

A. C. HOUGH.  
LOCK.

No. 486,107.

Patented Nov. 15, 1892.

Fig. 1.

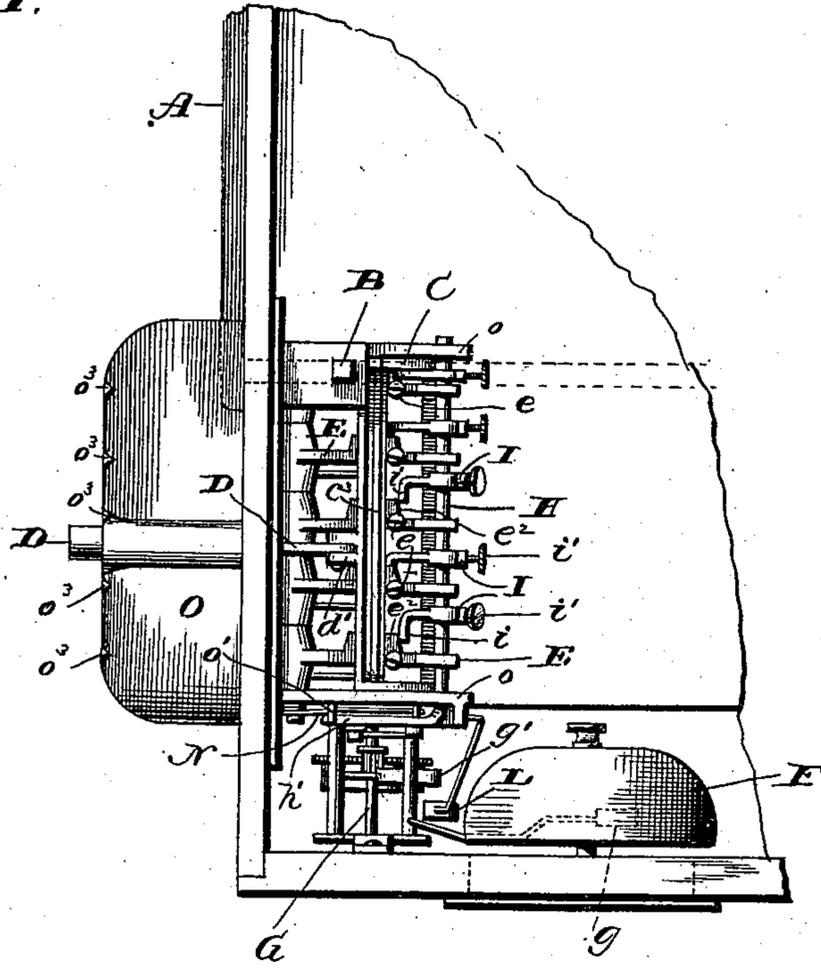
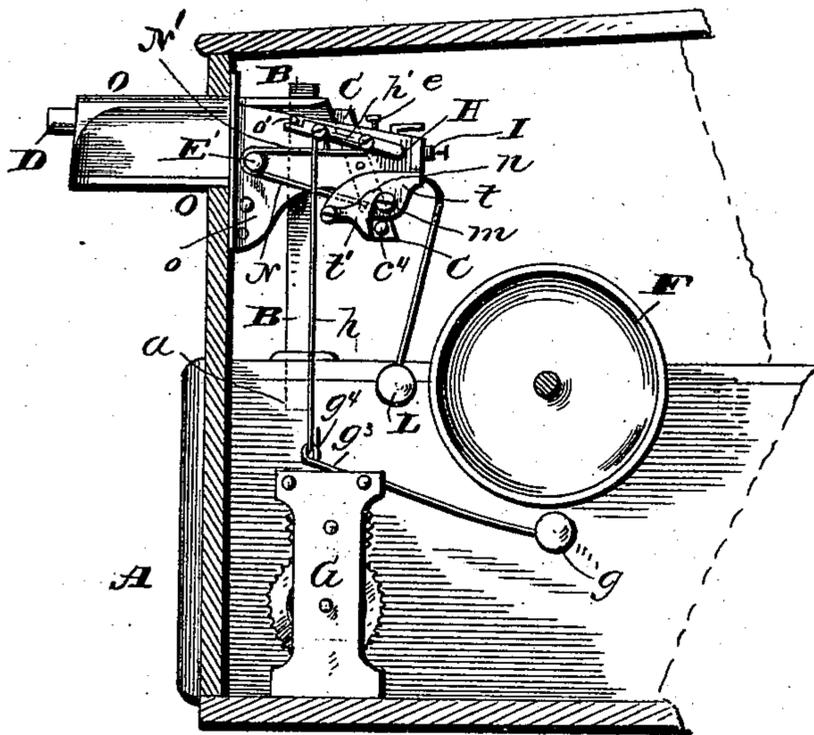


