

(No Model.)

R. H. ISBELL.
RAILROAD SWITCH.

No. 358,398.

Patented Feb. 22, 1887.

Fig. 1.

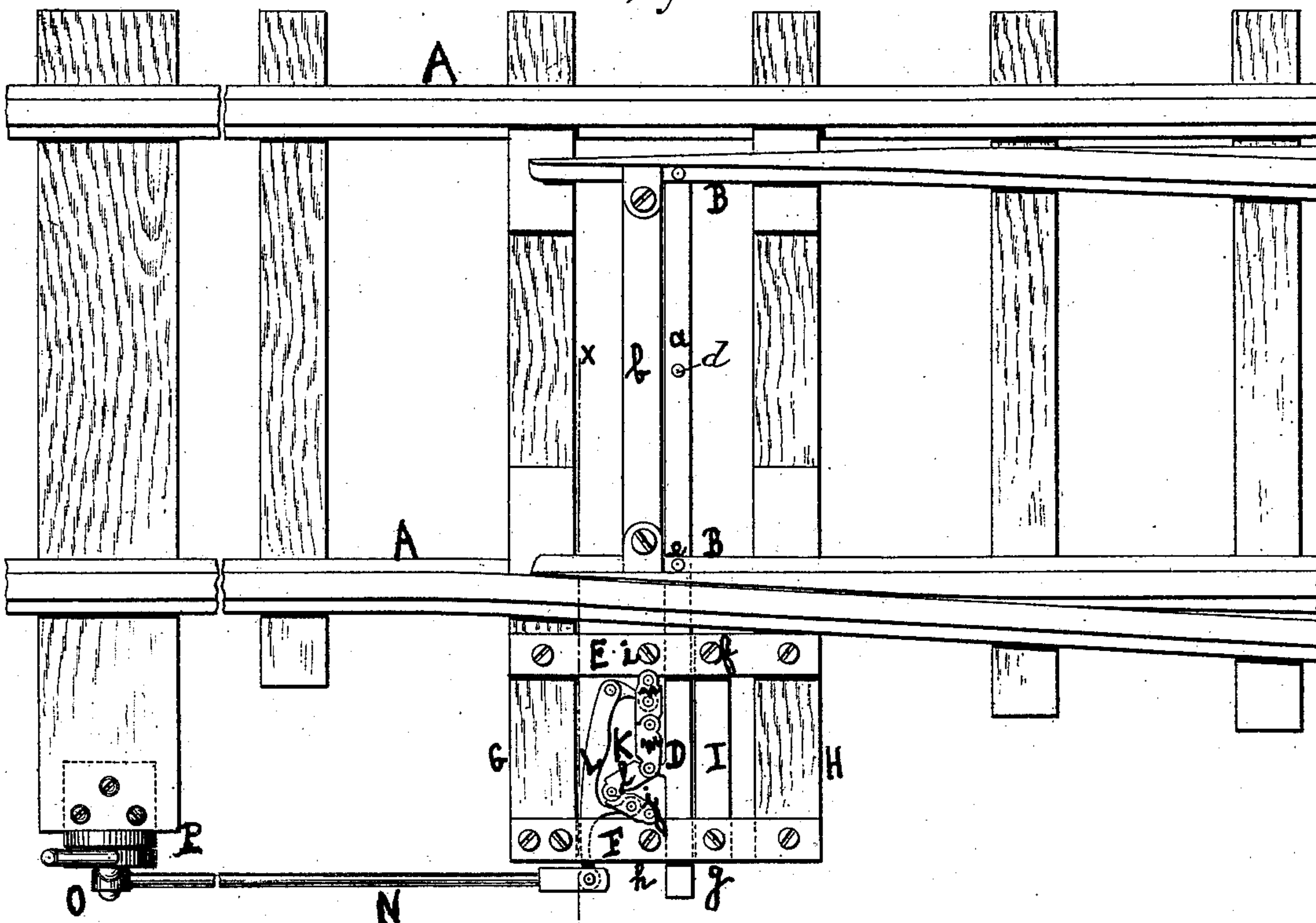


Fig. 3.

