E. F. KOHL.

KEYLESS LOCK.

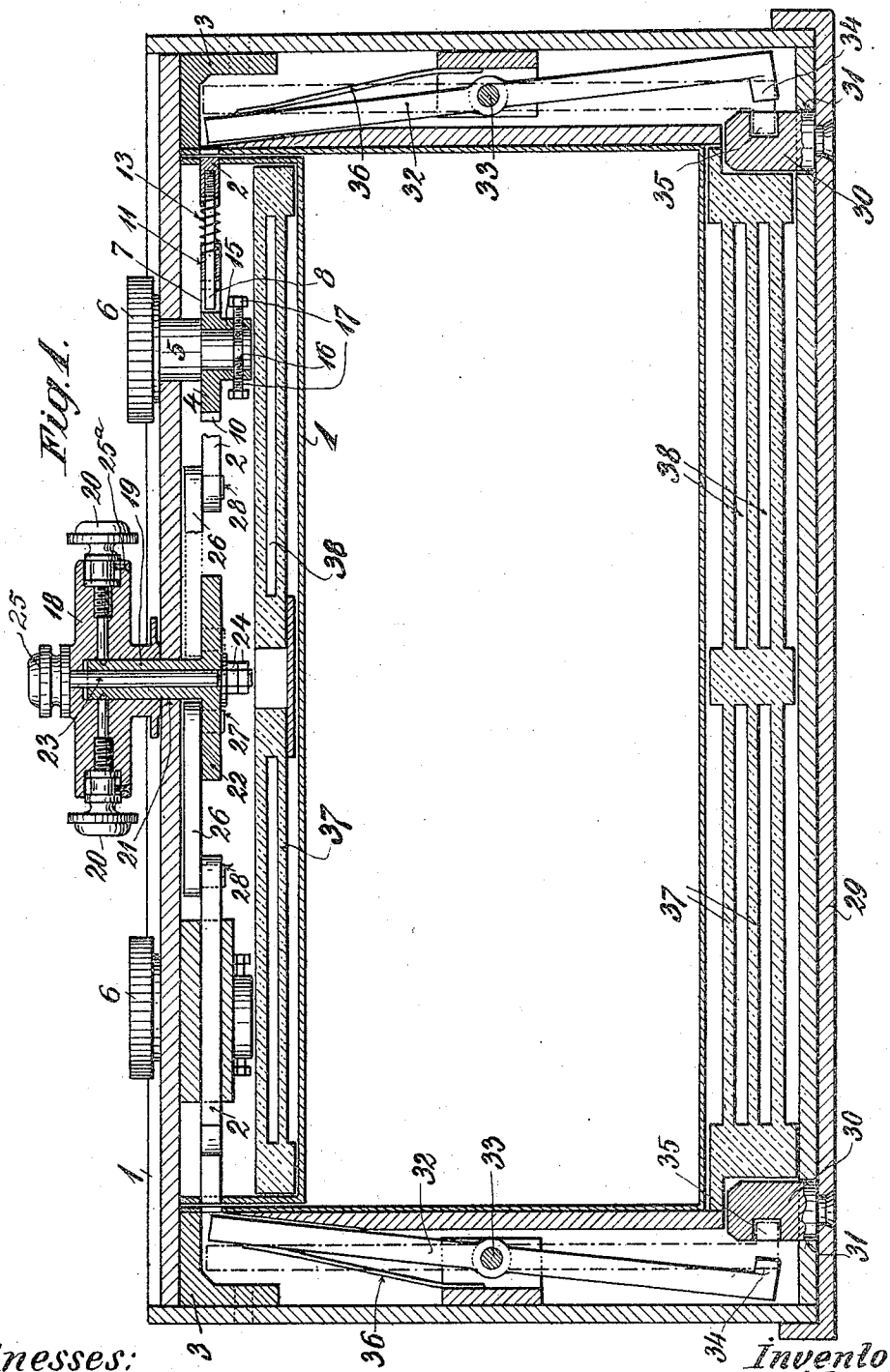
APPLICATION FILED DEC. 5, 1913.

