

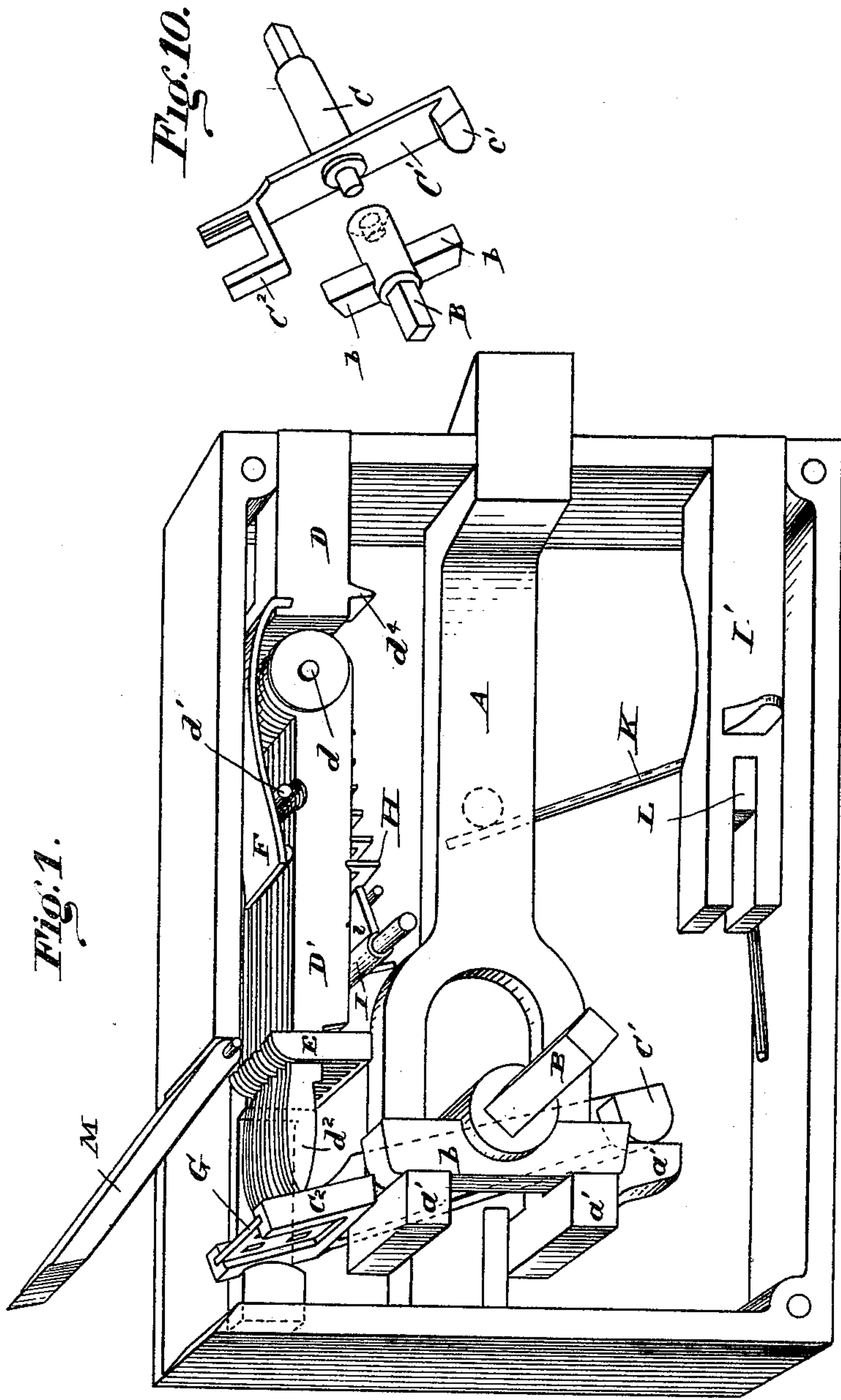
(Model.)

