Aug. 26, 1952 A. B. CASTLE 2,608,085

LOCKING DEVICE

Filed July 23, 1947

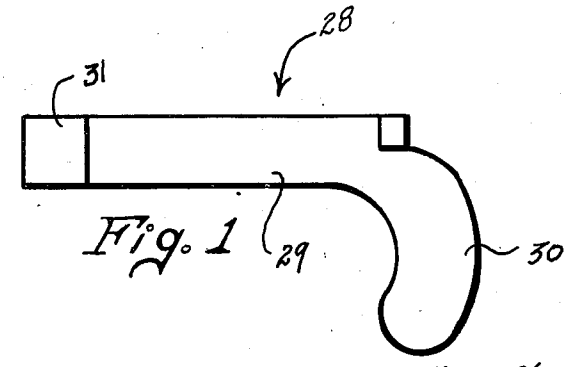

Fig. 1

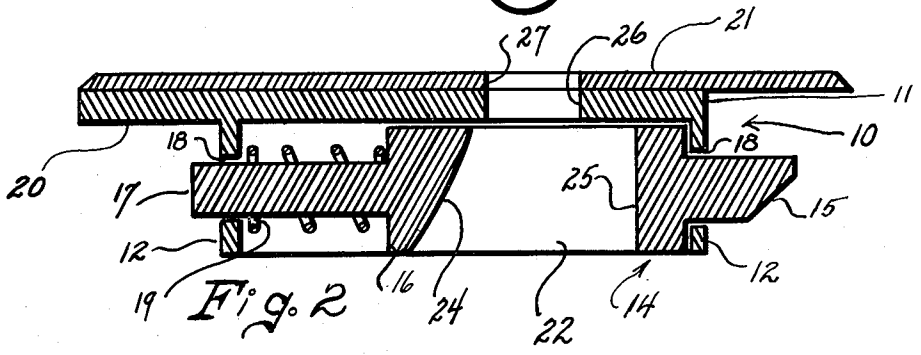

Fig. 2

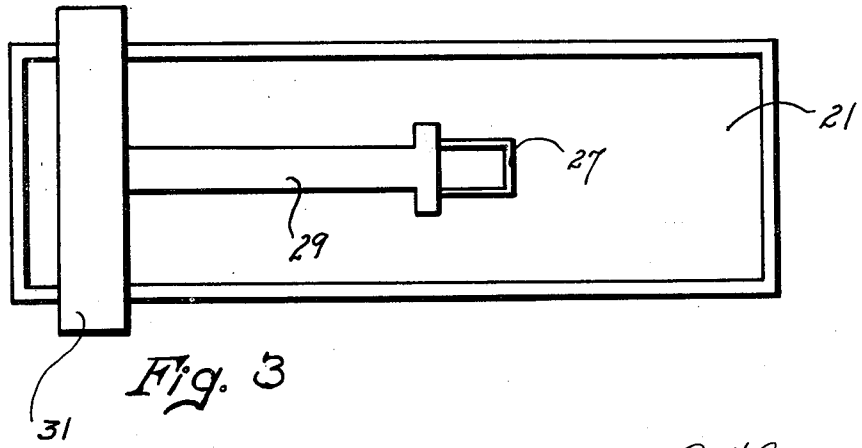

Fig. 3

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LOCKING DEVICE

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2 Claims. (Cl. 70—169)

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Generally, the present invention relates to locking devices, and more particularly to locking devices for use with closures of the type protecting manholes, subterranean vaults, and the like. It is to be distinctly understood, however, that my inventive concept is not thus limited, since it may be employed with efficacy in numerous other closure arrangements.

Certain problems are present in providing a suitable locking mechanism for relatively heavy closures such as are used for sealing manhole apertures and vaults having gratings or solid covers. For instance, conventional locks require the use of a key to manipulate the locking mechanism and then to raise or lower the cover a separate tool or handle on the closure is required. In addition, such closures are generally located in the street or pavement, with the attendant result that dirt or other foreign matter often enters the working parts of the lock and impairs its proper operation.

A primary object of my invention is to provide a locking device of the character described which overcomes the above and other objectionable features inherent in the prior art devices.

A further object of my invention is to provide a locking mechanism for closures wherein the key also functions as the handle to open the closure.

Yet another object of the present invention is to provide a locking mechanism which includes few essential working parts, which is positive in action and which can be inexpensively manufactured.

Still another object of my invention is to provide a locking mechanism for relatively heavy closure members wherein the operating mechanism is so designed that tampering therewith by unauthorized persons is quite difficult.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application wherein like characters denote corresponding parts in the several views, and in which:

Figure 1 is a side elevational view of the key employed to actuate the locking mechanism;

Figure 2 is a longitudinal sectional view of the locking mechanism;

Figure 3 is a plan view of my locking device.

As best shown in Figure 2, the locking device includes a metal housing 10 having top, end, and

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side walls, 11, 12 and 13, respectively. While I prefer that the housing 10 is cast as a unitary unit, it is, of course, to be understood that it may be fabricated in other ways. A bolt, designated generally 14, is mounted within the housing 10 for longitudinal sliding movement. The bolt includes a latch member 15 adapted to cooperate with a keeper (not shown), an enlarged intermediate portion 16, and a reduced extension 17. As was the case of the housing 10, the elements 15, 16 and 17 are also preferably formed as an integral unit.

