

April 17, 1945.

G. HOENGER

2,373,893

KEY EMBODYING SIGNALING DEVICES

Filed Dec. 23, 1943

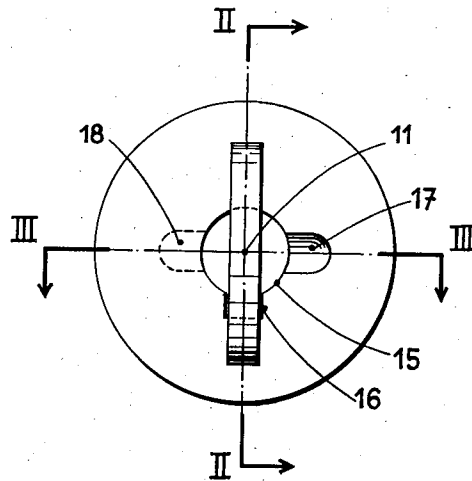


FIG. 1.

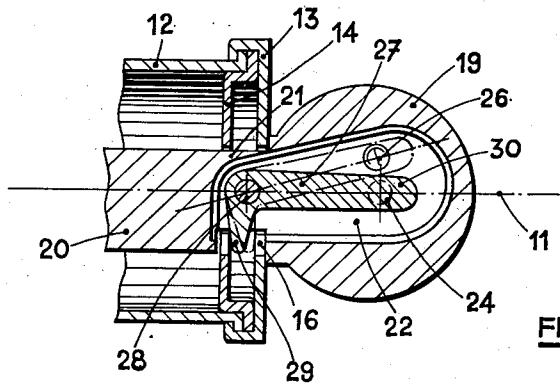


FIG. 2.

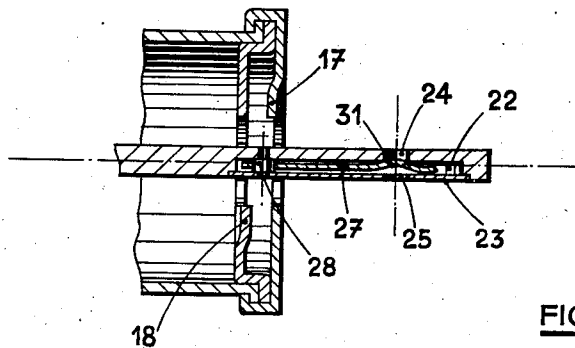


FIG. 3.

Inventor
Guido Hoenger
by
Young Emery & Thompson
attys.

UNITED STATES PATENT OFFICE

2,373,893

KEY EMBODYING A SIGNALING DEVICE

Guido Hoenger, Geneva, Switzerland

Application December 23, 1943, Serial No. 515,450
In Switzerland November 4, 1942

4 Claims. (Cl. 70—395)

This invention relates to a lock with a key and embodies a signaling device for indicating if the key has been used recently for opening or locking said lock.

In the devices heretofore proposed with the view to meet this requirement, the key is generally equipped with a ring surrounding the bit-holder of the key. When operating this latter in the lock, this ring is automatically subjected to an angular displacement with respect to the bit, which displacement indicates whether the key has recently been used for opening or for locking the lock. This arrangement may be suitable for keys the bit-holder of which has a circular section, but the addition of such a ring to flat keys of the kind denominated safety-keys, is disadvantageous because it deprives the keys of the benefit of their flat form.

The present invention provides a lock with a key embodying a signaling device indicating the actual position of the bolt when taking it off, wherein the signaling device is constituted by at least one element born by the key and movable in a plane parallel to the rotation axis of this latter in the lock, and at least one controlling element on the fixed part of the lock for determining the displacements of said movable element.

Fig. 1 is a front view of a flat key fully inserted within a cylinder lock.

Fig. 2 is a longitudinal cross section according to II—II of Fig. 1.

Fig. 3 is a longitudinal sectional view according to III—III of Fig. 1.

The embodiment represented is intended for a flat key for operating a cylinder lock revolving about an axis 11.

Only the parts of the lock necessary for the understanding of the working of the signaling device showing the actual position of the bolt when taking off the key, are represented in the drawing.

The lock embodies a drum 12, a front-plate 13 and a rear-plate 14. These two plates are each provided with a circular opening 15 and a slot 16. The front-plate is provided with a boss 17 stamped towards the back and located at 90° with respect to the slot 16. The rear plate is provided with a boss 18 pressed towards the front and located at 180° with regard to the boss 17.

The key intended for operating the lock is of small thickness with regard to its breadth and is limited by two lateral parallel faces. This key embodies a head 19 connected to a bit 20 by an intermediary part 21 the breadth of which is

slightly smaller than the diameter of the circular openings 15. Within the thickness of the key there is a recess 22 closed by a cover 23. The key and the cover are each provided with circular windows 24 and 25 located opposite each other. Moreover the bottom of the recess 22 has a blind hole 26.