M. RIEDINGER.
LOCK.

3 Sheets—Sheet 1.

No. 410,610.

Patented Sept. 10, 1889.



Attest.
H. Smith
C. H. Paver.

Inventor.
Michael Riedinger
per Wm. Hubbell Fisher
att'y.

(Model.)

M. RIEDINGER.
LOCK.

3 Sheets—Sheet 2.

No. 410,610.

Patented Sept. 10, 1889.

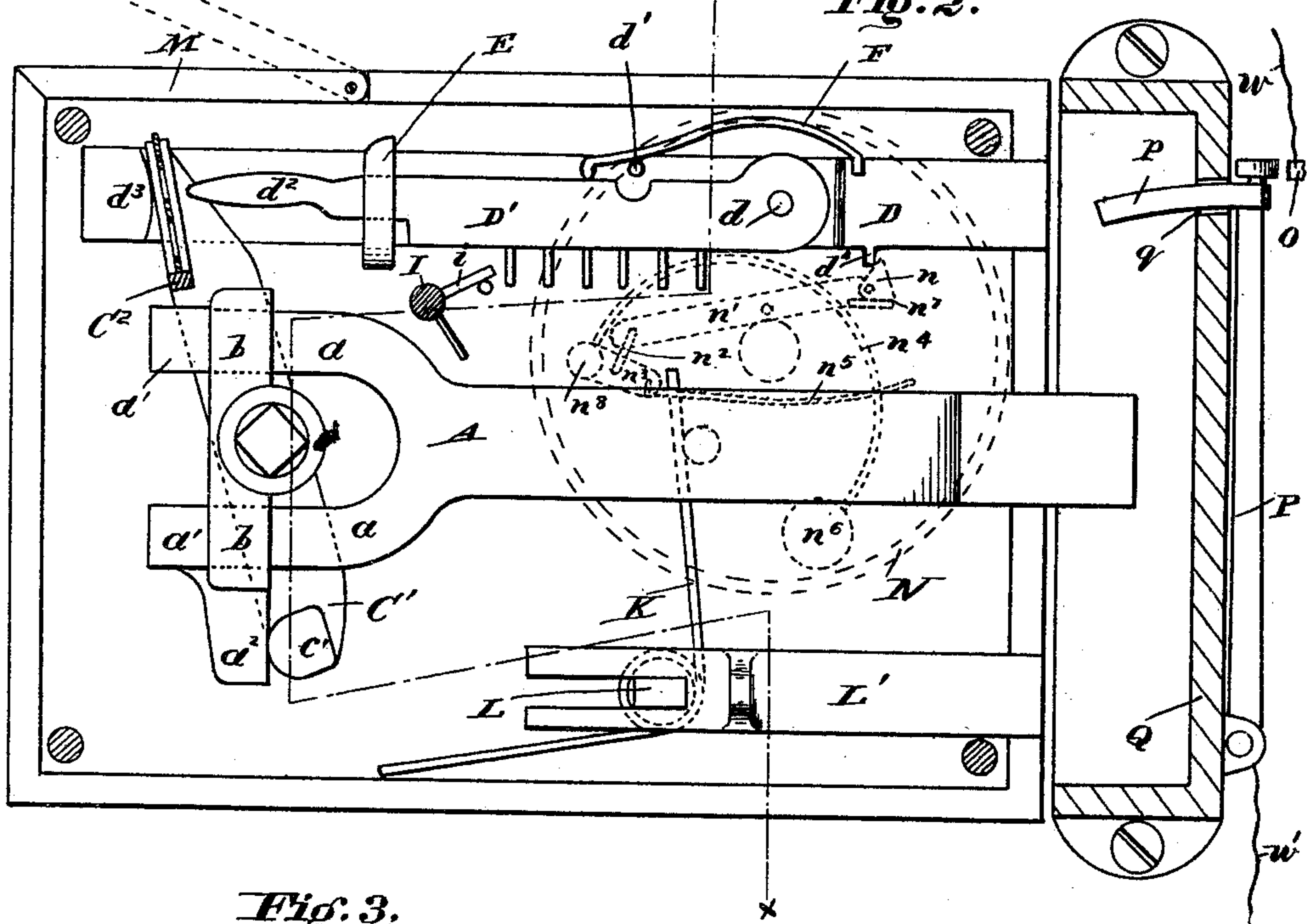
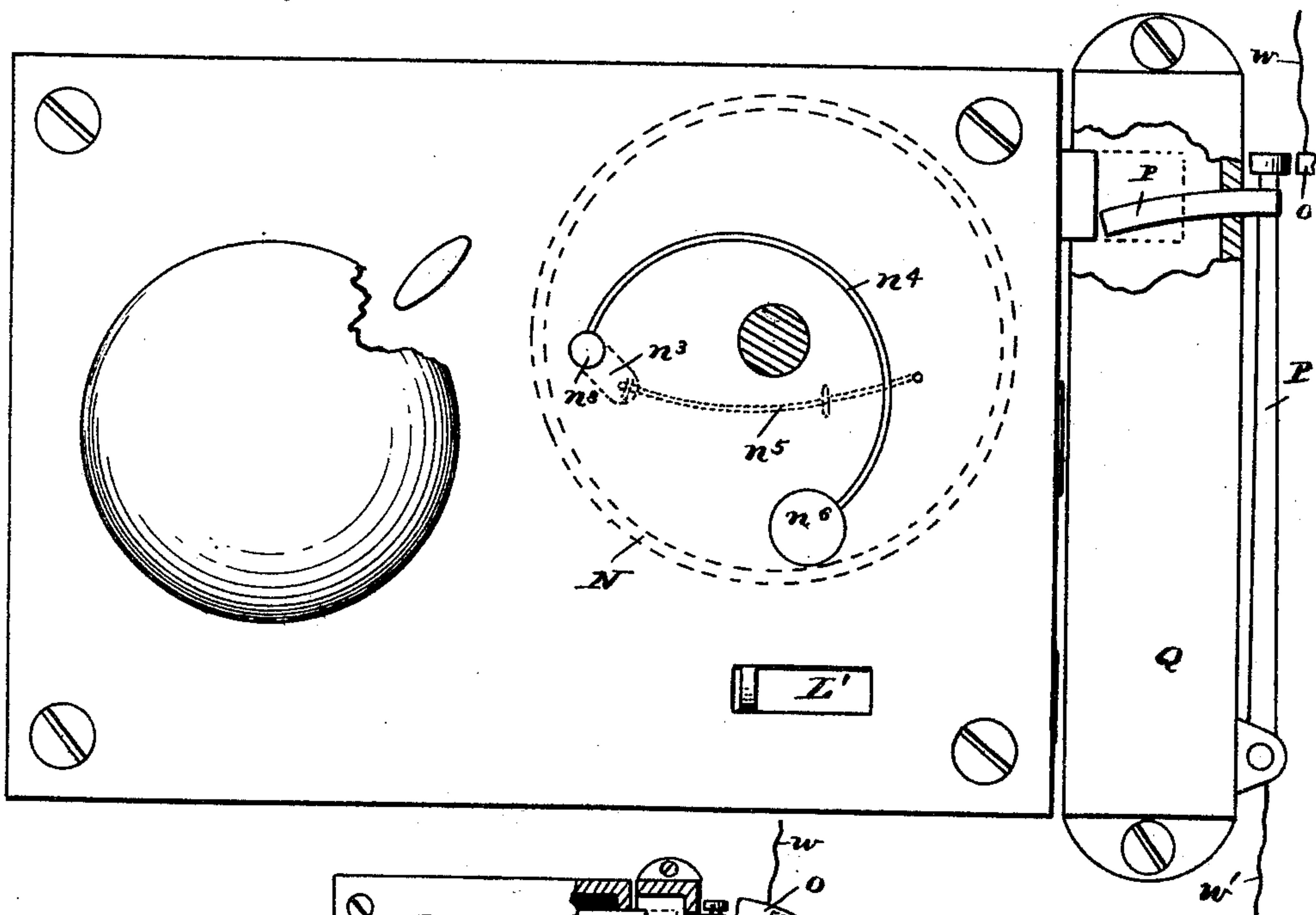


Fig. 3.



