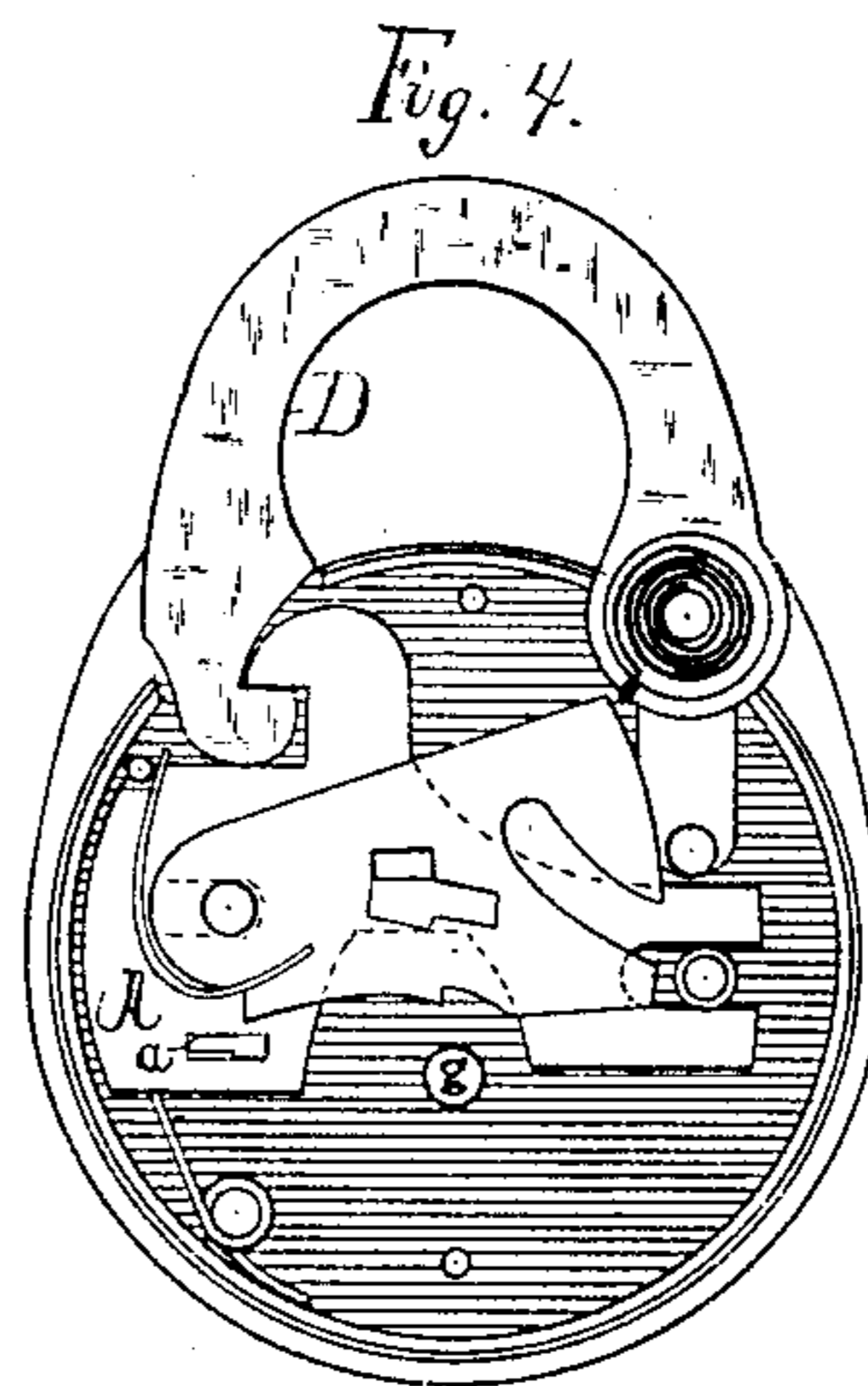
