Feb. 8, 1938. J. A. PHILLIPS 2,107,834

KEY

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Fig. 1.

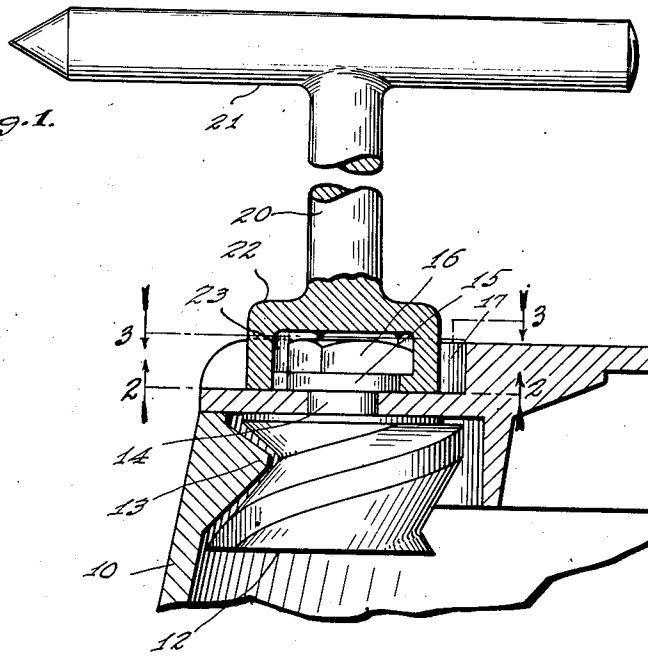


Fig. 2.

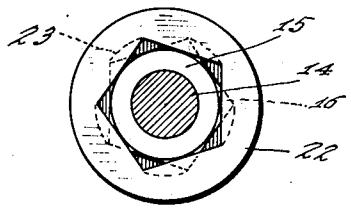
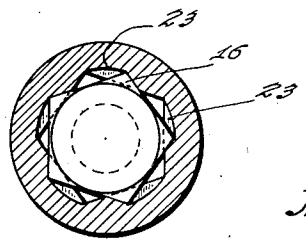


Fig. 3.



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KEY

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Application December 19, 1935, Serial No. 55,186

9 Claims. (Cl. 70—409)

My invention relates to water-meter boxes and similar devices provided with removable covers or lids normally held in place by locking mechanism including a rotatable member terminating on the outside of the lid or cover in a polygonal or other non-circular head adapted to receive a wrench or key by means of which the lock may be released. It is the object of my invention to so arrange the locking mechanism and the key as to permit the key, when the lock is released, to become operatively connected to the lid or cover so that it may be used as a handle in moving the cover to open the box.

In carrying out my invention, I provide the locking member of the box with a head having at its extreme outer end a flange which is non-circular and preferably polygonal in plan and which is spaced from the adjacent upper surface of the cover. For operating the locking member I provide a wrench having a socket corresponding in shape to that of the flange. Portions of the wall of this socket are cut away inwardly from the end of the socket so as to permit a limited rotation of the socket relative to the locking member when the socket is in place. This relative rotation carries the corners of the polygonal flange on the locking member into the undercut portions in the socket walls and prevents the key from being removed from the locking member by axial movement. As a result, the key becomes operatively connected to the cover of the box and serves as a temporary handle therefor.

The accompanying drawing illustrates my invention: Fig. 1 is a fragmental vertical section through a portion of a meter box and cover with the key in place in association with the locking member; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1; and Fig. 3 is a horizontal section on the line 3—3 of Fig. 1.

The meter box 10, only a portion of which is shown in the drawing, is provided with a removable cover 11 which may be hinged to the box or otherwise mounted, as for example through the medium of the invention shown in Patent No. 1,923,481 to John L. Ford.

Near its free edge or side, the cover is provided with some form of locking device, including a rotatable member 12 mounted in the cover. As shown in the drawing, the lower end of the locking member 12 is provided with a helical groove co-operating with a lug 13 which projects inwardly from the wall of the box 10. By rotating the locking member 12 in one direction, the cover 11 will be drawn tightly to its seat on the rim of the box, and by turning the rotatable member 12 in the opposite direction, the cover will be lifted a short distance from its seat. This particular form of locking member, while preferred, is not at all essential to my invention.

The locking member 12 has a journal portion 14 of reduced diameter rotatably mounted in the cover 11, and projects upwardly beyond the cover in the form of a head 15 having at its extreme upper end a flange 16 of non-circular, preferably polygonal, shape. As shown, the flange 16 is pentagonal, but it may take other forms. To protect the head of the locking member and also to discourage tampering by individuals not provided with a proper key, the head of the locking member may be located in an upwardly opening recess or pocket 17 in the upper surface of the cover 11.

The key which is used to operate the locking member 12 may take various forms. That shown in the drawing comprises a shank 20 having on its upper end a T-head 21 and on its lower end a socket 22 adapted to receive the head of the locking member. In cross-section, the head-receiving recess in the socket 22 generally corresponds in shape to the flange 16; but inwardly from the lower end of the socket the side walls of this recess are relieved, as indicated at 23 in Fig. 3 to permit a limited rotation of the socket relative to the locking member. In the case of a locking member with a pentagonal flange 16, as shown in the drawing, the extent of this rotation may be in the neighborhood of 36°; so that in its limit position the socket will be midway between two positions in either of which its openings would register with the flange 16. The limit position of the socket relative to the flange is illustrated in Fig. 3.

