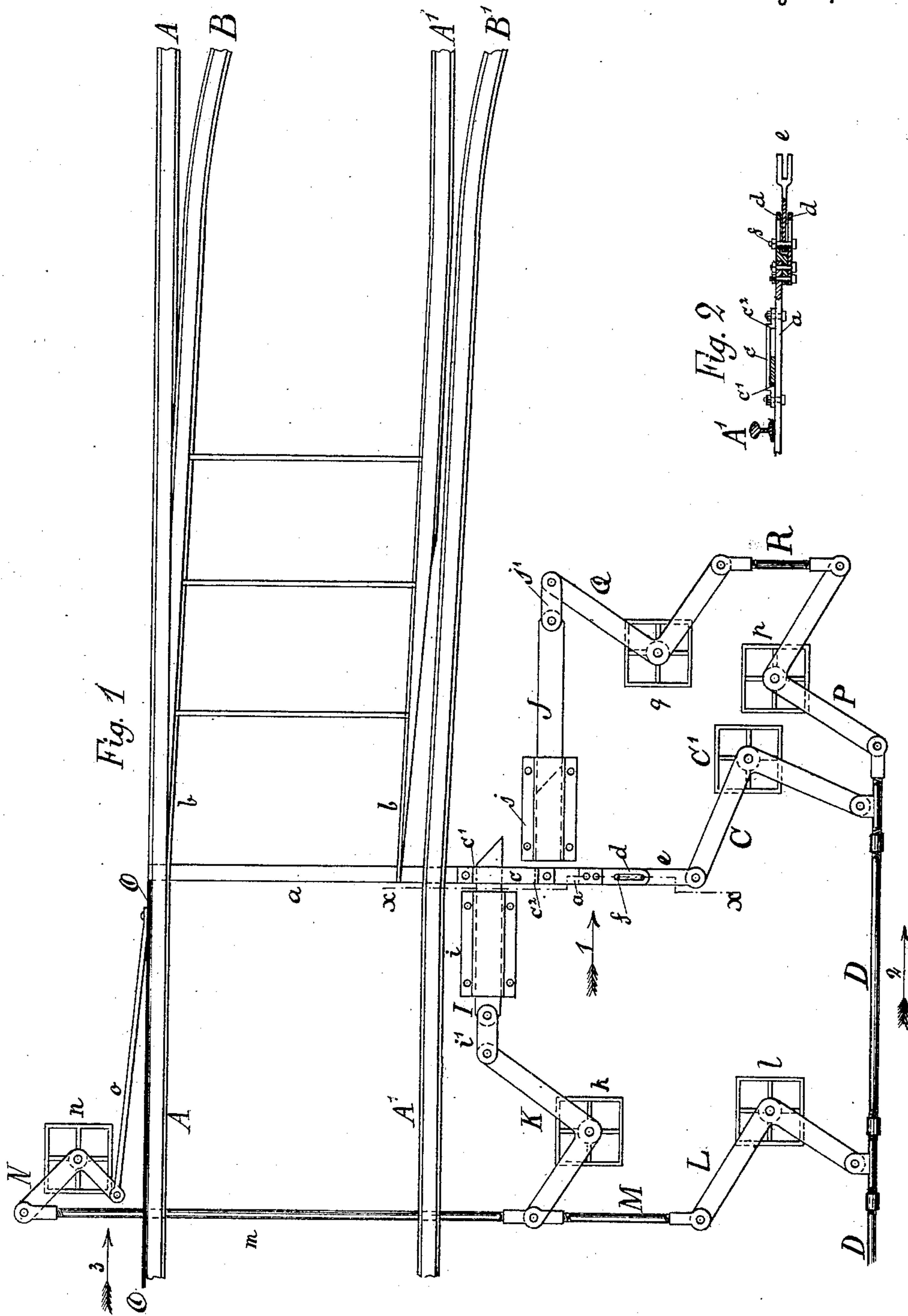


J. A. BONNELL.

RAILWAY SWITCH OPERATING AND LOCKING MECHANISM.
No. 341,398.
Patented May 4, 1886.



Witnesses:
Wm. S. Larnander
C. V. Heystrand

Inventor:
James A. Bonnell
by *A. W. Alenovich*
Attorney

(No Model.)

