

(No Model.)

E. P. OWEN.

SWITCH THROWING AND LOCKING APPARATUS.

No. 604,782.

Patented May 31, 1898.

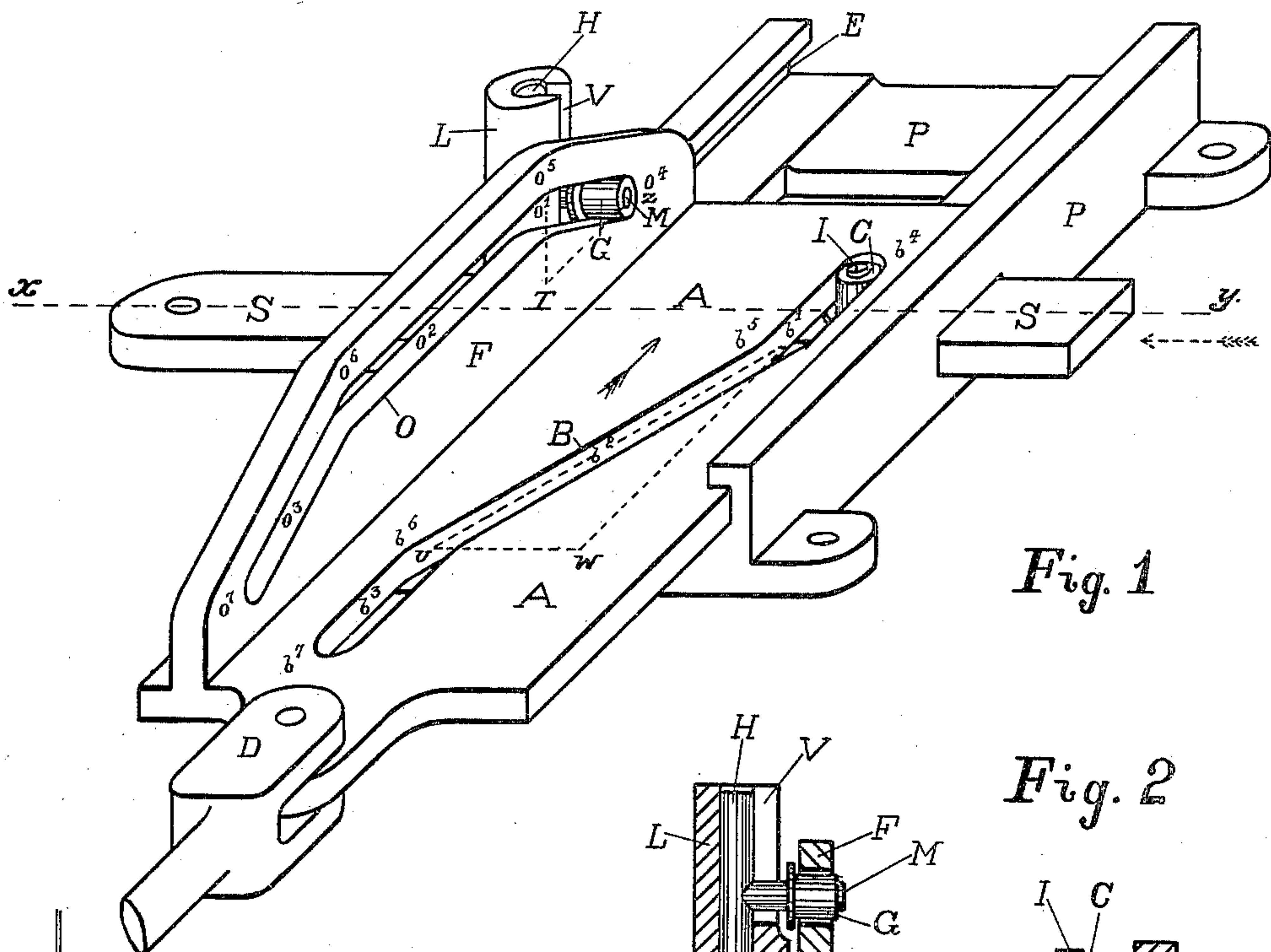


Fig. 1

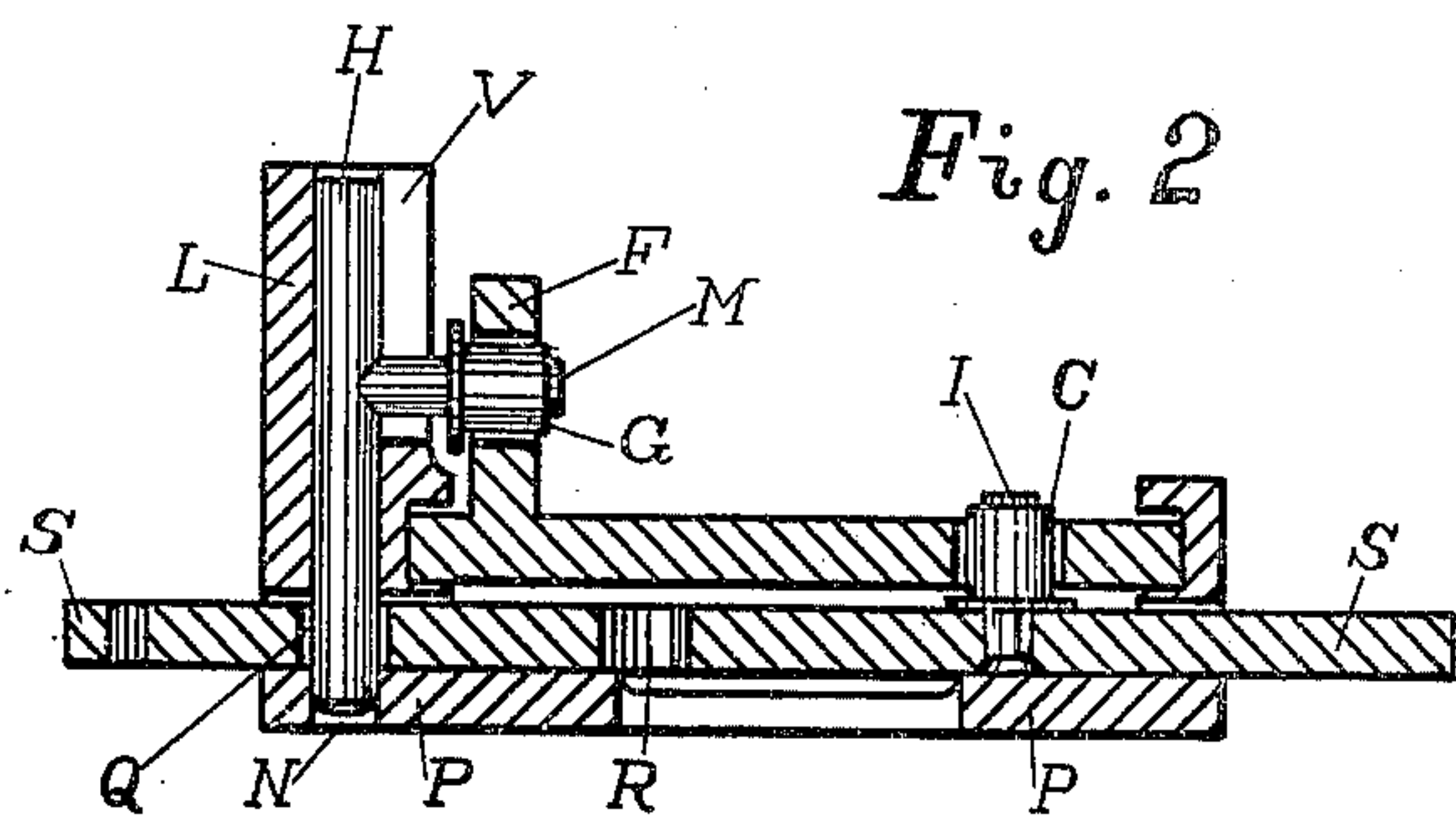


Fig. 2

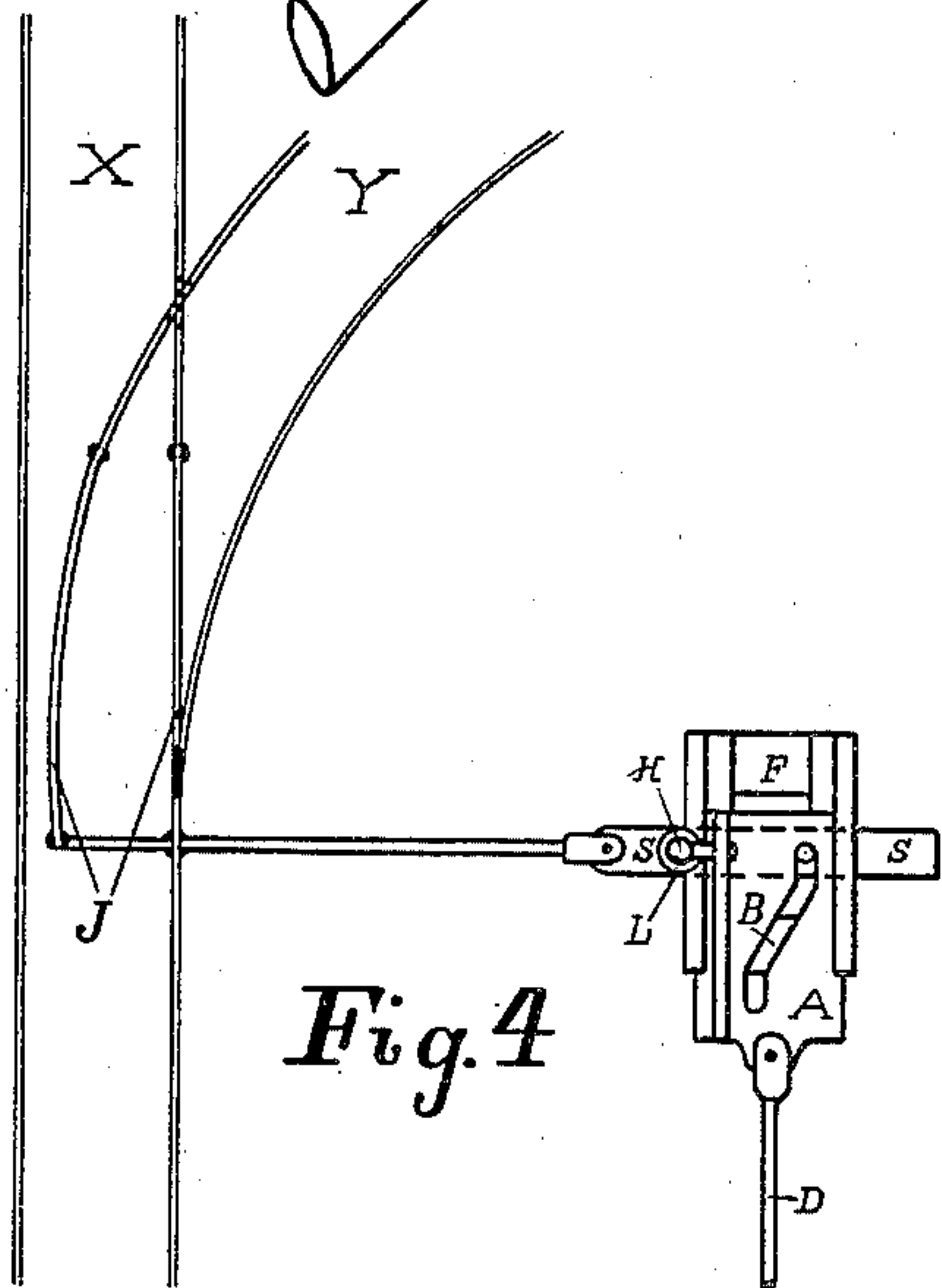


Fig. 4

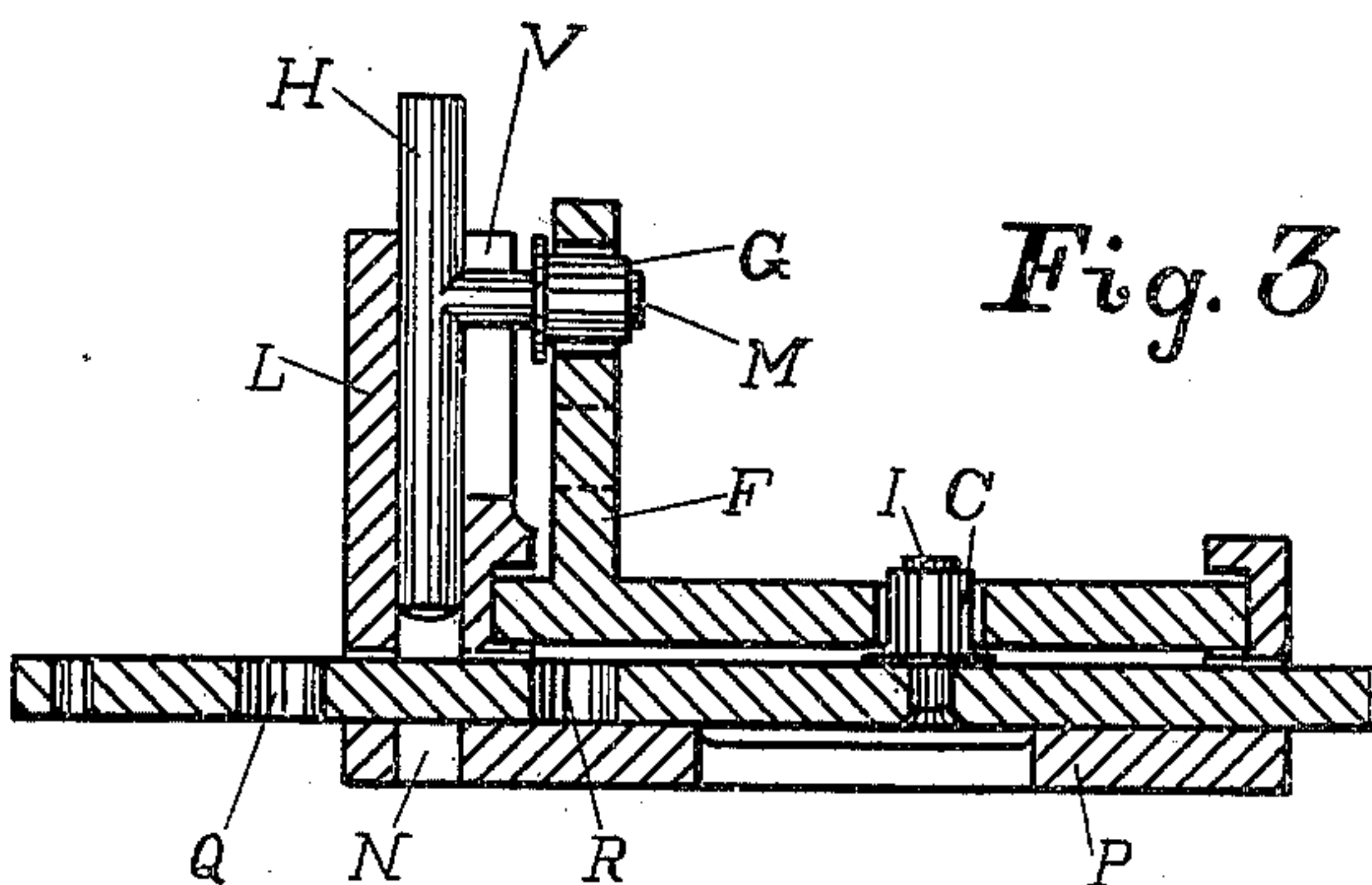


Fig. 3

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UNITED STATES PATENT OFFICE.

ELERSON PROCTOR OWEN, OF MANCHESTER, VIRGINIA, ASSIGNOR OF ONE-HALF TO MORTON RIDDLE, JR., OF PETERSBURG, VIRGINIA.

SWITCH THROWING AND LOCKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 604,782, dated May 31, 1898.

Application filed August 11, 1897. Serial No. 647,920. (No model.)

To all whom it may concern:

Be it known that I, ELERSON PROCTOR OWEN, a citizen of the United States, and a resident of Manchester, in the county of Chesterfield and State of Virginia, have invented certain new and useful Switch Throwing and Locking Apparatus, of which the following is a specification.

My invention relates to improvements in apparatus for throwing and locking railroad-switches; and the object of my improved apparatus is to provide a simple and effective device whereby a railroad-switch may be thrown and securely locked in position, either when set to main line or to branch line, in such a manner as to prevent its displacement by a passing train or other accidental cause.

Reference is had to the accompanying drawings, which form a part of this specification, and in which like letters refer to like parts in the several views.

Figure 1 is a perspective view of my device, showing its parts in such positions that the switch-bar is at one end of its travel and securely locked. Fig. 2 is a cross-section taken on the line xy in Fig. 1 and showing the switch-bar locked in one of its positions. Fig. 3 is a similar cross-section, but showing the parts in a different position, the switch-bar being unlocked and at about the center of its travel. Fig. 4 is a plan on a smaller scale, showing the manner of using my device in connection with a railroad-switch.