To unlock the locking member 12 by the use of the key shown in the drawing, the socket 22 is placed over the head 15 of the locking member, as indicated in Fig. 1, and is then turned in the direction to release the locking member—preferably counterclockwise, in accordance with custom. The relieved portions 23 in the inner wall of the socket are so arranged as to permit the key to rotate relatively to the locking member in the unlocking direction. When the key reaches the limit of its rotation relative to the head, the corners of the flange 16 engage the ends of the relieved portions 23 within the socket, as indicated in Fig. 3; and further rotation of the key relative to the head is prevented. Therefore, as counterclockwise rotation of the key continues, the locking member 12 is rotated to release the cover, the corners of the flange 16 remaining in the relieved portions 23. When the locking member 12 has been rotated to completely unlocked position, the cover 11 can be raised by lifting the key, axial separation of the key and locking member being prevented by the

presence of the corners of the flange 16 within the relieved portions 23.

To close the meter box, the lid is lowered into place and the key rotated in a locking, or clockwise direction. During the first portion of this rotation, the key rotates relatively to the locking member until the unrelieved portions of the inner surface of the socket engage the corners of the flange 16; and thereafter, the key and locking member rotate together until the locking operation is completed. When this has been accomplished, the key may be withdrawn by direct axial movement.

I am aware that it has heretofore been proposed to equip the box cover 11 and the key with co-operating provisions which would interengage and permit the key to be used as a handle in raising the cover when the cover-lock was released; but my invention has several advantages over such an arrangement in that no special form of cover is necessary, in that the exterior surface of the socket 22 is smooth and not provided with any projecting lugs, and in that it is not necessary to have the key in any specific position relative to the cover when it is being used to raise the cover.

I claim as my invention:

1. A combined key and handle for a meter-box lid having a rotatable locking member provided at its outer end with an outwardly extending flange of polygonal shape spaced from the adjacent portion of the lid, said key having a flange-receiving socket of size and shape corresponding to said flange, the inner walls of said socket inwardly from the open socket-end being provided with relieved portions to permit rotation of said key in an unlocking direction relative to said locking member and to limit such key-rotation to a position in which the open end of the socket will be out of registry with said flange.

2. A combined key and handle for meter-box lids, said key being provided with a socket having an open end of polygonal shape to pass the correspondingly shaped head of a rotatable lock member, the side walls of said socket at a distance inwardly from the open end thereof being relieved to permit only a limited rotation of the socket relative to the head of a lock member in place therein.

3. A combined key and handle for meter-box lids, said key being provided with a socket of generally polygonal shape to receive the correspondingly shaped head of a rotatable lock-member, the side walls of said socket having relieved portions to permit a limited rotation of the socket relative to the head of a lock member in place therein, and lips rigid with said socket and extending radially inwardly at the open end thereof to cover said relieved portions of the socket while leaving an opening for the passage of the lock-member head.

4. A combined key and handle for a meter-box lid having a rotatable locking member provided at its outer end with a radially extending, undercut projection, said key being adapted to interfit with the end of said locking member when moved axially into association therewith and having a radially extending projection adapted to be brought beneath the projection on said rotatable member to prevent axial separation of the element and key when they are rotated relatively to each other, and provisions on said key for limiting the extent of its rotation relative to said locking member.

5. A combined key and handle for a meter-box lid having a rotatable locking member provided at its outer end with a radially extending, undercut projection, said key being adapted to interfit with the end of said locking member when moved axially into association therewith and having a radially extending projection adapted to be brought beneath the projection on said rotatable member to prevent axial separation of the element and key when they are rotated relatively to each other.

6. A combined key and handle for a meter-box lid having a rotatable locking member provided at its outer end with a radially extending, undercut projection, said key being adapted to interfit with the end of said locking member when moved axially into association therewith and having a radially extending projection adapted to be brought beneath the projection on said rotatable member to prevent axial separation of the element and key when they are rotated relatively to each other, said key having a limited extent of rotation relative to said locking member.

7. In combination, a lock-operating member mounted for rotation in a meter-box lid about an axis generally perpendicular to the plane of the lid and fixed in axial position, and a key for rotating said operating member, said key and locking member being provided with interengaging provisions engageable by limited rotation of the key in an unlocking direction relative to said lock-operating member and operative when engaged to prevent axial separation of the key and lock-operating member, whereby the key may be employed as a handle to open the lid.

8. In combination, a lock-operating member mounted for rotation in a meter-box lid about an axis generally perpendicular to the plane of the lid and fixed in axial position, and a key for rotating said operating member, one of said last named members being provided with an outwardly projecting non-circular flange and the other with a socket of size and shape corresponding with said flange, the walls of said socket inwardly from the open socket-end being relieved to permit the key to rotate relatively to the operating member in an unlocking direction and to limit such key rotation to a position in which the open end of the socket is out of registry with said flange.

9. In combination, a lock-operating member mounted for rotation in a meter-box lid about an axis generally perpendicular to the plane of the lid and fixed in axial position, and a key for co-operation with said operating member, said operating member being provided with an outwardly projecting non-circular flange, and said key having a socket of size and shape corresponding with said flange, the walls of said socket inwardly from the open end thereof being relieved to permit the key to rotate relatively to the operating member in an unlocking direction and to limit such key rotation to a position in which the open end of the socket is out of registry with said flange, whereby said key may, after rotating said operating member in an unlocking direction and to limit such key rotation to a position in which the open end of the socket is out of registry with said flange, whereby said key may, after rotating said operating member in an unlocking direction, be employed as a handle to open the lid.

JAMES A. PHILLIPS.