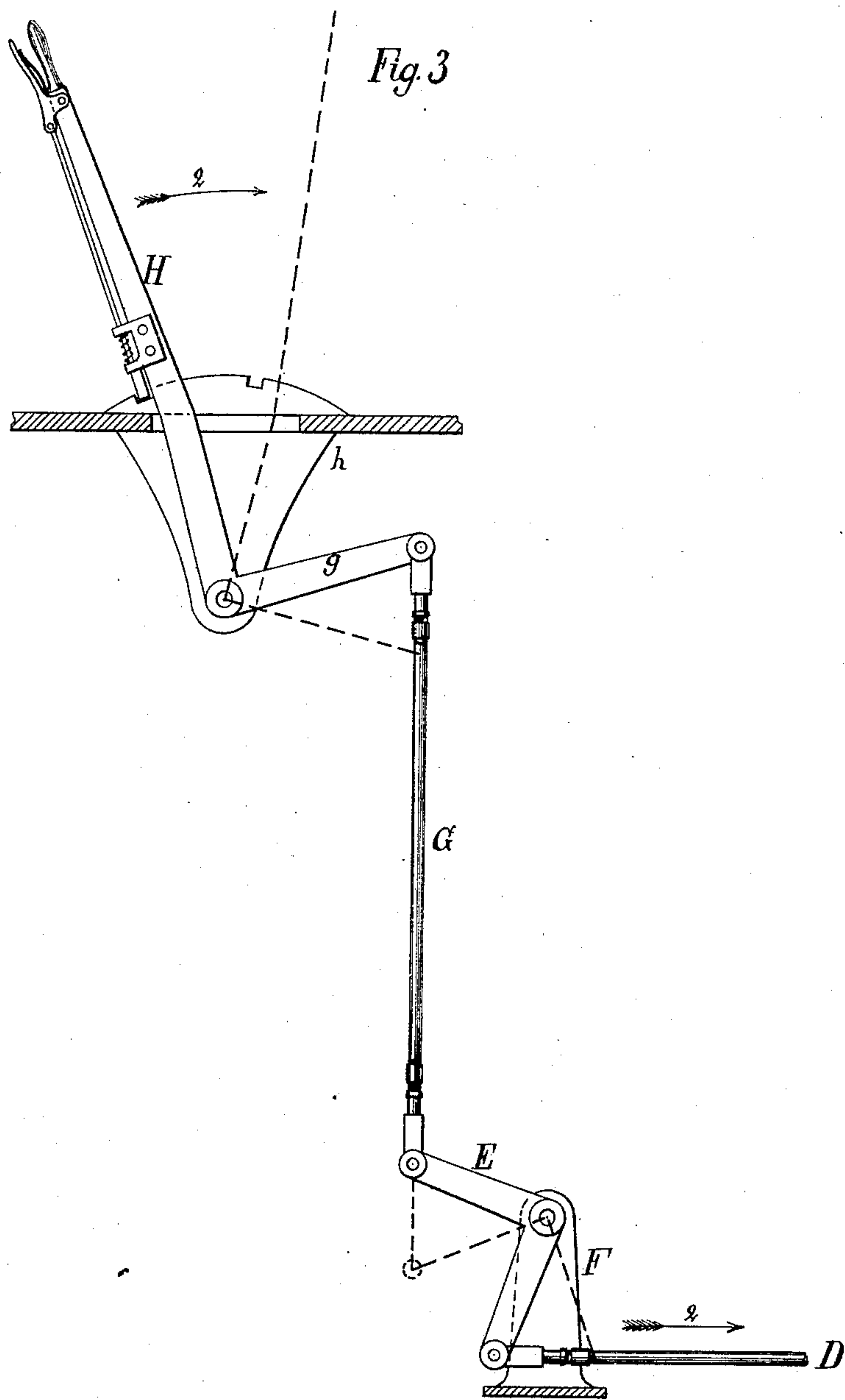
2 Sheets—Sheet 2.

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by *A. W. Almqvist*
Attorney

UNITED STATES PATENT OFFICE.

JAMES A. BONNELL, OF BROOKLYN, NEW YORK.

RAILWAY-SWITCH OPERATING AND LOCKING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 341,398, dated May 4, 1886.

Application filed January 5, 1885. Serial No. 152,236. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. BONNELL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Railway-Switch Operating and Locking Mechanisms, of which the following is a specification.

My invention relates to a combination of devices for operating railway-switches, by which the several functions of unlocking, throwing or shifting, and locking of the switch are performed successively by a single movement of only one hand-lever. The detecting-bar (patented to me by Letters Patent No. 291,868) is operated simultaneously with the switch and switch-lock by the same single movement of the hand-lever, the object being to reduce the expense of construction, prevent mistakes, and greatly simplify the labor of operation.

In the accompanying two sheets of drawings, Figure 1 represents a plan view of a railway-switch-operating mechanism constructed according to my present invention. Fig. 2 is a detail section of the same, taken on the line x of Fig. 1, and seen in the direction of arrow 1. Fig. 3 is a side elevation (in accordance with the position of the parts in Fig. 1) of the hand-lever and connection by which the operation is performed.

A A' are the rails of a portion of the main track or line of a railway, and B B' those of a branch line switching off from the main line by the switch-rails b .

