No. 860,940. PATENTED JULY 23, 1907.

J. ROCHE.

MULTIPLE KEY LOCK.

APPLICATION FILED JUNE 1, 1906.

Fig. 1

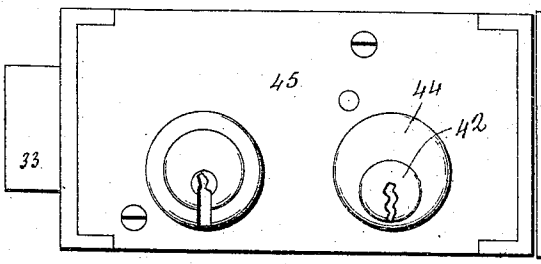


Fig. 2.

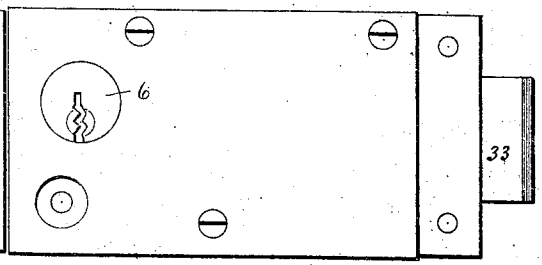


Fig. 3

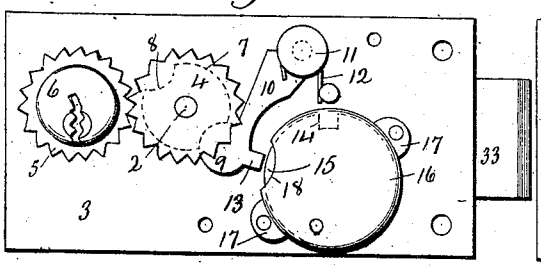
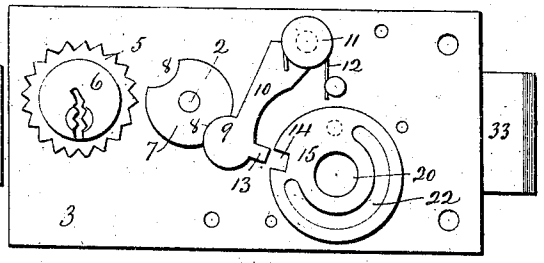


Fig. 4



a Fig. 5

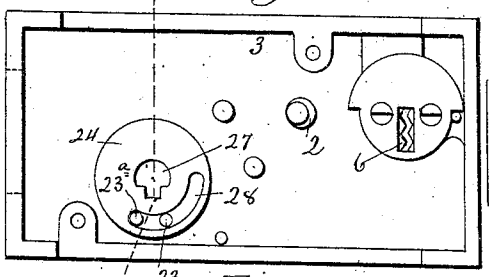


Fig. 6

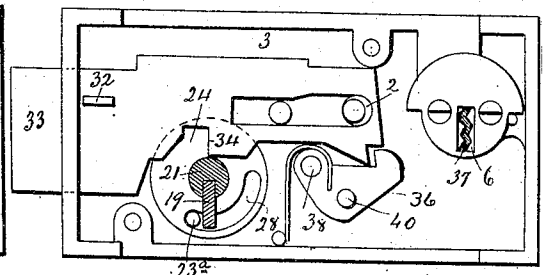
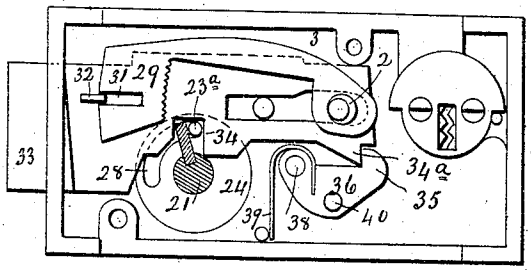
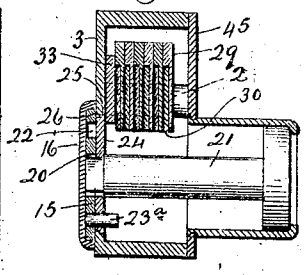


Fig. 7

Fig. 8

Fig. 12





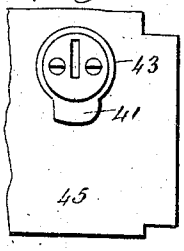


Fig. 9

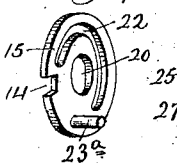


Fig. 10

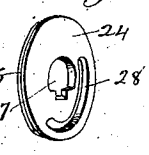
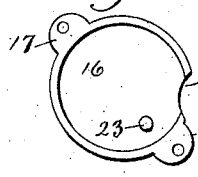


Fig. 11.



