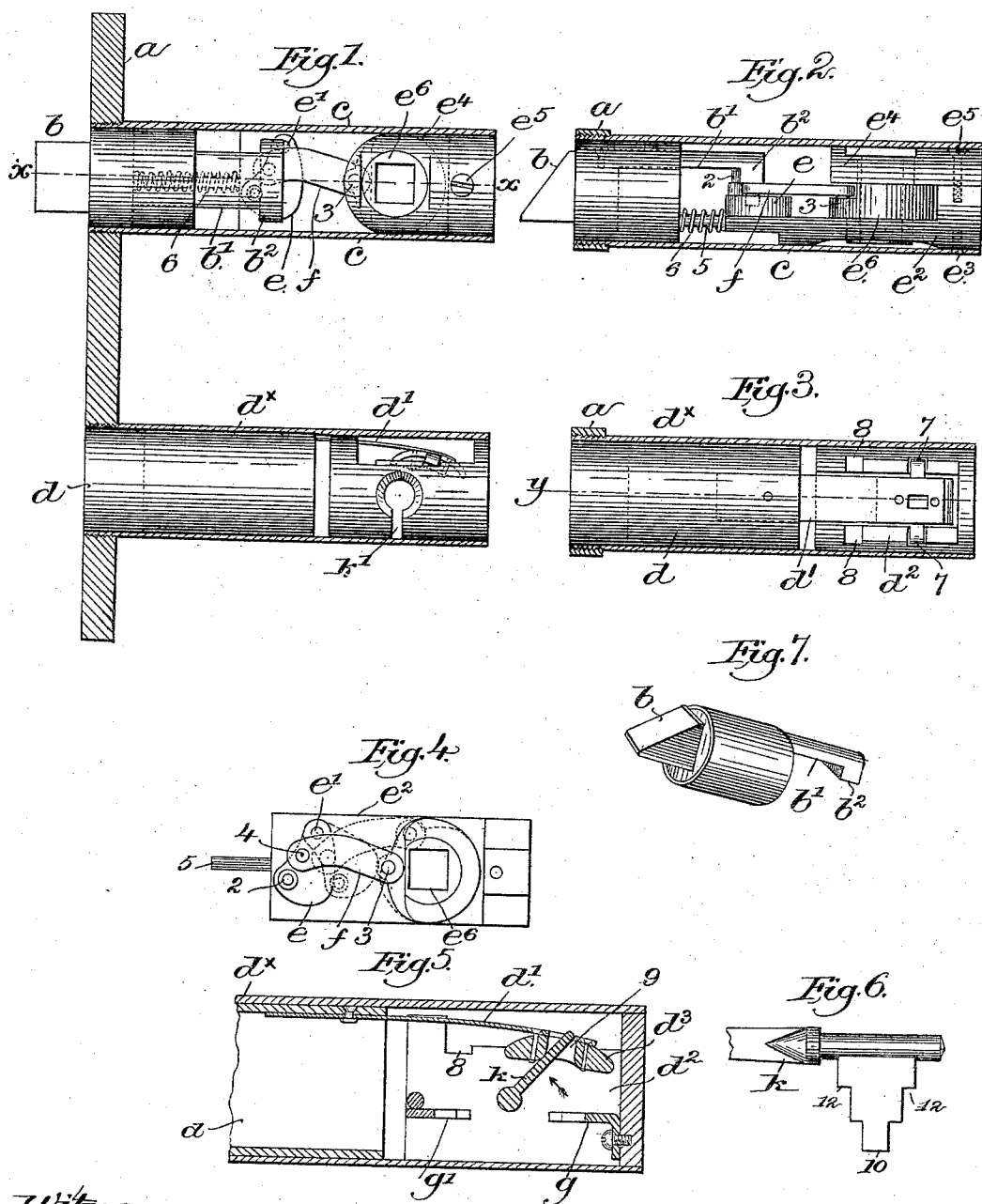


(No Model.)

M. O. ROYCE.
LOCK.

No. 489,692.

Patented Jan. 10, 1893.



Witnesses.
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UNITED STATES PATENT OFFICE.

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LOCK.

SPECIFICATION forming part of Letters Patent No. 489,692, dated January 10, 1893.

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To all whom it may concern:

Be it known that I, MARVIN O. ROYCE, of Somerville, county of Middlesex, State of Massachusetts, have invented an Improvement in Locks, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of an improved lock which may be readily applied to a door without the employment of skilled labor, the mechanism of the said lock being very simple and durable.