1,240,981.

Patented Sept. 25, 1917.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

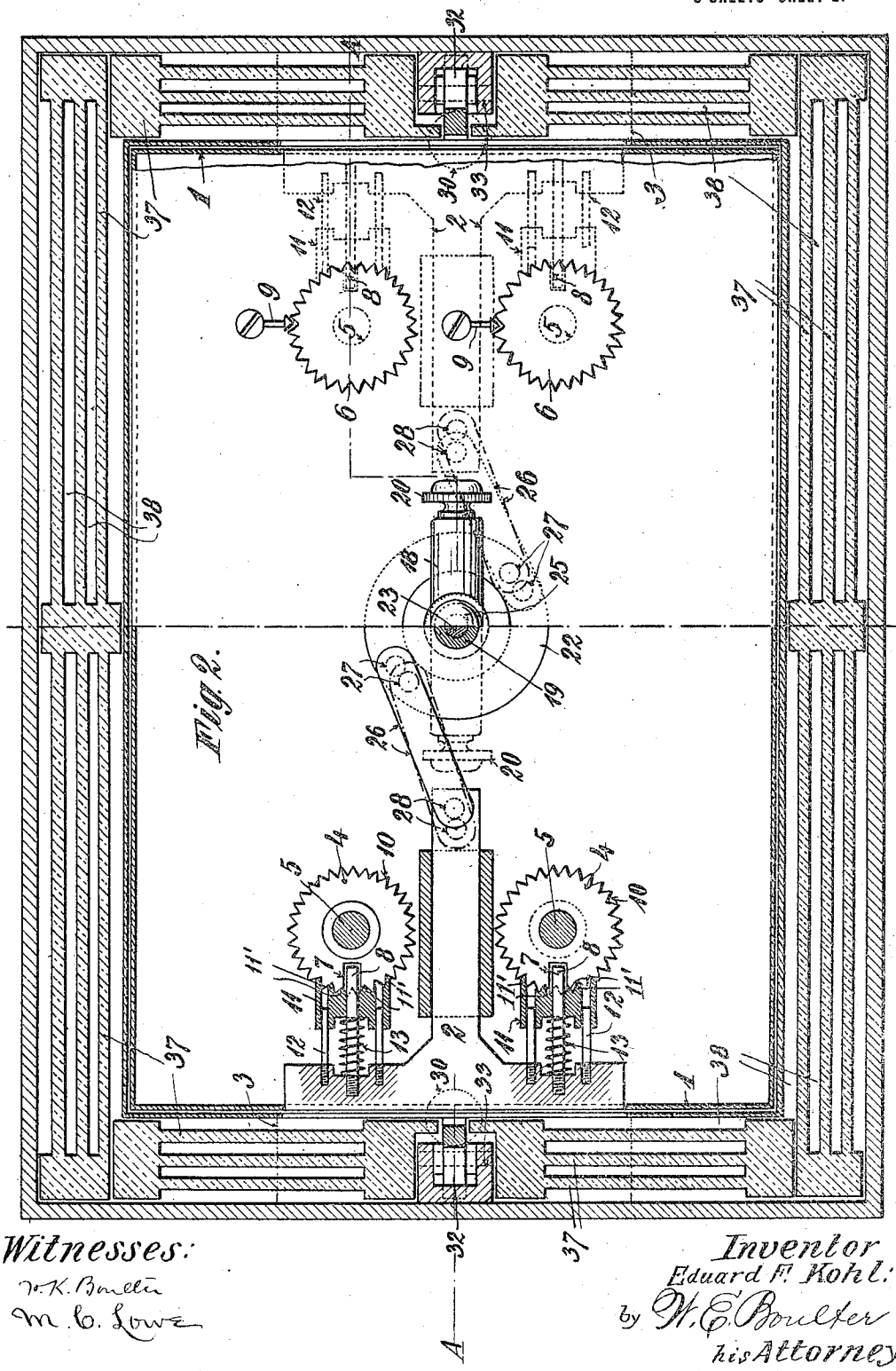


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 3.