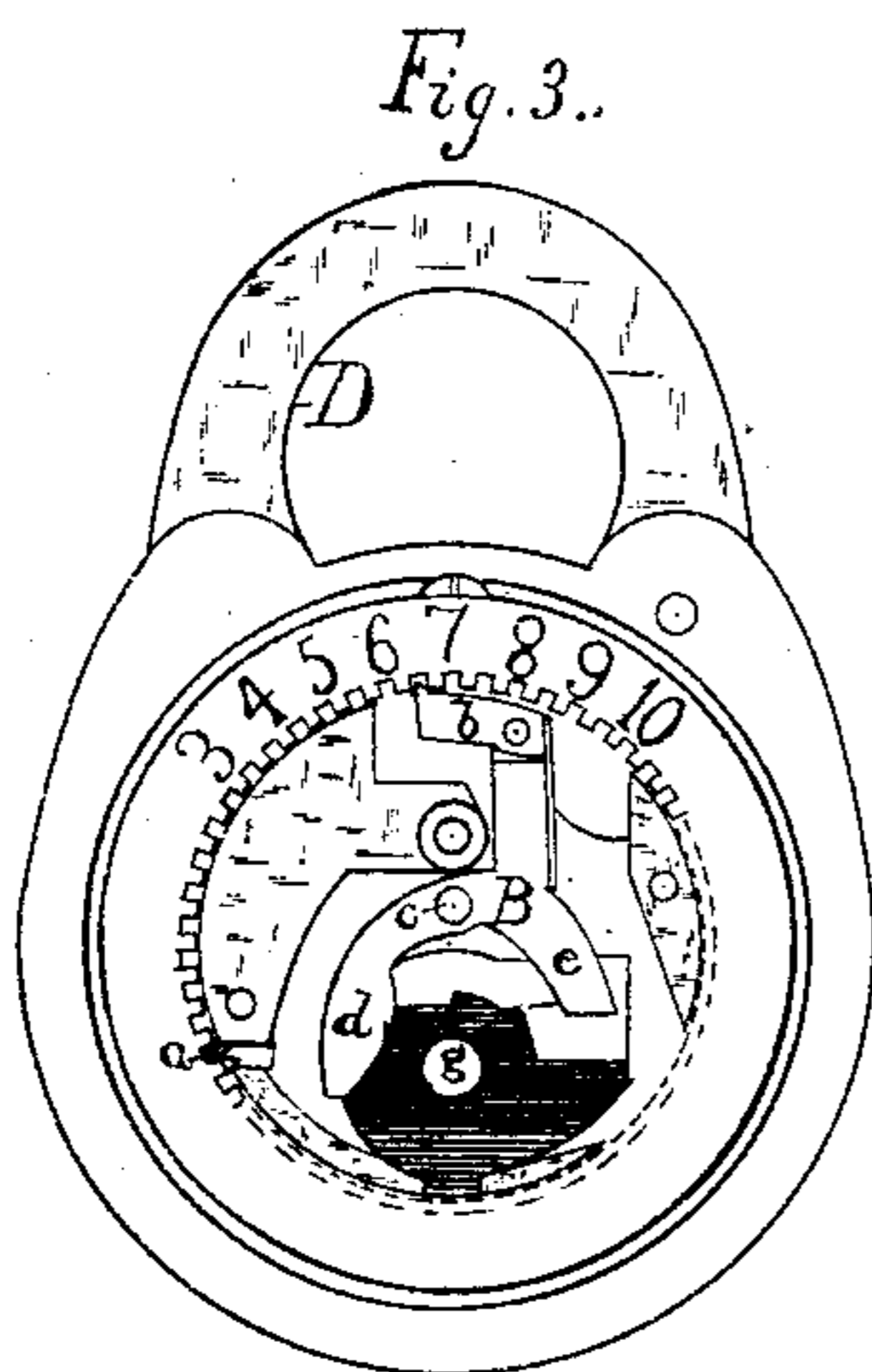