Within the recess 22 there is located the signaling device. This latter is constituted by a spring-steel crank-lever 27 pivoted on a fixed pin 28. One of its arms 29 projects outside of the key at the region of its intermediary part 21. The other arm 30 bears a stamped boss 31 intended to penetrate either into the window 24 or into the blind hole 26, and to lock the lever 27 in one of the extreme positions as indicated in full and in chain dotted lines (see Fig. 2).

The signaling device operates as follows:

The key can only be introduced into the lock in the position as shown in the drawing, that is by using the notch 16 for the passage of the bit. The key can only revolve in the lock after it has been fully introduced, that is, when the active or control part of the bit has overreached the plane of the rear-plate 14. The extremity of the arm 29 is then disposed between the two plates 13 and 14.

If, now, the key be turned a complete revolution in the right hand direction (seen in front) for locking the lock, then the lateral edges of the extremity of the arm 29 will successively meet the boss 18, and then the boss 17. This latter will push the arm 29 towards the back, with the effect of bringing the lever 27 into the position indicated in full lines on Fig. 2. Should now the key be taken out of the lock, then this latter is in its locked position and the arm 30 of the lever obstructs the windows 24 and 25, thus indicating that the key has last been used for locking the lock, and the stamped boss 31 engages the window 24 to keep the lever 27 firmly in its position.

To open the lock, the key should be turned through a complete revolution towards the left. The arm 29 meets successively the bosses 17 and 18. The arm 29 is pushed forward by the boss 18 and the lever 27 is brought into the position indicated in chain dotted lines on Fig. 2. Should now the key be taken out of the lock, then the latter is in the opened position and the windows 24 and 25 are no longer obstructed by the arm 30, this fact indicating that the key has been last used for opening the lock. In this case, the boss

31 engaging the blind hole 26 keeps the arm 30 firmly in its position.

If the opening direction of the lock is towards the right, the respective position of the controlling elements of the signaling device of the bosses 17 and 18 will be reversed. It is clear that these bosses can be replaced by one or more cams, by a helical slot, or by other known controlling elements.

By using a helical slot or a screw-pitch as the controlling element of the displacements of the signaling device, it is possible to obtain a device which indicates always the accurate position of the lock, even in the locks in which two complete turns of the key are necessary for effecting their opening or their locking.

The signaling device controlled by a helical slot or by a screw-pitch can be designed for producing either a translation motion parallel to the rotation axis of the key in the lock, or an oscillating motion about a pin carried by the key and situated at right angles to the rotation axis of this latter in the lock.

The extremity 30 of the arm 27 may move with respect to any kind of reference mark provided on the key.

The device described is only one example of embodiment for the subject matter of the present invention. The oscillating lever 27 can, for instance, be replaced by an element sliding internally in the recess provided within the key. The indicating element can be provided with reference marks indicating the opening or locking operations of the key.

What is claimed is:

1. Lock and key indicating mechanism comprising a bell crank lever pivoted in a cavity in the head of the key said lever having a longer spring arm extending substantially longitudinally of the key within said cavity and a shorter rigid arm projecting laterally from the cavity, means in the lock engaging said shorter arm during operation of the key said means moving said lever to one position when the key is turned in one direction to lock the lock and to another position when the key is turned in the opposite direction to open the lock, and means in said cavity to re-

tain said spring arm resiliently in either of said positions, said positions being visually ascertainable.

2. Lock and key indicating mechanism comprising a bell crank lever pivoted in a cavity in the head of the key said lever having a longer spring arm extending substantially longitudinally of the key within said cavity and a shorter rigid arm projecting laterally from the cavity at a point between the head and the stem of the key, axially spaced means in the lock located on either side of said projecting arm portion when the key is fully inserted in the lock, said means engaging said shorter arm during operation of the key, said means moving said lever to one position when the key is turned in one direction to lock the lock and to another position when the key is turned in the opposite direction to open the lock, and means in said cavity to retain said spring arm resiliently in either of said positions, said positions being visually ascertainable.

3. Lock and key indicating mechanism comprising a bell crank lever pivoted in a cavity in the head of the key said lever having a longer spring arm extending substantially longitudinally of the key within said cavity and a shorter rigid arm projecting laterally from the cavity, means in the lock engaging said shorter arm during operation of the key said means moving said lever to one position when the key is turned in one direction to lock the lock and to another position when the key is turned in the opposite direction to open the lock, and means in said cavity to retain said spring arm resiliently in either of said positions, said positions being visually ascertainable, said retaining means including a bulge on said spring closurably engageable with a window opening in a side of the key head.

4. Mechanism according to claim 2 in which said axially spaced means in the lock comprise a pair of bosses extending radially of the axis of the keyhole of the lock and opposite to each other, each of said bosses projecting towards the projecting arm portion, one from one side and the other from the other side thereof.

GUIDO HOENGER.