(No Model.) 2 Sheets—Sheet 1.

H. VAN HOEVENBERGH.

LOCK.

No. 396,628. Patented Jan. 22, 1889.

Fig. 1.

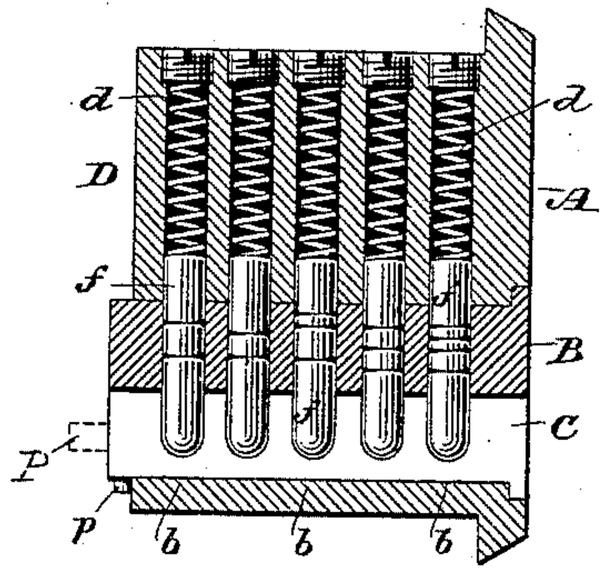


Fig. 2.

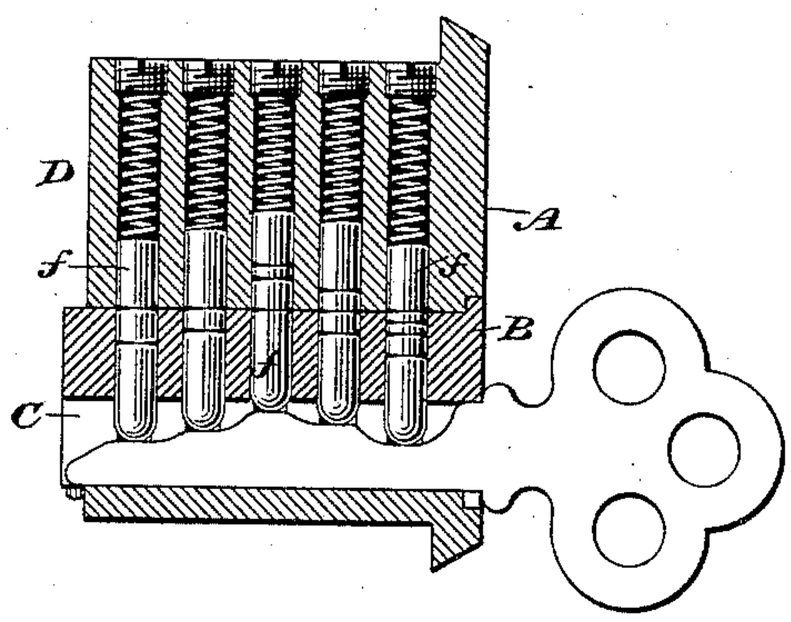


Fig. 3.