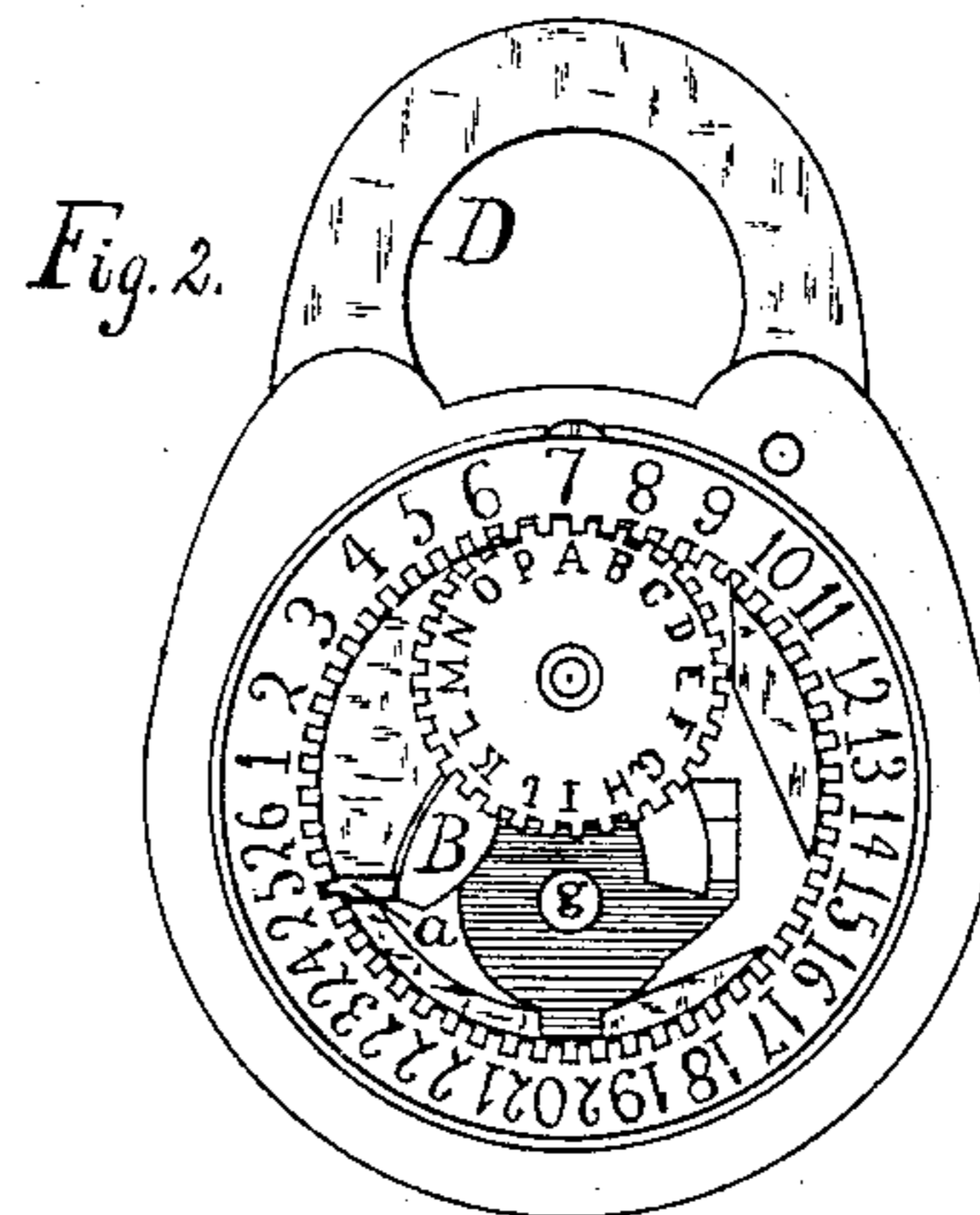
