

E. Stockwell

IMPROVED DIAL LOCK.

117478

PATENTED JUL 25 1871

Fig 1.

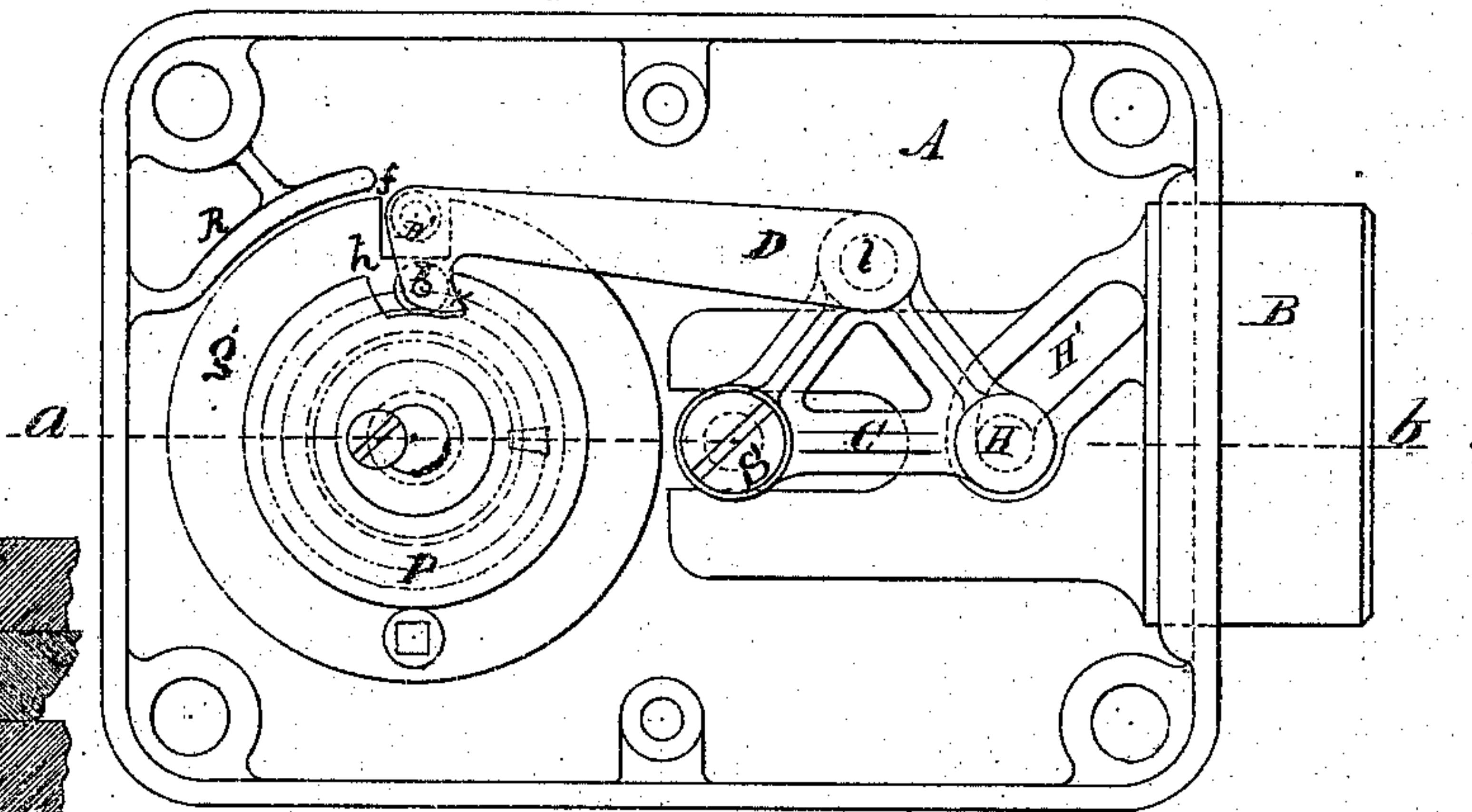


Fig 3.

