

(No Model.)

J. H. SHAW.
LOCK.

No. 469,951.

Patented Mar. 1, 1892.

Fig. 1

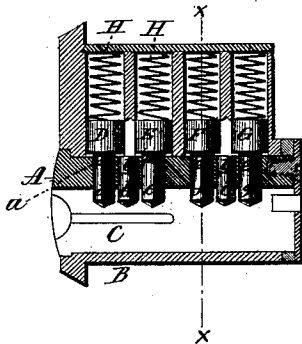


Fig. 2

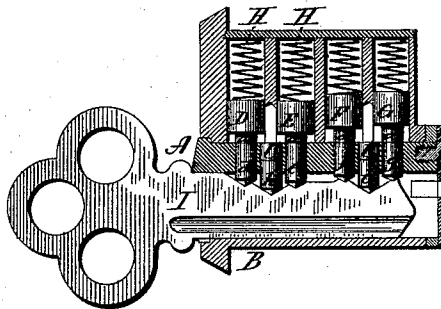


Fig. 3

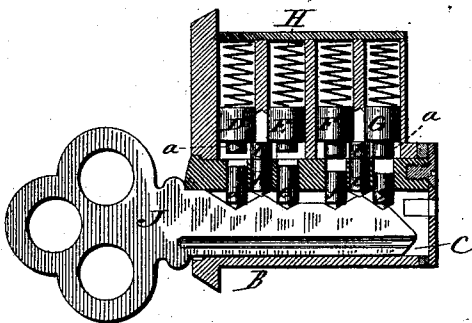
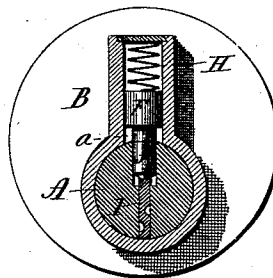


Fig. 4



Witnesses
J. H. Shaw
William D. Kealey

John H. Shaw
Inventor
By Atty
Earle Heywood

UNITED STATES PATENT OFFICE.

JOHN H. SHAW, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE SARGENT & COMPANY, OF SAME PLACE.

LOCK.

SPECIFICATION forming part of Letters Patent No. 469,951, dated March 1, 1892.

Application filed November 2, 1891. Serial No. 410,559. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. SHAW, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Cylinder-Locks; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a longitudinal central section cutting through the plane of the key-hole with all the parts in the normal position; Fig. 2, the same section showing the principal key in place for operation; Fig. 3, the same section showing the master-key in place for operation; Fig. 4, a vertical section cutting on line *x x* of Fig. 1.

This invention relates to an improvement in that class of cylinder-locks in which the cylinder is made rotative within its case and constructed to receive a flat key introduced longitudinally into the key-hole of the cylinder, the edge of the key bitted, combined with a series of tumblers in the case adapted to engage with the cylinder and a corresponding series of pins in the cylinder, upon which the bitted edge of the key is adapted to work, so that upon the insertion of the key the pins of the cylinder will force the tumblers out of engagement with the cylinder, and so as to permit the cylinder to be turned by the key.

The object of this invention is a simple construction whereby this class of lock may be adapted to the employment of a master-key which will unlock a series of locks, while the principal key of each lock will operate that particular lock, but none of the others of the series; and the invention consists in the construction, as hereinafter described, and particularly recited in the claim.

A represents the cylinder, which is arranged within the case B in the usual manner and is constructed with the usual longitudinally flat key-hole C, through which the key may be introduced.

D, E, F, and G represent a series of tumblers, more or less in number, which are arranged in the case radially to the cylinder,

and so that their inner end may engage with the cylinder when the tumblers are in their normal position, as represented in Fig. 1. Each tumbler is provided with its own independent spring H, the tendency of which is to yieldingly hold the tumblers in their cylinder-engaging position. The tumblers are each of larger diameter than the corresponding hole in the cylinder with which they are adapted to engage, and each tumbler is constructed with a projection *a* upon its lower end corresponding to the hole in the cylinder, and so that this formation of the ends of the tumblers produces a shoulder which will form a stop for the tumbler to arrest them in their normal or locking position. The projections *a* of the several tumblers preferably vary in length, as shown. In the cylinder radial pins *d, e, f, and g* are arranged, corresponding to the respective tumblers and adapted to move radially in their seats, but normally standing with their lower ends in the same longitudinal line, as represented in Fig. 1, and as usual for the pins in this class of locks. These tumblers and pins are adapted for the principal key I, (see Fig. 2,) so that when that principal key is inserted the respective pins *d, e, f, and g* will be raised until their outer ends come flush with the periphery of the cylinder and so as to raise the tumblers to a corresponding point, as seen in Fig. 2, which will liberate the cylinder from engagement with the tumblers, and so that by turning the cylinder may be rotated. As thus far described, the key-tumblers and their respective pins operate substantially in the usual manner of this class of locks. Between each two of the tumblers other pins *h i* are introduced, which normally stand with their lower ends in the same longitudinal level as the principal pins *d, e, f, and g*, as seen in Fig. 1; but these pins *h i* are shorter than the distance from the said plane to the periphery of the cylinder, so that normally between the ends of the pins *h i* and the periphery of the cylinder there would be a space. Into these spaces auxiliary pins *l* are arranged, the length of the auxiliary pins corresponding to the depth of the said space, and so that normally the outer ends of the auxiliary pins