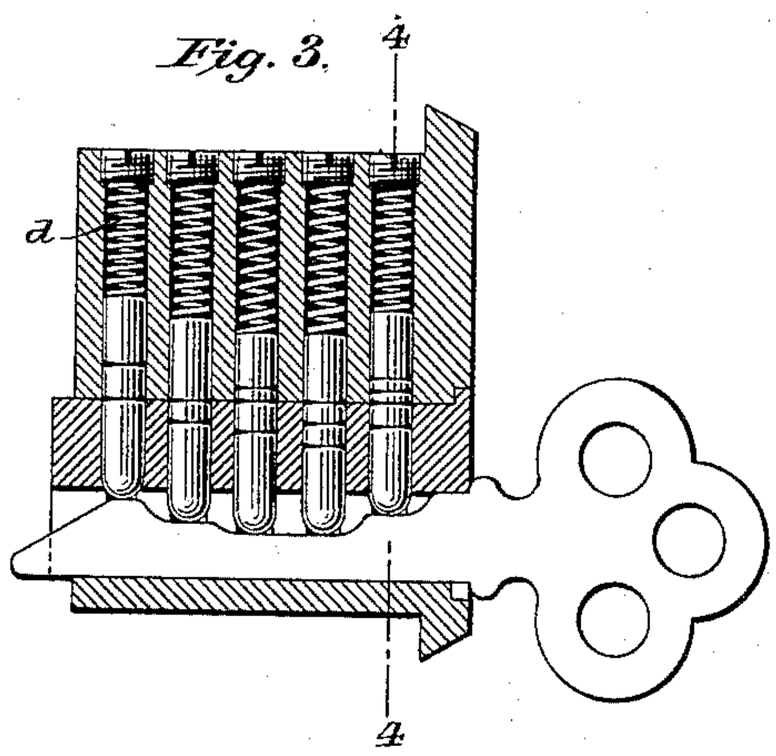


Fig. 4.

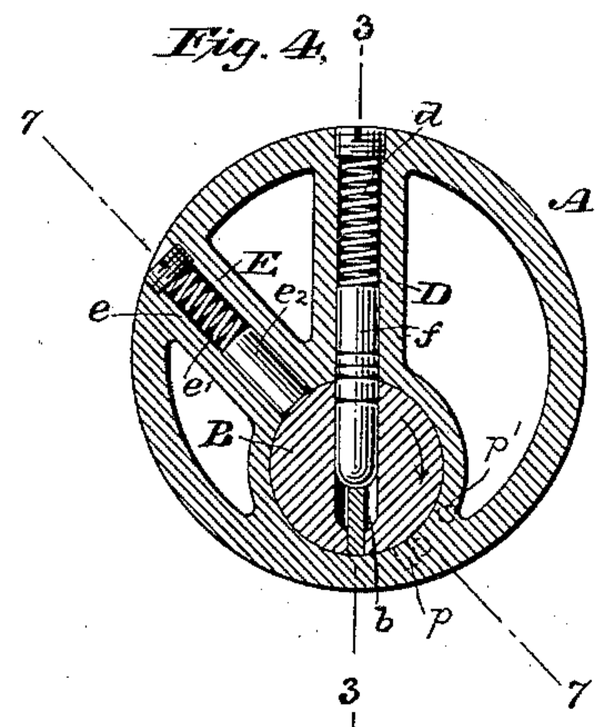


Fig. 5.

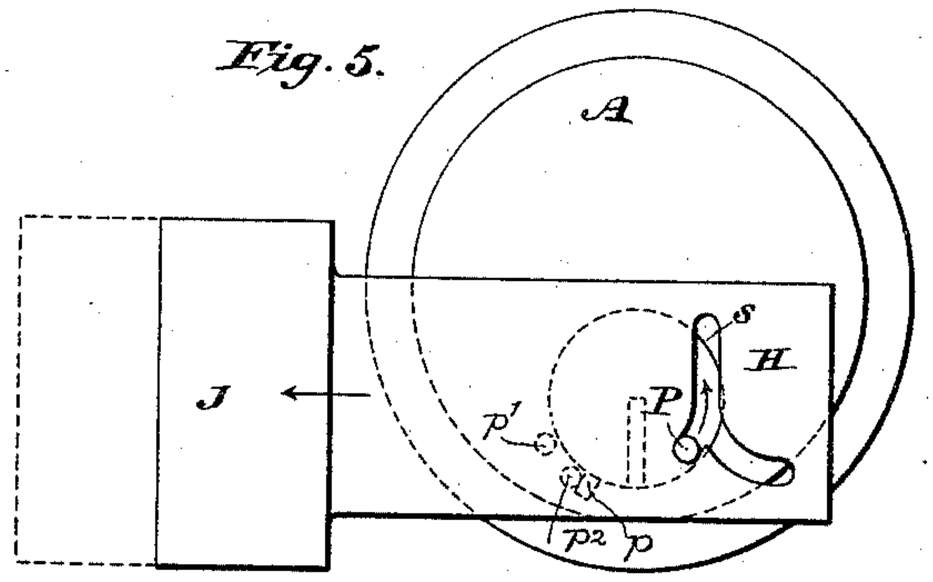
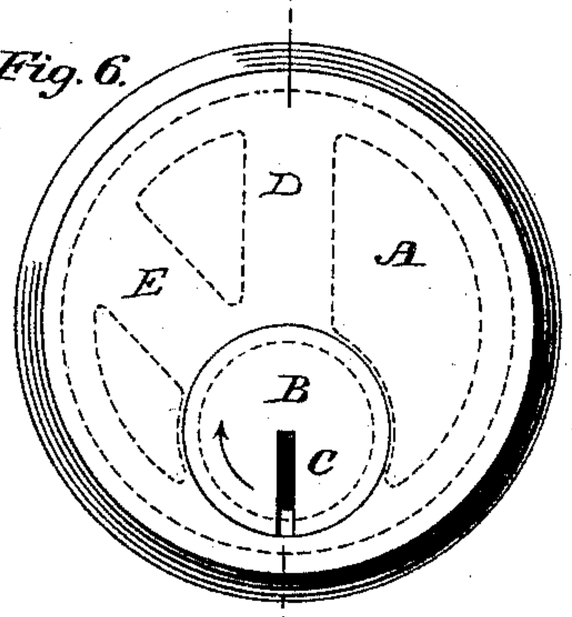


