(No Model.)

W. E. SPARKS.

CYLINDER LOCK.

No. 464,765. Patented Dec. 8, 1891.

Fig. 1

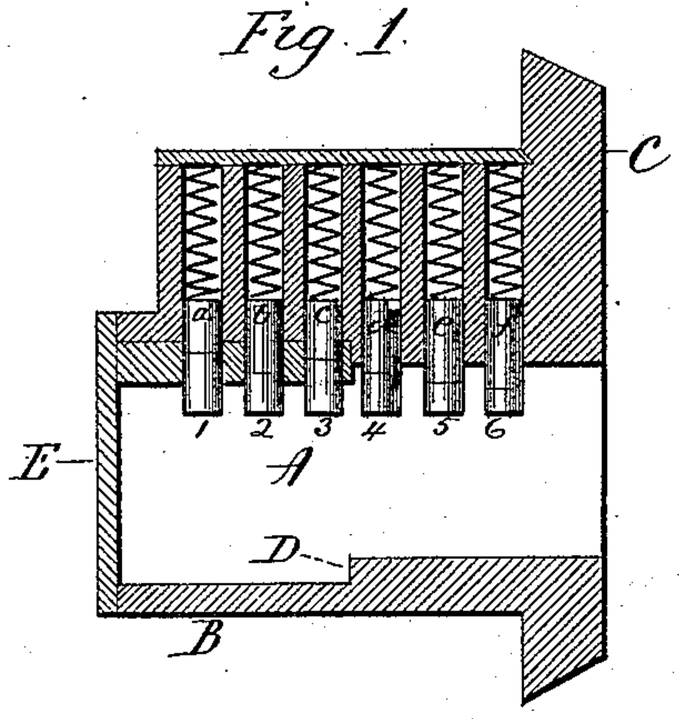


Fig. 4

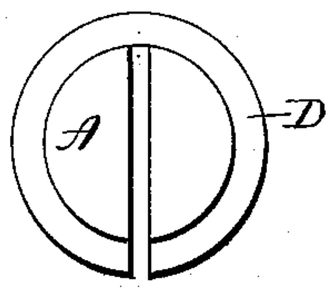


Fig. 6

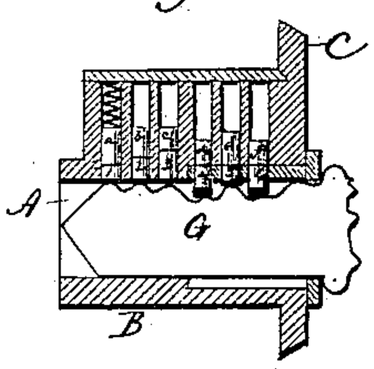


Fig. 2

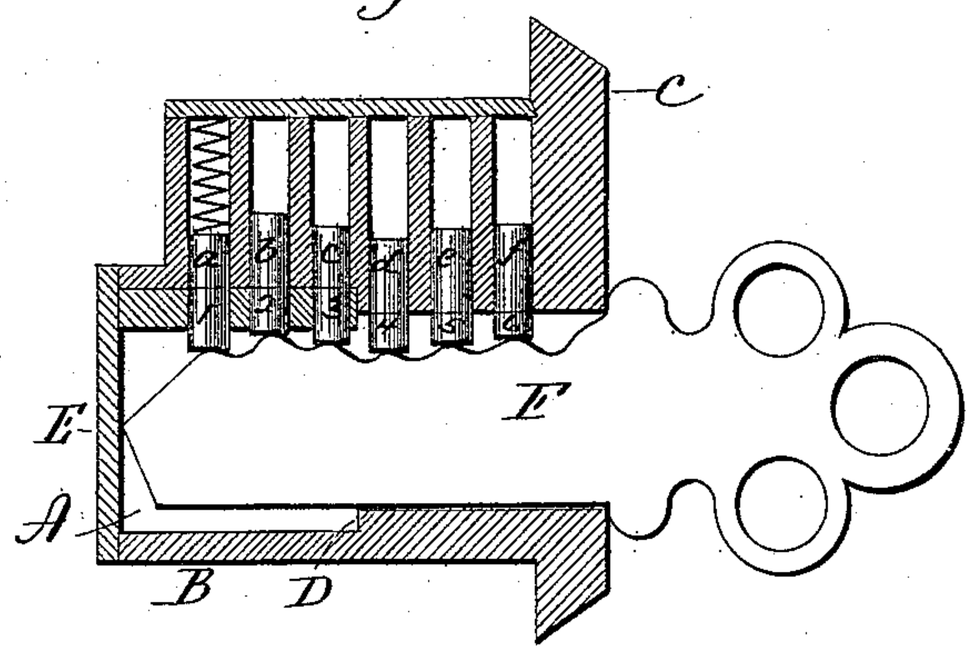


Fig. 7

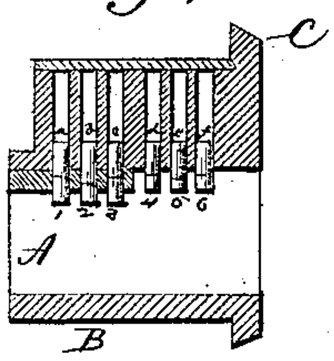


Fig. 3

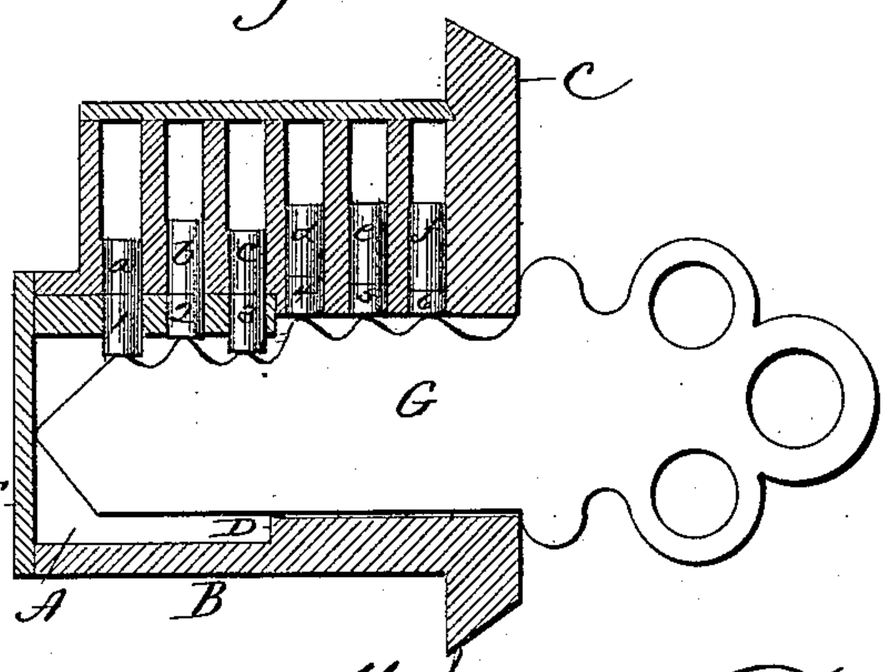
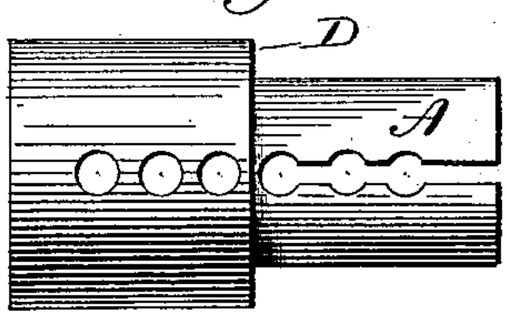


Fig. 5



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM E. SPARKS, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE SARGENT & COMPANY, OF SAME PLACE.

CYLINDER-LOCK.

SPECIFICATION forming part of Letters Patent No. 464,765, dated December 8, 1891.

Application filed August 31, 1891. Serial No. 404,278. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. SPARKS, 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 of the lock cutting through the key-hole, with the key removed and the parts in the normal condition; Fig. 2, the same view with the principal key in place; Fig. 3, the same with the master-key in place; Fig. 4, a front end view of the cylinder; Fig. 5, a top view of the cylinder; Figs. 6 and 7, modifications.

This invention relates to an improvement in that class of cylinder-locks in which the cylinder is arranged within a longitudinal case, the cylinder being constructed with a longitudinal flat key-hole, and in which radial pins or tumblers are arranged between the cylinder and case, adapted to be operated by the irregular shape of the edge of the key, so that the said pins may be brought into line with the periphery of the cylinder and the cylinder revolved by the turning of the key, or when the key is withdrawn the pins will interlock the cylinder and case, so that