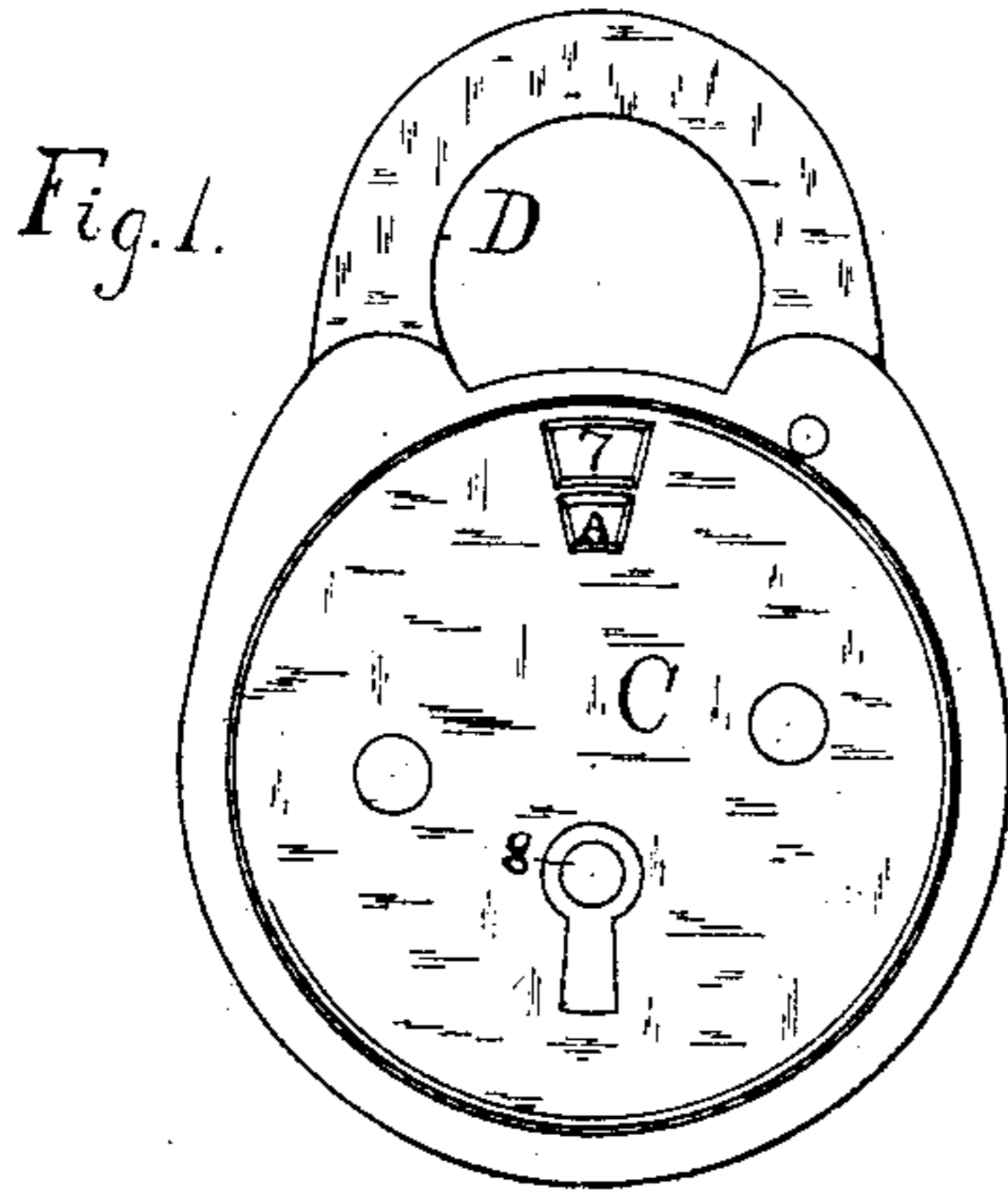


