

No. 677,363.

Patented July 2, 1901.

E. H. MIX.

COMBINED TIME AND COMBINATION LOCK.

(Application filed Feb. 25, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

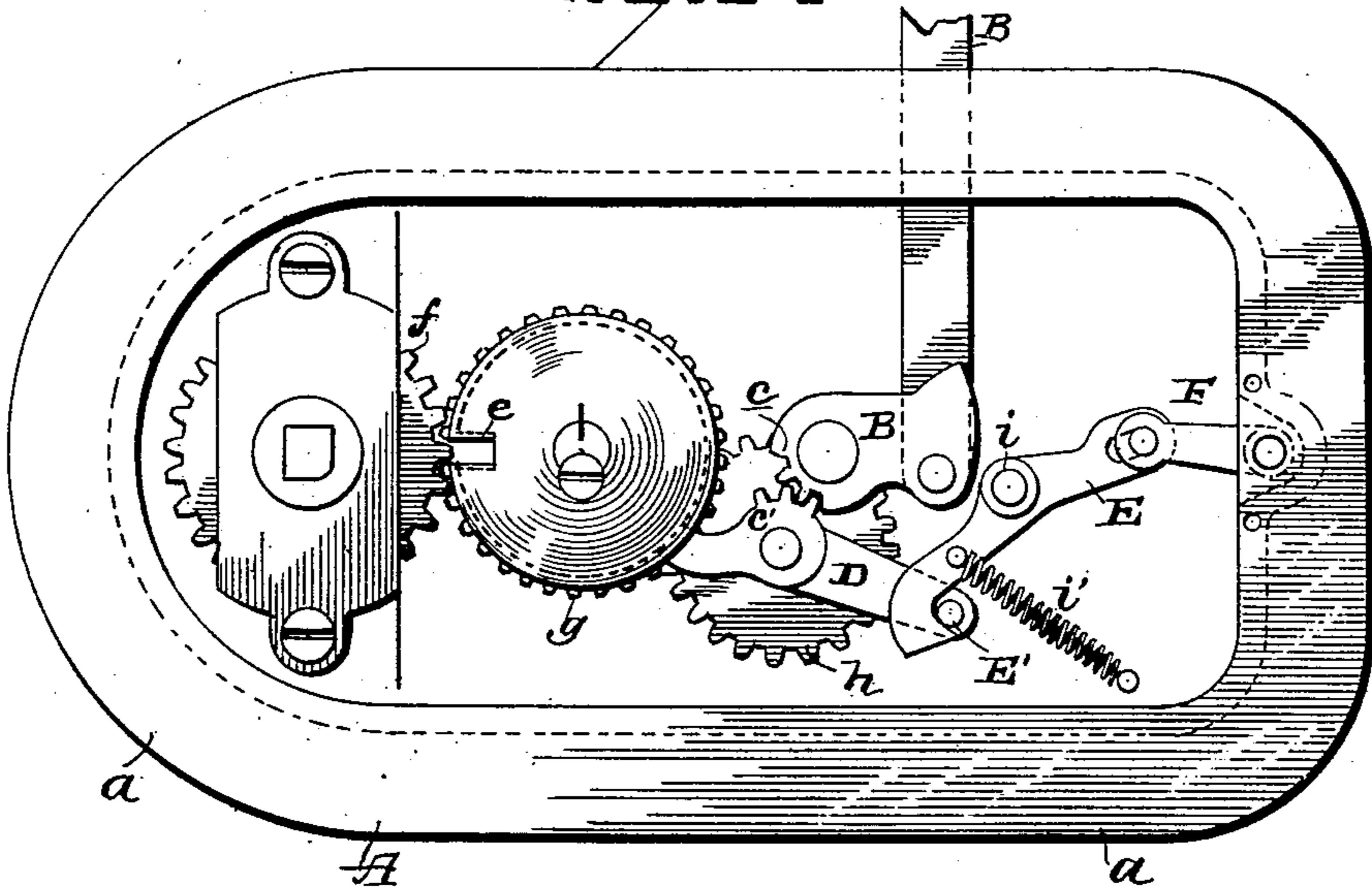
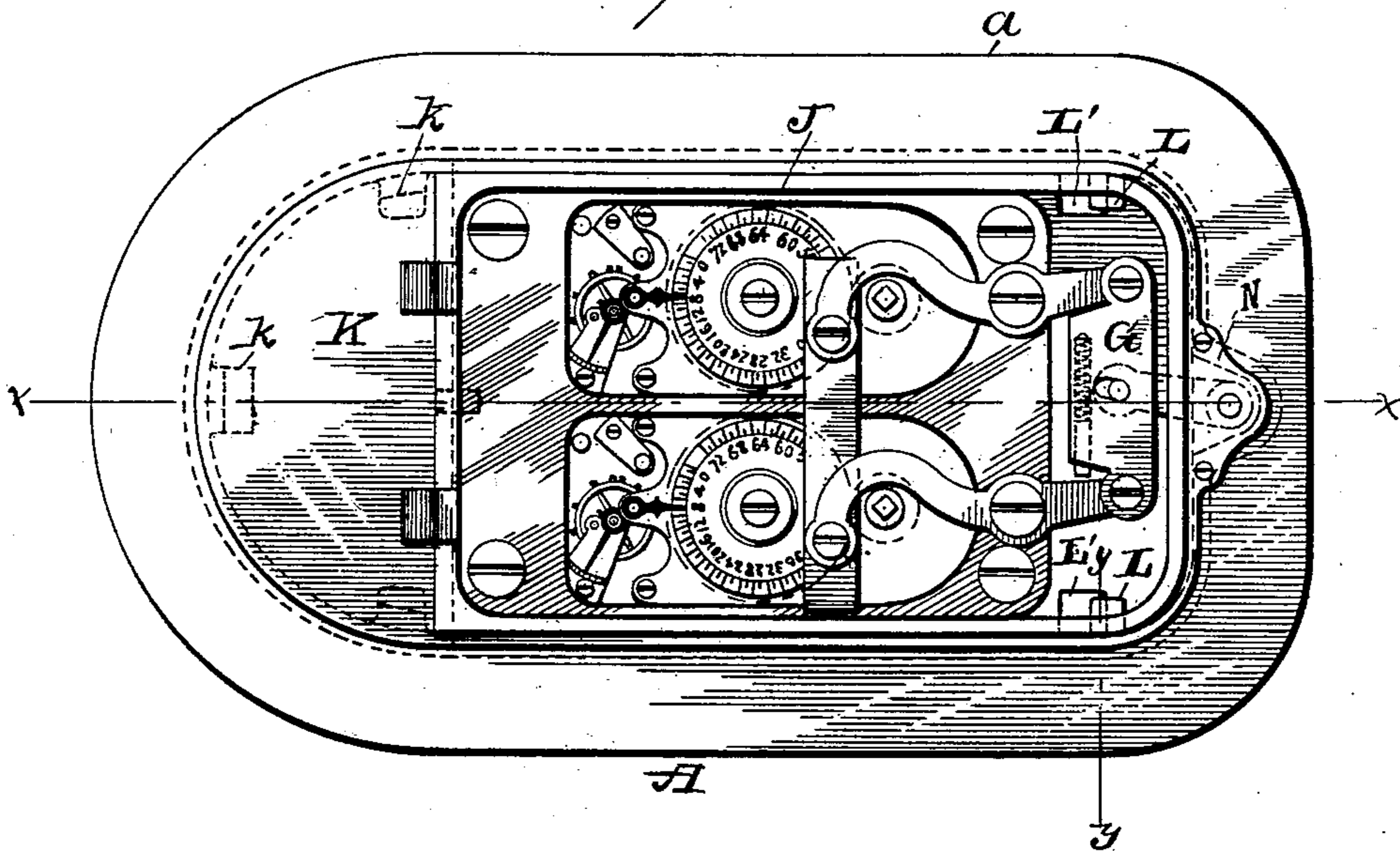