the cylinder may not be revolved, the object of the invention being to construct a series of locks each of which may be operated by its own independent key, and yet a master-key provided which will operate all the locks and without additional mechanism over that of the usual construction; and the invention consists in the construction as hereinafter described, and particularly recited in the claims.

A represents the cylinder; B, the case; C, the face-plate on the outer end of the case and through which the end of the cylinder projects in the usual manner. As here represented, the cylinder is reduced in diameter from about midway of its length toward the outer end, so as to form a shoulder D, the case being constructed with a corresponding shoulder, the cylinder introduced from the rear end and held in place by a collar E, applied to the rear end. The slot for the key-hole extends to the periphery of the reduced portion of the cylinder, as seen in Fig. 4, the width of the key-hole being less than the diameter of the pins, as seen in Fig. 5. The cylinder is provided with a series of pins 1, 2, 3, 4, 5, and 6, more or less in number, three of which 4, 5, and 6 are in the smaller diameter of the cylinder. In the case corresponding pins *a*, *b*, *c*, *d*, *e*, and *f* are arranged, as usual, in this class of pin tumbler-locks, each of the pins in the case being provided with corresponding springs, as shown, the tendency of the springs being to force the pins of the case onto the pins of the tumbler when the cylinder is in line therewith, and as seen in Fig. 1, and so that the pins of the case interlock with the cylinder, so as to prevent the turning of the case when the pins are in that position, and as seen in Fig. 1.