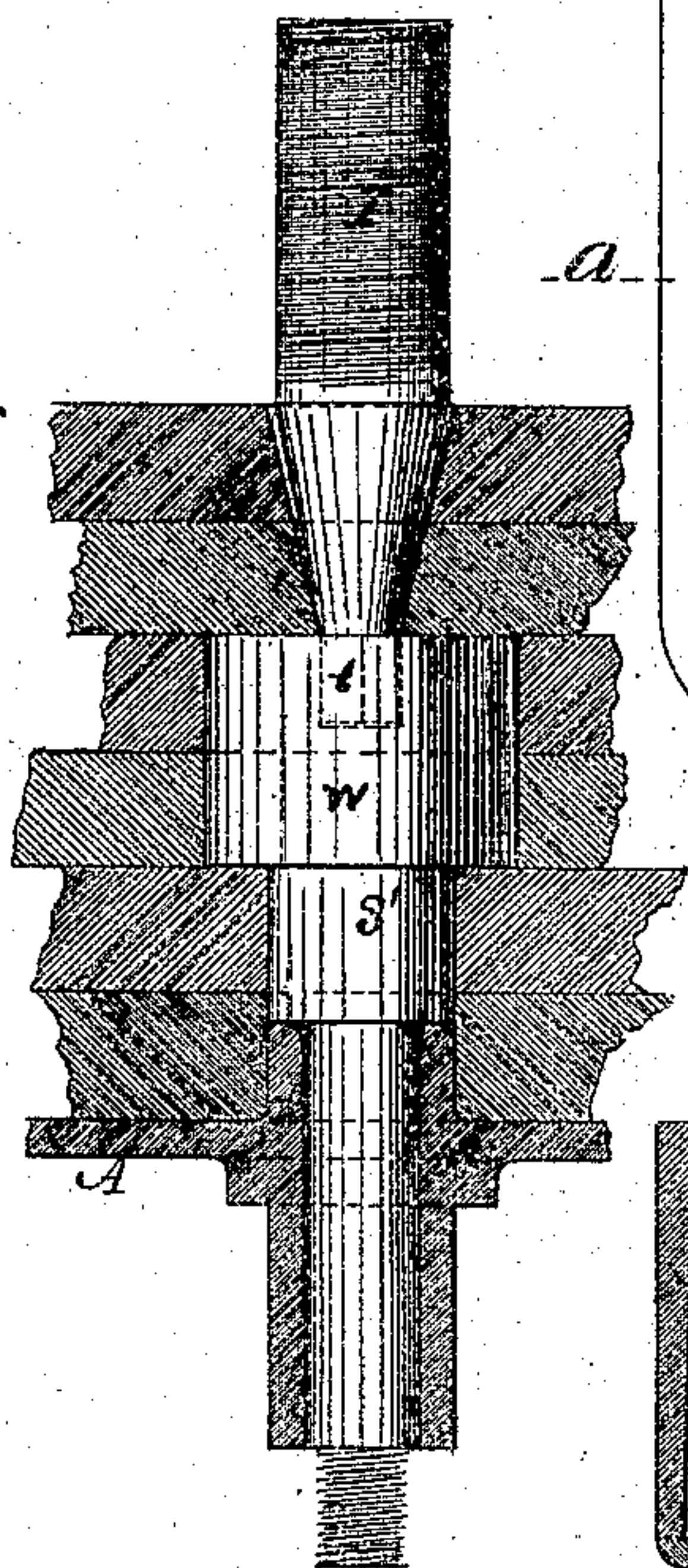


Fig 2.

