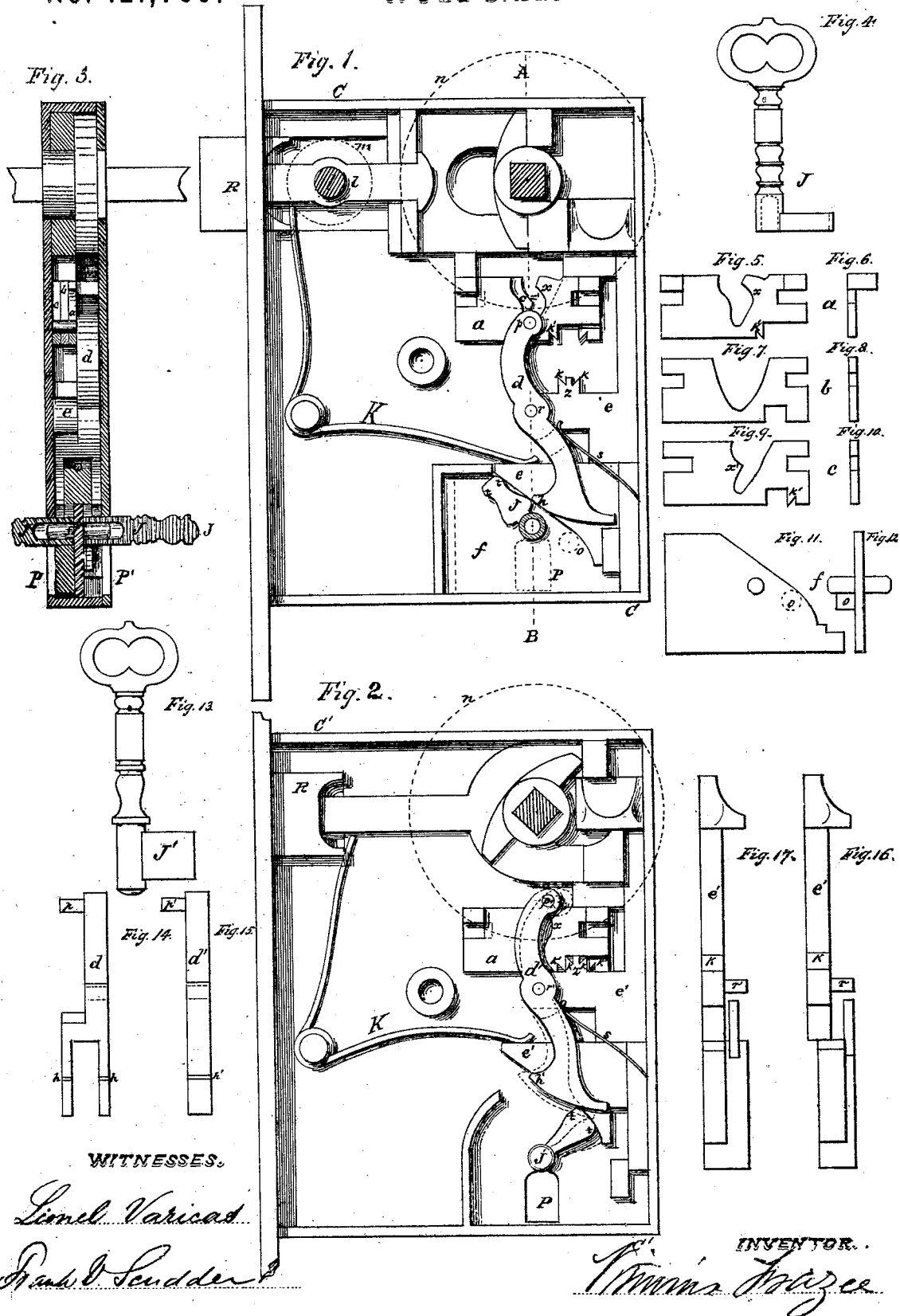


# FRAZEE'S NEW IMPROVED LOCK.

No. 121,769.

FULL SIZE.

Patented Dec. 12, 1871.



# UNITED STATES PATENT OFFICE.

VITRUVIUS FRAZEE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO HIMSELF  
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## IMPROVEMENT IN COMBINED LATCHES AND LOCKS.