will stand substantially flush with the periphery of the cylinder, as seen in Fig. 1; but the width or diameter of these auxiliary pins is less than the distance between the heads 5 or larger portion of the tumblers D E and F G, so that the shoulders of the said tumblers will overhang the said auxiliary pins, as clearly seen in Fig. 1.

The principal key I is constructed with its 10 bitted edge so that it has a recess corresponding to the pins *h i* of such shape and depth that when the key is in place, as seen in Fig. 2, it has no effect upon the said pins *h i*, but operates simply upon the pins *d, e, f, and g*.

15 The master-key J (see Fig. 3) is constructed with a bitted edge having projections *m*, which are adapted to operate only upon the intermediate pins *h i*, the remainder of the bit being of a shape so as to have no operative effect upon the principal pins *d, e, f, or g*. The extent of the projections *m m* on the 20 bit is such that when the key is in place, as seen in Fig. 3, it will raise the pins *h i* so far as to take the auxiliary pins *l* to a position to bring their lower ends flush with the surface of the cylinder, as seen in Fig. 3, and so that the auxiliary pins *l* will stand in the case, while the pins *h i* will remain in the cylinder, thus leaving the cylinder free from the case 30 so far as the pins *h i* are concerned. The outward or radial movement of the pins *h i* thus produced by the master-key causes the auxiliary pins *l* to operate against the shoulder of the principal tumblers D, E, F, and G, so as to raise those tumblers out of engagement 35 with the cylinder, and thereby leave the cylinder entirely free from engagement with the tumblers so that it may be rotated by turning the master-key in the same manner as by the principal key. The master-key pins *h i* and their auxiliary pins *l* are made alike throughout—a series of tumblers for which a single master-key is designed to operate—and so that that one master-key will operate through 45 the master-key pins to throw the tumblers out of engagement with the cylinder and independent of the pins of the principal tumblers; but the master-key pins, while inactive as to the principal key and operative only by the 50 master-key, afford an increased protection against tampering with the lock over what the same lock would possess without the master-key pins, for the reason that any radial movement of the master-key pins other than 55 that which is produced as by the master-key will bring the auxiliary pins into an engaging position between the cylinder and case, the same as any false position of either of the pins of the principal key would do.

60 While illustrating the principal pins and

their tumblers as four in number—that is, arranged in pairs, with an auxiliary tumbler between each pair—it will be understood that the master-key pins, with their auxiliary pins, 65 may be employed with a less number of tumblers and principal-key pins—as, for illustration, a single pair of tumblers D E, with their pins, may be employed with the single master-key pin *h* and its auxiliary pin *l* employed between them; or, as another illustration, a single 70 tumbler, as D, may be employed, with its principal-key pin and also with its master-key pin and auxiliary pin, so that it will be apparent that it is not necessary that the tumblers shall be arranged in pairs, it only being 75 essential that the tumblers shall be constructed with a laterally-projecting head, or so as to form a shoulder with a corresponding pin for the principal key, and with a master-key pin with an auxiliary pin between the said master- 80 key pin and the shoulder of the tumbler.

I am aware that cylinder-locks provided with a series of pins and tumblers have been constructed so that the tumblers may be operated by either the principal or master key 85 through the pins in the cylinder, and therefore do not claim, broadly, such a construction of cylinder-lock; but

What I do claim, and desire to secure by Letters Patent, is—

90 In a cylinder-lock, the cylinder arranged within a case and so as to be rotated therein, the cylinder constructed to receive a flat key having its edge bitted, one or more radial tumblers arranged in the case, each tumbler 95 provided with its spring and each adapted to interlock the cylinder with the case, and radial principal pins arranged in the cylinder and in the plane of the key-hole, corresponding to the respective tumblers, the said tumblers constructed with a laterally-projecting shoulder, 100 combined with a radial master-key pin arranged in the case in the plane with principal-key pin and parallel thereto, the said master-key pin divided into two lengths and adapted 105 under the action of the master-key to operate upon the shoulder of the tumblers, the division in the master-key pin being such that under the action of the master-key the outer portion will be forced from the cylinder into the case 110 and so as to bring the division between the two parts into line with the periphery of the cylinder, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses. 115

JOHN H. SHAW.

Witnesses:

BRUCE FENN,

NINA L. EGGLESTON.