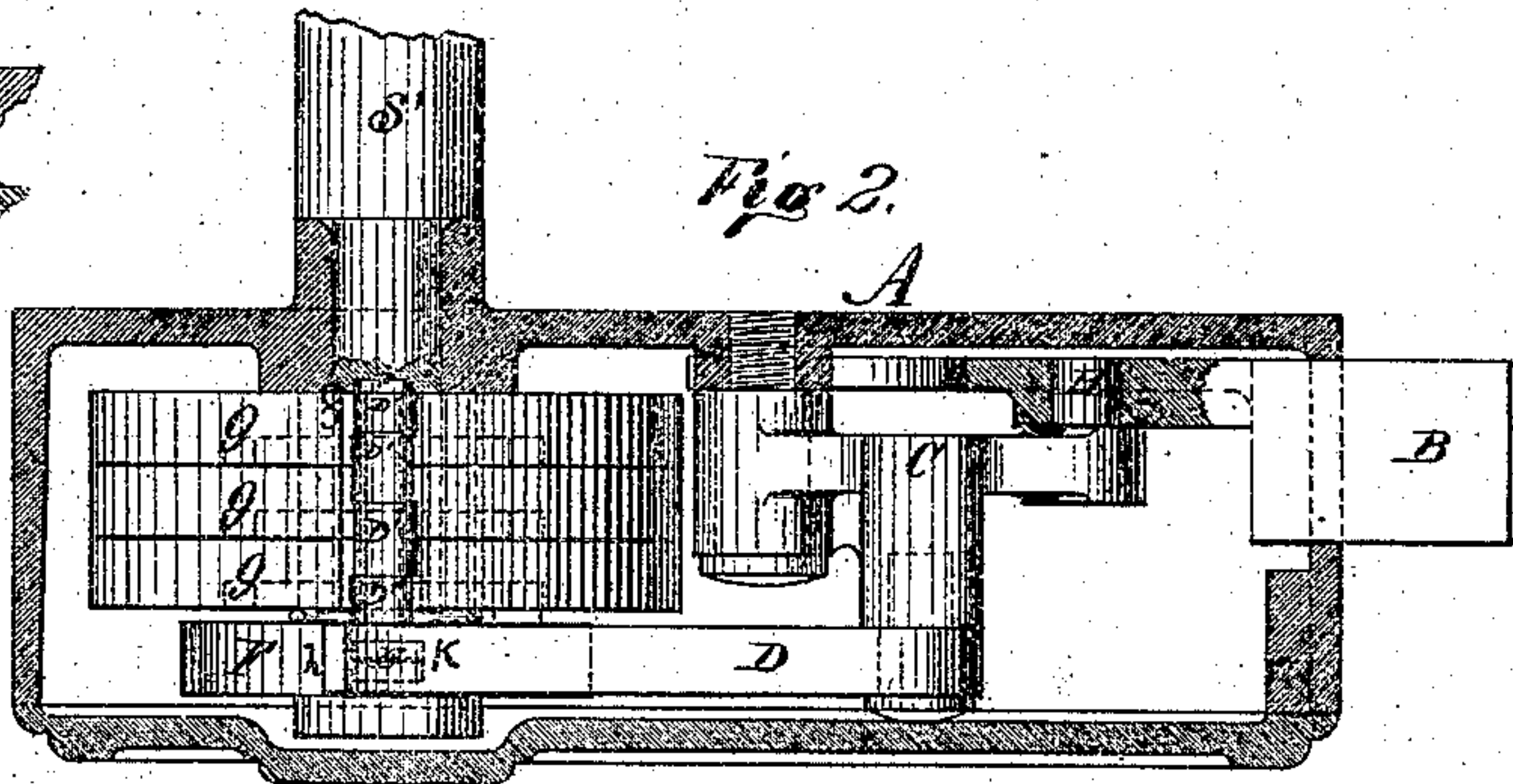
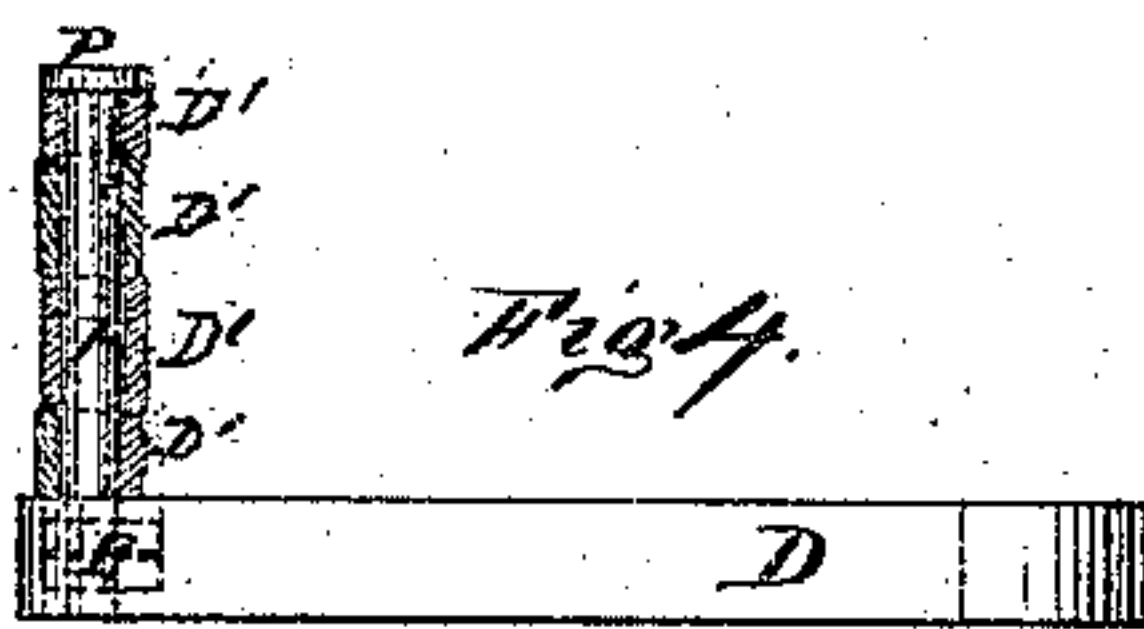