Fig. 6.



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(No Model.)

H. VAN HOEVENBERGH.

2 Sheets—Sheet 2.

LOCK.

No. 396,628. Patented Jan. 22, 1889.

Fig. 7.

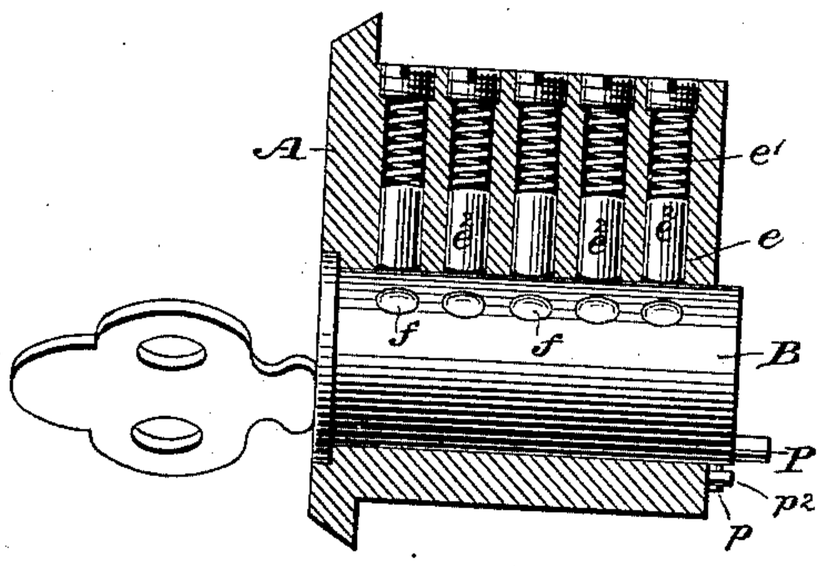
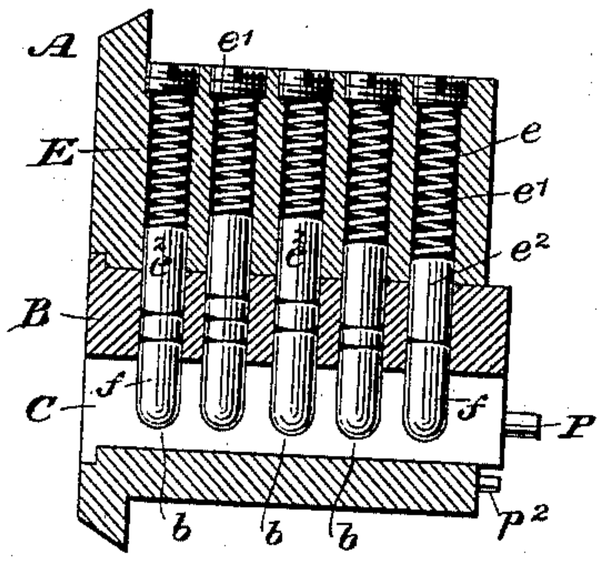


Fig. 8.