Attest.
H. Smith.
C. W. Parn.

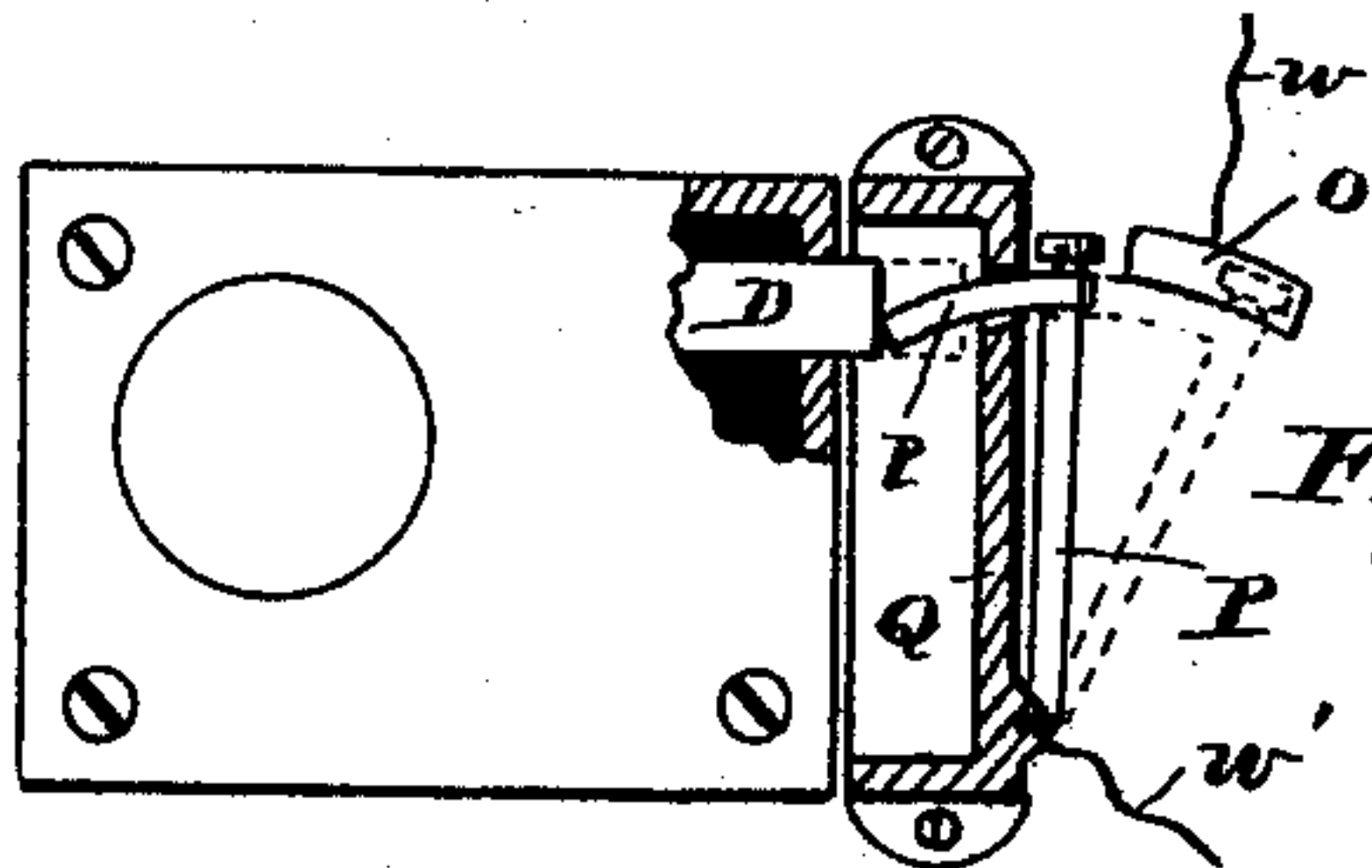


Fig. 4.