Fig 4.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PERMUTATION LOCKS.

Specification forming part of Letters Patent No. 117,478, dated July 25, 1871.

To all whom it may concern:

Be it known that I, EMORY STOCKWELL, of Stamford, in the county of Fairfield and State of Connecticut, have invented a new and Improved Permutation Lock; and that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The object of this invention is to construct a permutation lock which shall be simple in its parts and movements and yet be of great strength, and render the lock unpickable. The invention consists in the combination of a bell-crank lever with the fence-lever, and the bolt having a diagonal slot, the parts being so constructed and arranged that in an attempt to force the bolt the strain is thrown upon the bell-crank-lever and the pivot upon which it turns; also, in providing the fence with one or more eccentric rollers, revolving thereon in contact with the peripheries of the tumblers, which provision is for the purpose of preventing any one from determining the position of the tumblers by the application of a micrometer or other similar instrument; also, in a fence-lever, having a hooked end provided with an eccentric roller, and one or more eccentric rollers on the fence, in combination with the tumblers and a cam having a recess which receives the roller on the hooked end of the fence-lever, and by which the fence is raised; also, a curved rib, in combination with the lock-case and with the fence-lever, fence, eccentric rollers, tumblers, and recessed cam; also, in the construction of the two-part spindle and its socket; finally, in the general combination of the several parts of the lock, all substantially as hereinafter more fully set forth.

In the accompanying drawing, Figure 1 represents a plan view of my invention with face-plate removed; Fig. 2, a cross-section taken in the line *a b*; Fig. 3, a plan view of the two-part spindle; and Fig. 4, a detailed view of fence-lever and eccentric rollers in section.

Similar letters of reference indicate like parts in the several figures.

A represents the shell or casing of a lock. Into this shell or casing is fitted the spindle *s'*, to which are secured the tumblers *g g g* and cam F, so that when the spindle shall be revolved the tumblers and cam will revolve with it. Each of the tum-

blers has formed in its periphery a gating, *f*, all of which is common to locks of this description. D is the fence-lever, attached to which, at its upper end, is the fence P, and onto the fence P is placed a series of small eccentric rollers, *D'*, so that when the tumblers *g g g* are rotated by the spindle said rollers will revolve more or less when in contact with the peripheries of the tumblers. Into the periphery of the cam F is cut an angular gating or opening, *h*, into which is received the hooked end *k* of the fence-lever D when the gatings of the tumblers and the opening in the cam are in proper position or in line when adjusted to the proper combination. Into the lower end of the hooked end *k* of the lever D is fitted one or more eccentric rollers, E, which revolve by friction with the periphery of the cam F when the bolt B of the lock is thrown out of the shell A or in the locked position. Now, it will be observed that when the bolt B is in the locked position, and the combination then disarranged by moving the spindle *S'*, that the roller E revolves on the periphery of the cam F until the opening *h* cut therein is reached, when immediately the rollers *D'* on the fence P are brought in contact with the peripheries of the tumblers *g g g* and commence to revolve until the roller E again revolves, as before stated, and so on until the gatings in the tumblers and the opening in the cam are brought in line by the proper combination, when the fence P and hooked end *k* of the lever D drop into their respective openings, and the bolt B then operated. The object of these provisions is to render it impossible to fix the relative positions of the gatings in the tumblers and the opening in the cam by means of micrometric indication from the spindle, and this, it is believed, has been accomplished, since the little rollers before named do not at all times bear alike on the tumblers and cam—sometimes one, at other times two or more, or even all revolving. As the gatings and cam are drawn back when unlocking the lock the fence is carried under the rib or curb R, which effectually holds it in place and prevents its displacement. When the bolt is thrown out the fence is raised to its former position out of the gating by bringing the inclined sides of the opening *h* in the cam F as it revolves against the hooked end *k* of the lever D, so that this desirable result is accomplished without the aid of springs. The bolt B