F. W. MIX.  
Indicator-Lock.

No. 219,495.

Patented Sept. 9, 1879.



Witnesses:  
W. B. Thomson.  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

FRANK W. MIX, OF TERRYVILLE, CONNECTICUT.

## IMPROVEMENT IN INDICATOR-LOCKS.

Specification forming part of Letters Patent No. **219,495**, dated September 9, 1879; application filed June 9, 1879.

*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 certain new and useful Improvements in Indicator-Locks, of which the following is a specification.

My invention consists in the peculiar construction of certain parts, and in the peculiar construction and combination of parts, as hereinafter described.

In the accompanying drawings, Figure 1 is a front elevation of an indicator-lock which embodies my invention. Fig. 2 is a like view of the same with the cap-plate removed. Fig. 3 is a like view with one of the rotating indicators removed, in order to better show the operating-lever; and Fig. 4 is a like view with the indicator mechanism removed, thereby showing the interior of the lock.

The working parts of the lock herein shown are most clearly represented in Fig. 4, in which A designates a sliding bolt, the same bearing a stud, *a*, which projects forward and up through the front plate of the lock-case proper, for a purpose hereinafter described. This sliding bolt is thrown or forced out of engagement with the nose of the shackle D by means of a proper key, and into engagement by means of a spring, (not shown,) so as to form a self-locking or spring lock. The particular locking mechanism is, however, no essential part of my invention, and any other locking mechanism may be substituted therefor in connection with the indicator mechanism, which I will now describe.

The middle portion of the front plate of the lock-case is cut away to make room for other parts. The bulk of the indicator mechanism is placed on the outside of this plate, and consists, mainly, of an indicator-ring bearing a series of numbers on its face and teeth on its inside edge, as shown in Figs. 2 and 3. In the drawings this ring bears the numbers 1 to 26, inclusive; but it may be larger or smaller, and bear a greater or less number of numbers or other characters, as may be desired. This ring is placed in an annular recess formed in the face of the front plate of the lock or in the cap-plate C, or partly in both, the latter construction being preferred. Inside of this ring,

and mounted on a suitable post or stud of the lock-case, is a small geared wheel, meshing into the teeth on the inside edge of this ring. This indicator-wheel bears a series of letters. In the drawings it is marked with a portion of the alphabet from A to P, inclusive; but, if desired, it may bear other characters.

The cap C covers the registering or indicator mechanism, except at one point, where suitable openings are made to show the contiguous characters on one division of the ring and wheel, respectively, as shown in Fig. 1. I prefer to place these openings side by side, as shown; but both divisions may show through a single opening, if desired, or the openings might be located at other point or points over the ring and wheel and produce the same result so far as part of the features of my invention are concerned. The cap C is also provided with the ordinary key-hole.

The ring and the wheel constitute two rotating indicators, the latter of which is placed inside of the former and at one side, so as to leave room to insert the key inside of the ring; therefore the lettered wheel necessarily has a less number of divisions and teeth than the ring, so that the wheel makes a complete revolution while the ring is making only a part of a revolution, whereby when the parts are moved together the same letter on the wheel will not come opposite the same figure on the ring that it did in the last revolution.

As arranged in the drawings, with proper mechanism for moving the ring one division every time the lock is unlocked, the operation of locking and unlocking, if I have made no mistake in figuring, will have to be repeated four hundred and sixteen times before the same number and letter can be brought together a second time.

By making the divisions in the two rotating indicators of different relations to each other than those shown in the drawings a greater or less number of times will be required for producing the same result; and by making the divisions, together with the teeth, so that they have no common divisor, then the same letter and number can never be brought together a second time.

If desired, teeth might be formed on the

outside edge of the ring, and the geared wheel placed on the outside instead of the inside of the ring, although the latter is always to be preferred; or, if desired, a third indicator, of different size and division, may be placed on the outside of the ring and meshing into it, so as to register or indicate three different characters. Also, two wheels of different size might be fixed on different centers inside of the ring, for a like purpose.

I make the lettered wheel thinner than the ring, so as to make room for the operating mechanism, which is located behind the wheel and engages the edge of the ring. The operating mechanism consists of a lever, *B*, having a spring-pawl, *b*, on its upper end. This lever is hung on any proper fixed fulcrum, as at *c*, Fig. 3, and its lower end has two arms, *d* *e*, which extend downward on opposite sides of the key-post *g*.