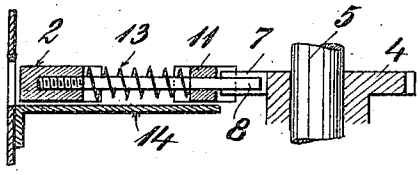


Fig. 4.

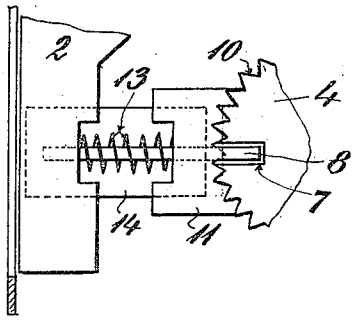
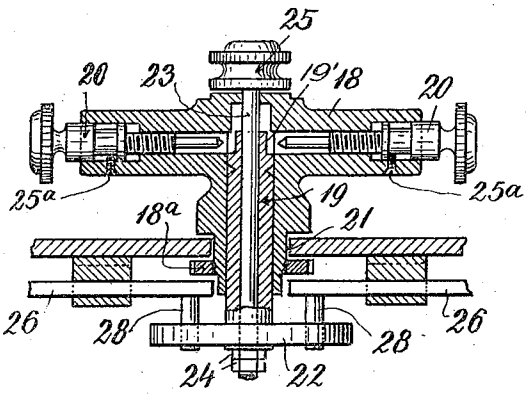


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDUARD FRANZ KOHL, OF VIENNA, AUSTRIA.

KEYLESS LOCK.

1,240,981. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed December 5, 1913. Serial No. 804,909.

To all whom it may concern:

Be it known that I, EDUARD FRANZ KOHL, a subject of the Austrian Emperor, and resident of Vienna, Austria, have invented a certain new and useful Improvement in Keyless Locks, of which the following is a specification.

This invention relates to keyless locks for receptacles, cash boxes, doors and the like of the kind which can be closed and opened without the aid of a key, the locking bolt being released by rotatable toothed disks so as to be turned into open position when these toothed disks assume a certain predetermined position. This adjustment of the toothed disks is effected from the exterior by means of adjusting disks provided with indicators which must be moved to correspond with a certain mark but can be adjusted with relation to the toothed disk in order to permit variation of the series of indicators (indicator word) to which the adjusting disks must be moved for the purpose of opening the cash box.

In spite of the possibility of altering the indicator word, these locks are not safe against unauthorized opening as each position of the adjusting disks at which the bolt can be moved into open position can be ascertained by the sense of touch. As is well known this position is formed by a deep radial slot and in every other position of the locking disk a tooth or a shallower slot in the periphery of the locking disk comes into line with the projection on the locking member. It is clear by lightly pressing the locking member against the locking disks and rotating the locking disks slowly or in steps, the hand actuating the latter encounters a frictional resistance as long as the projection on the locking member bears on the outer periphery or engages a shallow groove but this resistance is no longer encountered immediately the slot permitting movement of the locking bolt comes into the path of movement of the projection. It is thus easy to ascertain the position of all the locking disks in order, particularly when in manufacture on a large scale the bolts are not particularly well formed and the dimensions of the engaging parts of the bolts and locking disk are not very exact.

This disadvantage is avoided by the present invention in accordance with which the locking disks are subjected to the continuous action of a resilient pressure member which insures that the hand rotating the locking disk will encounter the same resistance to movement whether or no the locking disk is in the position permitting movement of the bolt.

The invention is illustrated in the accompanying drawings in which Figure 1 is a longitudinal section on line A—A Fig. 2 and Fig. 2 is a plan partly in horizontal section. Figs. 3 and 4 show somewhat modified forms of a detail. Fig. 5 shows another form of the actuating device for the bolt.

For the purpose of illustrations there has been taken a cash box with two locking bolts which are moved together and simultaneously actuate a device for holding the cash box to a fixed frame.