Inventor.

Michael Riedinger
per Wm. Hubbell Fisher
Atty.

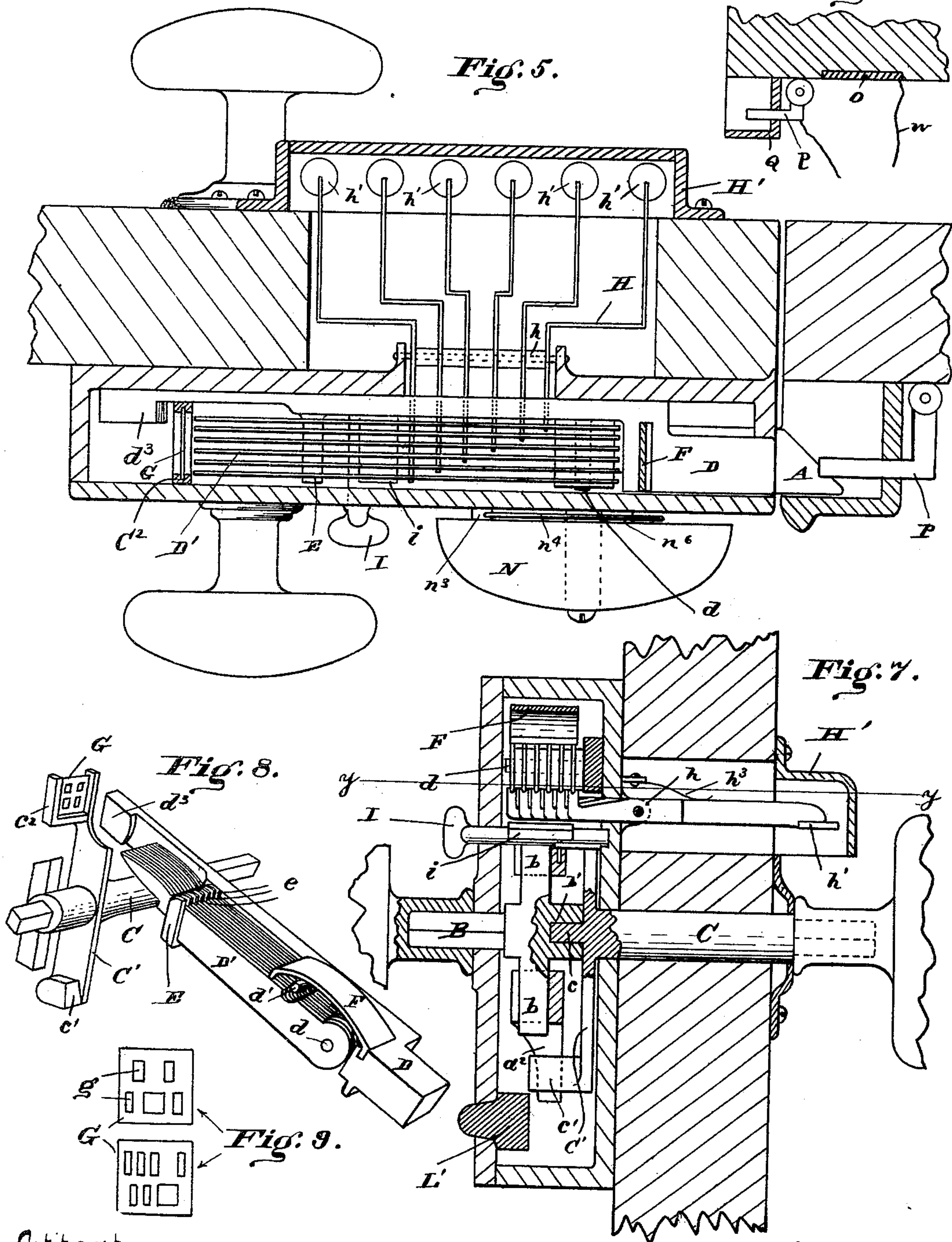
(Model.)

