

R. L. REED.  
LOCK.

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# UNITED STATES PATENT OFFICE.

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## LOCK.

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*To all whom it may concern:*

Be it known that I, ROBERT L. REED, a citizen of Washington, in the District of Columbia, have invented certain new and useful Improvements in Case-Locks; and I do hereby 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.

My invention relates to an improvement in locks, and more particularly to such as are adapted for securing case-doors.

Heretofore it has been customary in the construction of case-locks to provide a knob or handle adapted to remain permanently attached to the door and to employ a ratchet mechanism to prevent the knob or handle from being operated and a key for withdrawing said ratchet mechanism to permit the bolts to be withdrawn through the medium of the handle. This construction is open to two objections, viz: Two operating devices are necessary to operate it, thus necessitating the use of both hands of the operator, and the knob is left permanently in the door. The last-mentioned objection is particularly noticeable when the device is employed on the case-doors of museums, where the cases are located close together, as the garments of visitors, especially ladies, are apt to catch into the knobs or handles and thus become torn.

It is the object of my present invention to obviate these objections and to produce a locking device for case-doors which may be operated by a combined knob and key, which latter shall be detachable.

A further object is to so construct a case-lock and operating device therefor that the case may be unlocked and a firm engagement of the operating device be had with the door, whereby said door may be pulled open when unlocked without liability of slipping or disengagement of the operating device.

A further object is to construct a case-lock in such a manner that when the bolts are thrown the knob and its attached key will be prevented from turning farther, whereby it is retained in a proper position to be withdrawn.

A further object is to so construct the device that the knob and attached key can only be turned sufficiently to withdraw the bolt.

A further object is to construct the device

in such manner that when the knob and attached key shall have been turned sufficiently to withdraw the bolts the knob will be prevented from withdrawal, whereby the door may be pulled open by it.

A further object is to so construct the device that the knob and attached key cannot be withdrawn when the door is unlocked.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional view of my improved lock, showing its connection to a door. Fig. 2 is a face view of the rear portion of the device with the cover of the rear plate removed. Figs. 3, 4, and 5 are detached views.

A represents the stile of a door, and B B portions of the casing having recessed plates *a* for the reception of the free ends of sliding bolts C C, as hereinafter explained, said bolts being maintained in a vertical position by means of guides or loops *b*, secured to the inner face of the door.

The rear plate D of the lock, which is secured to the inner face of the door, is provided with a perforation *c* at its center, from which grooves *d d* extend in opposite directions to the ends of the plate.

Surrounding the perforation *c* and projecting from the front of the plate D is a cylinder D', partially closed at its free end to produce an inwardly-projecting flange *e*, having notches *e'* at diametrically-opposite points.

Projecting upwardly from and communicating with the cylinder D' is a receptacle D<sup>2</sup> for a series of pins *f*, as presently explained.

Inserted loosely in the cylinder D' is a barrel E, having a flange *g* at its rear end, adapted to abut against the flange *e* at the rear end of the cylinder D', and having diametrically-disposed recesses or notches adapted to align with the notches *e'* of the flange *e* when the parts are in their normal positions. The front end of the barrel E is provided with a flange or disk F, adapted to rest loosely in a recess in the plate D, for a purpose which will be explained farther on.

The barrel E is provided with a flat key-slot *h*, which extends longitudinally through



it, and communicating with this slot is a series of perforations  $h'$  for the reception of a series of pins  $i$ . The pins  $f$  are inserted in suitable perforations in the receptacle  $D^2$  and  
 5 correspond in number to the pins  $i$  in the barrel, and located above each pin  $f$  is a spring  $f'$ , which latter are maintained in place by a series of screws or pins  $f^3$ . The pins  $f$  are of varying lengths, so that when  
 10 a key  $G$ , having a series of notches in one edge, is inserted in the barrel the pins  $i$  will be raised until their upper ends lie flush with the periphery of the barrel the lower ends of the upper pins  $f$  having been raised until  
 15 they shall have passed the periphery, whereupon the barrel will be free to be turned by the key.

The pins of each lock will be adapted to be operated by a special key; but in museums  
 20 and similar places, where a number of cases are employed and it is desired that the superintendent may be enabled to open any case in the building or any case in a particular division, each lock will be so constructed that  
 25 a master-key may be employed. In order to accomplish this object, one notch in the master-key will be cut deeper than the notches of the other keys, and the pin in the receptacle  $D^2$  corresponding with this notch will  
 30 be made in two parts, so that when the special key is employed the lower end of one section of the pin will be raised above the periphery of the barrel, and when the master-key is employed the lower end of the other  
 35 section of said pin will be raised above the periphery of the barrel.