Specification forming part of Letters Patent No. 121,769, dated December 12, 1871.

*To all whom it may concern:*

Be it known that I, VITRUVIUS FRAZEE, of the city and county of San Francisco, State of California, have invented certain Improvements in Locks, of which the following is a specification:

My invention relates to the combination in a lock of a key or keys, with a dividing plate or without a dividing plate, (when used for bank-safes or inside doors,) in connection with a lever, slide-bolt, and ordinary connection, said lever having a pin in its upper end which moves within a certain curve formed in sliding tumblers so that the lock is fastened or unfastened by the proper movement of this pin within this curve when directed by the right key; but a total disarrangement of these tumblers is made the consequence of the insertion of the wrong key the bit of which has the slightest deviation from the true curve, and a corresponding stoppage from releasing the latch or dead-bolt.

Figure 1 is a front elevation of a front-door mortise lock, with cover removed, embodying my invention. Fig. 2 is a front elevation of an in-door mortise-lock, cover removed. Fig. 3 is a vertical transverse section of Fig. 1 through the line A B. Fig. 4 is the key that may be used on opposite sides of the lock, shown in Fig. 1. Figs. 5 and 6 are the plan and end elevation, respectively, of the top sliding tumbler. Figs. 7 and 8 are the plan and end elevation, respectively, of the stationary plate for separating the top and bottom sliding tumblers. Figs. 9 and 10 are the plan and end views, respectively, of the bottom sliding tumbler. Figs. 11 and 12 are the plan and end elevation, respectively, of the dividing plate. Fig. 13 is the key for the in-door lock, Fig. 2. Fig. 14 is an edge elevation of the lever for the lock shown in Fig. 1. Fig. 15 is an edge elevation of the lever for the lock shown in Fig. 2. Fig. 16 is an edge elevation of the slide for lock shown in Fig. 1. Fig. 17 is an edge elevation of the slide for lock shown in Fig. 2.

The various parts of the locks are made of iron or brass after the usual manner adopted in the manufacture of such articles, and may be separately described as follows: J represents the key used on the inside or outside of a front-door mortise-lock, as shown in Fig. 3. J' is the key for the lock used for bank-safes or inside doors, as shown in Fig. 2. C is the casing of the mortise front-door lock shown in Fig. 1. C' is the

casing of the in-door mortise-lock shown in Fig. 2. *e e'* are the slides for the front-door and in-door locks, respectively. *d d'* are the levers for the front and in-door locks, respectively, having pins *p* and *p'* in their upper ends and pivoted at *r* and *r'* to the slides *e* and *e'*. *a* and *c* in both locks represent the tumblers, which are actuated by the pins *p* and *p'* of the levers *d* and *d'*. *b* is the stationary separating plate between the tumblers *a* and *c*. *f* is the dividing plate between the key-holes. *n* shows in dotted circle the position of the door-knobs. K is the spring that actuates the bolt R and slide *e* or *e'*. *s* is the spring working on the lever *d* or *d'*. *l m* is the thumb-knob for lock, shown in Fig. 1, with night-latch attachment. P and P' are the key-holes. O is the stop to prevent further turning of the key J. *z* is the projection on the slide *e* or *e'*, which enters the gatings made for it in the tumblers *a* and *c*. *k k* are the angular teeth on the projection *z* of the slide *e* or *e'*, which engage in the angular cuts *k k'*, either to the right or left, when an improper key is used. *x x'* are the curved sides of slots cut in the upper edge of the tumblers *a* and *c*. *t t* are the curved portions, alike on both sides, of the bits of the keys J and J'.