Fig. 2.



WITNESSES  
E. D. Nottingham  
G. F. Downing

INVENTOR  
E. H. Mix  
By H. A. Seymour  
Attorney

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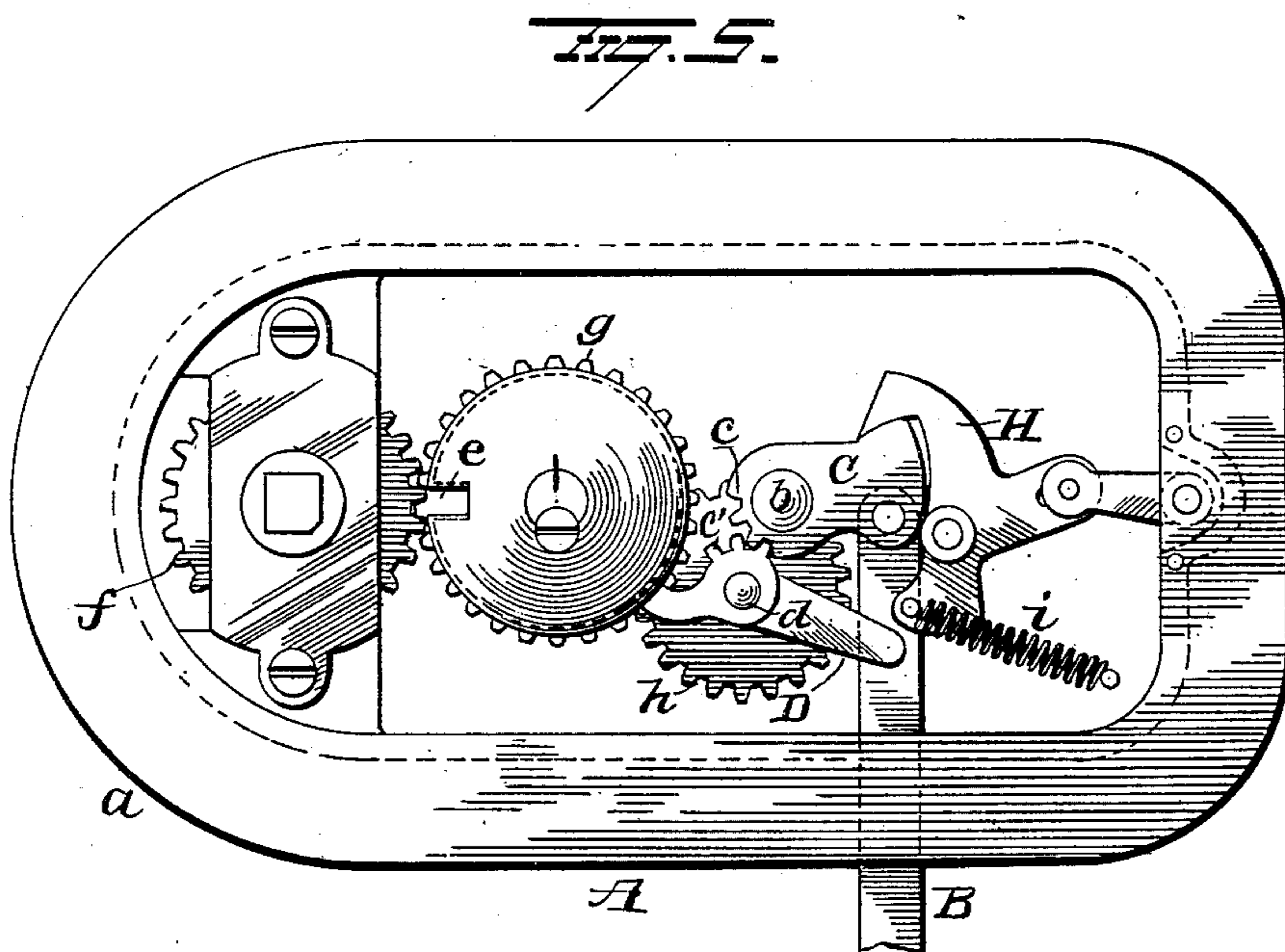
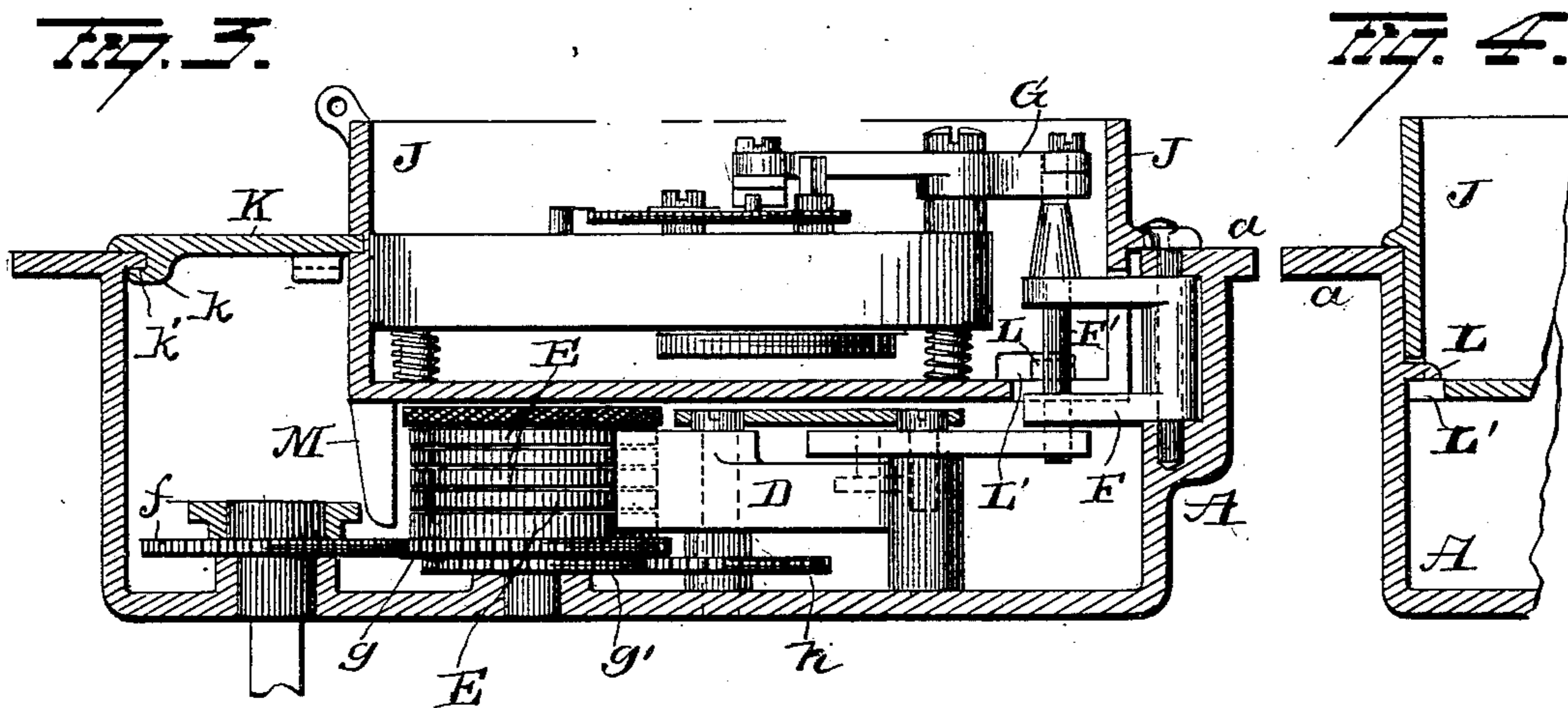
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# UNITED STATES PATENT OFFICE.

