

No. 690,537.

Patented Jan. 7, 1902.

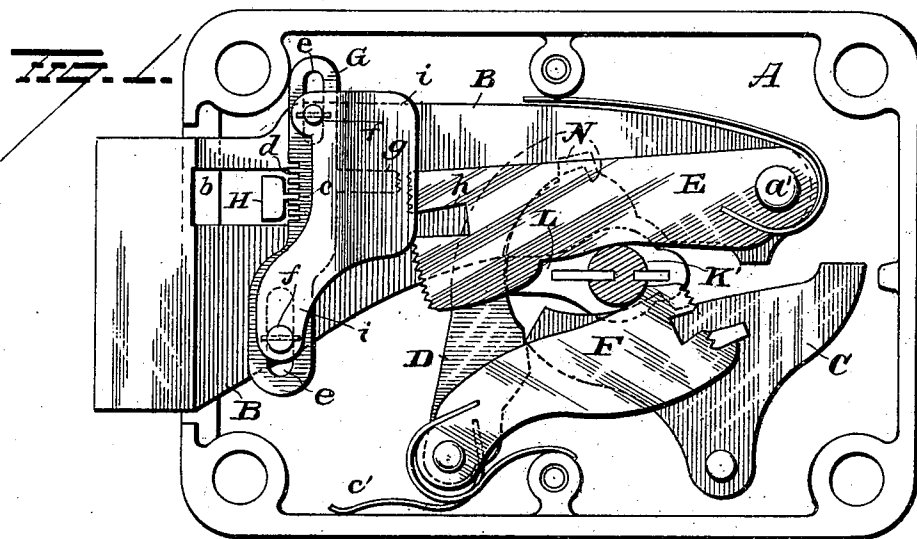
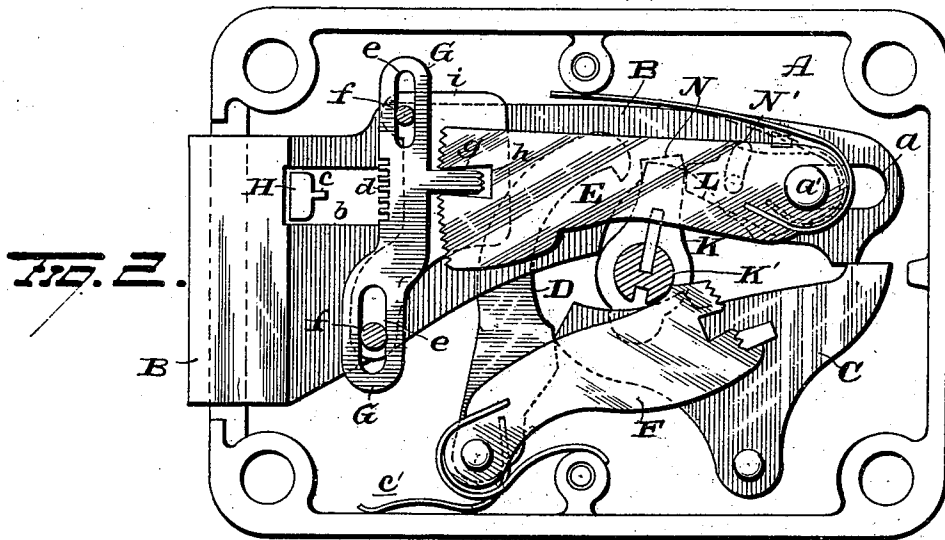
W. H. TAYLOR.

CHANGEABLE COMBINATION KEY LOCK

(Application filed Mar. 18, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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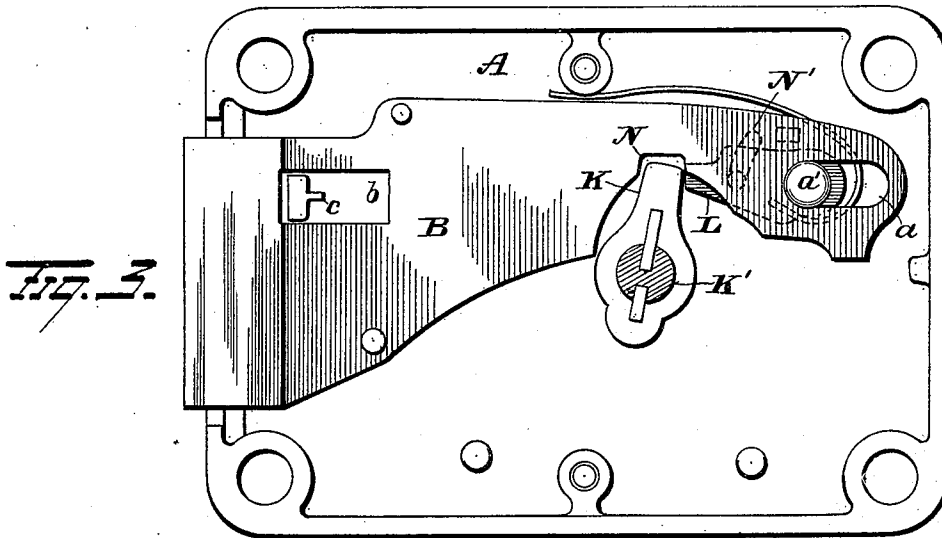
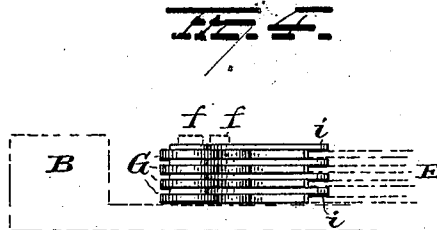
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

