

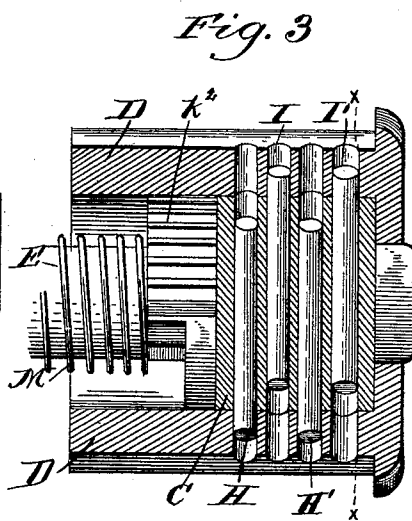
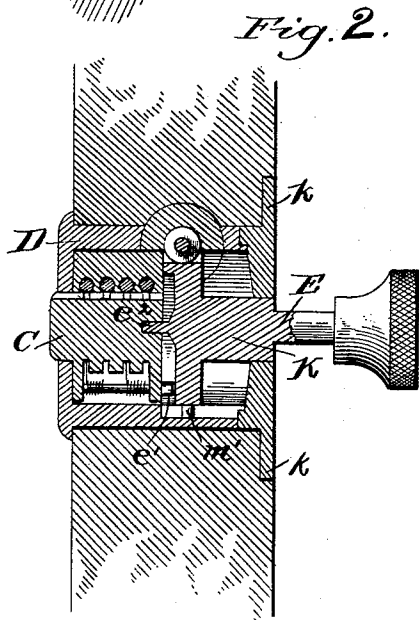
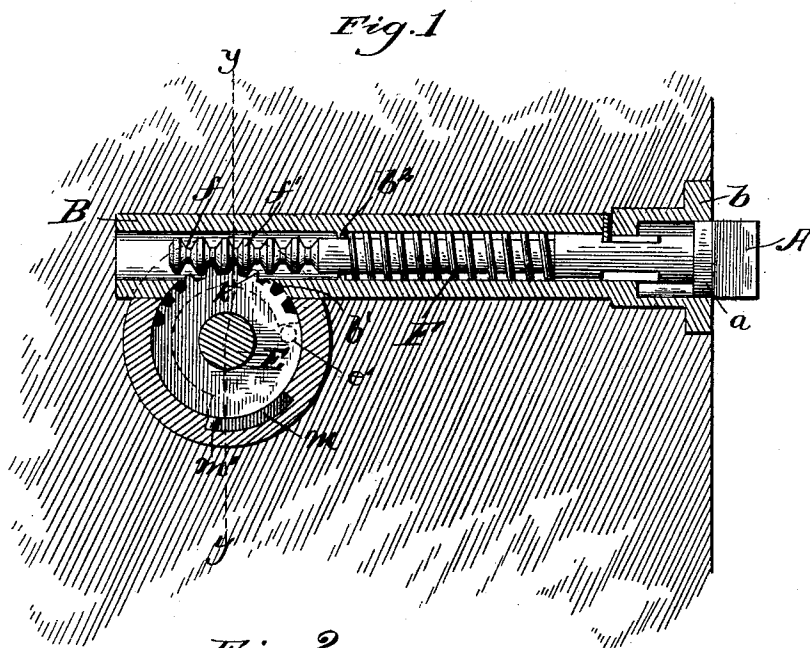
(No Model.)

2 Sheets—Sheet 1.

J. B. PRICE.
CYLINDER LOCK.

No. 481,421.

Patented Aug. 23, 1892.