The operation of the lock is as follows: To unfasten the lock, the key J, being turned in the usual manner, raises the slide *e* and lever *d*, *d* being in connection with *e* by the pivot *r*, and as they are raised the point *h* of lever *d* follows the shape of the key-bit, against which it is pressed by means of the small spring *s* which is attached to the slide *e*, the result of the two movements being transmitted to the pin *p* at the upper end of the lever *d*, thus guiding the pin *p* through the curved slot, one side, *x*, of which is formed in the tumbler *a* and the other side *x'* is formed in the tumbler *c*. The pin *p* passes exactly through this curved slot, the slide *e* passes up, and the projection *z* enters the gatings in the lower parts of *a*, *b*, and *c*, as shown in Fig. 2. The latch may now be withdrawn, as is shown in that figure. The pin *p* of the lever *d* or *d'*, by the pressure of the small spring *s*, having engaged with the upper edge of the tumbler *a*, thus retains *e* or *e'* in an unlocked position. The lock remains unfastened until the key is turned the other way, when the action described above is reversed and the lock becomes fastened. By any movement, in endeavoring to unfasten the lock, different from

that provided by the proper key, the tumblers *a* and *c*, one or both, become disarranged, as the pin *p* in this case travels a different curve. On one side of the slot, in *a*, the true curve *x* is preserved, but on the other it is widened out. If the pin *p* presses against the side *x* the tumbler is moved to one side and will remain there until the lever *d* falls, when it is again brought in place. In the tumbler *c* the true curve *x'* is cut on the reverse side of that of *a*. In the accompanying drawing the true curve of *a* is shown on the right side and that of *c* on the left, the plate *b* being merely a stationary separating plate to prevent *a* or *c* from moving each other by friction. The parts *a*, *b*, and *c* are guided and supported by the projections on the lock-case, which fit easily into the slots cut into the ends of *a*, *b*, and *c*. In the event of any tampering with the lock the gatings in the tumblers *a* and *c* will be moved out of line with the projection *z*, in which case the teeth *k'* on one or both tumblers will engage with the tooth *k* on *z*, thus stopping any further movement of the key, and consequently preventing the lock from being unlocked. On account of the sliding tumblers *a* and *c* being laid in their places quite loosely it is necessary that their line of traverse should be horizontal or nearly so, so as to insure perfect action; otherwise, in the process of unlocking, they would be liable to slide and prevent the unfastening of the lock. In Fig. 2 the dividing plate is dispensed with and the latch and yoke are made in one piece; consequently the door cannot be closed, as in Fig. 1, when the lock is fastened; but it may be locked or unlocked in the usual manner from the inner or outer side, and remain either way, with the key in or out; and as there is no dividing plate the key enters the case as in ordinary locks. The parts *a'* and *c'*, although performing the same offices as *d* and *e*, are somewhat changed in shape and simplified on account of the removal of the dividing plate *f*, the sliding tumblers *a* and *c* and plate *b* being substantially the same. The bits of these keys should be formed with both sides alike, and with curved sides *t t* that may be easily followed by

the point *h* on *d* or *d'*, and should be made before the cutting of the curves *x* and *x'* in *a* and *c*, so that by any adequate contrivance, such as by scratching with a point fixed in the place of the pin *p*, the curve may be marked by the key in its regular movement. After having unfastened the lock shown in Fig. 1 from the outside the knob (shown in dotted circle *n*) may be turned and the door opened; but in taking out the key (from the outside only) the lock again becomes fastened and the door may be closed and left secured, the spring-latch acting as in other locks. The key from the outside is prevented from making a complete circuit by means of the projection *o* on the dividing plate *f*, thus making it necessary to turn the key back and fasten the lock before it can be taken out. On the inside, however, the lock may be fastened or unfastened and remain with the key either in or out. By this means a person having a proper key may enter from the outside when the door is locked and the key left in the lock inside, and at the same time the plate *f* prevents any effective tampering with the key within by burglars, such as by turning it with pinchers or other instruments. It is further intended that the front-door lock shall in itself answer all the purposes of the usual front-door lock with night-latch attachment.

I claim as my invention—

1. The tumblers *a* and *c* provided with the curves *x* and *x'*, in combination with the pin *p* and lever *d* or *d'*, substantially as and for the purpose hereinbefore set forth.
2. The slide *e* and lever *d* pivoted thereto, in combination with the tumblers *a* and *c* and curves *x* and *x'*, substantially as and for the purpose hereinbefore set forth.
3. The lever *d* and tumblers *a* and *c*, in combination with the slide *e*, bolt *R*, and curved portions *t t* of the key, substantially as and for the purpose hereinbefore set forth.

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Witnesses:

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