

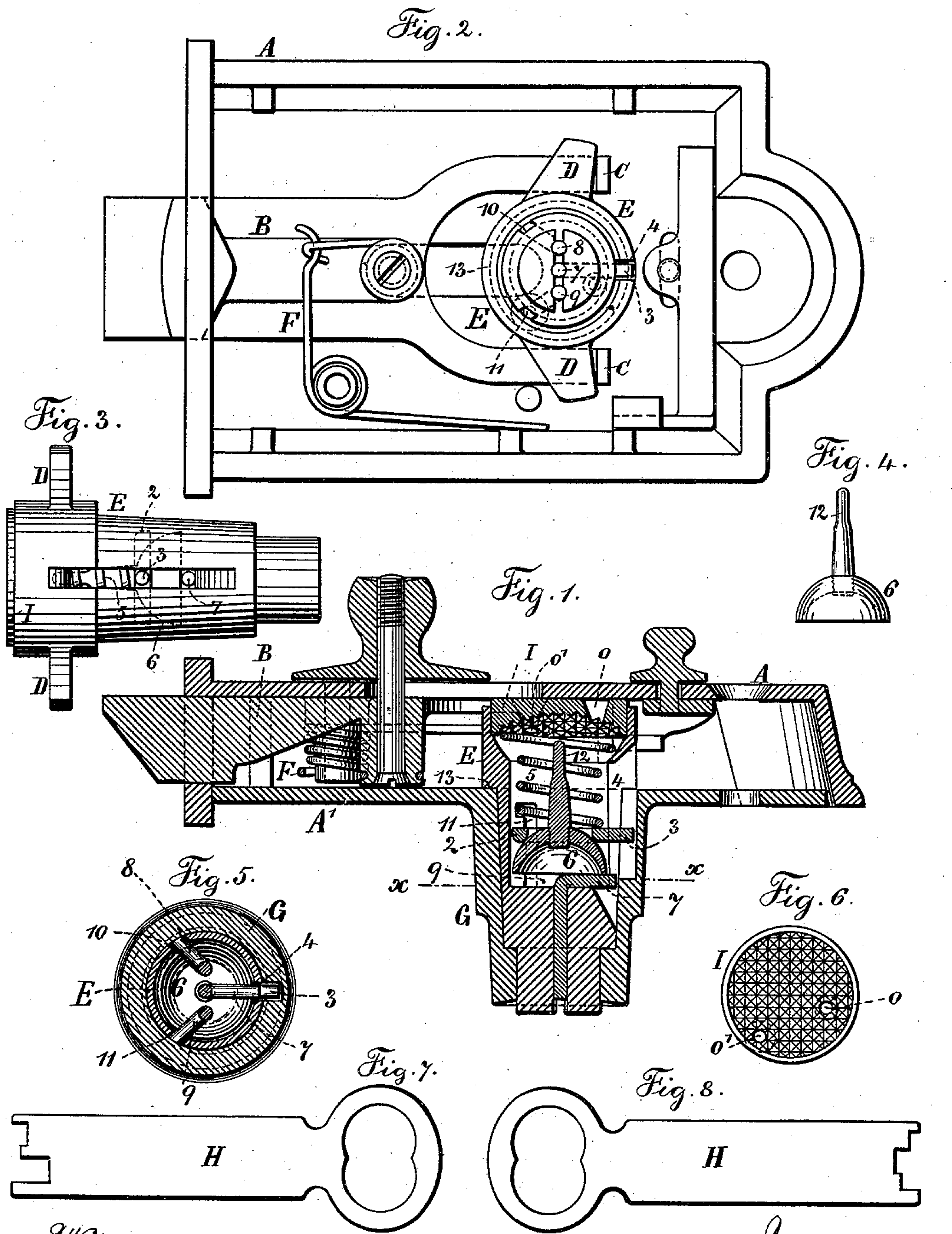
(Model.)

J. HARTNESS.

LOCK.

No. 384,441.

Patented June 12, 1888.



Witnesses:  
J. Stail  
Charles Smith

Inventor:  
James Hartness,  
per Lemuel W. Terrell atty



# UNITED STATES PATENT OFFICE.

JAMES HARTNESS, OF TORRINGTON, CONNECTICUT, ASSIGNOR TO THE  
UNION HARDWARE COMPANY, OF SAME PLACE.

## LOCK.

SPECIFICATION forming part of Letters Patent No. 384,441, dated June 12, 1888.