Witnesses:

J. B. McGirr.
H. A. Berkhart

Inventor

John B. Price.
By his Attorneys,
Edson Bros.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4

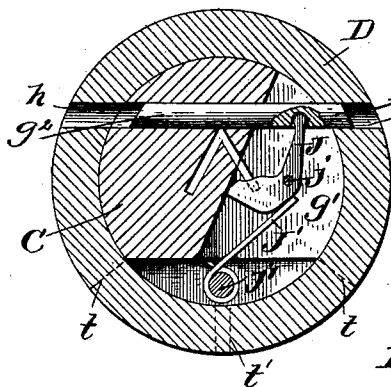


Fig. 5

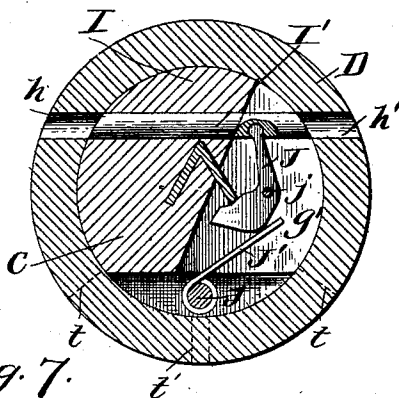


Fig. 7.

Fig. 6

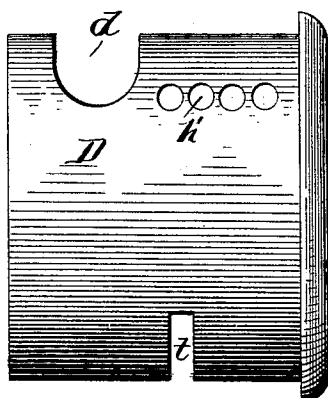
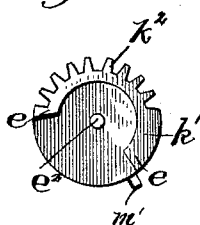


Fig. 9.

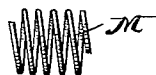


Fig. 8.

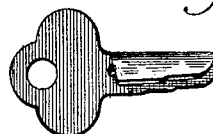


Fig. 10.

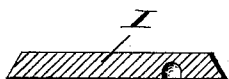


Fig. 11.

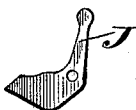


Fig. 12

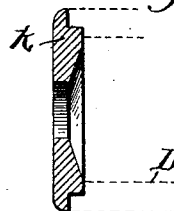
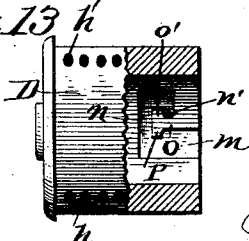


Fig. 13 h



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UNITED STATES PATENT OFFICE.

JOHN B. PRICE, OF WOLLASTON, MASSACHUSETTS.

CYLINDER-LOCK.

SPECIFICATION forming part of Letters Patent No. 481,421, dated August 23, 1892.

Application filed March 30, 1892. Serial No. 427,106. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PRICE, a citizen of the United States, residing at Wollaston, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in a Combined Lock and Latch; 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 present invention relates to an improvement in latches; and the objects are, first, to enable the latch to be applied to a door by simply boring two or more holes therein at right angles to and intersecting with each other; secondly, to adapt the latch either to right or left hand doors by a simple reversal of the position of the bolt, which can be accomplished without any change in the construction or position of the locking mechanism or the operating-spindle; thirdly, to enable the bolt to be held and locked in its retracted or projected positions by the manually-operated spindle, and free from engagement with the key-actuated plug or barrel to prevent the latter from releasing the bolt; fourthly, to provide a novel form of locking mechanism which can be easily released by the proper key and cannot be opened by a "pick" or other implement without considerable trouble and time, and, finally, to simplify the construction and cheapen the cost of manufacture of the latch.

With these ends in view the invention consists in the novel combination of devices and peculiar construction and arrangement of parts which will be hereinafter fully described, and particularly pointed out in the claims.