is connected to the fence-lever by means of a bell-crank, C. Into one angle of this crank is inserted the stump-screw, S, which is, in fact, the turning-point of the crank. To the second angle, at *l*, is attached the outer end of the fence-lever, and to the third angle is fitted a pin, H, which works into the diagonal slot H' formed in the bolt B, so that when the fence P and hooked end *k* have entered into the several gatings in the manner as before described, the cam F, being turned to the right or left by the action of the spindle S', will draw in or force out the fence-lever D, which, being secured to the bell-crank, as stated, will cause the pin H to travel up and down in the diagonal slot H', and, bearing on the sides of said slot, force the bolt B out or draw it in, as the case may be.

The great advantage from this mode of attachment, aside from its simplicity, is that, in case violence should be employed in an attempt to force the bolt back after it is locked, the strain is received directly on the stump-screw S, and no part of it is borne by the fence-lever, fence, tumblers, or cam, in this way not only rendering the lock exceedingly strong, but, at the same time, all chances of disarranging the operation of any of its parts are avoided, and it renders it impossible to ascertain or feel the position of the tumblers or other mechanism by means of the bolt. The spindle of the lock is made in two parts, I and S', which are connected together by a loosely-fitting joint, *t*, so that the part I, to which the dial is to be attached, may be removed at pleasure. The fixed part S' of the spindle is made of steel, and is formed with an enlarged head, *w*, which is secured between the plates composing the door of the safe, as shown, whereby the removal of the part S' by drawing or driving out is prevented. The head *w* may be hardened by any suitable means or process, and it would then present a solid mass of steel, which could be only drilled, if at all, with great labor and difficulty. The removable part I is formed with a tapering or conical portion, which enters an enlarged socket of corresponding form in the safe-door. By having the socket slightly larger than the spindle I, and the latter connected to the part S' by a loosely-fitting joint, the adjustment of the dial of the ring is facilitated, even should there be any inequality in the surface of the door. The object of having the socket of the form shown

is to prevent injury to the safe by the explosion of powder in the socket, the blast being outward, where there is least resistance, and thus proving harmless. The end of the removable spindle I is, as will be seen, loosely fitted into a square mortise made for that purpose in the head *w* of the fixed spindle S', to which particular means of attachment I do not wish to confine myself.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The bell-crank lever C H, turning on a pivot at *s*, in combination with the fence-lever D pivoted at *l* to the lever C, and the bolt B having a diagonal slot, H, all arranged and operating substantially as herein described, whereby, in an attempt to force the bolt, the strain is thrown upon the lever C and the pivot upon which it turns, as set forth.

2. In a combination-lock, a fence with one or more eccentric rollers revolving thereon in contact with the peripheries of the tumblers, substantially as described.

3. The lever D, having the hooked end *k*, and provided with the eccentric rollers D' on the fence P and the roller E on the part K, in combination with the tumblers *g g* and the cam F, having the angular recess *h* which receives the roller E, and by which the fence is raised, all arranged and operating substantially as described.

4. The curved rib R, in combination with the lock-case and with the fence-lever D *k*, fence P, eccentric rollers D', roller E, tumblers *g*, and cam F with angular recess *h*, all arranged and operating substantially as described.

5. The part I with conical end fitting an enlarged socket of similar form, in combination with the part S' having the enlarged head *w* secured within the door, as shown.

6. The combination of the angular slotted bolt B, bell-crank lever C H *s*, pivoted fence-lever D *k*, fence P, eccentric rollers D' E, tumblers *g*, cam F, and rib R with a casing *a* and a spindle, all arranged and operating substantially as herein described.

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Witnesses:

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