WARREN H. TAYLOR, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE
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CHANGEABLE-COMBINATION KEY-LOCK.

SPECIFICATION forming part of Letters Patent No. 690,537, dated January 7, 1902.

Application filed March 18, 1901. Serial No. 51,721. (No model.)

To all whom it may concern:

Be it known that I, WARREN H. TAYLOR, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Changeable-Combination Key-Locks; 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 ap-
10 pertains to make and use the same.

My invention relates to an improvement in changeable-combination key-locks; and it consists in the parts and combinations of parts, as will be more fully described, and
15 pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of my improved lock with the face-plate of the casing removed and the bolt in its locked position. Fig. 2 is a similar view showing the bolt in its unlocked position. Fig. 3 is a view of the mechanism for preventing the withdrawal of the key, and Fig. 4 is a detached view of the movable
20 fences and their casing.

A represents the lock-casing, and B the bolt slidingly mounted therein and provided with an elongated slot *e* for the passage of the fixed stud *a*, on which the tumblers E are mounted, and with a slot *b* for the stationary
30 spline H. This stationary spline H is provided with a tooth *c*, adapted to engage the notches *d* in the movable or changeable fence or fences G, which latter are slidingly mounted on and carried by the bolt B. There is a
35 fence G for each tumbler E, and each fence is provided with a series of notches *d* for engaging the tooth *c* of the stationary spline, and each is also provided adjacent to its ends with the elongated slots *e*, through which the
40 pins *f*, carried by the bolt, pass, and with a rearwardly-projecting tongue *g*, designed to enter the gating *h* in the tumbler. In the lock illustrated I have shown four tumblers and four fences. These fences are moved to
45 their proper positions by the tumblers and must necessarily remain undisturbed when once moved. Hence in order to prevent one fence from moving another by frictional contact therewith I locate the thin plates *i* be-
50 tween the several fences and also preferably

on or against the outer face of the outer fence, and as these spacing or friction plates are secured to the pins *f* the several fences are separated and prevented from imparting movement to the adjacent fences. Again, these fences are restrained against accidental movement when once set by their respective tumblers by the frictional contact of the friction or spacing plates. Hence after the
55 tongues of the fences pass out of the gatings in the tumblers preparatory to engaging the tongue on the stationary spline H the fences G are retained in their respective positions by the frictional contact of the plates *i*. These spacing or friction plates also engage and
60 separate the free ends of the tumblers, as clearly shown in Figs. 1 and 2, and hold them against any undue accidental movement and properly spaced to engage their respective
65 fences.

N is a recess formed in the edge of the bolt for the operation of the cam K of the key-hub K'. This cam when turned engages the side walls of the recess and slides the bolt
70 back and forth. The key-hub K' is provided with two slits to receive each of the two keys, respectively.

Mounted on the stud *a* below the bolt is the spring-pressed cam-stop L, the front end of which when the bolt is retracted rests in the path of the cam K and prevents the latter from turning sufficiently to bring the key to a position where it may be withdrawn. The combination under which the bolt is locked is, however, regulated by the key, which
75 throws the bolt to a locked position. Hence in order to change the combination it is necessary to change keys when the bolt is in its unlocked position, and in order to permit of the removal of the key I provide the pivoted
80 cam-stop L with a pin N, which latter passes through an elongated slot in the casing A. By moving this pin the stop L will be carried out of the path of the cam K, thus permitting the key-hub to be turned to the position
85 where the key can be removed. When a key is again inserted, the stop L will yield under the pressure and permit the cam to pass and automatically fall into position behind in rear
90 of the cam, so that unless the stop be re- 100

moved or elevated, as above explained, the key cannot be removed when the lock is unlocked.

With the construction thus far described it will be seen that the positions of the fences are automatically controlled by the particular key employed in throwing the bolt to its locked position.

By referring to Fig. 2 it will be seen that as the key is turned and each biting thereof engages its corresponding tumbler the fences of the several tumblers will be raised to the particular heights corresponding to the biting of the key. Now as the key continues to turn the bolt moves forward, and the movable or changeable fences all engage the stationary spline H and will be held at the particular elevation at which they were set by the key with which the lock was locked. Consequently when this same key is again inserted for retracting the bolt it will again raise the tumblers to their proper positions relative to their respective fences, so that the tongues or arms of the several fences will slide into the gatings of their respective tumblers. If, however, a different key be inserted, the gatings in the tumblers will not register with the tongues or arms of the fence, thus absolutely preventing the unlocking of the lock with any key other than the one employed for locking it.