The invention is fully illustrated in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal sectional view through the latch, showing the bolt projected and in engagement with the operating-spindle. Fig. 2 is a transverse sectional view showing the aligned operating-spindle and the axially-turning key-actuated plug or barrel coupled together and to the bolt, the section being taken through the latch on the line *y y* of Fig. 1. Fig. 3 is an enlarged sectional view through the fixed cylinder or shell, the plug or barrel therein, and a part of the operating-

spindle. Fig. 4 is a cross-section through the barrel or plug and its cylinder on the plane indicated by the dotted line *x x* of Fig. 3, showing one of the plungers or pins projected into engagement with the cylinder. Fig. 5 is a view similar to Fig. 4 with one of the plungers or pins retracted, as when a key is inserted in the key passage or way in the barrel. Fig. 6 is a face view looking at the inner end of the operating-spindle. Fig. 7 is an enlarged side view of the cylinder or shell for the axially-turning plug or barrel. Fig. 8 is a view of the key. Figs. 9, 10, 11, and 12 are detail views of parts of the latch. Fig. 13 is a longitudinal sectional view through the barrel on a line to illustrate the peculiar form of grooves therein.

Like letters of reference denote corresponding parts in the several figures of the drawings.

A designates the longitudinally-movable bolt of the latch, which is fitted in a longitudinal tubular jacket B, and C is the axially-turning barrel or plug arranged so that its axis lies at right angles to the longitudinal axis of the bolt A. This plug or barrel C is fitted snugly in a cylinder D, so as to turn freely therein when its pins or plungers are retracted from engagement with the cylinder by inserting the proper key into the longitudinal passage or way in said barrel or plug, and the cylinder D is of greater length than the barrel or plug to receive an endwise-adjustable spindle E, which is adapted to engage with the barrel or plug and the latch and to be manually withdrawn from the barrel or plug while still in engagement with the latch.

The jacket or sheath B for the bolt A is made tubular in form, and said jacket is of such length that it extends from the edge of the door to and beyond the cylinder D of the axially-turning barrel or plug, said inner end of the tubular jacket being fitted or seated in a transverse recess or groove *d*, formed in one side of the cylinder D. (See Figs. 1 and 7.) The front end of the tubular jacket is enlarged and flanged at *b* to adapt the same to be fitted flush with the edge of a door and to receive the head *a* of the bolt, which head *a* is beveled, as is usual. The inner end of the tubular jacket at a point within the walls of the barrel-cylinder D is provided in its lower

side with a recess b' , which opens into the longitudinal bore or chamber of the jacket, and at one side of this recess b' the jacket has an interior annular flange b^2 . The shank of the bolt A is reduced, so that it extends freely through this annular flange b^2 , and against said flange bears a spiral projecting spring F, which is coiled around the bolt and bears at its other end against a shoulder formed on said bolt in rear of the head thereon. The longitudinal movement of the bolt is limited by means of a fixed pin playing in a groove or recess in said bolt, and the inner reduced end of the bolt has a series of annular concentric grooves f formed therein, which provide a series of annular shoulders, forming a rack f' , which lies over or in the plane of the recess or slot in the tubular jacket to adapt a series of gear-teeth on the manually-operated spindle to engage with said rack.

I attach importance to the bolt fitted concentrically in its jacket to be turned by hand freely therein, and to the rack formed by the annular shoulders f' , as by this construction I am enabled to rotate or partially rotate the bolt on its axis and change the position of the beveled head thereof to adapt the latch for use on right or left hand doors, and at the same time the bolt does not become disconnected from the operating-spindle, as the shoulders forming the rack will turn between the gear-teeth of the spindle. It is necessary, however, to disconnect the pin that works in the longitudinal groove of the bolt when the bolt is turned, and the pin can be replaced in another groove in the bolt to guide the same in the tubular jacket B, which remains stationary in order that its groove or recess may receive the gear-teeth on the operating-spindle.

