

S. Miller.
Combination Lock and Latch.

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Fig. 1. PATENTED AUG 8 1871

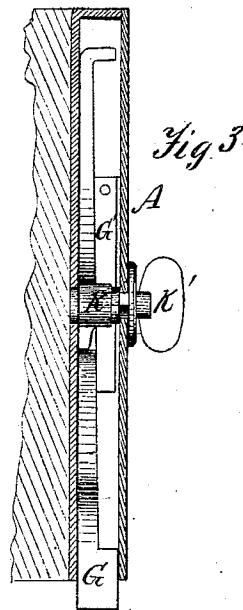
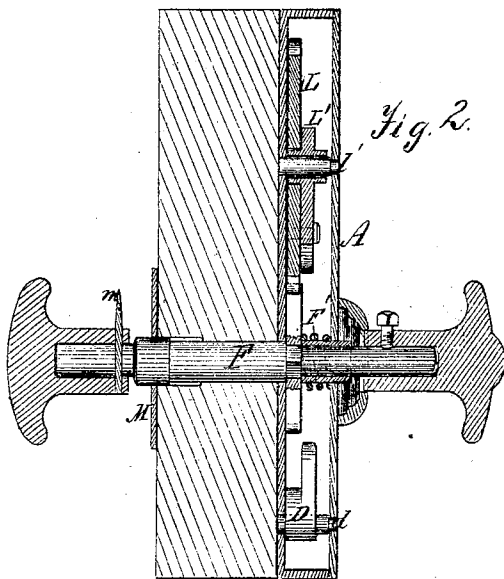
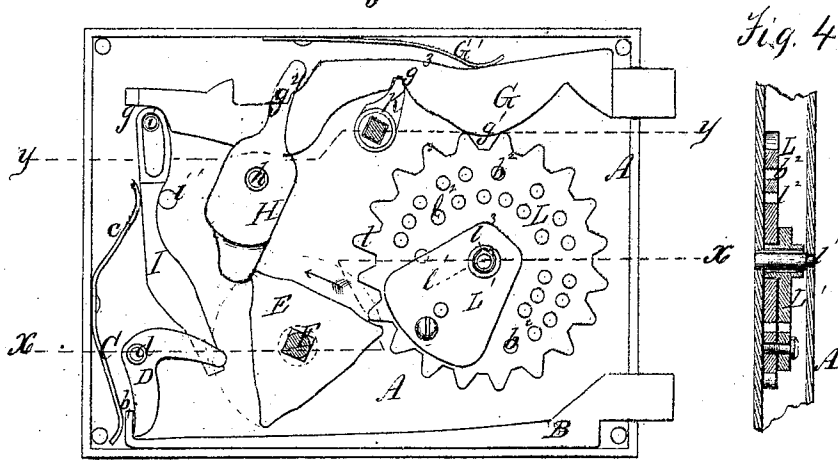
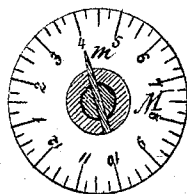


Fig. 5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN COMBINATION LOCKS.

Specification forming part of Letters Patent No. 117,912, dated August 8, 1871.

To all whom it may concern:

Be it known that I, SAMUEL MILLER, of Gratis, in the county of Preble and State of Ohio, have invented certain Improvements in Combination Lock and Latch; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing making a part of this specification, in which—

Figure 1 is an elevation, the front plate of the case being removed to expose the interior mechanism. Fig. 2 is a horizontal section on line *x x* of Fig. 1. Fig. 3 is a horizontal section on line *y y* of Fig. 1. Fig. 4 is a section of the gravitating tumbler and its weight. Fig. 5 represents the dial-plate upon the outside of the door.

The same letters of reference are employed in all the figures in the designation of identical parts.

This invention, relating to a combined lock and latch, consists in the construction, combination, and arrangement of various parts thereof, which will be generally explained in the following description and specifically pointed out in the claims.

The mechanism of the lock is inclosed in a case, A, which is to be secured to the inside of the door. The latch-bolt B is projected by the spring C, which bears against the turned-up ear *b* of the bolt. Against the other side of this ear *b* bears one arm of a gravitating bell-cranked lever, D, which turns upon the stud *d*, and reaches with its other arm to within the circle described by the points of the cam E. The latter is secured upon a squared portion of the spindle F, which turns in bearings in the plates of the case and projects a sufficient distance upon either side to receive suitable knobs by which to operate it. A spiral spring, F', encircles the spindle between the outer plate of the case and the cam E, pressing the latter against the opposite or inner plate of the case, in order that it may freely turn without coming in contact with the bell-cranked lever D, the horizontal arm of which is cut away upon the inner side, as shown clearly in Fig. 2, to permit the cam E to play under or behind it. To retract the bolt B it is necessary to bring the cam E in line with the horizontal arm of the lever D by moving the spindle F endwise so as to compress the spiral spring, after which the cam may be turned by the spindle to depress the horizontal arm of the lever D, and consequently draw the bolt back by the other arm. The locking-bolt G is arranged in the