As shown, in the lid 1 are the two locking bolts 2 which are movable toward opposite sides and which in closed position each engage under an angle member 3 on the adjacent inner wall of the cash box. Each locking bolt coöperates with two (or more) toothed locking disks 4 which are connected by spindles 5 with the external adjusting disks 6 and permit movement of the bolt 2 to open the cash box when their slots 7 lie in the direction of the path of movement of the parts 8 of the bolt.

Each of the adjusting disks 6 may be suitably rotated relatively to the locking disk 4 and therewith the indicator to which adjusting disk must be turned to permit opening of the lock in relation to the fixed mark 9 may be suitably varied.

Each locking disk 4 is provided on its periphery with triangular teeth 10 in which engages a pressure member 11 formed similarly to the teeth on the side adjacent thereto. That is to say, each pressure member is provided with a plurality of teeth 11′ which engage a plurality of the teeth on the respective adjacent locking disk. Each pressure member is guided on supporting pins 12 and on the part 8 of the bolt coöperating with the slot 7 on the locking disk and is held continuously in engagement with the teeth of the locking disk by a spring 13 coiled around the part 8. The triangular form of the teeth permits rotation of the locking disk in both directions and the hand actuating the same always encounters the same resistance whether or no the slot 7 of the locking disk lies in the direction of movement of the part 8. By the present con-

struction therefore it is impossible to ascertain by the sense of touch the position of the locking disks. In place of the pressing member being guided on guide pins, this may slide on a guide plate 14 (Figs. 3 and 4) secured to one of the inner walls of the lid.

By having a plurality of teeth on each pressure member constantly engaging a plurality of teeth on a locking disk, should the slot 7 of a disk 4 come opposite the part 8 of the bolt a number of teeth still remain in engagement so that the resistance in turning the disk is not diminished. Thus the hand of the operator rotating each locking disk will encounter the same resistance to the movement whether or not the locking disk is in the position permitting movement of the bolt.

In order to facilitate relative displacement of the locking disks 4 and the adjusting disks 6, the former are provided with sleeves 15 fitting on the spindles 5 and are secured by clamping screws 17 engaging in annular grooves 16 on the latter, so that after releasing said screws rotation of both disks in opposite directions can be effected. Preferably the locking disks 4 are secured by the bolt 2 and each adjusting disk 6 is moved through the desired angle, the adjusting screws thus remain in the same position so that they are easily accessible.

To actuate both bolts 2 together—each however may be actuated separately by a stud extending in the usual manner through the lid—there is provided a handle 18 which also forms a handle for the lid for removing and replacing the same. The handle 18 rests on the upper side of the lid and has a sleeve 19 with which it can be connected by means of clamping screws 20. The sleeve which extends from beneath through an opening 21 of the lid carries at the lower end an actuating member 22 in the form of a disk or lever and is secured by a bolt 23 and nuts 24 or the like. The bolt 23 terminates at the upper end in a knob 25 and is rotatable without acting on the operative parts of the lock; this arrangement has for its object to prevent an unauthorized person from ascertaining whether the handle or knob or both parts must be actuated to permit the lock to be actuated.

The movement of the clamping screw 20 is limited by pins 25^a so as to prevent removal of the latter by ill-natured persons; for the same purpose the pins themselves are mounted in a part of the handle which is not accessible after it has been attached. The actuating member 22 is connected by connecting rods 26 with the bolts 2 so that a forward movement or withdrawal of the bolts may be effected by rotation of the handle.

The rods 26 are placed with pins 27 and 28 from above in the corresponding openings in the bolts and in the actuating disk so that should the handle be sawn through with the intention of obtaining access to the inner locking arrangement, the actuating disk 22 simply drops into the inner side of the lid or cash box and thereby releases the connection with the bolts.

The pins 27 and 28 are preferably made of weak material such as wood, aluminium, zinc, cast iron or the like so that on forcible rotation of the handle these pins break but otherwise the locking arrangement is not damaged. To a person knowing the key word, the opening of the lock is however possible as the bolts can be moved into the open position, for example by means of a magnet after correct positioning of the locking disks. Fig. 5 shows a somewhat modified form of actuating device which renders still more difficult any attempt to force the lock. The pin 23 is made somewhat longer so that when the head 25 rests on the handle 18 the sleeve 19 with the actuating member drops as soon as the two clamping screws 20 are unscrewed.