The barrel or plug C is provided with a longitudinal key-passage of peculiar form, preferably V-shaped in cross-section, as shown in Figs. 4 and 5, to receive the V-shaped key, (indicated in the detail view, Fig. 8, as well as in cross-section in Fig. 5,) and said barrel is further provided with radial slots g' and transverse passages g^2 , each of the transverse passages extending through the plug or barrel on one side of its axis and opening at the ends thereof through opposite faces of the plug or barrel, and each passage being, furthermore, in communication with one of the radial slots. Any desired number of slots and transverse passages may be employed, and I may employ only four passages and a corresponding number of radial slots. In the transverse passages are fitted the reciprocating plungers or pins H H' and I I', the alternate plungers H and H' being movable simultaneously in one direction to engage with one side of the cylinder, the ends of said plungers fitting in radial openings h h' , formed in opposite sides of the cylinder. The plungers are controlled and actuated by tumblers J, which are fitted in the radial slots of the barrel or plug, and the tumblers are pivoted at intermediate points of their length on a common arbor or

pin j , which extends through the barrel, and one end of each tumbler is connected to one of the tumblers by having its rounded end fitted in a socket in the plunger, and the other end of the tumbler is projected into the longitudinal key passage or slot in the barrel by the pressure of a spring J' , which is coiled around a rod j' , one end of the spring bearing against one of the tumblers and the other end of each spring bearing against another tumbler at a point near its fulcrum, as shown in Figs. 4 and 5. Normally the springs bear on the tumblers to project the two sets of plungers in opposite directions and into the sockets in the fixed cylinder, while the inner ends of the tumblers lie in the key passage or slot, thus locking the barrel or plug against axial movement in the cylinder; but on insertion of the proper key into the V-shaped passage or slot in the barrel the wards on the key throw the tumblers against the pressure of their springs and the plungers are retracted within the barrel, thus freeing the barrel from the cylinder and enabling the barrel to be turned freely in its cylinder. The barrel or plug is not connected directly to the endwise-movable bolt, but the connection of the barrel and bolt is effected through the spindle E. The inner end of the spindle is formed with a disk-like head k' , which is recessed on one face to provide the shoulders e e , which are arranged in the path of a stud e' on the inner end of the barrel, and when the barrel is released and turned by the key the stud e' thereon impinges against one of the shoulders and impels the same to turn the spindle axially, whereby the spindle is actuated to cause its gear-teeth to retract the bolt. The inner end of the spindle is further provided with an axial stud e^2 , which fits in a central socket in the end of the barrel or plug, and thus centers the spindle and barrel in axial alignment. The spindle E has a cylindrical shank K, which passes through the face-plate k at one end of the cylinder D, and an enlarged head k' at its inner end, and on the periphery of this disk-like head is cut a series of gear-teeth k^2 , forming a mutilated gear-pinion adapted to engage the rack-teeth on the bolt to retract the same, and on its inner face this head is recessed to receive the stud e' of the plug or barrel and form the shoulders e e , against which the stud e' impinges to turn the spindle and retract the bolt when the key-actuated plug or barrel has its plungers released from the cylinder and turned by the proper key. The spindle is provided at its protruding end with a knob or thumb-piece, by which it can be turned axially or by which it can be moved endwise for the purpose of withdrawing the spindle, so that its shoulders e e are out of the path of the pin or stud e' on the barrel, such endwise movement of the spindle being permitted, as the spindle is in line with the barrel and its gear-teeth engage with the teeth of the rack on the bolt at right angles to the length of the latter. The gear-

teeth of the bolt and spindle are so proportioned that the spindle can be freed from the plug or barrel and still be engaged with the bolt, or the spindle can be withdrawn from engagement with both the bolt and plug or barrel.

