors and acts to lock the same closed when functioning.

As illustrated in Fig. 2, the door 3 carries a stiffening bar, and door 2 overlaps this bar so that when door 2 is locked closed door 3 will likewise be locked closed. A bar 8 is welded or otherwise rigidly secured to the frame 9 which acts to support doors 2 and 3, said bar 8 really presenting a lug on which the bolts or extensions 10 and 11 may fit so as to lock the door 2 against opening. Extensions 10 and 11 are merely integral projections of the lock casing 12, which casing is provided with a central pin 13 for receiving and guiding a spring 14 with a bore 15 having grooved portions 16 for the reception of a reciprocating or slide block 17. Near the upper part of the casing 12 as shown in Fig. 3, bore 15 is enlarged and presents a shoulder 18 for the reception of the various locking discs or plates 19 and 20. The detailed structure of these plates is shown in Figs. 8 and 9, disc or plate 19 being stationary and disc or plate 20 being movable. It will be evident that any desired number of these plates could be used according to the size of the auxiliary bore 21 and the thickness of the plates. There are usually two or more of the stationary plates and also as many of the movable plates. The plates 20 act in conjunction with the key to rotate the casing 12 and swing the extensions or bolts 10 and 11 into and out of locking position, while the plates 19 permit the parts to be rearranged to change the combination and also act

to prevent the block 17 from rotating when in an elevated position.

It will be observed that the movable plates have cutout portions 22 and 23 and an opening 24 centrally through which the slide block 17 is adapted to move. The apertures 25 and 26 are also provided so that the respective pins 27 and 28 may project therethrough and hold the plates against rotation. These pins also project through the slots 29 and 30 of the various plates 19. Plates 19 are also provided with a central opening 31 of the same shape as the opening 24 so as to receive the block 17. In addition, the plates 19 are provided with notches 32 and 33 for the reception of the flanges 34 and 35 depending from the face plate 36. Face plate 36 is provided with a central portion 37 fitting the aperture 38 in the door 2, and with an annular flange 39 extending beneath the door 2 so as to receive the bolts or rivets 40 whereby the parts are firmly clamped in place. In addition the bolts or rivets 40 extend through a ring 41 which is provided with an annular cutout 42 for the reception of the flange 43. In this way the casing 12 is firmly clamped in place but is allowed to rotate when the key 44 is functioning. It will be noted that the key 44 is provided with a grip or handle 45 merging into a shank 46 which has secured thereto a removable keyhead 47 held in place by suitable set screws 48. The keyhead 47 is adapted for the particular combination shown in the accompanying drawings, but if the combination was changed it would be necessary to provide a different keyhead. By rearranging the various plates the combination may be changed quite a few times without adding or subtracting from the number of plates, and for each combination it would be necessary to supply a new keyhead. In this way it is possible to make all the locks identical in construction and yet set the combination so that only the particular keyhead could be used. In this way a number of the locks may be used along the same street or in a group and yet each lock will require an independent keyhead.

When the key is functioning and has been pushed inwardly to the position shown in Fig. 4 and then rotated, it cannot be removed and may act as a handle for swinging the door 2 back and forth. This characteristic also necessitates the locking of the lock mechanism before the key can be removed and, consequently, when the door is closed it can never be left accidentally unlocked provided the key is removed. When the key is removed the slide block or plunger 17 quickly moves upwardly to the position shown in Fig. 3 so as to present a smooth surface and also a substantially waterproof joint so that water or other objectionable matter cannot enter into the various parts of the lock.

If desired the lock could be constructed and used as shown in Figs. 1 to 4, inclusive, or it could be used as shown in Fig. 11. This is a fragmentary bottom view of a manhole. The lock could be applied to a manhole as shown in Fig. 2 but instead of using the extensions 10 and 11 as locking bolts, apertures are provided in these extensions for the reception of pins 49 and 50 which pins extend through the thrust rods 51 and 52 and act as locking bolts, said rods slidingly extending through the sleeves 53 and 54 to the manhole cover 57. The casing receiving the manhole cover is preferably provided with reinforcing blocks 58 and 59 under which the ends of the rods 51 and 52 project when the parts are in locked position. In this way the manhole may be readily removed by the insertion of the key 44. This key forms a handle so that the manhole cover may be removed thereby and without the use of picks or other implements. In most cases the manhole cover is made comparatively heavy and is not locked in place but merely rests on the casing. In the present instance the manhole cover and the casing are made in the usual manner but the lock embodying the invention is applied thereto, thereby locking the manhole against being opened by an unauthorized person and at the same time presenting a key which acts as a handle whereby the cover may be readily removed.

As shown particularly in Fig. 10 the plate 20 is used and instead of the pins 27 and 28 there are provided lugs 27' and 28' which project into the cutaway parts 22 and 23. Aside from this construction the parts are identical and function as illustrated in Figs. 4 and 5.