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James Roche
Inventor.
By attys Seymour & Earle

UNITED STATES PATENT OFFICE.

JAMES ROCHE, OF TERRYVILLE, CONNECTICUT, ASSIGNOR TO EAGLE LOCK CO., OF TERRYVILLE, CONNECTICUT, A CORPORATION.

MULTIPLE-KEY LOCK.

No. 860,940. Specification of Letters Patent. Patented July 23, 1907.

Application filed June 1, 1906. Serial No. 319,685.

To all whom it may concern:

Be it known that I, JAMES ROCHE, a citizen of the United States, residing at Terryville, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Multiple-Key Locks; and I do hereby declare the following, when taken in connection with the 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 view in front elevation of a multiple-key lock constructed in accordance with my invention. Fig. 2 a view in rear elevation with the back-cap in place. Fig. 3 a view in rear elevation with the back-cap removed. Fig. 4 a view in rear elevation with the back-cap removed as well as the wheel carried by the eccentric and the small housing for the key-disk. Fig. 5 an inside view of the lock as stripped. Fig. 6 an inside view of the lock with the main bolt and guard-hook in place, with the key-center and its key in section, and the operating-pin of the key-disk in position to be immediately engaged by the key. Fig. 7 a corresponding view to which has been added one two-part tumbler and in which the key is shown as turned as far as it will go with the effect of moving the bolt sufficiently to bring the notch of the key-disk into registration with the nose of the locking-pawl as shown in Fig. 4. Fig. 8 a view in transverse section on the line *a*—*b* of Fig. 5 showing all of the tumblers in place. Fig. 9 a detached perspective view of the key-disk. Fig. 10 a corresponding view of the key-center disk. Fig. 11 a detached view in inside elevation of the housing for the key-disk. Fig. 12 a broken inside view of the front cover of the lock-case.

My invention relates to an improvement upon the multiple-key two-part tumbler lock of United States Patent No. 666,697 granted January 29, 1901, to the Eagle Lock Company on my application, the object of my present invention being to prevent the derangement of the tumblers and the fouling of the lock by the inadvertent or surreptitious separation by wrong or improper keys of the complementary parts of the tumblers which by my improvement are guarded against being unlocked and separated except after the lock has been specifically operated by the key to which it is set.

With these ends in view my invention consists in a multiple-key two-part tumbler lock having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

As herein shown the adjusting eccentric 2 is extended through the back of the lock-case 3 and provided with a wheel 4 meshing into a wheel 5 carried by the plug 6 of a supplemental pin-tumbler lock mounted in the case in accordance with the invention of James Murphy, which has been made the subject of a separate application May 9, 1906, Serial Number 315,859. It is to be understood, however, that my present improvement is not necessarily associated with the said improvement of the said James Murphy, though well adapted to be combined therewith.

A disk 7 mounted upon the eccentric 2 and located directly under the wheel 4 and rotating with the same and with the eccentric as though all were made in one piece, is formed with oppositely located semi-circular recesses 8, 8, receiving the rounded nose 9 of a locking-pawl 10 hung upon a stud 11, operated by a spring 12 and having a tooth 13 arranged to be entered into a locking-notch 14 in the periphery of a disk 15 (Fig. 9) located within a shallow circular cap-like housing 16 (Fig. 11) having ears 17 by means of which it is riveted to the back of the case 3. This cap has a portion of its edge cut away to form an opening 18 for the entrance of the tooth 13 aforesaid into the notch 14 when the same is brought into registration with it by the rotation of the disk 15 by the clients-key 19 to which the lock is at the time set. The disk 15 has a central opening 20 for the clearance of the inner end of the key-center 21 and with a concentric segmental slot 22 for the reception of a stop-pin 23 projecting into it from the housing 16 and located therein so that the end of the slot contiguous to an operating-pin 23^a carried by the disk 15 will engage with the said stop-pin 23 so as to leave the said operating-pin 23^a in just the right position for being engaged by the clients-key 19 when the same is inserted into the lock. Then at the very beginning of the turning movement of the key from left to right, the key through the operating-pin 23^a will turn the disk 15 from left to right and provided the key is the right key it will turn the disk 15 until the notch 14 thereof is brought into alinement with the tooth 13 of the pawl 10 as will be more fully described later on.