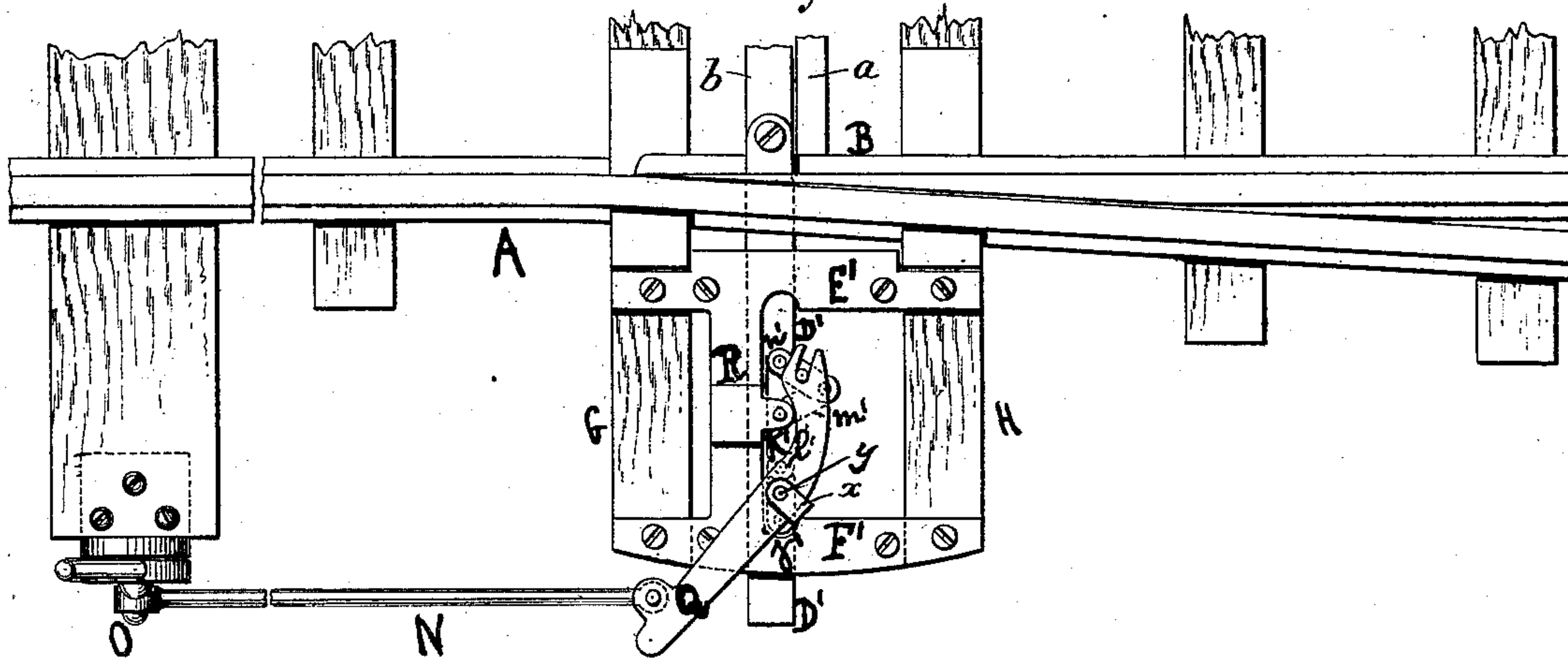
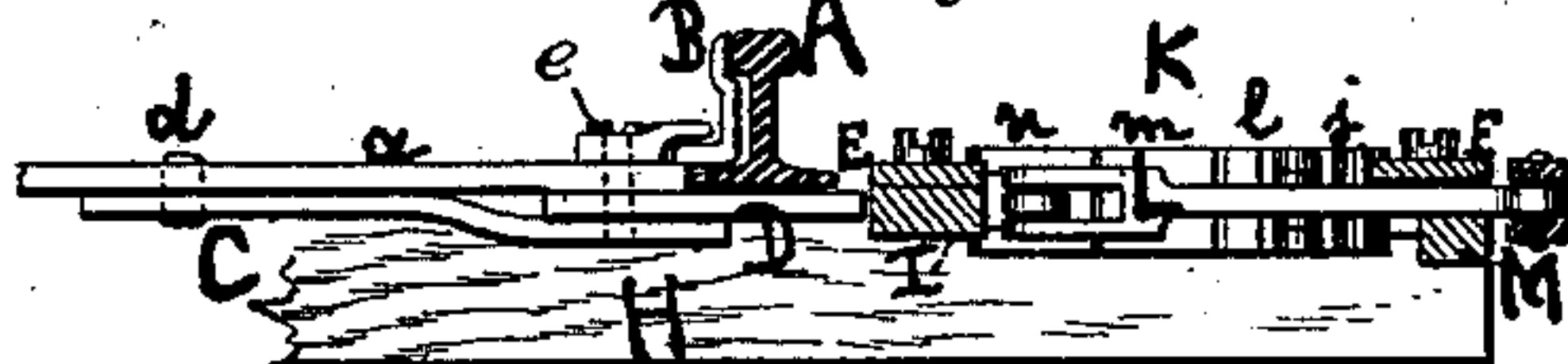