In Fig. 2, F represents the key, which is flat, and having one edge of irregular shape, corresponding to the irregular length of the cylinder-pins 1, 2, 3, 4, 5, and 6, and so that when inserted, as seen in Fig. 2, the said pins 1, 2, 3, 4, 5, and 6 will be forced radially outward to bring their outer ends flush with the surface of the cylinder, and so as to force the case-pins entirely into the case, and so as to leave the cylinder free to be turned by the key, as usual, in this class of locks.

The key F, Fig. 2, is the regular key for the lock, and operates all the pins or tumblers in the usual manner for this class of locks.

In Fig. 3, G represents the master-key. The edge of the master-key for the pins 1 2 3 is made the same as the principal key, so that when inserted it will force the pins outward into the same position as does the principal key; but that portion of the key which operates the pins 4, 5, and 6 corresponds to the diameter of the contracted portion of the cylinder, and so that it will force the cylinder-pins entirely out of the cylinder and bring their inner end flush with the periphery, as seen in Fig. 3. As the part of the key operating the pins 4, 5, and 6 brings those pins to the periphery of the cylinder it will operate the same upon the pins of other locks irrespective of their length, so that that portion of the pins will all be forced flush with the periphery of the cylin-

der when the master-key is inserted. These pins 4, 5, and 6 may therefore vary in length to any desirable extent, and so as to make a material variation in this part of the principal key; but for the pins 1 2 3 the bit of the key will be the same in all the individual keys as well as the master-key.

The cylinder is constructed with the reduced diameter in order to prevent the introduction of an instrument, which might readily force all the pins to the periphery of the cylinder, and thereby readily operate the lock by simply introducing a blade with a straight edge to bear against the inner ends of the cylinder-pins, and so as to bring them all into line. The reduction of the diameter of the cylinder permits only a portion of the pins to be thus operated, while the other pins may vary to so considerable an extent that tampering with the lock is very difficult.

It will be understood that either end of the cylinder or any portion of it may be thus reduced in diameter and having the pins therein arranged, as described, so that the master-key may bring them to a position flush with the periphery—as, for illustration, it may be made as seen in Fig. 6, with the larger diameter at the outer end—that is, the reverse of that first described.

The number of pins or tumblers may be varied, according to circumstances, as in other pin tumbler-locks.

While I prefer to reduce the diameter of the cylinder, as described, for the operation of the master-key, the cylinder may be made of equal diameter throughout, as seen in Fig. 7, but the slot for the key cut entirely through a part of the length of the surface of the cylinder, the master-key being made accordingly. Therefore while preferring the reduction of the diameter of the cylinder I do not wish to be understood as limiting the invention to such reduction.

I claim—

1. In a cylinder-lock, the combination of a cylinder having a portion of its length of a reduced diameter with a case of corresponding shape, the cylinder constructed with a longitudinal flat key-hole, a series of radial pins, a portion of which are in the larger diameter and the remainder in the smaller diameter of the cylinder, the pins of varying lengths, and corresponding spring-pins arranged in the case and adapted to engage with the pins of the cylinder when brought into line therewith with two keys, both of which have their edges bitted to correspond alike to the pins of the larger diameter of the cylinder and that portion of the bitted edge of the keys which corresponds to the pins in the reduced diameter of the cylinder, one of a projection corresponding to the length of the pins in the cylinder, so as to bring the outer end of said pins flush with the surface of the cylinder, the other having the same portion of the bitted edge of the key adapted to force the said cylinder-pins to a position with their inner ends flush with that portion of the cylinder, substantially as described.

2. In a cylinder-lock, the combination of a cylinder with a case of corresponding shape, the cylinder constructed with a longitudinal flat key-hole, which key-hole for a portion of its length extends through the periphery of the cylinder, but for the remainder of the length is closed on the periphery of the cylinder, a series of radial pins arranged in the plane of the said key-hole, a portion of the said pins being in that part of the key-hole which extends to the periphery of the cylinder, the pins varying in lengths, with corresponding spring-pins arranged in the case and adapted to engage with the pins of the cylinder when brought into line therewith, and two flat keys, one of which has its edge bitted through that portion corresponding to the open key-hole in the cylinder and corresponding to the length of the pins in that portion of the cylinder, so as to bring the outer end of said pins flush with the surface of the cylinder, and the other key having the same portion of its bitted edge adapted to extend to the said surface of the cylinder and to force the said cylinder-pins to a position with their inner ends flush with that portion of the cylinder, the remainder of the edge of both keys bitted alike and corresponding to the remainder of the pins in the cylinder, substantially as described.

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

WILLIAM E. SPARKS.

Witnesses:

FRED C. EARLE,

J. H. SHUMWAY.