EDWARD H. MIX, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE & TOWNE MANUFACTURING COMPANY, OF SAME PLACE.

## COMBINED TIME AND COMBINATION LOCK.

SPECIFICATION forming part of Letters Patent No. 677,363, dated July 2, 1901.

Application filed February 25, 1901. Serial No. 48,787. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD H. MIX, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in a Combined Time and Combination Lock; 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 appertains to make and use the same.

My invention relates to an improvement in combined time and combination locks, one object being to so connect the time and combination locks that no one without a knowledge of the combination can remove the time-lock from the combination-lock case and change the combination on which the lock is set.

A further object is to so connect a time and combination lock that the combination-lock is rendered inoperative by the time mechanism until the unlocking period is reached by the time mechanism, which latter then liberates the mechanism of the combination-lock and allows the latter to be operated in the usual manner.

With these ends in view my invention consists in the parts and combinations of parts and in the details of construction, as will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in elevation of the lock-case, showing the combination-lock mechanism. Fig. 2 is a similar view showing the time mechanism in place over the combination-lock mechanism. Fig. 3 is a vertical longitudinal sectional view on the line *xx* of Fig. 2. Fig. 4 is a view in section on the line *yy* of Fig. 2, and Fig. 5 is a plan view similar to Fig. 1, showing a modified form of combination-lock mechanism.