Projecting from the flange or disk  $F$ , near the periphery thereof and at opposite sides of the key-slot  $h$ , are two pins  $II$   $II$ , adapted  
 40 to enter elongated slots  $j$   $j$  at or near the inner ends of two links  $I$   $I$ . The links  $I$   $I$  at their opposite ends are made with flanges or hooks  $k$   $k'$ , the flange or hook  $k$  projecting in the opposite direction from the hook  $k'$ , and  
 45 on the under face of the hooked portion of each link a pin  $l$  is provided. The inner ends of the bolts  $C$  are adapted to enter the recesses in the plates and are recessed and provided with perforations to receive the pins  
 50  $l$ . Thus it will be seen the pins  $II$   $II$  on the flange or disk  $F$  are pivotally connected with the bolts  $C$ . A cover  $C'$  is placed on the plate  $D$  and provided with a recess  $C^2$  for the accommodation of the links  $I$   $I$ , and recesses  $m$   
 55  $m$  for the accommodation of the bolts, the walls of the recess  $C^2$  maintaining the links in proper position and preventing them from lateral separation.

The key for operating the lock is provided  
 60 with a handle  $J$ , the axes of the handle and key being in the same plane, and at the junction of the key proper and the handle two lugs or ears  $J'$  are provided, the back of the key lying flush with the end of one of said  
 65 lugs. Assuming now that the lock is in its normal position with the bolts thrown, the key is inserted in the barrel until the ears  $J'$

shall have entered the recesses  $e'$  in the flange  $e$  at the front end of the barrel. The insertion of the key will raise the pins therein, as  
 70 above described, and the key is turned, the ears passing behind the flange  $e$  at the front end of the cylinder, so that the ears will bear against said flange, and thus produce a firm hold for the handle, whereby the door may be  
 75 pulled open without the possibility of the key or attached handle slipping. When the barrel is rotated as just described, the links will be moved longitudinally, and the bolts pivoted thereto will be withdrawn. When the  
 80 bolts shall have been withdrawn, the two links will lie close together, the hooked end of one link engaging the opposite end of the other link, thus limiting the movement of the barrel and attached parts and preventing the  
 85 key from being turned farther than is necessary to withdraw the bolts. When the bolts are thrown by turning the key in a direction reverse to that above explained, the links will not be permitted to entirely pass each other;  
 90 but they will abut against each other at their inner ends, and thus prevent the barrel from rotating farther than to permit the bolts to be thrown and the ears  $J'$  to come in line with the recesses in the flange  $e$  of the cylinder  $D'$ ,  
 95 at which point the key may be withdrawn. This is accomplished by making the distance between the pins on the disk  $F$  less than the combined distance from the slots in the inner ends of both links to the inner ends of  
 100 both links. Thus it will be seen that the key cannot be turned farther than is necessary to withdraw the bolt; that when the key is in such position it will have a firm hold, whereby the door may be pulled open by pulling  
 105 upon the handle of the key; that in throwing the bolts the key cannot be turned beyond the point at which it should be withdrawn, and that the key cannot be withdrawn when the door is unlocked.

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

1. In a lock, the combination, with a bolt or bolts and devices for locking same, of a  
 115 combined key and knob rigidly connected together and provided with a projection for removably holding the key in the lock, the said projection being arranged in such relation to the wards of the key and to the opening in the lock-case for the key as to prevent  
 120 the withdrawal of the key without throwing the bolt or bolts to a locked position, substantially as set forth.

2. In a lock, the combination, with a cylinder having a recessed flange at one end and a barrel in said cylinder, a flange on one end of said barrel having recesses to align with the recesses of the flange of the cylinder, of  
 125 a combined handle and key having ears to enter said recesses and pass behind the flange of the cylinder, substantially as set forth.

3. In a lock, the combination, with a cylinder, of a barrel in said cylinder having sock-



ets, pins in said sockets, a receptacle having perforations adapted to register with the socket in the barrel, pins in the perforations of the receptacle, springs bearing on said pins, links pivotally connected to the barrel, and bolts pivotally connected to the links, substantially as set forth.

4. In a lock, the combination, with a disk, means for actuating same, and lugs projecting outwardly from said disks, of links loosely mounted on the lugs, the said links having shoulders adapted to engage and limit the rotation of the disk in one direction and with flat sides which engage and limit rotation of the disk in the opposite direction, and bolts secured to and actuated by said links, substantially as set forth.

5. In a lock, the combination, with a disk, of links having a sliding pivotal connection with the disk and the bolts connected with the free ends of the links, the said links over-

lapping each other and having engaging surfaces for limiting the rotation of the disk in both directions, substantially as set forth.

6. A combined key and knob rigidly connected together and provided with a projection for removably holding the key in the lock, substantially as set forth.

7. In a lock, the combination, with a barrel, of pins on one end thereof, links having elongated slots adapted to receive said pins, pins at or near the opposite ends of said links, and bolts having perforations to receive said last-mentioned pins, substantially as set forth.

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

ROBERT L. REED.

Witnesses:

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THEODORE A. T. JUDD.