In accordance therewith my invention consists in a lock having a face plate and attached tube, a catch having a projection at its inner end, and a fixed plug fitted into the outer end of the tube, combined with a rotating hub for the knob spindle and supported by said plug, a crank having a roller or other stud to co-operate with the projection, and a link connecting the hub and crank, and a spring, to operate, substantially as will be described, whereby the hub may be turned in either direction to carry the pivots of the link off from their center lines and turn the crank to draw the catch back and compress the spring. Also in the combination with a face-plate, a connected tube having a keyhole, and a bolt within said tube, of a key and mechanism intermediate said key and bolt, including a slotted locking-plate, to be engaged and actuated by said key to slide the said bolt within said tube, substantially as will be described.

Other features of my invention will be hereinafter described and particularly pointed out in the claim.

Figure 1 of the drawings represents in longitudinal section the front plate and tubes of a lock embodying my invention, the catch and bolt parts thereof, and their co-operating devices, being represented in elevation. Fig. 2, is a view of the catch part of the lock, the outside tube being in section in the line *x* Fig. 1, thus showing in elevation the catch mechanism within the tube. Fig. 3, is a like view showing the bolt tube and its interior mechanism. Fig. 4, is a detail showing part of the catch portion, the cap plate used to support the hub being removed to better show the hub and its connecting link and crank device, the full and dotted lines in said figure

showing the parts in their extreme positions. Fig. 5, is an enlarged section in the line *y*, Fig. 3. Fig. 6, is a detail showing the bit of the key in side elevation. Fig. 7, is a detail showing the latch detached.

The face *a*, of the lock may be of any suitable shape or material. The catch *b* and its connecting devices to be described, are contained in a tube *c*. The bolt *d* and its actuating devices are contained in a tube *d'*.

Referring to the catch part of the lock it will be seen that the catch *b*, having its face beveled in usual manner has a shank *b'* provided with a shoulder *b''* suitably shaped to be engaged by a roller or other stud 2 forming part of a crank *e* pivoted at *e'* on a plug *e''* preferably of cast metal and circular in shape and confined in the tube *c* by screw *e'''* shown in Fig. 2. This plug is represented as composed of two parts, one part, as *e''''*, being confined to the other part by a suitable screw, as *e'''''*; the part *e''''* having a suitable hole to embrace one end of a hub *e''''''* having a square or other hole to be entered by the usual knob spindle, the other part of the plug receiving the opposite end of the hub and confining it in place as best represented in Figs. 1 and 2, Fig. 4, showing the plug with the part *e''''* omitted. The hub *e''''''* is provided with a suitable stud or projection 3 which receives upon it a link *f*, the opposite end of which embraces a pin or projection 4 of the crank *e*. It will be obvious that these pins or projections 3, 4 may either be fixed in the link or be fixed respectively in the crank and hub. The plug referred to has a pin or projection 5 which serves to hold in working position the spiral spring 6, shown in Figs. 1 and 2, one end of said spring acting against the plug, and the other against the shoulder forming part of the catch. The shape of the plug externally is such as to substantially fill the tube *c*, and the hub *e''''''* is of such length that its ends will not rub against the interior of the tube.

The parts referred to as contained in the tube *c*, are assembled together substantially as shown and may be removed bodily from the tube *c* by taking out the screw *e'''*.

It will be understood in operation that the spring 6 acts to keep the catch out as represented in Figs. 1 and 2. The projection *b''* of the catch acting on the stud 2 holds the crank

e in its full line position represented in Figs. 1, 2 and 3, and the link acting on the hub holds the pin 3 on its front center so that the spindle and knob are held by the force of the spring to prevent any shaking of the knob. When the door is being closed and the catch meets the usual striker-plate, the catch is pushed into the tube *c* overcoming the pressure of the spring, the projection *b*² then retiring from the stud 2, the spring, however, reversing the movement of the latter as soon as the catch enters the hole in the usual striker-plate. To retract the bolt, the door being shut, the operator will turn the usual knob and thereby turn the hub, causing the stud 3 to be moved and with it the link *f*, putting them into the dotted line position shown in Fig. 4. The movement of the hub may be in either direction so as to carry the stud 3 from its normal position, on the center, either way, and draw back the lever *e*, and as soon as the operator releases the knob the spring 6 acts quickly to spring the lever, link, and hub back into their normal position, Fig. 1. The tube *c* will preferably be threaded into the face-plate *a*, by a thread more or less fine, so that by a half rotation of the tube the catch may be adapted to a right or left-hand lock.