The time-lock shown in the drawings is of the type patented by E. Stockwell and H. C. Stockwell July 19, 1892; but I would have it understood that I do not confine my invention to any particular form of time-lock or any particular form of combination-lock, as my invention relates more particularly to the manner of connecting the two and to mechanism interposed between the two for rendering the

combination-lock inoperative until released by the time-lock. Hence the details of the construction of the time mechanism and combination-lock are immaterial.

A represents the main casing, oblong in shape; with parallel sides and one straight and one rounded end. This casing has one open face, with an outwardly-projecting flange *a* surrounding the same, and is somewhat deeper than is required for the mechanism of the combination-lock, so as to receive and accommodate a portion of the time mechanism. The casing A is designed to be secured to the safe-door in any desired manner, and the combination mechanism dogs the locking mechanism of the door in any desired manner.

In the drawings the locking mechanism of the safe-door is indicated by the part B, which is designed to represent the movable part of the mechanism which is to be retracted in order to unlock the safe-door, no attempt whatever being made to show the bolt mechanism of the safe-door. The part B is connected at its inner end to the bolt C of the combination-lock. This bolt C is mounted on the post or stud *b* and is provided on its end adjacent to the tumbler with the teeth *c*, concentric with the stud *b* and meshing with teeth *c'* on fence D. This fence is pivotally mounted on the stud *d* and rests with the end of its shorter arm adjacent to the peripheries of the tumblers E, so that when the slots *e* in the tumbler aline with the end of the fence the end of the latter may be moved into the slots by the rotation of the knob or dial through which the tumblers are actuated. This knob or dial is connected to the pinion *f*, and the latter meshes with the pinion *g*, mounted on the stud below the tumblers and connected to the tumblers in the usual or any desired manner, so that when the combination-lock is released from the time mechanism a rotary movement of the knob or dial will move the tumblers, and the correct movement of the knob will cause the tumblers to move until their slots aline with the end of the fence.

Integral with pinion *g* is a smaller pinion *g'*, which latter meshes with the pinion *h* on the stud *d*, the pinion *h* being frictionally connected with the fence D, so as to cause

the latter to turn and enter the slots in the tumblers when all the slots aline with the end of the fence. When the knob or dial is turned to lock the combination, the fence is removed from the slots in the tumblers by the engagement of the latter with the fence, assisted somewhat by the frictional contact of pinion *h* with the fence.

In the construction shown in Fig. 1 the combination-lock is held from movement or rendered inoperative by the hook-lever *E* engaging the pin *E'* on the fence *D*, and thus holding the fence out of engagement with the tumblers and preventing its ends entering the slots in the tumblers until released by the time mechanism, and until this fence does connect with the tumblers there are no means for operating the bolt or part *B* through the knob or dial of the lock. When the fence enters the slots in the tumblers, the engagement of the walls of the slots with the fence turns the latter and transmits movement to the bolt or part *B* by the segmental pinion *c'* and *c* and bolt *C*. The hook-lever *E* is pivotally mounted on stud *i* and is provided with a spring *i'*, which tends normally to hold it in firm contact with the pin *E'* on the fence *D*. The opposite end of the lever *E* is connected by the swinging bracket *F*, mounted in casing *A*, and pin *F'*, carried by said bracket and engaging the bar *G* of the time mechanism, as clearly shown in Fig. 3. This bar *G* operates in the usual manner, as fully explained in the Stockwell patent referred to, and when it reaches its limit of movement it will have turned lever *E* sufficiently to release pin *E'* on fence *D*, thus permitting the latter to engage the tumblers and rendering the combination-lock operative. From this it will be seen that until the time mechanism releases the lever *E* the combination-lock is inoperative and is, as a matter of fact, disconnected from the bolt mechanism of the same. As soon, however, as the period arrives for which the time mechanism was set the mechanism of the combination-lock is automatically connected and rendered operative, thus permitting the safe to be opened by one having knowledge of the combination.