Fig. 2.



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ROBERT H. ISBELL, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO GEORGE F. BETTS, OF SAME PLACE, AND WALTER S. LOGAN, OF BROOKLYN, NEW YORK.

RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 358,398, dated February 22, 1887.

Application filed May 13, 1886. Serial No. 202,035. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. ISBELL, of the city of New York, in the county of New York and State of New York, have invented
5 a new and useful Improvement in Railroad-Switches and in the Method of Shifting and Locking the Same, of which the following is a specification.

My invention is of a railroad-switch in
10 which two connected toggle-joints, forming a double toggle-joint, are used to move and lock the switch by means of a single motion of a lever attached thereto.

It consists more particularly in such a construction and operation of parts that the
15 switch shall be self-locking whenever set in the desired position.

Figure 1 is a view of said switch, looking from above. Fig. 2 is a vertical cross section
20 on the line X X of Fig. 1. Fig. 3 is a view, looking from above, of a modified form of said switch.

A A represent the fixed rails, and B B the movable rails, of the switch, which are connected together by the rod *a* and the plate *b*.
25 Under the rod *a* is the metal arm C, bolted to the rod at *d* at one of the ends, and holding between its other end and the rod *a* one end of the bar D. The rod *a*, arm C, and bar D, and
30 the flange of the movable rail B just above them, are all securely bolted together by the bolt *e*, passing through them. The bar D passes loosely under the fixed rail A and under the cross-pieces E F, which are bolted on top
35 of the cross-ties G H. A cross-bar, I, fastened to the cross-pieces E F underneath them by the bolts *f g h i*, has slots cut in it, into which fits and slides horizontally back and forth the bar D. The double toggle-joint K,
40 composed of the arms *j l m n*, pivoted to each other so as to move freely, has its arm *j* at one end pivoted to the cross-piece F, its arm *n* at the other end pivoted to the cross-piece E, and its two arms *l* and *m* pivoted to each
45 other and to the bar D at one point. An operating-lever, L, is pivoted at one end to the arm *n* and at its other end to the arm *j* of the double toggle-joint K. A projecting arm of the operating-lever L extends outward under

the cross-piece F, and is sustained by a bar, 50
M, bolted to the under side of the cross-piece F, said bar M having an open slot or groove cut in its top, which allows the arm of the operating-lever free play to move backward and forward within the desired limits. 55

To the end of the arm of the operating-lever may be pivoted a connecting-rod, N, leading to the switch-lever O, to the bottom of which the end of the rod N is pivoted. The switch-lever O stands pivoted on a projecting piece, 60
P, so that it can be pushed back and forth, as demanded.