Referring now to the bolt part of the lock, I have represented the bolt *d* as made tubular with its outer end closed, such bolt having great strength coupled with lightness. The bolt has extended rearwardly from it a spring *d'*, said spring entering and fitting a longitudinal groove in a cage *d*². This spring is provided with a locking-plate *d*³ having suitable projections 7 to enter suitable notches 8, there being a double set of notches so that when the projections are in one set of notches the bolt will be out in locking position, and when in the other set of notches, as represented in the drawings, the bolt will be unlocked. This locking-plate, as represented, has one hole 9 adapted to be entered by a projection as 10 of the key *k*, partially shown in Fig. 6. In practice, however, it will be understood that this locking-plate may have one or more holes located in any particular part or parts of it, and of any desired configuration so that the movement of the bolt will require a particular shaped key. The cage *d*² to add to the difficulty of picking the lock may and will preferably be provided with suitable wards located at *g*, *g'*, the said wards having their edges nearest to the center of motion of the key cut away to correspond with the outline of the key. These wards may, if desired, be stamped out of sheet metal and suitably attached to the cage, or they may be confined to or made part of the cage in any usual or suitable manner.

In operation let it be supposed that the key *k* has been inserted into the usual key hole *k'* and its bit has been turned upwardly in the direction of the arrow Fig. 5, passing the ward *g*. In this condition the shoulders 12

of the key will act upon the locking-plate and the projection 10 will enter the notch in the locking-plate. In its further movement the shoulders lift the locking-plate sufficiently to remove the projection 7 from the notch 8 in the cage, and thereafter the projection 10 of the key acts to push the locking-plate the spring and the bolt with it to the left viewing Figs. 1 and 5, locking the bolt; the locking-plate in its final movement being left in such position that its projection 7 will enter the second set of notches 8, or the notches shown as vacant in the drawings. The motion of the key will be continued past the wards *g'* of the keyhole when it may be drawn out. In this condition the bolt is locked and is held in its locked position by the shoulder of the locking-plate in that set of notches nearest the plate *a*.

This invention is not limited to the exact construction shown for the mechanism intermediate the key and the bolt *d* to slide the latter within the tube, as the said mechanism, shown as a plate and a spring, may be variously modified.

The use of the spring as a support or carrier for the locking-plate enables the locking-plate to lie comparatively close to the center of motion of the key, so that a short bitted key may engage the plate and keep hold of it during the locking and unlocking movement, the spring enabling the bit of the key to be shorter than would be possible were the spring to be omitted, and with a short bit I can get a long movement of the bolt.

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

1. In a lock, a face plate, and attached tube, a catch having a projection as *b*² at its inner end, and a fixed plug fitted into the outer end of the tube, combined with a hub for the knob spindle supported by said plug, a crank having a roller or other stud to co-operate with the projection *b*², and a link connecting the hub and crank, and a spring, the combination being and operating substantially as described, whereby the hub may be turned in either direction to carry the pivots of the link off from their center lines and turn the crank to draw the catch back and compress the spring, substantially as described.

2. The tube, the catch therein having a shank provided with a shoulder *b*²; and a spring supported independently of and to normally keep the catch out; combined with a freely pivoted crank provided with a stud to move over the face of and actuate said shoulder *b*²; a link, and a hub for the knob spindle, the link being pivoted to said crank and connected with the said hub at the side of its periphery nearest the said crank, the hub being adapted to be partially rotated in either direction to retract the catch, substantially as described.

3. A face plate, a connected tube having a keyhole, and a bolt within said tube, combined

with a key, and mechanism intermediate said key and bolt, including a slotted locking plate, to be engaged and actuated by said key to slide the said bolt within said tube, substantially as described.

4. The tube *e*, its contained bolt and connected spring, a locking plate carried by the spring and provided with a projection, combined with a cage having a notch to co-operate with said projection, the said locking plate being adapted to be lifted to disengage said projection and notch, and thereafter be moved longitudinally by means of a key, substantially as described.

5. The tube *e*, its contained bolt, spring, and

locking plate adapted to be engaged by the bit of a key to be both lifted and moved longitudinally, combined with a cage having wards to correspond with the key to be used, and having notches to co-operate with projections of the locking plate, substantially as described.

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

MARVIN O. ROYCE.

Witnesses:

GEO. W. GREGORY,
FRANCES M. NOBLE.