As shown particularly in Figs. 3 and 4 an alarm device is carried by the casing 12 and is adapted to be caused to function by the actuation of the plunger or sliding block 17. It will be noted that there is provided a contact screw 60 carried by an insulating sleeve 61 and to this screw is connected a conductor 62 which is also connected to the terminals by a bell or other alarm device 63. A wire 64 connects one terminal of bell 63 to one side of the source of current 65, and the source of current is connected by wire 66 to binding post 67, whereby wire 66 is grounded on the casing 12. A hand operated switch 68 is interposed in wire 66 so that when an authorized person desires to actuate the lock, switch 68 is moved to an open position and when the plunger 17 is forced downwardly to the position shown in Fig. 4 the alarm will not be sounded. However, at night or whenever desired switch 68 may be closed and if an authorized or unauthorized person forces the plunger to its extreme lower position the alarm will be sounded. It will be noted that it is necessary to force the plunger to its extreme lower position before the keyhead 47 can function to unlock the mechanism.

I claim:—

1. A lock of the character described, including a rotatable casing, a face plate provided with an opening arranged against said casing, means for holding the face plate stationary while the casing rotates, the casing having locking members extending therefrom, a plunger mounted on said casing, a spring for normally holding said plunger so that the upper end will normally close the opening in said face plate, a plurality of ward plates arranged in said casing near the end adjacent said face plate, all of said plates having notches, means depending from said face plate and held stationary thereby extending into the notches of all of said plates, a pin extending from said casing through all of said plates, certain of said plates having an aperture slightly larger than said pin for receiving the pin, others of said plates having arc-shaped slots appreciably longer than the pin is thick, whereby as the key is inserted into the casing and said plunger is depressed, said key may engage and turn certain of said plates and the casing therewith while the remaining plates remain stationary.

2. A lock of the character described, including a stationary face plate having an aperture arranged substantially centrally thereof, and having a pair of depending prongs, a casing having a small bore merging into a large bore, said casing being positioned so that said prongs will project into said large bore, a ring connected with said

face plate and interlocking with part of said casing for holding the casing in contact with said face plate but allowing rotary movement of the casing with respect to said face plate, means extending from the casing acting as a locking member, a plunger formed substantially the shape of the small bore in the casing, said plunger being arranged in said casing, a spring acting on the bottom of said casing and on the plunger for normally holding the plunger so that one end thereof will fill the opening in said face plate, and a plurality of ward plates arranged in said large bore, all of said plates having cutaway portions for receiving said depending prongs, certain of said plates having arc-shaped slots and others of said plates having rounded apertures, and a pin carried by said casing extending through each of said apertures and through the respective slots, whereby when a key is forced into the casing and depresses said plunger the operating parts of the key may engage and rotate the plates having the rounded apertures and thereby rotate said casing, the plates having the arc-shaped slots being held stationary by said prongs.

3. A lock of the character described, including an apertured face plate, a rotatable casing having a locking member projecting therefrom, means for rotatably clamping said casing to said face plate, a plunger arranged in said casing, a spring acting on the plunger for normally holding one end thereof so that it will fill the aperture in said face plate, a plurality of ward plates arranged in said casing, and means for holding some of said plates stationary in respect to the casing and for holding others stationary in respect to said face plate.

4. A lock of the character described, formed with a rotatable casing, ward plates arranged in the casing, each of said ward plates having a centrally positioned irregularly shaped aperture extending therethrough, a spring-pressed reciprocating plunger normally extending through the apertures in said plates and at one end extending into the casing beyond said plates so that the ward plates cannot be rotated independently of the casing, means for holding certain of said ward plates continually against rotation and other of said ward plates stationary in respect to said casing, and a locking bolt extending from the casing and actuated thereby.

5. A lock of the character described, including a casing provided with means acting as a locking bolt, a face plate arranged at one end of said casing, said face plate having an opening in line with the central part of said casing, a spring pressed plunger arranged in the casing, said plunger having one end normally filling said opening, and key actuated means carried by the casing and stationary in respect to the casing, said key actuated means transmitting movement from a key when used to said casing for moving said casing through an arc of a circle.

6. A lock of the character described, comprising a rotatable casing having at one end a ward chamber and at the remaining part a plunger socket irregularly shaped in cross section, said socket merging into the ward chamber, a locking member extending from said casing and moved thereby into and out of locking position, a plunger slidably mounted in said socket, spring means for moving said plunger so that part thereof will extend into said ward chamber and normally remain in said ward chamber, supporting means for said casing formed with a depending member extending into said ward chamber, a plurality of stationary ward plates positioned in said ward chamber and held stationary by said depending member, a plurality of movable ward plates arranged in said ward chamber, and means extending from said casing projecting through said movable ward plates whereby when said movable ward plates are rotated said casing will be rotated, all of said ward plates having apertures arranged centrally thereof and of a shape to permit said plunger to slide therethrough.

7. In a lock of the character described, a face plate having an aperture, a plunger having an upper end of a size to fit into and fill said aperture so that the upper surface of the face plate will be substantially smooth and uninterrupted throughout, a casing rotatably supported adjacent said face plate, said casing having a ward plate chamber and a plunger socket of sufficient length to receive said plunger, a spring positioned in said socket and acting to normally hold said plunger with the upper end in the aperture in said face plate, a plurality of ward plates arranged in said chamber, each of said ward plates having an aperture through which said plunger projects when the plunger is filling the aperture in said face plate, said plunger being of a length sufficient to have a portion continually projecting into said socket, means for holding certain of said ward plates stationary in respect to said face plate, the remaining ward plates being stationary in respect to said casing, and means acting as a locking bolt carried by said casing whereby said plunger must be depressed in order to permit a key to engage and rotate the ward plates which are stationary in respect to said casing.

JOHN WILLIAM LOVATT.