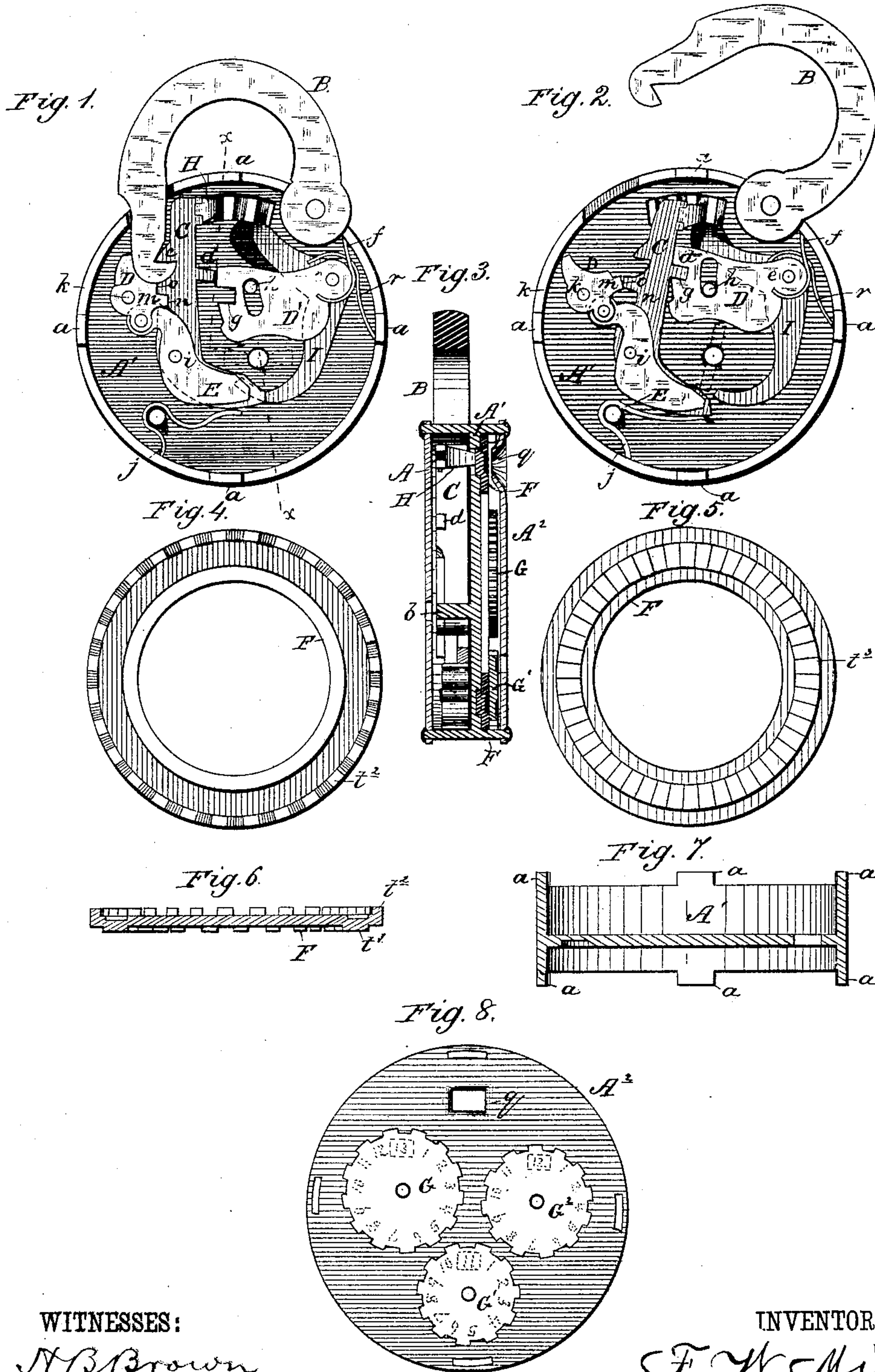


(Model.)

F. W. MIX.  
Indicator Lock.

No. 241,691.

Patented May 17, 1881.



WITNESSES:

N. B. Brown

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

FRANK W. MIX, OF TERRYVILLE, CONNECTICUT, ASSIGNOR TO EAGLE  
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## INDICATOR-LOCK.

SPECIFICATION forming part of Letters Patent No. 241,691, dated May 17, 1881.

Application filed January 21, 1881. (Model.)