The switch-bar to which the ends of the switch-rails are attached and by which the switch is thrown is designated by the letter a . Upon the bar a is secured a bail, c , similar to a bolt-guard or keeper of an ordinary door-lock, with the difference, however, that in this case the stops or keepers proper, c' c'' , are at the ends of the opening of the said rail, and are so arranged in position as to interlock with the respective bolts (as will be presently described) at the termini of the throw of the switch-bar a when the closing end of the switch-rail is in contact to open or close connection with the main track. At its free end the switch-bar a (by a slip-joint formed of a jaw, d , slotted longitudinally, as seen in Figs. 1 and 2, and a link, e , inserted in the said jaw,

and having a pin, f , secured to it, which passes through the two opposite slots in the jaw) is connected by a pivotal joint to a bell-crank, C, pivoted to a casting, C', embedded in the ground, the other end of the said bell-crank being pivoted to a lug on the rod D, which forms part of the connection of the hand-lever in the signal-house, by which the switch is operated.

Fig. 3 shows one manner of connecting the rod D to the hand-lever—viz., by a bell-crank, E, pivoted to an upright bracket, F, upon the ground or ground-floor, and a vertical rod, G, connecting the other arm of the said bell-crank to an arm, g , which projects at an angle from the hand-lever H, the latter being an ordinary lock-lever—such as is used for similar purposes—and mounted in a suitable metallic bracket, h .

I and J are the locking bolts or bars. These are arranged at opposite sides of and at right angles to the switch-bar a , and are fitted to slide in suitable guides, i j , respectively. They are furthermore beveled on one edge at the locking end, as shown in Fig. 1, and at the opposite end they are connected by pivotal links i' j' , respectively, to respective bell-cranks K Q, pivoted to castings k q , the said bell-cranks being further connected by rods or links M R, which are pivoted to other bell-cranks, L P, respectively, said bell-cranks L P being fulcrumed on castings l p , and having their other arms pivoted to jaws or lugs on the operating-rod D. The bar M is prolonged by an extension, m , to the side of the track opposite that at which the switch-lock is located, and is there connected (by a bell-crank, N, fulcrumed upon a casting, n , and a rod, o , from the said bell-crank N) with the detecting-bar O, a description of the construction and operation of which bar will be found in Letters Patent No. 291,868, granted to me January 15, 1884, and whose object is to prevent (by the pressure of the train upon the said detecting-bar) the moving of the switch by the hand-lever so long as the train is passing over the switch.

The construction and arrangement of the levers and connecting-bars or equivalent devices for obtaining the required movements of the bolts, switch-bar, and detecting-bar will of course depend entirely upon the location of

the track, ground, and other circumstances specific for each separate case, and they form no specific claim in my present invention; but the unlocking, throwing, and relocking of the switch by a single movement of only one hand-lever is dependent on an intermittent movement or a loss of movement of the switch-bar, in order that it may remain still while one bolt is withdrawn, then moved forward to throw the switch, while the other bolt from the opposite side enters to engage at the opposite end of the throw the other end stop.

The operation is easily understood with reference to Fig. 1, the switch being thrown against the rail A to connect with the branch line, and all the parts being in position accordingly, and corresponding also with the position of the parts shown in full lines in Fig. 3. It will be seen that the switch is now locked in position by the bolt I interlocking with the stops c' , the bolt J being entirely withdrawn from the switch-bar and the pin f in the link e of the slip-joint being at the inner end of the slot in the jaw d . Let us now suppose that the lever H be drawn to the other end of its throw, into the position indicated in dotted lines in Fig. 3, the rod D moving in the direction indicated by arrows 2. This will cause the bolt I to withdraw from the bail c , while at the same time the bolt J approaches the bail from the opposite side and the pin f travels to the outer end of the slot in the jaw d without causing any motion of the switch-bar a until after engaging the end of the slot. The bar a will then begin to move in the direction to throw the switch against the rail A' B'. The incline or bevel at the end of the bolt I allows its gradual withdrawal from the moving bar without contact with the stop c' after being unbolted from it. At the same time the beveled point of the bolt J is gradually entering the bail c , the incline surface following the receding

stop c' until, at the end of its throw, the straight edge of the bolt J at the obtuse angle with the incline engages the stop c' and again locks the switch. At the same time the detecting-bar is moved upon its pivoted supporting-links, so as to first rise a little above the rail-surface, then move in the direction of arrow 3 and again drop in a normal position. It is evident that the movement while throwing the switch in the opposite direction—that is, into the position shown in the drawings—is performed in exactly the same manner as just described, only in reverse order. By this my invention the switch is thus not only thrown, but secured against any liability of accidental displacement while set to receive a train, and likewise against any possibility of being moved by the hand-lever while the train is passing over it, and all this by no more labor and in no longer time than ordinarily required to only throw the switch.

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

The combination of the sliding switch-bar a , having stops or keepers c' c'' corresponding with the termini of its throw, with the slide-bolts I J, interlocking alternately with their said respective stops at the completion of each throw, the said bar a being provided with a slip-joint, $d e f$, allowing it to rest during the withdrawal of the bolts, and all being operated simultaneously by one hand-lever, H, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 1st day of October 1884.

JAMES A. BONNELL.

Witnesses:

A. W. ALMQVIST,
C. V. HELJESTRAND.