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By his Attorney
Pope Edgecomb & Perry

UNITED STATES PATENT OFFICE.

HENRY VAN HOEVENBERGH, OF NEW YORK, N. Y.

LOCK.

SPECIFICATION forming part of Letters Patent No. 396,628, dated January 22, 1889.

Application filed July 19, 1888. Serial No. 280,416. (No model.)

To all whom it may concern:

Be it known that I, HENRY VAN HOEVENBERGH, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Locks, of which the following is a specification.

The invention relates to the construction of the class of locks known as "pin-tumbler" locks. In the best known form of this lock, as described in Reissue No. 8,158, Letters Patent No. 48,475, to Linus Yale, Jr., a cylindrical portion is fitted to and revolves within a fixed portion. The cylinder has a series of holes or receptacles arranged in a line parallel with its axis and the fixed portion has a similar series. These are arranged to register with each other when the bolt is thrown. Within the holes are sectional pins or tumblers, and these, when the bolt is thrown and the key withdrawn, take their places across the line of junction of the cylinder and support and prevent turning the cylinder and moving the bolt.

The present invention relates particularly to this species of lock; and it consists in certain improvements whereby any one of a number of differently-shaped keys may be used to throw and lock the bolt, while it can then only be unlocked by the particular key which locked it. In other words, each different key when inserted forms by the conjoint action of itself and the tumblers a special matrix or combination which must be exactly reproduced in order to release the bolt.

By these improvements, also, the bolt may be secured in both the forward and back positions, and is not necessarily self-locking.

In carrying out the invention there is applied to the fixed portion of a lock of the class referred to two lines or series of receptacles for pin-tumblers, one of which is made to receive more or less of the tumblers, according to the conformation of the particular key which is employed, and when the key is turned the tumbler-carrier is moved into such a position that, as the key is withdrawn, locking-tumblers in the other series of receptacles are forced into the ducts of the carrier and hold the latter in its second position. These tumblers must be caused to resume their position by the same key in order that the movable carrier can be again turned into its first position to withdraw the bolt. In order to increase the possible number of combinations and the resulting security of the lock the pin-tumblers are made of varying lengths.

In the accompanying drawings there are shown the various essential parts of the locking mechanism.

Figure 1 is a sectional view when the bolt is withdrawn. Fig. 2 is a section showing a key inserted, which brings a line of separation of the tumblers into the line of junction of the tumbler carrier and receiver, so that the carrier may be revolved and the bolt thrown. Fig. 3 is also a section showing a key of a different form inserted and bringing a different line of separation of tumblers into the line of junction of carrier and receiver. Fig. 4 is a transverse section through the line 4 4 of Fig. 3. Fig. 5 shows a convenient device, as seen from the back, for moving the bolt by the revolution of the carrier. Fig. 6 is a front view of the lock. Fig. 7 is a section through 7 7 of Fig. 4. Fig. 8 is a section through 7 7 of Fig. 4 after the carrier has been revolved, the bolt thrown, and the key withdrawn.

In an application filed January 17, 1888, Serial No. 261,049, (Patent No. 387,833, dated August 14, 1888,) certain features here shown are shown and claimed.

Referring to the figures, A represents the stationary fixed support, in which is placed the movable carrier B. This is provided with a longitudinal slot, C, into which the key is inserted in a manner well understood, and also the series of ducts *b*. The stationary part is provided with two series of pin-tumbler receptacles, D and E. The series D corresponds to that which has heretofore been employed in a Yale lock containing the springs *d d*, which tend to force the locking-tumblers *f f* forward into the corresponding ducts, *b*, in the movable carrier B. The second line or series of receptacles, E, consists of an equal number of ducts, *e e*, which are directed toward the axis of the movable cylinder, and each duct is provided with a spring, *e'*, which tends to force the corresponding pin-tumblers, e^2, toward the movable carrier B. When the latter is in such position that its ducts are in

alignment or register with the series of ducts D and the key is withdrawn, the parts assume the position shown in Fig. 1. If the key is inserted, more or less of the pin-tumblers are forced into the several ducts of the series D, as shown in Fig. 2, and remain lodged there, while the carrier is turned into its second position.