upper part of the case and sustained in position in the slot in the end of the case, through which it plays, and the upper end of a vertically-sliding bar, I. When the bolt is projected, as shown in Fig. 1, the recess *g* is brought opposite to the slide-bar, and hooks over the latter so as to prevent the retraction of the bolt until it is lifted to clear the slide-bar. The rear end of the bolt is held in forcible contact with this slide-bar by the spring G' bearing upon its upper edge. The rear end of the bolt is lifted so that it may be retracted into the case by means of a long cog, *l*, of the cogged wheel or tumbler L, which turns on a stud, *l'*, so disposed that the points of the cam E will mesh into the cogs of the tumbler, which, in turn, bears against the under side or edge of the bolt formed with a swell at *g*¹, which stands vertically above the axis of the tumbler when the bolt is projected, as shown in Fig. 1. The tumbler carries a weight in the form of a plate, L', which is so arranged in relation to the long cog *l* that when the latter stands under the swell *g*¹ of the bolt G it will incline to one side or the other of such cog at a sufficient angle to cause the tumbler to turn on its axis the moment it is released from the pressure of the bolt and its spring. The tumbler has numerous holes *l*², bearing some definite relation to the cogs, so that the position of the weight L' can be changed to carry the long cog *l* to different points in the circle described by it in revolving the tumbler, and consequently necessitate fewer or more, as the case may be, revolutions of the cam E to turn such cog under the swell *g*¹ of the bolt. The face-plate of the case is made in two parts, one of which only need be removed to gain access to the tumbler for the purpose of changing the position of the weight L'. That part of the stud *l'* passing through the weight L' is formed with a feather, *l*³, vertically above its center, and the aperture in the weight has a corresponding groove which coincides with the feather when the weight is at rest freely suspended from the stud. This feather and groove will quickly check the oscillation of the tumbler and weight as they are released from the pressure of the bolt G, and stop them in the required position. The bolt G is retracted through the medium of a lever, H, turning loosely upon a stud, *h*, and, extending over the face of the bolt, is provided with a short lateral projection which plays in the recess *g*² in the upper edge of the bolt. The lower

weighted end of this lever extends within the circle described by the points of the cam E, which, in turning the tumbler—when it is revolved in the direction of the arrow in Fig. 1—oscillates the lever without affecting the bolt, the recess g^2 being made of sufficient extent to permit this; the lower end of the lever being weighted, holds it in an upright position, so that when the cam is turned in the opposite direction, after the bolt G has been raised, it will bring the projection on the upper end of the lever in contact with the edge of the recess g^2 and draw the bolt inward. As soon as the long cog of the tumbler has been turned under the bolt the cam is thrown out of gear with the tumbler by moving the spindle F endwise. In this condition the cam is again turned in the direction of the arrow until one of its arms is brought to the left side of lever H, with which it is then made to engage, and by turning it in the opposite direction oscillates the said lever, with the lateral projection on its upper arm in contact with the edge of the recess g^2 in the bolt, a sufficient distance to retract the bolt into the case. The construction of the tumbler, cam, and this lever, and their relative arrangement, may be such, as shown in this instance, that at the moment when one of the arms of the cam has turned the long cog of the tumbler under the bolt another arm stands on the left side of and so close to the lever that, by reversing the movement of the cam, it will cause the lever to push the inclined part of the bolt onto the slide-bar I before the arm engaged with the tumbler can turn the long cog from under the bolt, so that it will be unnecessary to disengage the cam from the tumbler. The slide-bar I is suspended on the stud i , passing through a long slot in its upper end, and pressed by the end c of the spring C against another stud, i' , along which it is guided in its vertical movements. Its lower end extends into the circle described by the points of the cam E, under the cut-away part of the lever D, and it is so arranged that in turning the cam in the direction opposite to that indicated by the arrow in Fig. 1 one of its points will push the bar up and lift the end of the bolt G so high as to release the tumbler L, which is then immediately turned by the weight. It will thus be seen that it is necessary to be careful in arranging the cam after the bolt has been raised by the long cog of

the tumbler, in such a manner that it shall act upon the lever H to push the inclined portion of the bolt on top of this slide-bar before it comes in contact with the latter; for, if the cam operates upon this slide-bar first, in turning it in a direction opposite to that indicated by the arrow, it will, in elevating such slide-bar, cause it to lift the bolt, in consequence of which the tumbler will be released and turned by its weight, so that when the cam releases the slide-bar the bolt will assume its normal position, with its recess g hooking over the slide-bar. The under side of the bolt G, just beyond the recess g , is made inclined, as shown, so that in riding over the slide-bar the bolt is raised sufficiently to release the tumbler. K represents a short oscillating arm, entering a recess, g^3 , in the bolt G. On turning this arm by means of the thumb-piece K', on the outside of the case and inside of the door, it first lifts the bolt, when projected, and then retracts it, independently of all the other parts; and, reversing the motion of the arm, the bolt may be projected by it. A stationary index-plate, M, on the outside of the door, around the spindle F, and a pointer, m , on the latter, serve in the usual manner in determining the true position of the tumbler for retracting the bolt G.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The gravitating toothed tumbler L, constructed with a long cog, l , in combination with the bolt G, substantially as set forth.

2. The toothed tumbler L, having an elongated cog, l , in combination with an adjustable weight, L' , substantially as set forth.

3. In combination with the tumbler L and weight L' , the feather B , on the stud B' , and corresponding groove in the weight, substantially as and for the purpose set forth.

4. The combination of the bolt G, sliding bar I, cam E, and gravitating-tumbler L, substantially as set forth.

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

SAMUEL MILLER.

Witnesses:

JOHN BOOKWALTER,
WILLIAM H. FOCHT.