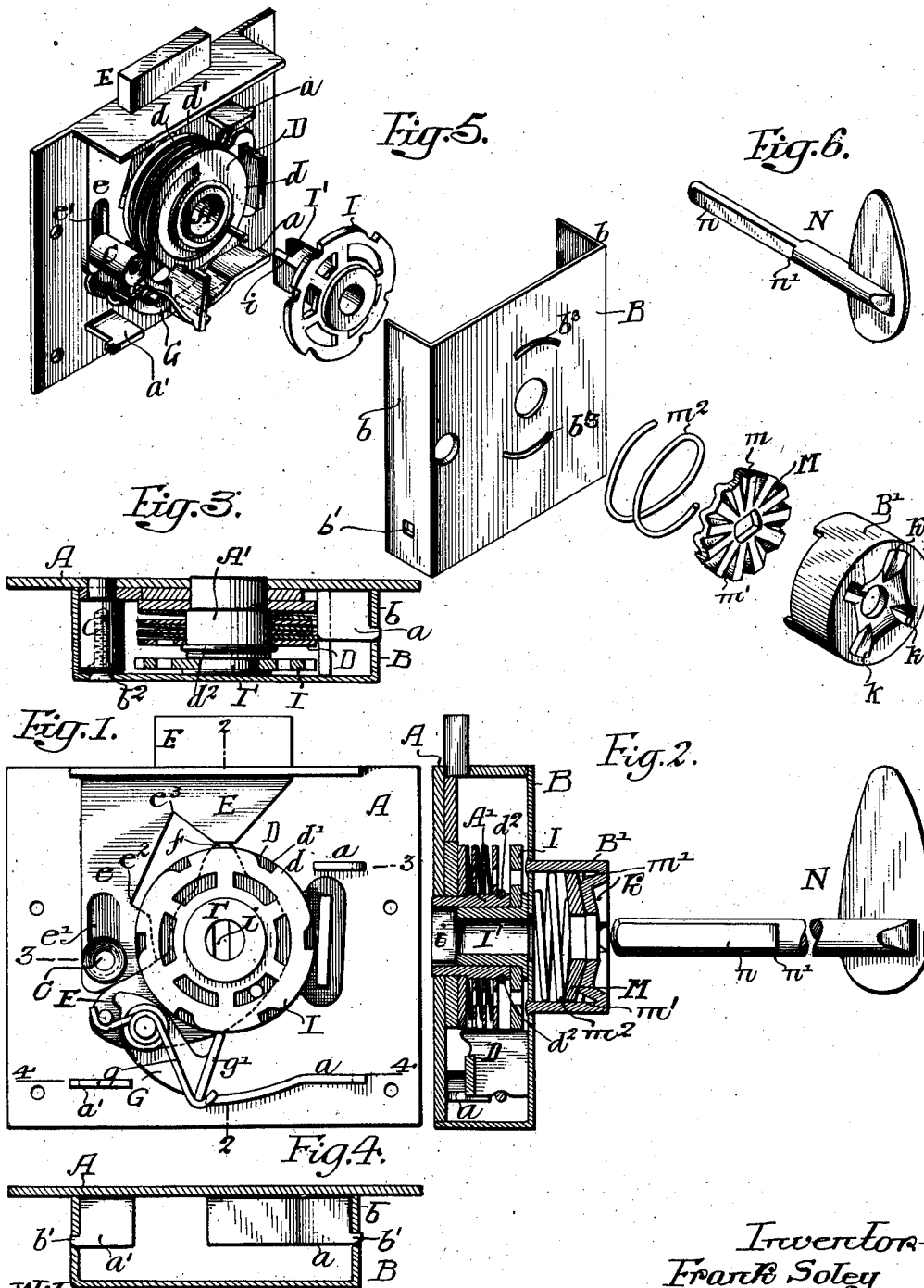


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LOCK.

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976,515.

Patented Nov. 22, 1910.



Witnesses:
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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that I, FRANK SOLEY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Locks, of which the following is a specification.

My invention relates to certain improvements in combination locks.

The object of my invention is to provide such a lock with a detachable key, which must be inserted in the lock in a particular manner in order to actuate both the click and the lock mechanisms.

The invention is particularly adapted for use in places where it is not desirable to have a permanent knob on the combination lock, and the lock must be made at a reasonable price.

In the accompanying drawing:—Figure 1, is a face view of the lock with one side of the casing removed; Fig. 2, is a sectional view on the line 2—2, Fig. 1; Fig. 3, is a sectional view on the line 3—3, Fig. 1; Fig. 4, is a sectional view on the line 4—4, Fig. 1; Fig. 5, is a perspective view illustrating parts of the lock detached; and Fig. 6, is a perspective view of one form of key which may be used.

A is the back casing of the lock, B is the front casing flanged at *b*, *b* and notched at *b'* to receive the projections *a*, *a'* of the back casing A. A screw *b²* passes through an opening in the casing B and into a post C projecting from the back casing A.