It can be seen from Figure 2 that the end walls 12 are formed with alined apertures 18 which serve as bearings for the latch 15 and the reduced extension 17. The diameter of the apertures 18 is such that ample clearance is provided for the sliding movement of the bolt 14 and yet prevent the entry of dirt, grit, or the like, into the interior of the housing 10. A helical spring 19 surrounds the extension 17 and one end thereof bears against wall 12 while the other contacts the intermediate portion 16 whereby the bolt is normally maintained in the closed or locked position.

To guard against tampering with the locking mechanism, it will be observed that the top wall 11 is provided with a shelf 20 which extends a substantial distance beyond the end of the extension 17 when the bolt is in its locked position. Also, to improve the external appearance of the device, I provide a cover plate 21 which is secured to the top wall 11 by any suitable means such as spot welding, bolts, or the like. In certain circumstances, it may be advisable to dispense with the cover plate.

The intermediate portion 16 of the bolt is formed with a recessed area 22 having a cam or contact surface 24 and a substantially vertical wall 25. An elongated key slot 26 in the top wall 11 and a similar slot 27 in the cover plate communicate with the recessed area 22, for a purpose to be hereinafter more fully described.

To operate the locking mechanism, there is provided a key 28 having a body portion 29 and a cam surface 30 at one end thereof. The other end of the body 29 carries a handle or grip member 31 for proper manipulation of the key.

When it is desired to unlock the bolt mechanism, the cam portion 30 of the key is inserted through the slots 26 and 27 into the recessed area 22, and upon movement of the key toward the right (Fig. 2), the cam 30 will cam the surface 24 toward the left, thus compressing the spring 19 and effect withdrawal of the latch 15 from its keeper. After the bolt is unlocked, the

closure may be raised by the handle, thus enabling the key **28** to serve not only as a means for unlatching the bolt, but also as a means for raising the closure. When it is desired to lock the closure, the key **28** is withdrawn from the recess **22** and the closure is dropped or shoved into place, whereupon the spring **19** will urge the bolt **14** into its locked position.

By virtue of the recess **22** having the cam surface **24** in combination with the relatively small size of the slots **26** and **27**, the danger of unauthorized personnel successfully unlocking the device is reduced to a minimum. For example, if a straight edge tool was inserted into the recess so as to bear against the cam surface **24**, it would merely slide down such surface and not cam the bolt rearwardly against the action of the spring **19**.

Another distinct advantage of my improvement is that the recess **22** is not likely to retain dirt or the like which may find access through the slots **26** and **27** and thus impair or otherwise adversely affect the proper functioning of the moving parts. If, however, for some reason the spring **19** fails to return the bolt **14** to its locked position, this defect may be readily rectified by inserting the key **28** into the recess **22** with the cam **30** thereof in contact with the wall **25** and, upon applying pressure to the key, the latch **15** will be forced into proper relationship with its keeper.

It will be appreciated from the above that there is provided a locking mechanism for closures which is rugged in design and which can be quickly and easily operated. In addition, the relationship between the key slots and the actuating mechanism of the bolt is such that unauthorized tampering is very difficult. Furthermore, due to the relatively simple nature of the mechanism, it is well adapted for use with all types of closures, regardless of the plane in which such closures operate.

I claim:

1. A locking mechanism for closures, comprising a support, a bolt having a latching portion mounted for longitudinal sliding movement with respect to said support, a spring means cooperating with the bolt and the support normally maintaining the latching portion in a locked position, the said bolt being provided with an elongated slot extending therethrough and axially of the bolt, the support having an entrance opening of lesser length than the elongated slot registering with the slot, the end wall of the elongated slot remote from the latching portion being inclined in a direction away from the latching portion, the wall of the entrance opening in proximity to the inclined wall of the elongated slot being spaced from said inclined wall in the direction of the latching portion whereby it is necessary that a tool having a curved end portion be employed, the curved end portion being inserted through the entrance opening into the slot and moved in a direction toward the inclined wall, the curved end portion of the tool engaging the inclined wall and thus moving the bolt against the action of the spring means to unlock the bolt.

2. A locking mechanism for closures, comprising a support, a bolt mounted for longitudinal sliding movement with respect to said support, the said bolt having a latch portion, a reduced extension, and an enlarged portion intermediate the latch portion and the extension, spring means surrounding the extension and bearing against said support to maintain normally the latch portion in a locked position, the said enlarged portion being provided with an elongated slot extending therethrough and axially of the enlarged portion, the support having an entrance opening of lesser length than the elongated slot registering with said elongated slot, the end wall of the slot remote from the latch portion being inclined in a direction away from the latch portion, the wall of the entrance opening in proximity to the inclined wall of the slot being spaced from the said inclined wall in the direction of the latch portion, whereby it is necessary that a tool having a curved end portion be employed, the curved end portion being inserted through the entrance opening into the elongated slot and moved in a direction towards the inclined wall, the curved end portion of the tool engaging the inclined wall and moving the bolt against the action of the spring means to unlock the bolt.

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