2 Sheets—Sheet 1.

C. C. BLISS.

TIME AND PERMUTATION LOCKS COMBINED.

No. 182,154. Patented Sept. 12, 1876.

Fig. 1.

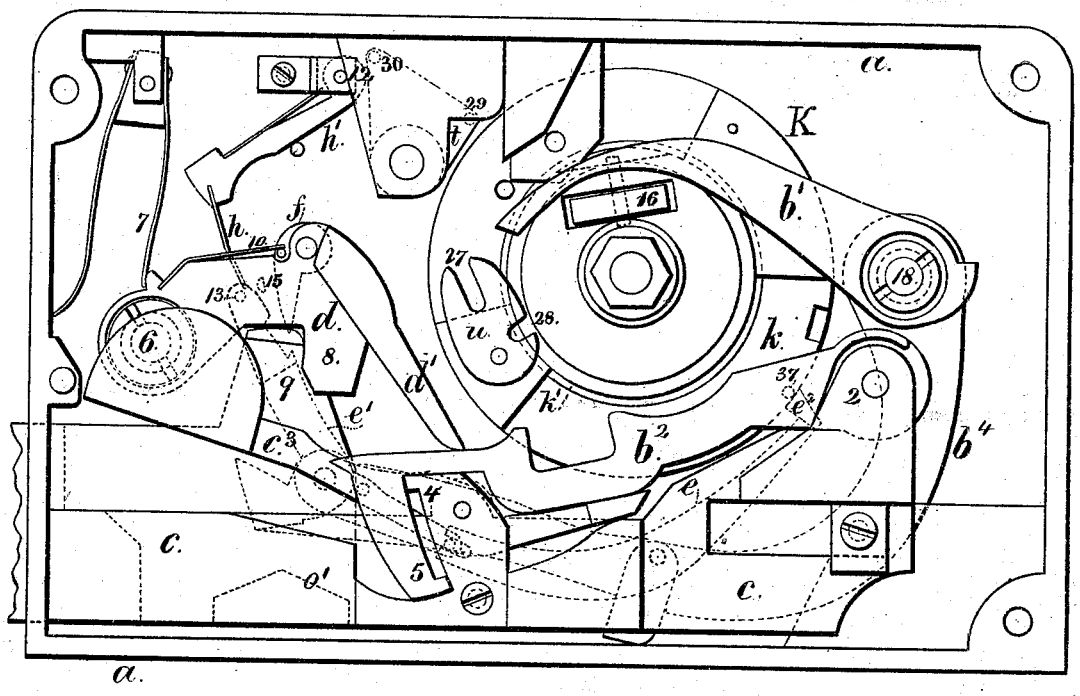
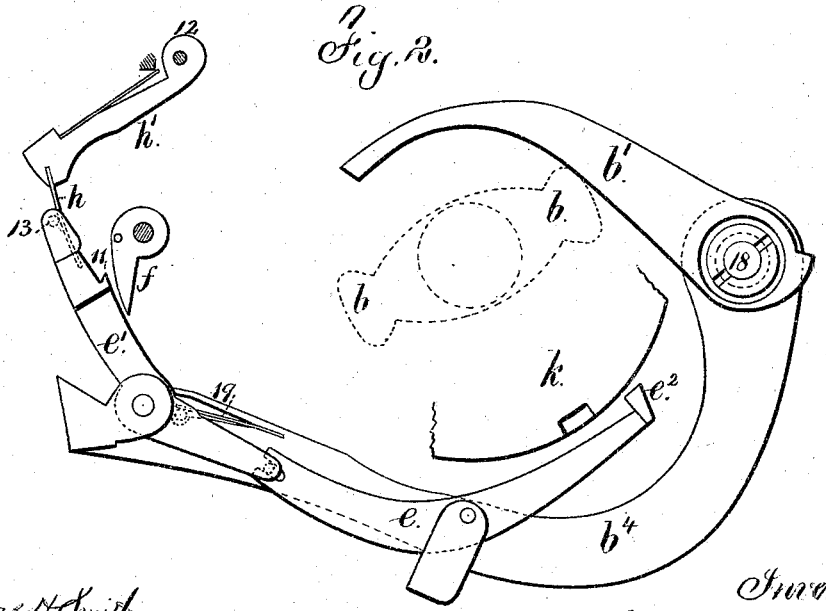


Fig. 2.



Witnesses

Chas. H. Smith

Harold Sewell

Inventor

Charles C. Bliss

per Lemuel W. Serrell Atty.

2 Sheets—Sheet 2.

C. C. BLISS.

TIME AND PERMUTATION LOCKS COMBINED.

No. 182,154. Patented Sept. 12, 1876.

Fig. 4.