In Fig. 1, A is a slotted plate or frame having the usual connections D, which extend to the switch-lever, and sliding with a longitudinal motion in the bed-plate, frame, or support P, the latter having grooves E or tongues or friction-rollers or ball-bearings for the proper guiding of the slotted plate A. The slotted plate A has a slot designated generally as B. This slot B has the part b' , extending from the point b^4 to the point b^5 in a straight line parallel with the direction of the motion of the plate A. From the point b^5 the slot B extends in a diagonal direction, as at b^2 , to a point b^6 , a distance equal to the hypotenuse of a right-angled triangle, the base of which, as represented by the dotted line U W, is equal to the travel of the switch-bar S. The part b^3 of the slot B, extending from the point

b^6 to the point b^7 , is similar to the part b' , and it also extends in a straight line parallel with the direction of the motion of the plate A.

Attached to or a part of the slotted plate A is the slotted plate F, having a slot designated generally as O. The slot O has the part o' extending, from the point o^4 to the point o^5 , in an upwardly-inclined direction a distance equal to the hypotenuse of a right-angled triangle, of which the base (represented by the dotted line T Z) is equal, or thereabout, in length to the part b' of the slot B in the plate A, and the other side of which right-angled triangle is equal to the distance through which it is necessary to raise or to lower the locking-bolt H in order to release or to lock the switch-bar S. From the point o^5 the slot O in the plate F extends, as shown at o^2 , to a point o^6 in a direction parallel to the surface of the plate A, the length of the part o^2 of the slot O being equal, or thereabout, to the length of the side of the imaginary right-angled triangle, the hypotenuse of which is formed by the part b^2 of the slot B of the plate A. From the point o^6 the slot O in the plate F extends, as shown at o^3 , in a downwardly-inclined direction, and this part o^3 should be equal in length and in inclination, but in a reversed direction, to the part o' of the slot O.

S is the switch-bar, connected in the usual manner by one end with the movable switch-rails J (see Fig. 4) and sliding with an endwise motion in suitably-formed grooves or other bearings in the bed-plate, frame, or support P. Attached to or a part of the switch-bar S is a pin or journal I, carrying a friction-roller C, which operates neatly in the slot B of the plate A.

Q and R (see Figs. 2 and 3) are holes or sockets in the switch-bar S and adapted to receive the end of the locking-bolt H and a distance apart from one another equal to the full travel of the switch-bar S, as regulated by the form of the slot B of the plate A. The locking-bolt H, which has a pin or journal M, which in its turn has a friction-roller G operating neatly in the slot O of the plate F, is caused to move in an upward or in a downward direction or to remain stationary, according to the movement of the plate F and

according to the position which the friction-roller G, which is attached to the locking-bolt H by means of the pin or journal M, occupies in the slot O of the plate F. For the proper
 5 guiding of the locking-bolt H it is caused to operate in the guide-bracket L, which has in one side of it a vertical slot V for the proper guiding of the pin or journal M, which, forming a part of or being attached to the locking-
 10 bolt H and having the friction-roller G, is the means by which the slot O in the plate F operates upon the locking-bolt H.

Assuming now that the apparatus is in the position shown in Figs. 1, 2, and 4, the switch-
 15 bar S is at the outer end of its stroke, the movable switch-rails J (see Fig. 4) being set to the main line X. The friction-roller C, which by means of the pin or journal I is connected with the switch-bar S, is now at one of
 20 the ends b^4 of the slot B of the plate A. The friction-roller G, which by means of the pin or journal M is connected with the locking-bolt H, is now at the lowest point o^4 of the corresponding end of the slot O of the plate
 25 F. Consequently the locking-bolt H is at its lowest position, and (passing through the hole or socket Q in the switch-bar S, and, for the sake of additional strength and resistance to bending or shearing strain, into the hole or
 30 recess N in the lower part of the bed-plate, frame, or support P) thus securely locks in position the switch-bar S and, by means of the suitable connections, the movable switch-rails J.

Assume now that the operator wishes to change the position of the movable switch-rails J from the position in which they now are and to set and lock them in position for
 35 the side track or branch line Y. He operates the switch-lever in such a manner as, through and by means of the usual connections and the rod D, to move the plate A, and consequently the plate F, in the direction indicated
 40 by the solid arrow. Following this movement of the plates A and F, owing to the fact that the part b' of the slot B of the plate A (which part b' now embraces the friction-roller C and the pin or journal I, which are attached to the switch-bar S) is straight and is parallel
 45 with the direction of the motion of the plate A it will impart no motion by means of the friction-roller C and the pin or journal I to the switch-bar S; but during the time that the friction-roller C is passing from the point
 50 b^4 to the point b^5 —that is, along the part b' of the slot B—the friction-roller G will be passing from the point o^4 to the point o^5 —that is, along the part o' —of the slot O of the plate F. Now since the part o' of the slot O is
 55 (starting from the point o^4) upwardly inclined the friction-roller G will, in passing along the part o' of the slot O, be caused to rise, and since the friction-roller G is, by means of the pin or journal M, connected with the locking-
 60 bolt H the said locking-bolt H will also and at the same time be caused to rise and a distance (depending upon the proper inclination