M. RIEDINGER.
LOCK.

3 Sheets—Sheet 3.

No. 410,610.

Patented Sept. 10, 1889.



Attest
H. Smith.
C. W. Paver.

Inventor.
Michael Riedinger
per Wm. Hubbell Fisher,
Atty.

UNITED STATES PATENT OFFICE.

MICHAEL RIEDINGER, OF CINCINNATI, OHIO.

LOCK.

SPECIFICATION forming part of Letters Patent No. 410,610, dated September 10, 1889.

Application filed April 2, 1888. Serial No. 269,515. (Model.)

To all whom it may concern:

Be it known that I, MICHAEL RIEDINGER, a citizen of the United States, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Door-Locks, of which the following is a specification.

The several features of my invention and the advantages arising from their use, conjointly or otherwise, will be apparent from the following description.

In the accompanying drawings, forming part of this specification, Figure 1 is a perspective view of the inside of the lock, the view being taken on that side of the lock which is usually toward the inside of the door. Fig. 2 is an elevation of the interior of the lock, taken on the same side of the lock as Fig. 1. Fig. 3 is an elevation of the inside cover or face plate of the lock, the bell removed. Fig. 4 is a diminished view illustrating the mechanism for ringing the electric bell. Fig. 5 is a section taken at the line *y y* of Fig. 7, and looking at the section from that position which is on the right-hand side in Fig. 1. Fig. 6 is a top view, partly in section, of the device for ringing the electric bell. Fig. 7 is a section taken at the line *x x*, Fig. 2. Fig. 8 is a detached view in perspective, illustrating the combination-tumblers and co-operating parts. Fig. 9 shows two different perforated plates, illustrating how the combination may be changed. Fig. 10 is a view of the knob-spindles.

The outer casing of the lock is substantially the same as that of the ordinary door-lock.

The knob-bolt A terminates within the lock in the usual bifurcated end *a a*, which surrounds the knob-spindle. The ends *a a* terminate in the lugs *a' a'*, against which the cross-arm *b* of the inside knob-spindle B bears, enabling the bolt to be thrown by the inner knob in whichever direction it is turned. The outer knob-spindle C is journaled on the inner knob-spindle B in any desired way, a convenient means being a stem *c*, received in a socket *b'* in the end of the other knob-stem.

The outer knob-spindle C is provided with the cross-arm C', rigidly attached to it, and which is provided at one end with the lug *c'*,

bearing against the lug *a²* from bolt A, to throw the bolt A, and at the other end with a yoke or holder *c²*, to hold the combination-plates.

The spring K, which bears against the lock-casing and against lug on the bolt A, serves to throw the bolt A out. This spring K may be coiled about any lug cast on the face or casing of the lock, but it is most conveniently attached to the guiding-lug L of the slide-bolt L'. The safety-bolt D is located above the knob-bolt A.

A series of tumblers D', all similar in shape and size, are mounted on the pivot *d*, projecting from the side of the bolt D. These tumblers are supported at their other ends by the bracket E, projecting from the bolt D, each tumbler being received in its own socket or slot *e*.

The spring F is attached to the top of the bolt D and pressed downward on the tumblers D'. The downward movement of this spring is limited by the pin *d'*. The spring F serves to keep the tops of the tumblers even.

The tumblers D' terminate in the contracted ends *d²*, whose upper and lower edges are preferably beveled off slightly, as shown, making a somewhat pointed extremity.

The combination-plates G are received in grooves in the yoke *c²*. A convenient means of changing the combination-plates is shown in Fig. 2. A portion M of the top of the casing immediately over the yoke *c²* is hinged and can be readily raised, as indicated in dotted lines, and through the opening the combination-plates may be removed and a new one inserted.