It should be borne in mind that the bittings of the keys must bear a certain fixed relation to the notches in the changeable fences, so that when the key is operated the raising of the tumblers will raise the changeable fences to just the right points, so that they will engage properly with the stationary spline H.

Although the mechanism above described is applicable to locks of any type, I have shown it in connection with a guard-key mechanism which is used in connection with safe-deposit locks or other locks where the presence of a custodian or other person holding a second key is necessary before the lock can be unlocked. This guard-key mechanism comprises one or a series of tumblers F, mounted on the stud j and each provided with a gating to receive the fence on guard-lever C. This guard-lever is approximately triangular in shape and is designed at its rear end to be engaged by the bolt B, which operates to reset the guard mechanism, while its front end is designed to engage the cam-locking lever D, as shown in Figs. 1 and 2. This second set of tumblers F is engaged by a guard-key inserted in the second slot in the key hub or plug K', and when moved by the key the gatings in their ends are brought into line with the fence on guard-lever C, thus permitting the latter to turn. During this turning movement its front end engages the cam-locking lever D and carries the hooked end thereof out of the path of the cam K. This hooked end normally rests in the path of the cam K and prevents it from being turned sufficiently

to throw the bolt to an unlocked position. As the bolt B nears its unlocked position it engages with the heel or rear end of guard-lever C, withdraws its fence from the tumbler-notches, and leaves it in its locked position.

When the bolt B is moved outwardly to a locked position, the cam-locking lever D is forced out of the way by the cam K, and after the latter has passed it falls back into the path of the cam and prevents the lock from being unlocked until the guard mechanism shall have been first unlocked.

It is evident that many slight changes might be resorted to in the relative arrangement of parts herein shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to confine myself to the exact construction of parts herein shown and described; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a changeable-combination key-lock, the combination with a bolt carrying an adjustable fence of a tumbler adapted to set the fence, means for retaining the latter in place when the bolt is locked, said adjustable fence when the bolt is retracted, automatically engaging with its tumbler and moving with it until the bolt is again locked, and a friction-plate bearing on the fence and its tumbler.

2. In a changeable-combination key-lock, the combination with a bolt and a series of changeable fences carried by the bolt, of a pivoted tumbler for each fence, the several fences being adjusted by their respective tumblers as the bolt is moved to its locked position, so that the same key which locked the lock will properly set the tumblers to receive their respective fences as the bolt is withdrawn, means for retaining the movable fences against movement when the bolt is in its locked position, and spacing-plates for each fence and its corresponding tumbler.

3. In a changeable-combination key-lock, the combination with a bolt and a plurality of adjustable fences carried by the bolt, of a pivoted tumbler for each fence, a stationary spline engaging the series of adjustable fences when the bolt is in its locked position, for holding the adjustable fences against movement, and friction plates or washers interposed between the adjustable fences and overlapping the ends of the tumblers adjacent to the fences.

4. In a changeable-combination key-lock, the combination with a bolt and a series of longitudinally-movable fences carried by said bolt, of a tumbler for each fence and means for preventing one fence from imparting movement to another.

5. In a changeable-combination key-lock, the combination with a bolt and a series of movable fences carried thereby, of a tumbler

for each fence and friction-plates interposed between the fences.

6. In a changeable-combination key-lock, the combination with a bolt and a series of
5 movable fences carried thereby, each fence having a notched edge, of a tumbler for each fence, a stationary spline having a tongue adapted to enter a notch in each fence, and friction-plates interposed between these several
10 movable fences.

7. In a changeable-combination key-lock, the combination with a bolt carrying adjustable fences, of a tumbler for each fence, the
15 several fences being adjusted by their respective tumblers as the bolt is moved to its locked position, so that the same key which locked the lock will properly set the tumblers to receive their respective fences as the bolt is withdrawn, means for retaining the movable fences against movement when the bolt
20 is in its locked position, a key-hub having a projection thereon, and a nest of supplemen-

tary guard-tumblers for locking the key-hub against rotation.

8. In a lock the combination with a bolt, 25 tumblers and a key-plug, of a locking-lever for engaging a projection on the key-plug for locking the latter against rotation, and a nest of supplementary guard-tumblers for actuating the locking-lever.

9. In a lock, the combination with a bolt, 30 tumblers, and a key-plug having slots for two keys, of a locking-lever for engaging a projection on the key-plug for locking the latter against rotation, and a nest of supplementary
35 guard-tumblers for actuating the locking-lever.

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

WARREN H. TAYLOR.

Witnesses:

SCHUYLER MERRITT,
WM. P. MOSELY.