Fig. 2.



Witnesses  
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 His Attorney

(No Model.)

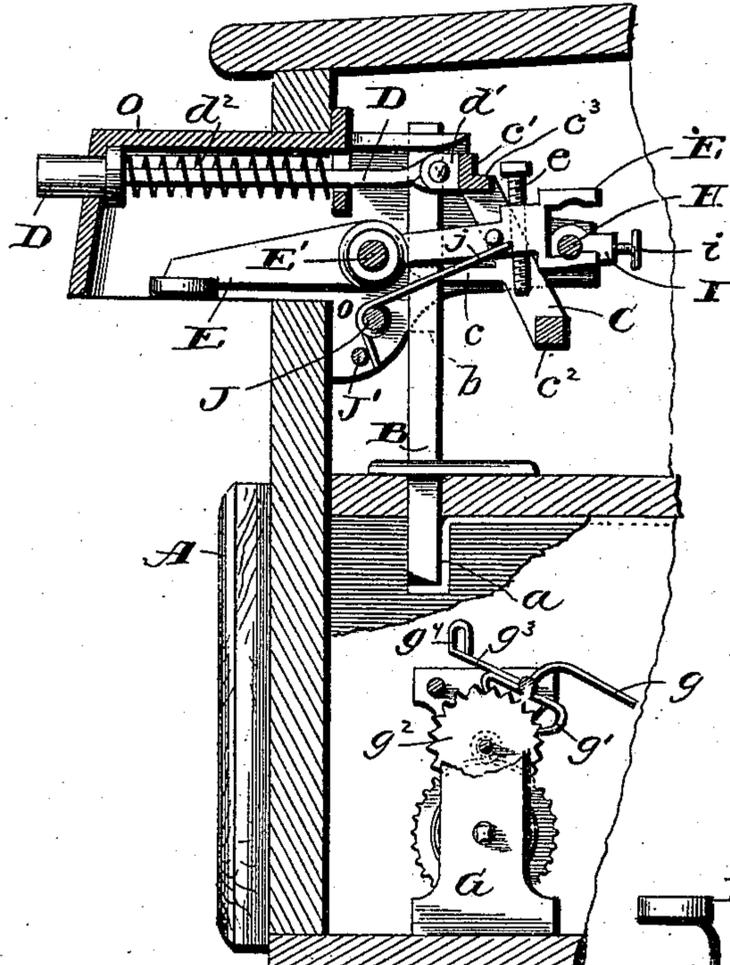
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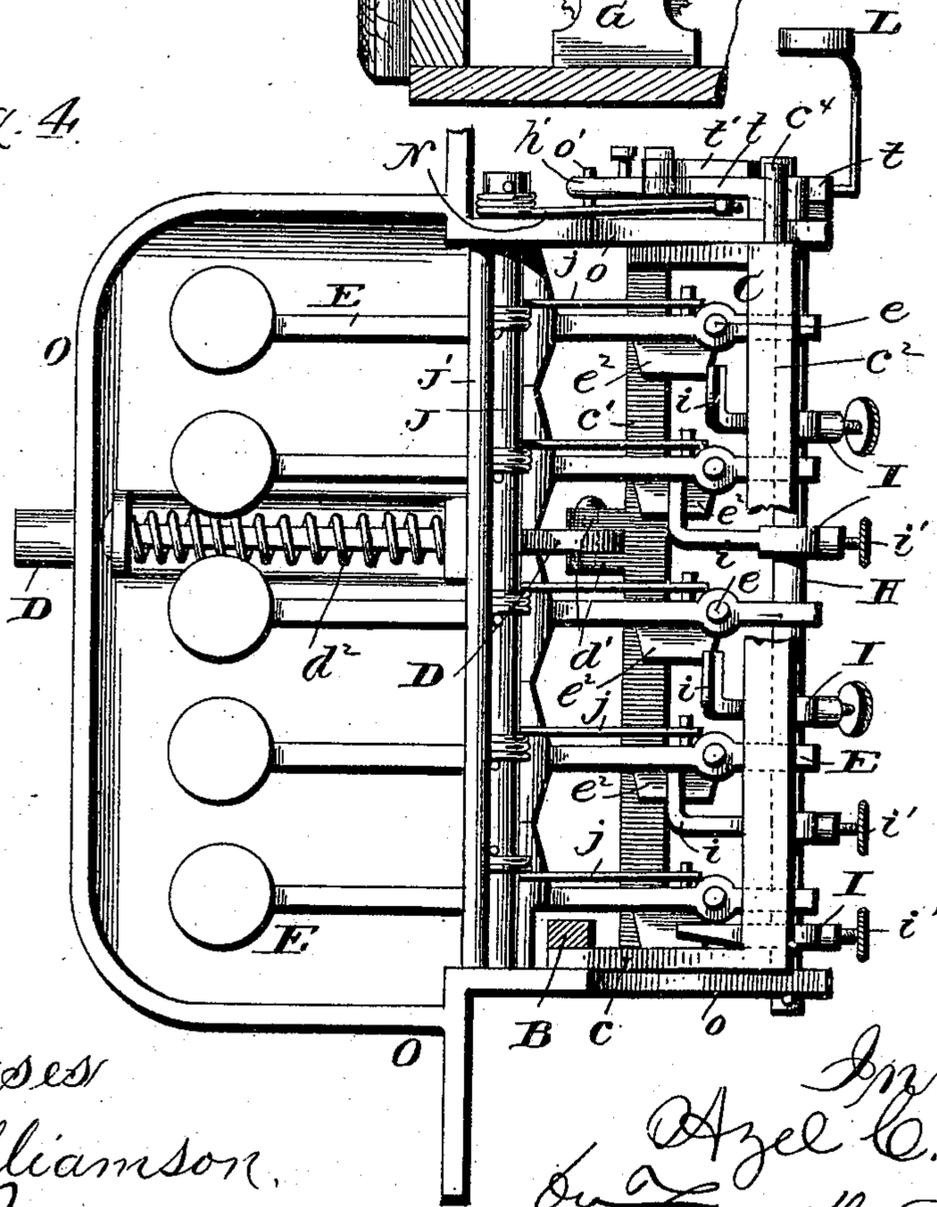
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*Fig. 3*



*Fig. 4*



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# UNITED STATES PATENT OFFICE.

AZEL CLARENCE HOUGH, OF SOUTH BUTLER, NEW YORK.

## LOCK.

SPECIFICATION forming part of Letters Patent No. 486,107, dated November 15, 1892.

Application filed August 16, 1892. Serial No. 443,192. (No model.)

*To all whom it may concern:*

Be it known that I, AZEL CLARENCE HOUGH, a citizen of the United States, residing at South Butler, in the county of Wayne and State of New York, have invented certain new and useful Improvements in Locks for Cash-Drawers, &c.; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in combination lever-locks adapted more especially for use with cash-drawers or tills.