Each combination-plate is provided with two series of openings *g*—an upper and a lower series. These openings are so located that the openings of the lower series come opposite the ends *d²* of the tumblers when the latter are down and the upper end of the arm C' is thrown forward by the outside knob, and the upper openings come opposite the ends *d²* when the tumblers are in their normal position—i. e., raised—so that if the tumblers corresponding to the lower openings be allowed to drop by the corresponding keys *h'* on the outside when the outer knob is turned

all the ends d^2 will pass into the openings g , and the door may be opened by the outer knob. If, however, the proper tumblers are not lowered when the outer knob is turned, the solid portion of the combination-plate will strike against the end d^2 of one or more tumblers and throw the bolt D out, locking the door, at the same time that the bolt A is withdrawn.

The preferred means for lowering the tumblers is a series of levers H, one for each tumbler. These levers are all fulcrumed on a short shaft h in the side of the casing and extend entirely through the door, their ends being preferably separated somewhat, as shown, for convenience in manipulation, and each provided with a finger tip or key h' . Within the lock the levers terminate in upwardly-extending feet h^2 , one under each tumbler. The weight of the keys keeps the tumblers raised.

When desired, a spring h^3 may be employed to aid in pressing down its adjacent key, as shown in Fig. 7; but where the keys are made sufficiently heavy the springs h^3 may be omitted.

The outer ends of the levers H (the fingertips) are preferably protected by an overhanging hood H' .

The spindle I, operated from the inside of the door, is placed immediately under the tumblers and carries a fan i , which, when the spindle is turned, raises the ends of all the tumblers at once to a point above the line of travel of the combination-plates G. In this way the combination may be thrown entirely out of gear and the door be opened by the outer knob in the usual way. The bolt D is returned by the arm C' , which bears against the lug d^3 on the inner end of the bolt.

When an attempt is made to open the door by a person unacquainted with the combination, means are provided for ringing a bell to announce the fact. I have two means of accomplishing this purpose, either or both of which may be employed in the same lock.

In Fig. 2 the device for ringing the gong N is shown in dotted lines. A lug d^4 on the bottom of the bolt D bears against the top of the triangular dog n . The dog n rests on the plate n^7 , and one angle is pivoted to the lever n' . The other end of the lever n' is connected by the link n^2 with the arm n^3 , which latter is rigidly attached to the rock-shaft n^8 . The rock-shaft n^8 passes through the casing of the lock and has the curved clapper-stem n^4 attached to it on the outside. The clapper n^6 rests nearly against the gong N. The spring n^5 tends to depress the lower end of the arm n^3 , to which it is attached. When the bolt B moves forward, the lug d^4 tilts the dog n forward, depresses the upper end, and raises the lower end of lever n' , raises arm n^3 , and moves the bell-hammer away from the bell until the lug d^4 has passed the dog n . The bell-hammer then being released, the spring n^5 will force said hammer against the latter and ring

the latter. Upon the return of the bolt B the lug d^4 will tilt the dog n backward and operate lever n' and arm n^5 , and draw the bell-hammer from the edge of the bell. As soon as the lug d^4 has passed the dog n the hammer will again be forced against the bell and ring the latter.

The alarm electrically is shown in Figs. 2, 3, 4, and 6.

One wire W of the battery which operates the alarm-bell when the circuit is closed is attached to the plate O, set in the wall or door-frame. The other wire W' is attached to the switch P. The switch P is hinged at the bottom of the keeper Q, and is provided with an insulated arm p , which extends into the keeper Q through an opening q opposite the bolt D. When the bolt D is moved forward, it strikes against the arm p and throws the switch-lever over to plate O, thus completing the circuit and causing the bell to ring. There being nothing to return the armature P when the bolt D returns to place, the bell continues to ring until the armature is again set by hand.

The mode of operation of the lock as a whole is readily understood from the modes of operation of the several parts, as already described.