The operation of the device is as follows: When the switch-lever O is left upright, as shown in the drawings, the rod N pulls the
65 arm of the operating-lever L as far back as it will go in the open slot in which it plays. This of course pulls backward the end of the operating-lever nearest the arm, and which is pivoted to the toggle-joint arm *j*, and draws 70
this arm and the connected arm *l* along with it, throwing them out of the straight line, while the farther end of the rock-shaft, which is pivoted to the arm *n*, is pushed forward, and thus pushes the arm *n* and the arm *m* 75
(pivoted thereto) as far as they will go—that is, it drives them into a straight line with each other, and this same movement of pushing the arms *m* and *n* into a straight line and of pulling the arms *j* and *l* until they stand at 80
an angle has also pushed the bar D, (since it is pivoted to the arms *l* and *m*,) and the bar D has carried with it in its movement the moving rails B B, attached to each other and to said bar D. The parts are all so adjusted that 85
the amount of movement allowed to the operating-lever will be just that which will bring the arms *m* and *n* into line, or the arms *j* and *l* into line, supposing the movement of the switch-lever to be reversed. That same 90
amount of movement is also arranged to carry the bar D just so far backward or forward that it will bring the moving rail B on one side or the other up close against the corresponding fixed rail, A, according as the switch-lever is 95
turned; but when either of the two sets of arms *j l* or *m n* are straight the movable rails B B cannot be moved, except by moving the

switch-lever O, and remain fixed in the position in which they are set, since the bar D is held fast by being pivoted to two arms which are set in a straight line parallel to the bar
 5 and bear solidly against one of the cross-pieces E or F, and since the rails B B cannot move when the bar D cannot; but by pulling the switch-lever O as far as it will go, one straight line of the double toggle-joint is broken, the
 10 bar D is pulled along in breaking the straight line, the rails B are pulled with it, and at the same time another straight line of the other two arms of the toggle-joint is formed, acting to prevent the bar D from moving back again
 15 and thus locking the switch.

The form of mechanism shown in Fig. 1, and already described, I consider preferable; but a modification is shown in Fig. 3, where the cross-pieces E' and F' are connected by a cross-
 20 bar, R. A recess is cut into the bar D' deep enough to receive the double toggle-joint K', which is pivoted at each of its ends to an inner end of one of the portions of the bar D', which lies beyond the recess. The toggle-
 25 joint is pivoted at the connecting-point of its two inner arms to the cross-bar R, and the arms j' and n' are respectively pivoted to an operating-lever, Q, having projecting arm, which is in turn pivoted to the end of the rod
 30 N, connecting with the switch-lever O. The operating-lever Q has one end slotted to allow the pin connecting it with the link n' a slight motion in the slot. At its other point of connection with the toggle-joint there is a yoke
 35 or keeper, x , which embraces the top and bottom of the operating-lever, and the pin y , that forms the pivotal connection between the operating-lever and the other half of the toggle-
 40 joint, passes through the yoke, the lever, and the toggle-joint. The moving rails B are connected with the inner end of the bar D', as before, and the operation of the device is the same as already described. The rod N pulls
 45 or pushes the operating-lever Q. This movement sets two adjacent arms of the toggle-joint straight and the other two at an angle, at the same time pulling or pushing the bar D' backward or forward, and moving one or the

other of the rails B up against the fixed rail A corresponding thereto. The switch is locked, 50 as before, by the two arms in a straight line, preventing the movement of the bar D', which holds the rails B B fast, and is unlocked, changed, and relocked on the other side by a reverse pull of the switch-lever O. 55

I claim—

1. In a switch, the combination, with the double toggle-joint having four links, of an operating-lever pivotally connected with and fulcrumed on said links, substantially as de- 60 scribed.

2. In a switch, the combination of the movable rails B B, bar D, connected therewith, double toggle-joint K, having two of its links 65 working on fixed centers and pivoted to said bar, and the operating-lever fulcrumed on said toggle-joint, all substantially as and for the purposes described.

3. In a switch, the combination of the movable rails B B, bar D, double toggle-joint K, 70 a lever, as L, fulcrumed on said toggle-joint, and means for operating said lever, substantially as and for the purposes described.

4. In a switch, and in combination with the movable rails thereof, the bar D, connected 75 with said rails, a double toggle-joint consisting of two pairs of links, having the nearest ends of the two pairs of links pivotally attached to said bar and their opposite ends working on fixed pivots, and an operating-le- 80 ver pivotally connected to both pairs of links and fulcrumed thereon, substantially as described.

5. The combination of the movable rails B, a bar, D, connecting said rails, two pairs of 85 links, $j l$ and $m n$, the links $l m$ being pivoted to the bar D, and one end of each of the links $j n$ working on fixed pivots, with an operating-lever, L, pivotally connected with and fulcrumed on said links, all substantially as 90 shown and described.

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Witnesses:

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