Said invention consists in certain structural features of the locking mechanism, which will hereinafter more fully appear, and in an alarm mechanism to be set in action when a wrong key is manipulated. The alarm thus sounded consists of a series of taps on a gong or other sonorous device to distinguish from the alarm that is sounded, consisting of a single tap, when the lock is properly operated to open the drawer. The alarm sounded by manipulation of the wrong keys thus render difficult, without detection, any experimenting with the keys to ascertain the combination.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which drawings—

Figure 1 is a plan view of a portion of the drawer or till, showing my invention applied. Fig. 2 is a side elevation, partly in section. Fig. 3 is an enlarged view in section showing the locking and alarm mechanisms. Fig. 4 is a bottom plan view with the casing or housing of the locking mechanism.

Although I shall describe my invention as applied to a cash-drawer or till, having designed it especially for such use, I wish it understood that I consider myself entitled to its use in other relations. The drawer A (shown in the drawings) is locked shut by means of a vertically-movable bolt or latch-bar B, whose lower end engages a notch *a* in the upper edge of one side of the drawer.

A pivoted swinging frame C, having a projection or arm *c*, whose end engages a recess or cavity *b*, made in the bolt about midway of its length, moves the bolt to disengage it from the drawer, and its movement to actuate the bolt is effected through a horizontally-movable push bar, rod, or key D, whose outer end is enlarged, as shown, for convenient engagement by the thumb. Said rod is pivotally connected to ears or lugs *d'*, which project from the upper part of the frame, and is normally pressed outward by a coiled spring *d*<sup>2</sup>, that encircles it. The frame C is in the form of a parallelogram whose ends are shorter than the sides and is pivoted at its ends, so as to rock on a horizontal axis. Said frame constitutes part of and is a co-ordinate element in the lock, which is supported by and partly inclosed in a casing or housing O, that is secured to the rear side of the casing A by screws passing from the inside thereof so as to extend partially within and partly without the casing A. The outwardly-projecting portion is on the same side as that on which the cash-drawer opens, and it houses the key-levers E on all sides except the bottom, so that they are invisible excepting to one looking from below. There are five of these key-levers E, as shown, and these, for the purpose of distinguishing from the push rod or key D, which I term the "operative" key, I term the "retaining" keys, and the latter I again designate as "proper" or "improper" keys, according as to whether they are arranged to permit or prevent by their manipulation the swinging of the frame C by pressing inward upon the operative key. The five keys are practically alike in construction, and are pivoted midway of their ends and side by side on a horizontal shaft E', that is secured to side plates or extensions *o o* of the casing O. At its end outside of the case containing the drawer each key is formed for ready engagement by the finger and at its end inside the drawer-casing it carries a vertically-disposed screw *e*. The screw *e* is vertically adjustable and has a length equal to the distance between the upper and lower sides *c' c*<sup>2</sup> of the frame C, and as the latter when the bolt B is in locking position is inclined from a vertical line, so that the upper side *c'* is in the rear and the lower side *c*<sup>2</sup> in advance of the

upper and lower ends, respectively, of the screw, it will be seen that said screw can be adjusted so that its upper end, when the lever E is not actuated, will be struck by the upper side of the frame C, if it be attempted to move the latter inward by the operative key, or so that its lower end, when depressed by actuating the key E, will be struck by the lower side  $c^2$  and will prevent movement of the frame; and, further, said screw can be so adjusted that when the key is actuated it will be out of the way of both sides of the frame, and the latter may thus be swung to raise the bolt. With this adjustment the top of the screw will, when the key is at rest, be in the first-named position and the key will be a proper key. As a gage to determine the proper adjustment necessary to constitute a proper key, a rearwardly-projecting rib or flange  $c^3$  is provided on the upper side of the swinging frame, with reference to which the heads of the screws can be placed—as, for instance, by comparing the lower side of the head with the upper face of the flange. The improper keys of course must have their screws so adjusted that with the keys at rest the screws will at top and bottom clear both sides of the frame, and it follows that with this adjustment when an improper key is actuated the lower end of the screw will be projected across the path of the lower side of the swinging frame and will prevent its movement.