*To all whom it may concern:*

Be it known that I, FRANK W. MIX, of Terryville, in the county of Litchfield and State of Connecticut, have invented a new and Improved Indicator-Lock; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view of the locking mechanism for the shackle-bar with the front plate removed, the shackle being shown in its locked position. Fig. 2 is the same view, showing the unlocked position. Fig. 3 is a vertical section through line *xx* of Fig. 1. Figs. 4, 5, 6 are respectively a front, back, and sectional view of the indicator-ring, the filling or enamel which carries the letters being left out. Fig. 7 is a sectional view of the middle portion of the case. Fig. 8 is an inside view of the rear face-plate, to which a portion of the indicator-wheels are attached, and through which the letters show.

My invention relates to certain improvements in indicator-padlocks, in which a change is made in the indicator-wheel, and a different set of symbols, figures, or letters made to show through openings in the case, for the purpose of enabling the proper authorities to detect any surreptitious opening of the lock.

My invention has reference more particularly to that type of lock, previously patented by me, in which an annular indicator turns loosely in a peripheral seat in the lock-case; and my improvement consists, first, in the peculiar construction of the annular indicator-wheel; secondly, in its combination with the bolt mechanism; thirdly, in the peculiar construction of the bolt mechanism; and, fourthly, in the peculiar construction of the case, as herein-after more fully described.

In the drawings,  $A A' A^2$  represent the case of the lock, formed of three parts, the middle portion,  $A'$ , of which is cast and has a web or partition and a peripheral rim or flange, and the other parts,  $A A^2$ , of which are simple face-plates. The web portion of the middle piece is not midway of the rim, but a little to one side, so that it forms, in connection with the

face-plate  $A$ , a deep compartment for the bolt mechanism, and with the face-plate  $A^2$  a shallower compartment for the indicator mechanism. In attaching these face-plates permanently to the central piece the peripheral rim of the latter is formed with shoulders *a*, which project through slots in the edge of the plates and are riveted down to tightly hold the same. Upon the web portion of the middle section is formed the key-pin *b*, Fig. 3, adapted to receive the key, which is formed with two diametrical bits.

$B$  is the shackle-bar, pivoted upon a pin upon one side and provided with one or more notches at its other end for engagement with the locking-bar  $C$ . This locking-bar has a tooth or lug *c*, which engages with the notch of the shackle-bar, and upon its back side a lug, *d*.

$D'$  is the tumbler, pivoted upon a center-pin, *e*. This tumbler is normally held down by a spring, *f*, and is provided with a notch, *g*, which notch, when the tumbler is raised, receives the lug *d* on the back of the locking-bar, and allows the latter to be withdrawn from the shackle. This tumbler is slotted and is guided in its movement by pin *h*. The locking-bar  $C$  is pivoted upon a pin, *i*, and has its lower end bent around and under the key-pin, while the tumbler rests above it, so that immediately after one bit of the key acts upon the tumbler to raise it the other bit acts upon the locking-bar to withdraw it from the shackle. The locking-bar  $C$  is forced into engagement with the shackle-bar by spring *j*.

On the opposite side of the shackle-bar from the locking-bar I place a seat or abutment,  $D$ , pivoted upon a pin, *k*. To the lower end of the seat or abutment I joint the upper end of a curved lever,  $E$ , fulcrumed upon the pin which forms the pivot of the locking-bar. This abutment  $D$  has a lug, *m*, which, when the locking-bar is engaged with the shackle, rests in a recess, *n*, of said locking-bar, and which lug, when the locking-bar is drawn back, rests against the shoulder *o* of the locking-bar and holds it back, as shown in Fig. 2. Now, the point of contact of the end of the shackle-bar with the abutment I arrange to be inside of the fulcrum-pin of the abutment, so that when the shackle-



bar is closed its end strikes the abutment and turns it, causing its lug *m* to pass off shoulder *o* into recess *n*, at which time the tension of spring *j* asserts itself and forces the locking-bar into engagement with the shackle.

The function of lever *E* is as follows: When the locking-bar is being withdrawn from the shackle the same bit of the key which acts upon the locking-bar also acts upon the lower end of the lever *E*, throwing it outward and its upper end inward, which movement, it will be seen, tilts the abutment *D* outward and raises its lug *m* to a position where it rests against the shoulder *o* of the locking-bar.

So far I have only described the construction and operation of the locking mechanism. I will now proceed to describe the construction of the indicator mechanism and its co-operation with the bolt mechanism.