In the construction shown in Fig. 5 the combination-lock is rendered inoperative by the engagement of the hook *H* with the bolt *C*. As this bolt is connected to the fence by the segmental gearing *c c'*, it will be seen that so long as the bolt is held by the hook *h* the fence is held out of contact with the tumblers, thus accomplishing precisely the same end accomplished by the construction disclosed in Fig. 1.

The means for connecting the time mechanism with the operative parts of the combination-lock will of course vary with different constructions of locks both as to the form of the parts and method of connection. To simplify the connection between the two parts and to save all space possible, which is very important in the contracted quarters

of many burglar-proof safes, the time-lock *I*, while contained in its own case *J*, is set partly into the case *A* of the combination-lock and is locked therein by the combination itself, so that no one without a knowledge of the combination can remove the time-lock from the combination-lock case, and thus change the combination on which the lock is set. This locking of the time-lock into the combination-lock case is accomplished as follows: First, the locking-plate *K*, which covers that portion of the combination-lock case not covered by the time-lock, is placed in position in rear of the space occupied by the time-lock case and is held in place by lugs *k* on the plate engaging corresponding lugs *k'* on the combination-lock case. The combination-lock case is also provided with lugs *L*, (shown in Figs. 2, 3, and 4,) and the inner face of the time-lock case *J* is provided with bayonet-cuts *L'*, which correspond with the lugs *L*, so that when the time-lock casing is set down over the lugs and pushed backward the lugs *L* on the combination-lock case enter the bayonet-cuts *L'* in the time-lock case, and the forward end of plate *K* enters a groove in the rear end of the time-lock case, thus locking the time-lock case and plate *K* in place. It should be stated, however, that the time-lock case cannot be seated in the combination-lock case until the tumblers or combination-wheels are set on their proper combination, so that the integral locking-lug *M*, depending from the time-lock case, can enter the notches in the tumblers. When the time-lock case has been thus entered and pushed rearwardly, the locking-lug *M* passes out of the slots or notches, thus permitting the tumblers to be turned, and when any one of the tumblers has been turned so as to carry its notch out of line with the locking-lug *M* the time-lock case will be locked in place against removal until the combination is again set. As an additional safety a projection or flange *N* on the time-lock case is screwed to the forward end of the combination-lock case.

It is evident that the locking-plate *K* is not essential to the invention, but is merely used because in the construction as illustrated the time-lock case is smaller than the combination-lock case, whereas if the two cases were approximately the same size the same result would be accomplished by having additional lugs and bayonet-cuts at the rear of the case *A*, corresponding with the lugs *L* and bayonet-cuts *L'*.

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 shown and described; but,

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

1. In combination of a casing containing a

combination-lock mechanism, a separate casing containing time-lock mechanism, the latter casing interlocking with the former and provided with a projection or lug which, unless the combination is set, prevents the removal of the time-lock casing from the combination-lock casing substantially as described.

2. The combination with a casing containing combination-lock mechanism, of an independent casing containing time-lock mechanism, the latter casing interlocking with the former and provided with a projection or lug which unless the combination is set prevents the removal of the time-lock casing from the combination-lock casing, and means designed to hold the fence of the combination-lock mechanism out of engagement with the tumblers for a predetermined time under the control of the time-lock mechanism.

3. The combination with a casing containing combination-lock mechanism, of a casing containing time-lock mechanism, the two casings having interlocking shoulders, and the time-lock-mechanism casing having a lug adapted to engage the tumblers for locking said latter casing within the larger casing.

4. The combination with a casing containing combination-lock mechanism, of a casing containing time-lock mechanism, and provid-

ed with a depending lug adapted to engage the tumbler-wheels of the combination-lock, the two casings being provided with interlocking lugs, and means connecting the time mechanism and the fence of the combination-lock mechanism whereby the combination-lock mechanism is rendered inoperative by the time mechanism.

5. The combination with a casing containing combination-lock mechanism, of a casing containing time mechanism the two casings having lugs which are interlocked and disengaged by a sliding or longitudinal movement, the casing containing the time mechanism having a depending lug which engages the tumbler or combination wheels, and prevents a separation of the two lock-cases, and means connecting the time mechanism with the fence of the combination mechanism whereby the combination-lock is rendered inoperative by the time mechanism.

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

EDWD. H. MIX.

Witnesses:

SCHUYLER MERRITT,  
WM. P. MOSELY.