To provide for restoring the disk 15 to its normal position and therefore for repositioning its operating-pin 23^a, I employ a corresponding disk 24 located within the case 3 and formed with a bearing-shoulder 25 rotating upon a corresponding shoulder 26 sunk below the level of the bottom of the case. This disk has an irregular central opening 27 for the reception of the inner end of the key-center 21 by means of which this disk is operated, for which reason I shall hereafter call it the "key-center disk" to distinguish it from the disk 15 which I shall hereafter call the "key-disk" for the reason that it is operated by the clients key. This key center-disk 24 has a segmental slot 28 receiving the operating-pin 23^a with which the upper or right hand end of the slot engages so that when the disk 24 is turned from right to left by the turning of the key 19 from right to left preparatory to removing the said

key, the disk 24 will, through the said pin 23^a carry the key-disk 15 back into its starting position in which it is shown in Figs. 5 and 6. Any key introduced into the lock through the key-center 21 and turned from left to right will engage with the operating-pin 23^a and turn the key-disk 15 from left to right for a distance dependent upon the character of the key. When the key is turned back preparatory to its removal, the key-center 21 will turn the key-center disk 24 which through the medium of the pin 23^a will act to turn the key-disk 15 back to the position from which it was started. But no key but the special clients-key 19 to which the lock is set at the time, will carry the key-disk 15 far enough from left to right to bring its notch 14 into registration with the tooth 13 of the pawl 10. Therefore no key but the right or proper or legitimate key, as it may be called, can be put into the lock and operated so as to unlock the complementary parts of its two-part lever tumblers each of which consists of a main part 29 and a supplemental part 30. If they cannot be unlocked they cannot be fouled and "mixed up", and of course the right key would never be used to that end. For convenience and so as not to obscure the other mechanism of my improved lock, I have shown only one of these tumblers in Fig. 7. A detailed account of their description and operation will be found in my prior patent already referred to.

In order to turn the key-disk 15 far enough from left to right to bring its notch 14 into registration with the tooth 13, all of the two-part tumblers must be operated by the bittings of the key so as to bring the slots 31 in their main parts 29 into registration with a stump 32 on the main key-bolt 33 as illustrated by Fig. 7 in which a single tumbler is shown. Just before the slots 31 in the tumblers have been brought into alinement with the said stump 32, the operating-pin 23^a has been brought into engagement with an operating shoulder 34 on the bolt 33, whereby the key, acting through the operating-pin 23^a, moves the bolt 33 inward until the shoulder 34^a at its end is brought into engagement with the nose 35 of its guard-hook 36 as shown by Fig. 7. During this movement the stump 32 enters the slots 31 in the tumblers and during this movement also the operating-pin 23^a moves far enough from left to right and with it, the key-disk 15, to bring the notch 14 therein into registration with the tooth 13 of the pawl 10. It is this last movement of the operating-pin 23^a and disk 15 which is required to bring the notch 14 into registration with the tooth 13, and this last movement is only possible by the entrance of the stump 32 into the slots 31 of the tumblers and the slots 31 of the tumblers can only be brought into registration with the stump 32 by the particular clients-key 19 to which the lock is at the time set. Therefore the operation of the lock so as to bring the notch 14 in the key-disk 15 into registration with the tooth 13 of the pawl 10 can only be effected by the particular clients-key to which the lock has been set, from which it follows that no wrong key nor improper key if inserted into the lock in place of the right key cannot possibly derange or foul the lock by effecting the unlocking of the two-part tumblers since the unlocking of the tumblers can only be effected after the notch 14 has been brought into registration with the tooth 13 for at all other times the tooth 13 rides upon the edge of the key-disk 15 and effectually locks the eccentric 2 against rotation. When, however, the notch 14 has been registered with the tooth 13 the eccentric 2 which passes through the supplemental parts 30 of the tumblers may be turned for unlocking the complementary parts of the two-part tumblers after which they may be set to a new key and there relocked by turning the eccentric back to its normal position, all as fully described in the prior patent referred to.