Whenever an improper key is actuated an alarm consisting of several taps is sounded on a bell or gong F by a hammer  $g$ , that is vibrated by a spring-actuated mechanism G, composed of a train of gears and pinions. The hammer is on the same arbor with a pallet  $g'$ , that is actuated by an escape-wheel  $g^2$ , and also attached to said arbor is an arm  $g^3$ , that controls the movement of the mechanism G through the pallet and escape-wheel. This is done by means of a vertically-movable rod  $h$ , whose lower end is loosely connected to the arm  $g^3$  by a loop  $g^4$  at the end of the latter, which rod when at the upper limit of its motion holds said arm from being vibrated by the mechanism G, but which when lowered permits it, and so the hammer, to vibrate and sound the gong by a repetition of taps. The upper end of the rod  $h$  is connected to the crank or radial arm  $h'$  of a horizontal rock-shaft H, that extends parallel with but in a slightly-higher plane than the shaft E' and is journaled in the side pieces  $o$  of the casing O. Said shaft is adapted to be moved by means of arms I, that are placed thereon, one for each retaining-key E, which have lateral extensions  $i$ , that by a lateral adjustment of the arms along the shaft are adapted to be engaged by lugs or projections  $e^2$  on the inner ends of the keys E when they are arranged as improper keys. Screws  $i'$  are provided, by means of which the position of the arms on the shaft, either for engagement by the key-lugs  $e^2$  or out of their way, may be fixed.

The inner end of each key E is forked or bifurcated, so as to have a portion extending over the shaft H above and below the same for engagement thereby to limit the motion of the key up and down. Each retaining-key is returned to and kept in its normal position by a spring  $j$ , that is passed around a rod J, placed just below the shaft E', and has one end bearing against the inner end of the key and its other end bearing against a second rod J', placed just below the other. To sound an alarm each time and just before the cash-drawer is opened when the proper keys are actuated, a hammer L is provided, which depends from a plate  $t$ , pivoted by a screw  $m$  to one of the side pieces  $o$  of the casing O. To said plate  $t$  is pivoted a swinging dog or pawl  $t'$ , having a portion with an abrupt and an inclined face projecting below the plate  $t$  and a lug or extension  $n$  to engage the screw  $m$  on its upper side. A lug or stud  $c^4$  on the end of the frame C is located relative to the dog  $t'$  so that when the frame is swung to lift the drawer-bolt the abrupt side of the dog will be engaged by the lug and by reason of the lug  $n$  and pivot-screw  $m$  the plate  $t$  will be rocked upon its pivot  $m$  against the stress of a spring-arm N and the hammer L moved away from the gong. Because of the different centers of motion the lug  $c^4$  will pass out of engagement with the dog, and the spring N will, being free to act, return the parts to and beyond their former position and strike the hammer with some violence against the gong F, giving a single tap. When the frame C returns to its former position under pressure of the spring on the operative key D, the lug  $c^4$  will engage the inclined side of the dog and lift the same out of its path until its abrupt side is passed, whereupon the dog will drop into position to again be ready to actuate the hammer. The spring-arm N extends from a coil around the shaft E', from which another rod N' extends to the crank-arm  $h'$  of the rock-shaft H to restore said shaft and its connecting parts to the position from which they are moved by the actuation of an improper key. The upward movement of the arm  $h'$  is limited by a stop-lug  $o'$  on the side piece  $o$  of the casing O, against which it strikes. It will be understood that the swinging frame C is journaled in the side pieces  $o$  and that proper guide-plates are provided for the drawer-bolt to move through. The position of the retaining-keys is indicated on the casing O by means of a mark or index  $o^3$ , placed on the front lower edge thereof opposite each key.