When the key is inserted and turned a portion of its bit strikes the arm *d* of the lever *B* and oscillates said lever to draw back the pawl *b* over two teeth of the ring. As the key-bit passes on it soon strikes the opposite arm, *e*, of said lever and throws the pawl in the opposite direction, thereby moving the ring and the wheel one division, and a different letter and number are registered or indicated through the openings in the cap-plate *C*.

I prefer to notch the edge of the tumbler for the sliding bolt, as shown in Fig. 4, so that when the key has been moved a certain distance to unlock the lock it cannot be moved backward, so as to return the indicators to their former position, but must necessarily be turned forward before it can be removed.

The stud *a* on the lock-bolt enters between the teeth of the ring to prevent moving the same, as shown in Fig. 2, except when the lock is being locked and unlocked. So soon as the lock-bolt is moved to disengage it from the shackle the stud *a* is disengaged from the teeth of the ring, so that it may then be moved. I prefer to make this stud *a* wide enough so that when the lever *B* is moved in the direction to draw back the pawl over the teeth of the ring the inside edge of said stud will engage the outside edge of the arm *d*, and thereby carry the lever in the direction to drive the pawl forward and move the indicators independently of the fact whether or not the key-bit properly engages the inner edge of the arm *e*.

If desired, another stud might be placed on the lock-bolt to engage the outside edge of the arm *e*, or the lever might have only a single lower arm resting in a slot or between two studs in the lock-bolt, so that the pawl would be operated both ways by the bolt, and wholly independently of any engagement with the key-bit.

This lock is principally designed for use in the mail-service; but it may be used for any

purpose where it is desired to detect any unauthorized opening of the lock. When locked, as shown in Fig. 1, a record may be made of the characters exposed to view, and this information communicated to the proper officers on the route or at its destination. In case the lock has been opened a different number and letter will be indicated, so that the opening will be at once detected.

If there were but one indicator, or two of the same division, the lock could soon be manipulated so as to indicate the same as before; but with two differential indicators the great number of times of unlocking necessary to bring the same characters to view renders it highly improbable that one unlawfully opening the lock should be able to manipulate it so as to indicate the same as before.

The lock may also be used to locate any act of pilfering by placing it on a through-mail pouch, recording the characters indicated at the forwarding-office, but without informing others, and then having every officer on the route whose hands it passes through record in like manner the characters indicated, and afterward a comparison of the several records, in case the lock was opened on the route, will reveal the place where it was done.

I am aware that indicator-locks of various constructions are old.

I claim as my invention—

1. In combination with a lock, the indicator-ring and indicator-wheel, geared together and bearing suitable characters, and mechanism for partially rotating said ring and wheel every time the lock is unlocked, substantially as described, and for the purpose specified.

2. The combination of the lock proper with two rotating indicators having peripheral teeth which continuously mesh into each other, and also bearing suitable characters upon their flat faces, and the cap *C* on one of the broad sides of the lock, having openings for showing the two contiguous characters on the side of said rotating indicators, substantially as described, and for the purpose specified.

3. In an indicator-lock, the combination of the indicator-ring and its operating mechanism with the lock-bolt bearing the stud *a* for engagement with the teeth on the inner edge of said ring, substantially as described, and for the purpose specified.

4. In an indicator-lock, the combination of the indicator-ring bearing teeth on its inside edge, the operating-lever located inside of said ring and bearing a spring-pawl for engaging the teeth of said ring, and suitable mechanism for operating said lever, substantially as described, and for the purpose specified.

5. The mechanism of a lock proper, in combination with two rotating indicators having peripheral teeth which continuously mesh into each other, and also bearing suitable characters upon their flat sides, showing through

openings in the case, mechanism for partially rotating said indicators every time the lock is unlocked, and mechanism for locking the indicator-wheels against rotation when the parts are at rest, substantially as described, and for the purpose specified.

6. In an indicator-lock, the indicator ring

surrounding its operating mechanism and the key-hole of the lock, substantially as described.

FRANK W. MIX.

Witnesses:

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