To permit the spindle to move endwise in the barrel in which the head of the spindle is snugly fitted, I provide a longitudinal groove *m* on the inner surface of the barrel, and in this groove works a guide-pin *m'*, which serves to keep the spindle and barrel in proper alignment, and at right angles to the inner end of this longitudinal groove is a circumferential groove *n*, which has a lateral enlargement *n'*, a division wall or flange *o* separating the groove *n* and the longitudinal groove *m*, said wall *o* having the lug *o'*, in rear of which the pin *m'* is adapted to take when the spindle is adjusted to retract and lock the latch-bolt. The spindle is normally forced inward, so as to engage with the barrel or plug and the bolt, by means of a spring *M*, and when said spindle is drawn outwardly from engagement with the barrel or plug and is still in engagement with the bolt the guide-pin *m'* bears against a ledge *p* in the groove *m*, the spindle being turned slightly after its withdrawal, so that the pin lies in front of the ledge *p*.

The latch is applied to a door as follows: Two holes are bored in the door, one at right angles to the other, and the transverse hole is of greater diameter than the longitudinal bore and such passages intersecting with each other. In the larger transverse bore is fitted the cylinder *D*, containing the key-actuated barrel, and the bolt and its jacket are fitted in the longitudinal passage with the rear end of the jacket in the recess *b* in the upper side of the cylinder, so that the rack-teeth of the bolt engage with the gear-teeth of the spindle. To retract the latch from the outside of the door, the key is fitted in the barrel to retract the plungers and the barrel is turned so that its stud *e'* impinges against one of the shoulders *e* on the spindle, thus turning the latter on its axis and causing the same to retract the latch-bolt *A*; but when the key is withdrawn the spring projects the latch, which in turn operates the spindle and barrel to return the same to normal position. When it is desired to confine or lock the latch in its projected position and prevent said latch from being retracted by operating the plug or barrel from the outside of a door, it is necessary to first disengage the teeth of the spindle *E* from engagement with the rack of the latch, which is accomplished by pulling the spindle outwardly and then turning the same axially until the pin *m'* thereon is in rear of the projection *p* of the cylinder, after which the spindle is pushed inward, so that its teeth are engaged with the teeth of the latch, whereby the latch is locked in place, so that it cannot be forced inward, and the barrel or plug is disconnected from the spindle, which prevents the plug or bar-

rel from turning the spindle and retracting the latch when the key is inserted in the barrel or plug from the outside of the door. In adjusting the spindle so that its pin *m'* is in rear of the shoulder *p* and its teeth engage with the latch the position of the spindle and latch are changed equivalent to one tooth on the spindle or latch, and unless this change of position of the latch and spindle is effected the latch will not be locked in its projected position or the spindle disconnected from the barrel. The latch can be held in its retracted position by means of the spindle, which is first turned axially, so that the pin *m'* thereon rides in the groove *n* and the gear-teeth thereof retract the bolt, after which the spindle is drawn outward to bring the pin *m'* in the lateral groove *n'* and in the path of the walls *o o'*, forming said grooves *n n'*, the gear-teeth of this spindle still being in engagement with the bolt, whereby the spindle is held from axial movement and the latch is retracted. The latch can only be released by first turning the spindle slightly and forcing it inward to bring the pin *m'* in the groove *n*, and the spring will then propel the latch and return the spring to normal operative position.

The cylinder or shell provided for the reception of the barrel and spindle has a segmental peripheral slot *t*, formed at a point over the barrel or plug, in which slot plays a pin or stud *t'*, which is rigid with the barrel or plug, as indicated in Fig. 4, the pin serving to limit the axial movement of the barrel or plug in the cylinder and to prevent the same from being forced inward by pressing on the key.

The lock is secured in the door by screws or other equivalent fastening.

I am aware that changes in the form and proportion of parts and details of construction can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such changes and modifications as fairly fall within the scope of the same.

What I claim as new is—

1. The combination, with a latch-bolt, of the key-actuated plug or barrel seated in a suitable fixed shell at right angles to said latch-bolt and an operating-spindle in line with the plug or barrel and connected to the latch-bolt, the adjacent ends of the plug and spindle being connected to permit said spindle to have a limited axial movement irrespective of the plug to retract or project the latch-bolt, as and for the purpose described.