In the particular lock shown the eccentric 2 is further safe-guarded by a supplemental pin-tumbler lock having the said plug 6 receiving the "manager's" key 37 (shown in section in Fig. 6) which is inserted into the plug for unlocking the same and turning the wheel 4 which revolves the wheel 5 which turns the eccentric 2 which separates the complementary parts of the tumblers. It is when the parts of the tumblers are so separated that a new clients-key is put into the lock after which the "manager's key 37 is turned back with the effect of rotating the wheels 4 and 5 and returning the eccentric 2 into its normal position whereby the complementary parts of the tumblers are relocked in new positions determined by the bittings of the new key. The said key 37 is then removed from the plug 6. It will be understood, of course, that when the wheel 5 is turned the disk 7 is revolved with the effect of lifting the rounded nose 9 of the pawl 10 out of one of the recesses 8 against the tension of the spring 12, whereby the tooth 13 is entered into the notch 14 which thus becomes a clearance notch.

In the lock shown, the guard-hook 36 which holds the bolt 33 in its locked position, is hung upon a stud 38, provided with a spring 39 and carries a pin 40 engaged by a cam 41 on the inner end of the plug 42 of a pin-tumbler guard-key lock 43 mounted in a cylinder 44 in the front cover 45 of the lock-case 3.

I do not limit myself to the particular construction shown and described, as locks of this character will be varied in detail to meet the requirements of different banks and other users, my particular invention residing in means for making the turning of the eccentric 2 by which the complementary parts of the tumblers are separated and unlocked dependent upon the use of the particular key to which the lock is set.

I claim:

1. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers preparatory to resetting them and for relocking them after they have been reset, a notched disk and a locking pawl, the said disk having its notch brought by a key of the lock into operative relation with the said pawl preparatory to turning the eccentric for resetting the tumblers.

2. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, a key-center for the reception of a key to coact with the said tumblers, a key-center disk, a key-disk operated in one direction by the key itself, and in the opposite direction by the key-center disk, and locking means interposed between the key-disk and the said eccentric.

3. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, a key-center for the reception of a key coacting with the said tumblers, a key-center disk.

a key-disk operated by the key in one direction and by the key-center disk in the opposite direction, and a pawl coacting with the key-disk which normally holds it in its locked position and which coacts with the eccentric for normally locking the same.

4. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, a key-center for the reception of a key coacting with the said tumblers, a key-disk operated in one direction by the key itself, and in the opposite direction by the key-center disk, a pawl coacting with the key-disk, and a recessed disk mounted upon the eccentric and coacting with the said pawl which normally holds the eccentric in its locked position.

5. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, a main bolt, a key-center for the reception of a key coacting with the said tumblers, a key-disk operated in one direction by the key itself and in the opposite direction by the key-center disk and coacting with the main bolt, and means interposed between the key-disk and the eccentric for normally holding the same in its locked position.

6. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, a main bolt, a key center for the reception of a key coacting with the tumblers and the said bolt, a key-center disk, a key-disk coupled with the key-center disk for being turned in one direction thereby, an operating-pin mounted in the key-disk and directly engaged by the key for being turned thereby in one direction and directly engaged with the bolt for moving the same to enter its stump into the alined slots of the tumblers, and locking means interposed between the key-disk and the eccentric.

7. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, a main bolt, a key-center for the reception of a key coacting with the said tumblers and bolt, a key-center disk mounted in the lock-case and rotated by the key-center, a key-disk coupled with the key-center disk for operation in one direction thereby, a cap-like housing applied to the back of the lock-case for the reception of the key-disk, and means interposed between the key-disk and the eccentric for normally holding the same locked.

8. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after the have been reset, a main bolt, a key-center for the reception of a key coacting with the said tumblers and bolt, a key-center disk, a notched key disk turned in one direction by the key-center disk and in the opposite direction by the key itself, a locking pawl having a tooth to enter the notch in the said disk, and a disk mounted upon the eccentric and coacting with the said pawl which is normally held in its locked position by the riding of its tooth upon the edge of the key-disk.

9. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, means controlled by a key for unlocking and relocking the said eccentric, and a supplemental lock for the said eccentric.

10. In a multiple-key lock, the combination with a plurality of two-part lever-tumblers, of an adjusting eccentric for temporarily unlocking the complementary parts of the said tumblers for resetting them and for relocking them after they have been reset, means controlled by a key for unlocking and relocking the said eccentric, a supplemental pin-tumbler lock, a wheel mounted upon the plug thereof, and a wheel mounted upon the eccentric and meshed into by the wheel aforesaid.

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

JAMES ROCHE.

Witnesses:
OTIS B. HOUGH,
HARRY C. CLOW.