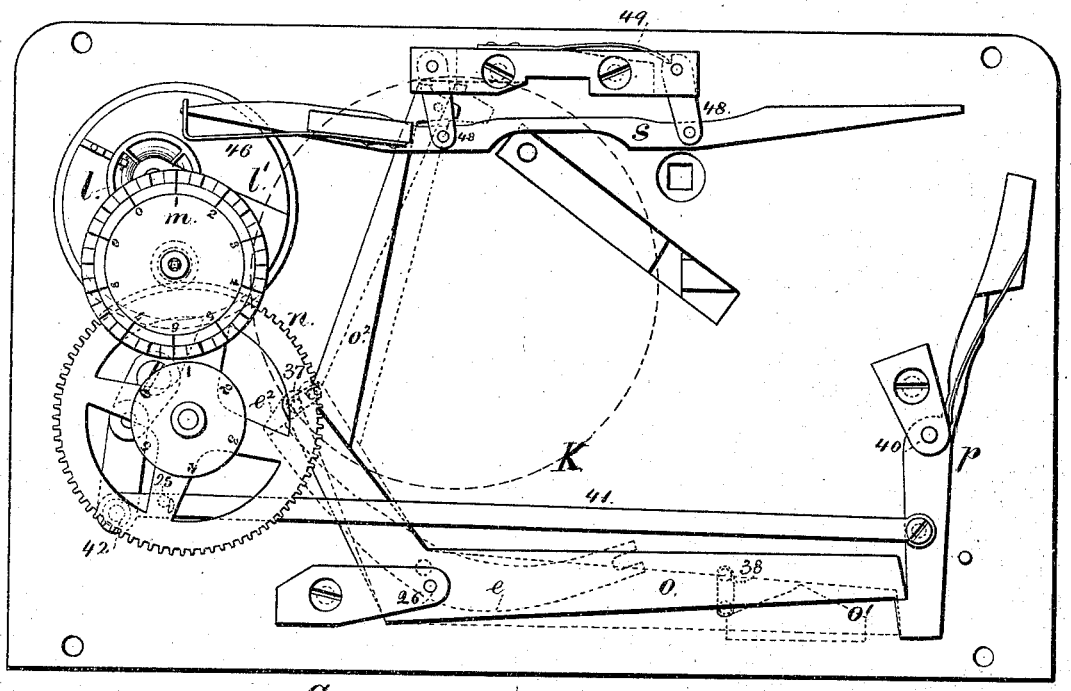


Fig. 3.

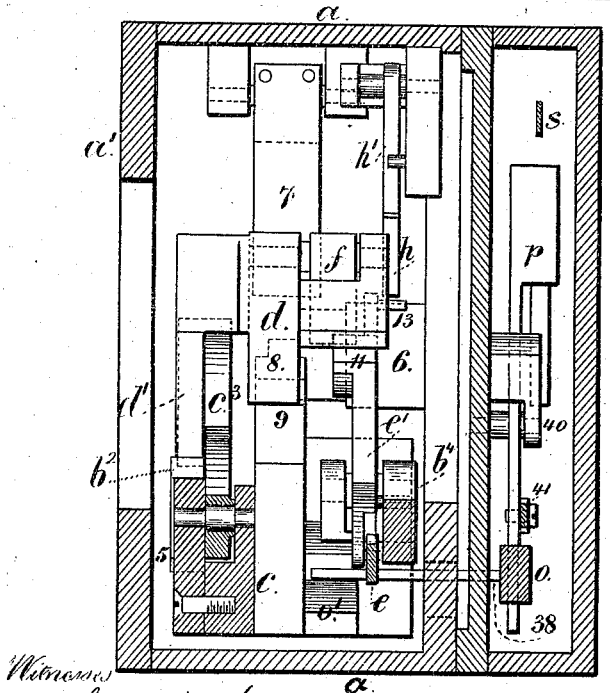


Fig. 6.

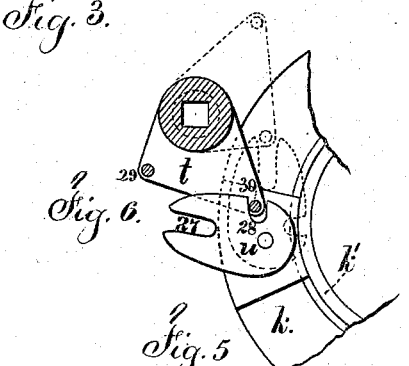
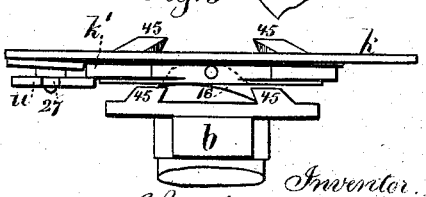


Fig. 5



Witnesses
Chas. H. Smith,
Harold Sinclo

Inventor.
Charles C. Bliss.
per Lemuel W. Serrell
Atty

UNITED STATES PATENT OFFICE.

CHARLES C. BLISS, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN TIME AND PERMUTATION LOCK COMBINED.

Specification forming part of Letters Patent No. **182,154**, dated September 12, 1876; application filed November 18, 1875.