2. In a latch, the combination of the spring-actuated bolt, an independent key-actuated turning plug or barrel at right angles to the bolt, and an endwise-adjustable spindle normally geared to the bolt and connected to the plug or barrel, said spindle adapted to be disconnected from the plug or barrel while still engaged with the bolt, as and for the purpose described.

3. In a latch, the combination, with a bolt and an axially-turning key-actuated plug or barrel, of an endwise-movable spindle arranged in axial alignment with said plug or barrel and connected normally to said plug and the bolt, said spindle being capable of endwise movement to disconnect the same from either the plug or the bolt, as and for the purpose described.
4. In a latch, the combination, with a bolt and a key-actuated plug or barrel, of the spindle geared to the bolt and having means to connect the same to the barrel or plug to turn axially therewith, said spindle adapted to be withdrawn from engagement with the plug or barrel while still connected to the bolt, and means for holding the connected bolt and spindle against movement when the bolt is retracted, as and for the purpose described.
5. In a latch, the combination, with a key-actuated plug or barrel, of an endwise-movable bolt and a spindle arranged in axial alignment with the plug or barrel and connected therewith, said bolt and spindle being coupled to permit of reversal of the bolt without disconnecting the parts, as and for the purpose described.
6. In a latch, the combination of an endwise-movable bolt having a rack at its inner end, a key-actuated plug or barrel, and a spindle in axial alignment with and connected to the barrel and having a gear which meshes with the rack of the bolt, as and for the purpose set forth.
7. In a latch, the combination of an endwise-movable bolt provided with a rack, the spindle geared to said rack and provided with the shoulders *ee* at its inner end, and the plug or barrel having the stud *e'* adapted to impinge against the shoulders *e* of said spindle, as and for the purpose described.
8. In a latch, the combination, with the fixed cylinder and the jacket arranged at right angles to each other, of the reciprocating bolt in the jacket, a key-actuated plug fitted in one end of the cylinder and having the tumbler-controlled plungers and the stud *e'*, and the spindle fitted in the opposite end of the cylinder in line with the plug and having shoulders in the path of the stud *e'* of said plug, said spindle and bolt being connected by means which retracts the bolt when the spindle is turned on its axis, as and for the purpose described.
9. In a latch, the combination, with a cylinder, of a key-actuated plug or barrel fitted in one end thereof, a reciprocating bolt at right angles to the cylinder and disconnected from the barrel or plug, and an endwise-adjustable and turning spindle geared to the bolt and normally connected to the plug or barrel to turn axially therewith, said spindle connecting the bolt and plug for simultaneous operation and adapted to be withdrawn from engagement with either or both of said parts, as and for the purpose described.
10. In a latch, the cylinder having the longitudinal and circumferential grooves *m n* connected together, combined with a spindle having the guide-pin fitted in the grooves and provided with the gear-pinion, the reciprocating bolt having the teeth meshing with the gear-pinion on the spindle, and the key-actuated plug or barrel in axial alignment with the spindle and connected thereto, substantially as described.
11. In a latch, the combination, with a cylinder, of the spring-impelled bolt provided with the concentric annular shoulders forming the rack, the spindle operating in one end of the cylinder and having the gear-pinion meshing with the rack and the shoulders *ee* on its inner end, and the plug or barrel having the stud fitted between the shoulders and the tumbler-controlled plungers, which engage with the cylinder, as set forth.
12. In a latch, the axially-turning plug or barrel having the slots and passages, the two sets of plungers fitted in passages and arranged so that adjacent plungers project beyond the plug in opposite directions, the tumblers pivoted in the slots and connected to the plungers, and the springs, substantially as described.
13. In a latch, the combination, with a cylinder, of a plug or barrel having its V-shaped key passage or way and transverse passages connected by the radial slots, the tumblers pivoted in said slots, the plungers in the passages connected to the tumblers, and the springs bearing on the tumblers, substantially as described.

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

JOHN B. PRICE.

Witnesses:

CHAS. F. THAYER,
HENRY J. THAYER.