The upper end of the sleeve is of somewhat reduced diameter, as shown at 19′ so that even when the screws 20 are screwed home they cannot clamp the sleeve 19 when the latter has not previously been raised by means of the knob 25 in order that the wider part of the sleeve with the slight recess moves into the path of the points of the clamping screws. The handle passes through the cover plate and is secured on the lower side of the same by a nut 18^a.

The connecting bolts 28 of the connecting members are made somewhat longer in order that on the actuating member 22 dropping, this does not come out of engagement with the bolts.

In the embodiment shown the cash box is secured to a stationary base 29 simultaneously with the locking of the lid.

For this purpose the base plate is provided with lugs 30 which pass through holes 31 in the base of the cash box into the interior thereof. In a part of the wall of the cash box accessible from the exterior is pivotally mounted about pivots 33 a double arm lever 32, the upper end of which comes into the path of movement of the bolt 2; its lower end is formed as a stud 34 with which registers a recess 35 in the lug 30 in the base 29. If the locking bolt 2 is moved into closed position, it pushes back the upper end of the lever against the action of a spring 36 and thereby forces the stud 34 into the recess 35 in the lug 30 so that the cash box cannot be removed. On unlocking the bolt, the levers 32 automatically return into their original position and the cash box may be lifted from the base plate.

The cash box may also be rendered fire proof for which purpose it is formed with an outer and an inner casing. In lieu however of the space between the two walls be-

ing filled with ashes or the like as heretofore, blocks 37 of non-conducting material which themselves form hollow spaces 38 may be inserted therein. These hollow spaces produce stationary layers of air which act as a very efficient heat protecting medium. Any form and dimensions of blocks may be used provided they form the desired hollow spaces.

Having described my invention I declare that what I claim and desire to secure by Letters Patent of the United States is:—

1. In a keyless lock, the combination with a locking bolt and a plurality of locking disks adapted to permit movement of the locking bolt into the unlocking position only at a prearranged position, each of said locking disks being provided with teeth, of slidably mounted pressure members yieldingly supported by the bolt, and one of such locking members being arranged adjacent each locking disk, and each pressure member being provided with teeth, a plurality of which are constantly in engagement with a plurality of the teeth on the respective disk, and means arranged to exert a constant pressure upon each of the pressure members to maintain the teeth of the latter constantly in engagement with the teeth of the locking disks whereby the hand of the operator rotating each locking disk will encounter the same resistance to the movement whether or not the locking disk is in the position permitting movement of the bolt.

2. In a keyless lock, the combination with a locking bolt and a plurality of locking disks adapted to permit movement of the locking bolt into the unlocking position only at a prearranged position, each of said locking disks being provided with teeth, of pressure members, guides carried by the bolt and upon which guides the said pressure members are slidingly mounted, one of said pressure members being arranged adjacent each locking disk, and each pressure member being provided with teeth, a plurality of which are constantly in engagement with a plurality of the teeth on the respective disk, and a spring bearing upon each of the pressure members and exerting a constant pressure thereon to maintain the teeth of the pressure members constantly in engagement with the teeth of the locking disks for the purposes set forth.

3. In a keyless lock, the combination with a plurality of locking bolts, of means for actuating them simultaneously, a plurality of locking disks for one bolt adapted to permit movement of said bolt into unlocking position only at a pre-arranged relative position of said disks, each of said disks being provided with teeth, pressure members yieldingly slidingly supported by the bolt and each provided with a plurality of teeth for engagement with a plurality of teeth on the respective disk and maintained constantly in engagement therewith throughout the arc of a circle whereby the hand of the operator rotating each locking disk will encounter the same resistance to its movement whether or not the locking disk is in the position permitting movement of the bolts.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDUARD FRANZ KOHL.

Witnesses:
WILHELM BERGER,
ADA MARIA BERGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."