D is the locking mechanism, consisting of a series of tumblers and washers *d*, *d'*, a locking bolt E having an extension *e* slotted at *e'* to engage the post C, a bolt thrower F having a nose *f* engaging the projections *e²* and *e³* on the bolt E and pivoted to this bolt thrower is a lever G having a spring *g* and a projection *g'* adapted to engage the notches in the tumblers.

Heretofore the driving disk was mounted on the stem of a permanent knob, but in the present instance the driving disk I is carried by a hollow stud I' adapted to an opening in the hollow post A' projecting from the back A of the casing; the tumblers and washers being held in place by a split ring *d²* adapted to a groove in the post, as illustrated clearly in Fig. 2. The hollow stud has in its end opposite the end carrying the driving disk, a slot *i* clearly shown in Fig. 1, and

this slot is off-center in the present instance and is adapted to receive the projecting end *n* of the key N, this end is also off-center, being cut away more at one side than at the other, so that the key must be inserted to its full depth and accurately fit the opening before the locking mechanism can be turned.

Secured to the section B of the casing is a casing B'; this casing B' has projections which pass through slots *b³* in the casing and are riveted so as to firmly secure the casing B' to the casing B. The end of the casing B' is pressed in, as shown at *k*, to form ratchet teeth on the inside of the casing. Within the casing B' is a click disk M having a series of depressions *m*, twelve in the present instance, which aline with the projections on the inner surface of the casing B' to form a click mechanism. A spring *m²* is arranged back of the disk so as to force it in contact with the end of the casing B'. A hole *m'* in the center of the disk is shaped to correspond to the portion *n* of the key N so that when the key is turned the click disk will turn with it. The key can be forced through the opening in the casing B', so that the portion *n'* of the key will bear against the click disk, and by pressing against this click disk with the key more or less sound can be made, so that in the place of figures or letters on the casing, and a pointer, as in the ordinary combination lock, the clicks are counted, and if any one is close to the person operating the lock, and it is desired that the combination should not be read, by placing a slight pressure on the key, the click disk is pushed away sufficiently from the projections on the casing that there will be no sound, but the click will be felt by the hand of the operator, and in some cases, where the operator is familiar with the combination, the click disk may be pushed entirely clear of the projections on the casing and the lock turned to the right and left at the proper combination.

In order to engage the lock mechanism by the key, the key must be moved into its extreme position so that the end *n* will engage the slotted portion *i* of the stud I', and, in the present instance, as this slot is off-center, the key must correspond with it, and consequently the key must be placed in the lock in a certain position in order to not only pass through the click disk M but

through the stud I' and into position in the slot i.

The shape of the slot and the opening in the click disk will depend upon the shape of the key, and the key can be shaped in many different ways, so that a number of changes can be made, not only in the combination, but also in the shape of the key and the slots.

By making the casing in two parts, one part A having the projections *a*, *a'* and the part B having the notches, the parts can be readily snapped together and, if necessary, the screw *b*² may be used as an additional fastening.

I claim:—

1. The combination in a lock, of a casing, a combination mechanism within the casing, a driving disk for actuating the combination mechanism, said driving disk having an opening, a removable key shaped to fit said opening, and click mechanism also engaged by the key so that, on the turning of the key, both the click mechanism and the driving disk will be operated.

2. The combination in a lock, of a casing, a series of tumblers and washers mounted therein and forming the combination mechanism, a bolt, actuating mechanism therefor, a driving disk mounted in the casing independent of the tumblers but connected thereto, said driving disk having a hollow spindle with an irregular opening therein, and a click mechanism consisting of a notched casing and a notched disk, the projections on the disk engaging the notches in the casing, with a detachable key adapted to engage

both the driving disk and the notched disk of the click mechanism.

3. The combination in a casing, of a bolt, a series of tumblers and washers mounted on a hollow spindle projecting from the back casing of the lock, means for actuating the bolt when the tumblers are in a certain position, a driving disk having a spindle adapted to the hollow spindle carrying the tumblers and having recesses to receive a pin of the combination mechanism, the hole in the driving disk being irregular, a detachable key shaped to fit the irregular opening in the driving disk, a casing secured to the shell of the lock and having an opening therein, a disk within the casing, and a spring tending to force the disk against the end of the casing, both the disk and the casing being notched to form a click mechanism; the driving disk and the notched disk being connected by the key.

4. The combination in a lock, of a casing, combination mechanism within the casing, a driving disk for actuating the combination, said driving disk having a hollow stud, said stud being slotted at its extreme inner end, with a click disk mounted within the casing, and a key adapted to an opening in the click disk and shaped to engage the slotted portion of the hub of the operating disk.

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

FRANK SOLEY.

Witnesses:

WM. E. SHUPE,
WM. A. BARR.