The use and operation of my invention will be readily understood and is as follows: Having determined what the combination shall be—that is, which shall be the proper keys and which the improper—the screws of the former are adjusted vertically, so that when the key is depressed at its rear end there will be no interference with the swinging of the frame C by an inward pressure upon the op-

erative key, and the screws of the improper keys are adjusted so that when the said keys are at rest the screws will not prevent the swinging of the said frame; but when the keys, 5 one or all, are actuated the lower end of the screw will be in the path of the lower side  $c^2$  of the frame. Next, the arms I on the rock-shaft H are adjusted to a position on the shaft, so that with reference to a proper key the extension  $i$  of an arm will not be struck by the 10 lug  $e^2$  on the key when it is actuated, and with reference to an improper key, so that said extension will be engaged by the lug and the shaft H rocked to allow the mechanism G to 15 cause vibration of the hammer  $g$  and the sounding of several strokes on the gong F. When the proper keys are actuated, a single tone will be struck on the gong by the mechanism described, and there being nothing 20 when said keys are depressed to prevent the swinging of the frame C the operative key is pressed inward to swing said frame, and the latter through its arm  $c$  will lift the bolt B out of engagement with the locking-notch in 25 the drawer-side and the drawer will be free to be opened.

As changes or variations may be made from the mechanism shown and described by the skilled mechanic which will not involve 30 departure from the scope of my invention, I regard myself as being entitled to make the same.

Having thus described my invention, what I claim to be new, and desire to secure by Letters Patent, is—

1. In combination, a lock having several keys any of which are adapted to be set to act as releasing-keys, an alarm mechanism adapted to sound a single tone when a proper 40 key is actuated, and an alarm mechanism adapted to sound several tones when an improper key is actuated, substantially as described.

2. In combination with a cash-drawer and 45 its locking mechanism, a gong, a spring-actuated motor having an escape-wheel and pallet, the pallet-arbor, the hammer of said arbor, the detent-arm also on said arbor, the rock-shaft connected with said arm, and the 50 keys adapted to release said arm by rocking

the shaft to permit the motor to actuate said hammer.

3. In combination, the locking-bolt, the pivoted swinging frame, the arm thereon engaging the bolt, the series of pivoted keys, the 55 adjustable screw carried by each key, the rib or flange on the frame, serving as a gage for the adjustment of the screw, and the key or rod attached to the frame to swing the same, 60 substantially as described.

4. In combination with the pivoted keys, the rock-shaft H, an arm on said shaft for each key adapted to be engaged thereby, and the alarm mechanism actuated by said rock-shaft, substantially as described. 65

5. In combination with the pivoted keys having each a lateral extension, a rock-shaft, the arm for each key on said shaft, adapted to be engaged by said extension, the crank-arm on the shaft, the alarm mechanism, and 70 the rod between the latter and said crank-arm, adapted to set said alarm mechanism in operation, substantially as shown and described, and for the purpose specified.

6. In combination, the sliding locking-bolt, 75 the pivoted swinging frame connected with the bolt, the key for swinging the frame, the spring for maintaining said latter parts in their normal position, pivoted keys carrying screws or pins to co-operate with said frame, 80 the bell-hammer adapted to be actuated by said frame, the rock-shaft, the arms thereon, one for each key, the spring-actuated motor having an escape-wheel, the second hammer 85 carried by the pallet-arbor, the detent-arm also on said arbor, the rod connecting said arm with the rock-shaft, and the forks on the keys embracing said shafts, substantially as described.

7. In combination, the several keys, the 90 swinging frame, the bell-hammer carried by the pivoted plate  $t$ , the pivoted dog  $t'$ , carried by said plate, and the lug on the frame to engage said dog, substantially as described.

In testimony whereof I affix my signature in 95 presence of two witnesses.

AZEL CLARENCE HOUGH.

Witnesses:

CHARLES H. BETTS,  
DEWITT C. WHEELER.