Application filed February 6, 1888. Serial No. 263,119. (Model.)

*To all whom it may concern:*

Be it known that I, JAMES HARTNESS, of Torrington, in the county of Litchfield and State of Connecticut, have invented an Improvement in Locks, of which the following is a specification.

This invention relates to that class of locks in which there is a cylinder contained within the circular case, and the cylinder is provided with cams or connections to the bolt or latch, so that by the partial rotation of the cylinder the latch or bolt will be withdrawn. Locks of this character have heretofore been provided with tumblers in the cylinder, which tumblers have to be moved by the key into the proper positions before the cylinder can be partially rotated. In my present improvements there are tumblers adapted to receive endwise movements from the bits of the key, and these tumblers act upon a universal tumbler formed as a hollow half-globe, having a stop-finger projecting from the center of the convex side, and at the end of the hollow cylinder is a perforated target, the hole in which may occupy any desired position, and the universal tumbler is turned by the joint action of the three sliding tumblers into such a position that the finger is in line with the hole and permits an end movement to be given to the parts by the action of the key, the finger passing into the hole in the target, and this end movement permits the cylinder to be rotated by the key sufficiently for moving the latch or bolt. By this improvement great security is obtained, because the position of the finger results from the joint action of three or more tumblers, and the hole in the target cannot be ascertained by the action of picks upon the tumblers, especially when the surface of the target is corrugated or roughened or made with numerous recesses forming false holes that do not allow the finger to pass into or through the target; and this improved lock is especially applicable to the doors in hotels and public buildings, because the targets throughout the locks on one section or group of doors can have one hole in the same position in each target, so that all the locks in that section can be opened by one master-key; but each lock has a second hole in the target in a different

position in each lock, and each lock can then have its own appropriate key, so that the key for one door will not open the lock upon another door.

In the drawings, Figure 1 is a horizontal section through the cylinder and lock. Fig. 2 is an elevation of the lock with the lock-plate and case removed, the cylinder and tumblers occupying their proper positions. Fig. 3 is a detached elevation of the cylinder. Fig. 4 is a detached view of the universal tumbler and stop-finger; and Fig. 5 is a section at the line *xx*, Fig. 1, endwise of the tumblers and the universal tumbler. Fig. 6 is a detached view of the target, and Figs. 7 and 8 show two keys.

The lock-case A is of any desired size or character, and within it is the bolt or latch B, having claws C, against which the cams D upon the cylinder E act to move the bolt or latch when the cylinder E is partially revolved, and F is the spring that projects the bolt or latch. These parts are introduced to illustrate the manner in which my improvements are made use of; but the bolt or latch and the cylinder and the connection between the parts may be of any desired character.

Within the hollow cylinder E is a follower, 2, having a projection, 3, that passes through the slot 4 in said cylinder E, and this projection 3 passes into a longitudinal slot in the circular case G, that contains the said cylinder E; hence this projection 3 prevents the cylinder E being rotated until the follower 2 has been moved endwise of the cylinder sufficiently for the projection 3 to pass out of the slot in the circular case G, and there is a spring, 5, which acts against the follower 2, to project the same toward the outer end of the cylinder E. The inner portion of this cylinder E is hollow or tubular for the reception of the follower 2 and the universal tumbler 6; but the outer end of said cylinder is slotted transversely for the reception of either plate-key H, (shown in Figs. 7 and 8,) and within the slot of the cylinder there are sliding tumblers 7 8 9, and it is preferable to employ tumblers with cylindrical shanks, the holes in which the same slide corresponding to the slot that receives the plate-key, the cylindrical portions of the tumblers being of greater diameter than the width of



the slot, so as to slide within the parallel grooves or channels in the cylinder E. Each of these sliding tumblers is L-shaped, and there are longitudinal grooves or slots around the cylinder E, preferably equidistant, as shown at 4 10 11, and into these slots the L-shaped ends of the respective tumblers pass and they are guided by such slots.

The universal tumbler 6 is in the form of a hollow hemisphere, and it rests within the ring-shaped follower 2, such follower being recessed or beveled to correspond to the exterior surface of the universal tumbler, and the L-shaped portions of the sliding tumblers 7 8 9 bear upon the rim of the universal tumbler at equal distances apart, or nearly so, and there is a projecting finger, 12, which is perpendicular to the rim of the universal tumbler and at the center of the convex side thereof. At the end of the cylinder E is the target I, the same being preferably circular and setting into the recess at the end of the cylinder E, where it is secured by hammering over the edge of the cylinder at the end or in any other suitable manner, and in this target are one or more holes, as shown at  $o\ o'$ , and it is preferable to corrugate the surface of the target or fill the same with numerous indentations similar to the surface of a thimble.