In Figs. 1, 2, and 3 it will be observed that the tumblers are shown in three different positions. In Fig. 1 the parts are in the positions that they occupy when the bolt is in its back position and the key withdrawn. In Fig. 2 a key of a certain shape is inserted and its several steps have raised the pin-tumblers into such a position that a line of junction of the tumblers is brought exactly to the line which separates the surfaces of the fixed and movable holders. In Fig. 3 a key of an entirely different construction is shown as regards its steps, and a different line of junction of the tumblers is brought into the line of separation of the surfaces of the two holders. In other words, each of these keys has forced a different combination of tumblers into the upper or fixed receptacle, D. If now the key in Fig. 3 is turned to the right, as indicated in Fig. 4, and the movable cylinder is carried through nearly a whole revolution, it finally brings its line of tumblers into agreement with the line of tumblers in the second series of ducts, E, or on the line 7 7 of Fig. 4. The tumblers in this second receptacle may be all of the same length, as shown in Fig. 7, and if, when the carrier has been revolved to this point, as described, the key is withdrawn the parts take the position shown in Fig. 8—that is, as the key is withdrawn the springs e' force the tumblers across the line of separation of the fixed and movable carrier and lock them in that position. It will from this readily be seen that a number of differently-shaped keys may be used to bring lines of junction of the tumblers into agreement with the line of meeting of the surfaces of the two holders, and it will also be seen that when the parts are brought into the positions shown in Fig. 8 it will be absolutely necessary to use a key similar in shape to that which left the tumblers in the positions therein shown in order to again bring them into such a position that the fixed and movable holders can be separated, and it will also be readily seen that by varying the relative lengths of the tumblers in the several receptacles the possible number of keys, each of different form, that can be used may be increased indefinitely.

In order to insure the coincidence of the lines of ducts in the fixed and movable holders, the pin p is fixed in a suitable place upon the movable part B and the pins p' and p^2 are fixed upon the support A. These prevent a complete revolution of the carrier B, but form limiting-stops and fix the positions where the key may be inserted and withdrawn.

In Fig. 5 there is shown a convenient device for throwing the bolt by the revolution of the carrier B. A pin, P, projects from the rear of B and moves in a slot, *s*, in the extension H of the bolt J. The arrows indicate the relative movements.

I claim as my invention—

1. In a pin-tumbler lock, the combination, with a revolving tumbler-carrier, of a stationary holder having two series of ducts, in line with either of which the line of tumblers in the carrier may be placed by the revolution of the carrier.

2. The combination of a tumbler-case and a key-cylinder revolving therein, the case containing two series of tumbler-recesses, and the cylinder having one series of tumbler-recesses, which latter may be made to coincide with either series of recesses in the case by the revolution of the carrier, and tumblers of varying lengths in said recesses.

3. The combination of a tumbler-case having two series of tumbler-recesses, a tumbler-carrier or key-cylinder having one series of tumbler-recesses, which may be brought into line with either series in the tumbler-case by the revolution of the cylinder, and limiting-stops for arresting the cylinder in either position.

4. The combination of a tumbler-case having the series of tumbler-recesses, a tumbler-carrier or key-cylinder having one series of tumbler-recesses, which may be brought into line with either series in the tumbler-case by the revolution of the cylinder, limiting-stops for arresting the cylinder in either position, and tumblers of varying lengths in said recesses, whereby keys of different forms may be used to operate the lock.

In testimony whereof I have hereunto subscribed my name this 1st day of June, A. D. 1888.

HENRY VAN HOEVENBERGH.

Witnesses:

DANL. W. EDGECOMB,

CHARLES A. TERRY.