of the part o' of the slot O and upon the length of the locking-bolt H) sufficient to withdraw
 65 the locking-bolt H from the hole or recess N 70 and from the hole or socket Q in the switch-bar S, thus freeing the latter. Now as the plates A and F continue to move in the direction indicated by the solid arrow the friction-roller G will pass along the part o^2 of the
 75 slot O—that is, from the point o^5 to the point o^6 ; but since this part o^2 of the slot O is parallel with the line of direction of the motion of the plates A and F and also parallel with the plane of the plate A the friction-roller G, 80
 and consequently the locking-bolt H, will not be caused to rise or to fall, and will thus leave the switch-bar S free to move with an endwise motion during the passing of the said
 85 friction-roller G along the part o^2 of the slot O; but while the friction-roller G is passing along the part o^2 —that is, between the point o^5 and the point o^6 —of the slot O of the plate F the friction-roller C will be passing along
 90 the part b^2 —that is, between the point b^5 and the point b^6 —of the slot B of the plate A, and since the part b^2 of the slot B of the plate A is obliquely inclined to the line of the direction of the motion of the plate A the
 95 friction-roller C, and consequently the switch-bar S, will be caused to move in the direction of the dotted arrow and a distance equal to the base (shown by the dotted line U W) of the right-angled triangle, the hypotenuse of
 100 which is formed by the part b^2 of the slot B, which distance is, as we know, that through which it is required that the switch-bar S shall move in order that the movable switch-rails
 105 J may be changed from one position to another—as, for instance, from the position “set to main line” to the position “set to branch line.” The switch-bar S has now completed
 110 its movement, and the hole or socket R in the switch-bar S will be immediately beneath the locking-bolt H. The plates A and F still 110
 continue their motion in the direction indicated by the solid arrow. The friction-roller C will now pass along the part b^3 of the slot B, which part b^3 , being similar to and having
 115 the same direction as the part b' , will consequently not confer any endwise motion upon the switch-bar S by means of the friction-roller C and the pin or journal I; but the friction-roller G, which is connected with the
 120 locking-bolt H, will now be passing along the part o^3 —that is, from the point o^6 to the point o^7 —of the slot O of the plate F, and since the part o^3 of the slot O is (starting from the point o^6) inclined downwardly the friction-roller G, and consequently the locking-
 125 bolt H, will be caused to descend and a distance (depending upon the proper inclination of the part o^3 of the slot O and upon the length of the locking-bolt H) sufficient to enable the locking-bolt H to pass through the
 130 hole or socket R in the switch-bar S and, if required, into the hole or recess N in the bed-plate, frame, or support P, thus securely locking the switch-bar S, and consequently the

movable switch-rails J, in their new position—that is, “set to branch line” Y.

In order to return the movable switch-rails J to their original position of “set to main line” and to lock them in that position, it is only necessary for the operator to operate the switch-lever in a direction opposite to that in which he previously operated it in order to place the movable switch-rails J in the position “set to branch line.” Upon his doing so the plates A and F will move in a direction opposite to that indicated by the solid arrow, and the reverse of the movements which we have followed out and explained above will take place.

Having now described my invention, what I claim, and desire to secure by United States Letters Patent, is—

1. In a switch throwing and locking device the combination of a flanged plate having a slot which engages a pin in a switch-bar, and which when operated shall by means of the slot and pin cause the switch-bar to operate

the switch-rails, and having in its flanged portion another slot which engages a pin which is directly attached to a locking-bolt, and which when operated shall cause the locking-bolt to enter a perforation or hole in the said switch-bar, and so to lock the switch-rails, a switch-bar having perforations adapted to receive a locking-bolt, a locking-bolt, and a frame to guide the slotted plate and also to guide the locking-bolt, substantially as set forth.

2. In a switch throwing and locking device the combination of the flanged plate A F, having slots B and O, the switch-bar S, having the perforation Q and R, the locking-bolt H and the frame P L, having the slots E and V, all as and for the purpose set forth.

Signed at Richmond city, in the State of Virginia, this 6th day of August, A. D. 1897.

ELERSON PROCTOR OWEN.

Witnesses:

JOHN O'BRIEN,
EUGENE JONES.