To all whom it may concern:

Be it known that I, CHARLES C. BLISS, of Norwich, in the county of New London and State of Connecticut, have invented an Improvement in Locks, of which the following is a specification:

In Letters Patent No. 156,906, heretofore granted to me, there is a range of circular tumbler-rings upon disks that are clamped together by a screw-nut having a fork or lever. In my present invention I make use of the same kind of tumblers, but I have modified the hook-ended stops, and I construct each screw-clamping nut with two notches, operated by the swinging keys, each having two pins, that give such nuts a more extended turning movement than in aforesaid patent, and more thoroughly loosen the parts. I also employ a peculiarly-constructed lifting-pawl upon the bolt-dog, and a jack upon the lifting-lever, in combination with the fence-lever, the parts being constructed so that the jack does not reach the pawl, except when the notches of the tumbler receive the fence, and when the movement of the main lever takes place, the fence is moved away from the tumblers. I also employ a balanced latching-lever, that connects the bolt to the cams upon the spindle of the handle, and depress this latching-lever by a finger projecting from the bolt-dog, so that the latching-lever remains out of action until the bolt-dog is raised; hence force cannot be applied to the bolt until all the other parts of the lock are in their proper position.

The time mechanism that is combined with this lock is constructed so that the fence is prevented by a pin from moving toward the tumblers until the time arrives when the clock mechanism removes that pin and allows the fence to press against the tumblers. The movement of the bolt in locking or unlocking resets the time-latches, and applies a spring-starting mechanism to the balance-wheel, so as to insure the first movement thereof, if it has stopped. The mainspring of the time-movement is wound in the act of setting the mechanism to run the required number of hours.

In the drawing, Figure 1 is an elevation of the front side of the lock, with the handle, spindle, and front plate removed. Fig. 2 is a diagram showing the main lever, jack, and pawl of the dog. Fig. 3 is a cross-section, showing the relative positions of the levers, bolt, and time mechanism; and Fig. 4 is a view at the rear of the lock, showing the time mechanism.

The lock-case *a* is provided with a front plate, a^1, that is removed in Fig. 1, and to this plate a^1 the spindle and handle are connected, and also the dials or pointers of the usual character, and upon the inner end of the spindle are the bolt-cams *b*, (seen in Fig. 2,) that serve to raise the arm b^1 of the main lever, and also to connect with the latch-lever b^2, for projecting or retracting the bolt. There are also upon the inner end of the spindle the stubs 45, that act upon the rocking stop 16 of the circular tumblers, and there are similar stubs, 45, upon the back of one tumbler, taking the rocking stop upon the next tumbler. By reference to the plan, Fig. 5, the operation of these stubs and stops will be apparent. The distance between one stub and the next is less than the length of the swinging stop; hence, when the tumbler or spindle is turned one way, the incline of one stub first presses back one end of 16, passes over the same, and then presses back the other end of 16, throwing the first end into the notch of the next stub, so that the two will move reliably together; but by a reverse movement the parts separate, and the tumbler or spindle makes nearly a complete revolution before the stop and stubs again interlock. The bolt *c* is fitted to slide back and forth in the case, and may be the bolt proper, or the bar for actuating one or more bolts. This bolt and the latch-lever b^2 are connected together by the joint 2, and the latch-lever b^2 is more than counterbalanced by the weighted lever c^3, that lifts this latching-lever b^2 toward the cam *b* whenever the pawl-dog *d* is raised, and with it the finger d', that, ordinarily, presses upon this latch-lever b^2, and keeps it down until all the other parts of the lock are in position for the dog to be raised; hence the latch-lever b^2 cannot be brought into position for the spindle-cams to act upon the same, or for any end motion to be given to the bolt, until the lock is ready to be opened.

There are segmental projections 4 and 5

It will be apparent that two or more time movements might be applied so as to act upon the link 41 or lever *p*. They, of course, would require to be wound to the same extent each time the lock is set; but if one of the movements should accidentally stop, either of the others would act to liberate the locking mechanism.

I claim as my invention—

1. The combination, with the lock-bolt *c* and spindle-cams *b*, of the latch-lever b^2, its balancing lever or spring c^3, the dog *d*, and its arm *d'*, substantially as specified.

2. The rocking stop 16 and stubs 45, in combination with the circular tumblers and lock-spindle, substantially as set forth.

3. The pawl *f* upon the dog *d*, in combination with the jack e^1, fence-lever *e*, and main lever b^4 of the lock, substantially as set forth.

4. The guard-spring *h* upon the lever-arm *h'*, in combination with the dog *d* and jack e^1, substantially as set forth.

5. The nut *u*, with the fork 27 and notch 28, in combination with the stationary key *t* and its pins 29 and 30, as and for the purposes set forth.

6. The lever *o*, with the pins 37 and 38, in combination with the clock-movement, the fence e^2, and the double inclines o^1 upon the bolt, substantially as set forth.

7. The spring starting-finger 46 for the balance, operated by the movement of the lock-bolt, substantially as set forth.

Signed by me this 13th day of November, A. D. 1875.

CHARLES C. BLISS.

Witnesses:

S. S. THRESHER,

T. W. SWAN.