It is now to be understood that the spring 5 keeps the follower and the universal tumbler 6 toward the outer end of the cylinder E, and in so doing the tumblers 7 8 9 are also slid forward and their L-shaped ends stop at the ends of the slots 4 10 11, and in this position the finger 12 is at some little distance from the surface of the target I. If, now, the proper key is introduced, the tumblers 7 8 9 are moved endwise to a greater or less extent and the universal tumbler is turned within the follower, so that the end of the finger 12 occupies any desired position within the cylinder E, and this position is determined by the length of the bits or wards at the end of the key, and it is evident that only three tumblers can be used to advantage, because as these act at equal distances apart around the rim of the hollow hemispherical universal tumbler, such universal tumbler is rolled or rocked more or less at the point of contact of the tumblers, and all the tumblers bear properly and evenly upon the rim of the universal tumbler; hence there is no liability of false motion, and when the universal tumbler 6 has thus been rocked upon its bearing in the follower 2 the end of the finger 12 will be exactly in line with the hole in the target I, so that as the key is pushed in the tumblers, universal tumbler, finger, and follower will be moved endwise of the cylinder E, and the finger will pass into the proper hole in the target, and during this movement the projection 3 upon the follower 2 will be carried sufficiently far to be out of the slot in the circular case G, and hence the cylinder E can be rotated and give motion to the parts that withdraw the bolt or latch. The hole in the target

should be flaring backwardly, so as not to bind the finger as it is passed through such hole. Upon withdrawing the key, the parts assume their normal positions, and if a different key is inserted the end of the finger 12 will not be brought into line with the hole  $o$  in the target I. Some locks will be made with but one hole in this target I, and hence can only be opened by a key having the proper shape to give the necessary movement to bring the finger 12 in line with that hole, and there may be a second hole, or even a third or more holes, in the target I, so that two or more keys with different bits may be used with one lock, and this gives opportunity for using one or more master-keys to a group of locks, and in the case of manufactories or hotels any desired number of locks can be opened by one master-key; or a second master-key can be used to open certain locks of one group and certain locks of another group, thereby permitting access by the party holding the master-key only to the desired places where he is entitled to go.

I have shown the cylinder E as having an offset or shoulder at 13, that sets against the inner face of the circular case G upon the removable cap-plate  $\Delta'$ , and the slot 4 as extending down into this shoulder or offset, so as to allow the projection 3 to pass out of the circular case G and not prevent the cylinder revolving, and this shoulder determines the position of the cylinder E within the circular case G.

I claim as my invention—

1. The combination, with the bolt or latch and the cylinder for acting upon the same, of tumblers within the cylinder, a universal tumbler with a finger, against which universal tumbler the sliding tumblers act, a follower or support for the universal tumbler, a spring for moving the parts endwise of the cylinder, and a target having one or more openings therein for the passage of the finger, substantially as set forth.

2. The combination, with the cylinder E, of the circular case for supporting the same, a follower within the cylinder having a projection passing through the slot in the cylinder and into a slot in the case, a universal tumbler resting against the follower and having a projecting finger, 12, L-shaped tumblers sliding within the cylinder and acting upon the rim of the universal tumbler, and a perforated target for arresting the end movement of the parts, except when the finger passes into the perforation, substantially as set forth.

3. The combination, in a lock, of sliding tumblers, a universal tumbler against which the sliding tumblers act, a finger projecting from the universal tumbler, and a perforated target for arresting the movements of the parts, except when the finger passes into the perforation, substantially as set forth.

4. The combination, in a lock, of a universal tumbler having a projecting finger, sliding

tumblerstoactuponthesame, andatarget hav-  
ing two or more perforations, whereby the  
lock is adapted to two or more different keys,  
substantially as set forth.

- 5 5. The combination, in a lock, with the uni-  
versal tumbler, means for supporting the same,  
and tumblers actuated by the key for setting  
the universal tumbler, of the target having a

roughened surface and one or more perfora-  
tions in the same, substantially as set forth. 10

Signed by me this 1st day of February, 1888.

JAMES HARTNESS.

Witnesses:

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ALBERT F. BROWN.