While the various features of my invention are preferably employed together, one or more of said features may be employed without the remainder, and, in so far as applicable, one or more of said features may be employed in connection with locks and locking devices other than those herein specifically set forth.

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

1. In a door-lock, the combination of a knob-bolt, an outer knob operating independently of the inner knob, an arm attached to the stem of the outer knob and adapted to throw the knob-bolt, the combination-plate set in the end of the said arm and provided with variously-placed openings, a series of tumblers in the line of travel of the said plate, and means for adjusting the tumblers to the positions of the openings in the said plate.

2. In a door-lock, the combination of a knob-bolt, an outer knob operating independently of the inner knob, an arm attached to the stem of the outer knob and adapted to throw the knob-bolt, the combination-plate set in the end of the said arm and provided with variously-placed openings, a series of tumblers in the line of travel of the said plate, and means for adjusting the tumblers to the positions of the openings in the said plate, and an auxiliary bolt attached to the tumblers and adapted to be thrown out by them as the knob-bolt is withdrawn.

3. In a door-lock, the combination of a knob-bolt, an outer knob operating independently of the inner knob, an arm attached to the stem of the outer knob and adapted to throw the knob-bolt, the combination-plate set in the end of the said arm and provided with

variously-placed openings, a series of tumblers in the line of travel of the said plate, and means for adjusting the tumblers to the positions of the openings in the said plate, and an auxiliary bolt attached to the tumblers and adapted to be thrown out by them as the knob-bolt is withdrawn, and an electric switch adapted to be moved by the said auxiliary bolt so as to close an electric circuit to ring a bell.

4. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' , combination-plate G, provided with openings g and attached to the arm C', bolt D, tumblers D', and means for dropping one or more of the tumblers D, substantially as and for the purposes specified.

5. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' , combination-plate G, provided with openings g and attached to the arm C', bolt D, tumblers D', and levers H, passing through the door and each upholding one of the tumblers D in the lock, substantially as and for the purposes specified.

6. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' , combination-plate G, provided with openings g and attached to the arm C', bolt D, tumblers D', levers H, passing through the door and each upholding one of the tumblers D in the lock, spring F, and pin d' , substantially as and for the purposes specified.

7. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' , combination-plate G, provided with openings g and attached to the arm C', bolt D, tumblers D', levers H, passing through the door and each upholding one of the tumblers D in the lock, and shaft I, provided with leaf i .

8. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning

independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' and yoke c^2 , combination-plate G, provided with openings g and held in yoke c^2 , bolt D, tumblers D', and means for dropping one or more tumblers D', substantially as and for the purposes specified.

9. In a lock, the combination of knob-bolt A, provided with lug a , outer knob turning independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' , combination-plate G, provided with openings g and attached to the arm C', bolt D, tumblers D', and means for dropping one or more of the tumblers D', switch-lever P, provided with projection p , and wire W, and plate O, having wire attached thereto, substantially as and for the purpose specified.

10. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, arm C', attached to stem of outer knob and provided with lug c' , combination-plate G, provided with openings g and attached to the arm C', bolt D, tumblers D', and means for dropping one or more of the tumblers, lug d^4 on bolt D, lever n' , having dog n , link n^2 , arm n^3 , and rock-shaft n^8 , rigidly connected to arm n^3 , clapper and clapper-spring, and gong, substantially as and for the purposes specified.

11. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, arm C', attached to the stem of outer knob and provided with lug c' and yoke c^2 , combination-plate G, provided with openings g and held in yoke c^2 , bolt D, tumblers D', and means for dropping one or more tumblers D', and outer casing provided with hinged portion M near the combination-plate, substantially as and for the purposes specified.

12. In a lock, the combination of knob-bolt A, provided with lug a^2 , outer knob turning independently of the inner knob, and arm C', attached to stem of outer knob and provided with lug c' and yoke c^2 , substantially as and for the purposes specified.

MICHAEL RIEDINGER.

Attest:

WM. E. JONES,
G. A. W. PAVER.