*F* is the main indicator-wheel, which is of an annular form, turning loosely in a seat on the opposite side of the web or partition from the bolt mechanism. This ring or wheel has (see Figs. 4, 5, 6) a row of teeth, *t*<sup>3</sup>, upon its flat side next to the partition, which rest in a recess in said partition, and has upon its outer face a row of crown-teeth, *t*<sup>2</sup>, projecting at right angles from the periphery of the ring, while a recess in its outer face is filled with celluloid or other equivalent material, as shown in black in Fig. 3, to give a good background for the figures or letters that are placed thereon. Meshing with the crown-teeth of this wheel are three subsidiary indicator-wheels, *G* *G'* *G*<sup>2</sup>, which are carried by pins that are attached to the face-plate *A*<sup>2</sup> on the back side of the lock. Each one of these wheels is provided with a row of figures or letters which show through openings in the case for each, and the teeth of which wheels and the numbers or letters thereon are arranged for a differential effect, to prevent the easy recurrence of the same symbols. Where the indications on the ring or annular wheel show through the case this face-plate is depressed, as at *q*, to bring the case down to the plane of this wheel. Now, to connect these wheels with the bolt mechanism, the middle plate of the case is cut away just opposite the teeth on the back of the annular dial, and a pawl, *H*, is jointed to the upper end of the locking-bar *C* and protrudes through the opening in the middle partition and acts upon the teeth of the indicator-wheel to move it and change the indications every time the locking-bar is withdrawn.

As a modification of this structure I may not use an articulated or jointed pawl, as shown, but may have a rigid stud or spur formed on the side of the locking-bar, which spur acts upon the teeth of the annular indicator to move it. In such case, however, the locking-bar must be connected with its fulcrum-pin loosely, so as to permit the slight lateral variation necessary to allow the spur to pass over the teeth of the indicator, and the locking-bar and spur

will be forced against the teeth of the indicator-ring by a flat spring on the face-plate.

For locking the indicator-ring against being moved by other agency than the locking-bar I employ an elbow-lever, *I*, fulcrumed upon the same pin with the tumbler, the arms of which lever are pressed upward by the tension of the spring *r*. The upper one of the arms of this elbow-lever has its end bent and extended through an opening in the middle partition, where it engages with the teeth of the indicator-ring, while its lower end rests beneath the key-pin in position to be struck by the key-bit.

Now, in opening the lock it will be seen that the lower bit of the key first depresses the lower arm of the elbow-lever and removes its upper arm from the teeth of the main indicator-wheel. Immediately following this the opposite bit of the key raises the tumbler until its notch is opposite the lug of the locking-bar, when the other bit of the key strikes the lower end of locking-bar and withdraws it from the shackle, at same time moving the indicator-wheels by means of the pawl above.

Now, in defining my invention more clearly, I would state that I am aware that it is not new, broadly, to combine a locking mechanism acting in one plane with an indicator mechanism acting in another plane, by a pawl or jointed piece which connects the locking mechanism with the indicator mechanism, and I do not claim this broadly. I do not know, however, that an indicator-wheel having teeth or notches upon its side has ever been thus combined with the locking mechanism, and I claim it as a novel and meritorious construction.

Having thus described my invention, what I claim as new is—

1. An indicator-lock consisting of a locking mechanism acting in one plane, and a set of indicator-wheels resting in a plane parallel to the first, one of said indicator-wheels having teeth or notches upon its side for movement by the direct engagement of the locking-bar, and being geared to the other indicator-wheels, so as to impart motion thereto, substantially as shown and described.

2. The indicator-ring herein described, having a set of teeth or notches on its flat side, and a set of crown-teeth on the other flat side, combined with a set of indicator-wheels engaging with these crown-teeth, and with a locking mechanism engaging with the teeth or notches on the back side of said ring, as described.

3. The combination, with a locking mechanism and the indicator mechanism, of a case composed of a middle web or partition cast in one piece with a peripheral rim extending on each side of the web portion, and forming the entire edge of the lock, and two flat face-plates applied thereto, substantially as described.

4. The combination, with the shackle-bar and the locking-bar *C*, of the pivoted abutment

D, arranged in the plane of the locking-bar, and the additional lever E, jointed to the side of abutment D, and arranged, as described, to throw back the abutment and hold the locking-bar back when the shackle-bar is out, as described.

elbow-lever I, arranged in the plane of the bolt mechanism, and extending into range of engagement with the said indicator-ring, substantially as and for the purpose described.

FRANK W. MIX.

Witnesses:

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5. The combination, with the indicator-ring having teeth upon the flat side, of the locking