No. 756,081. PATENTED MAR. 29, 1904.

S. C. TUSSING.

AUTOMATIC SWITCH.

APPLICATION FILED JUNE 30, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

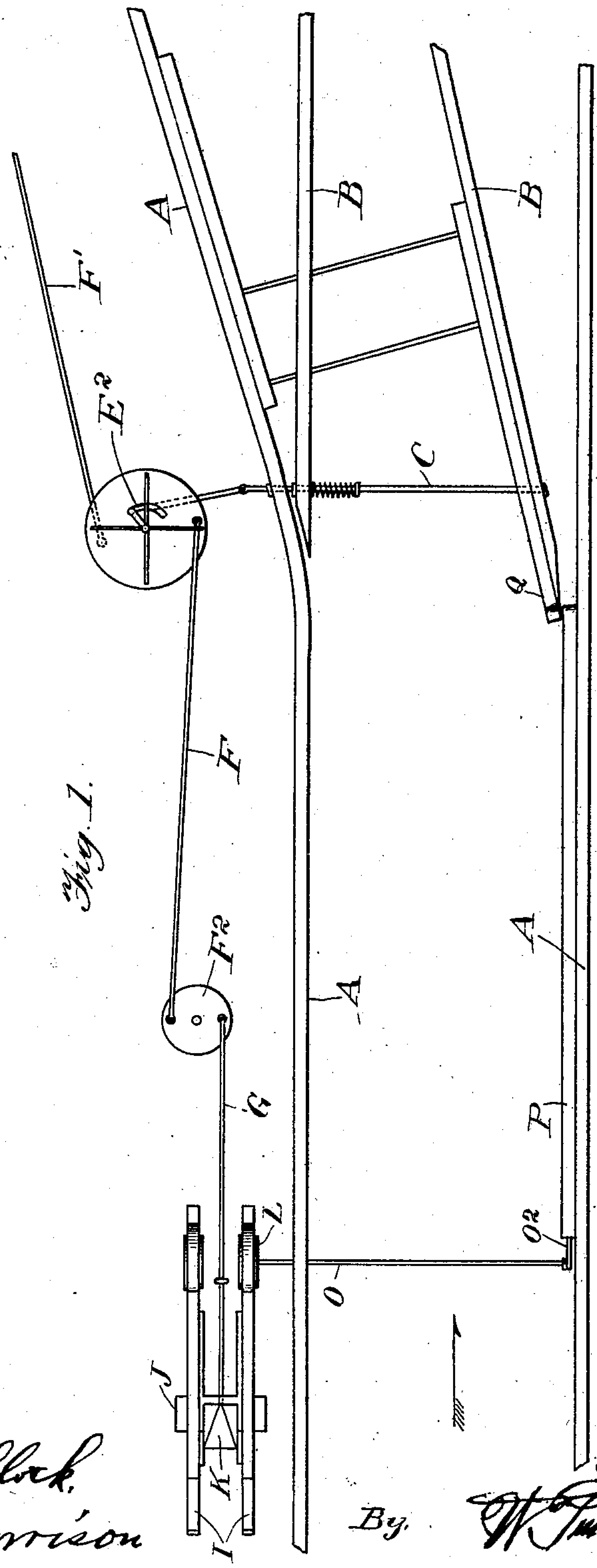

Fig. 1.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.

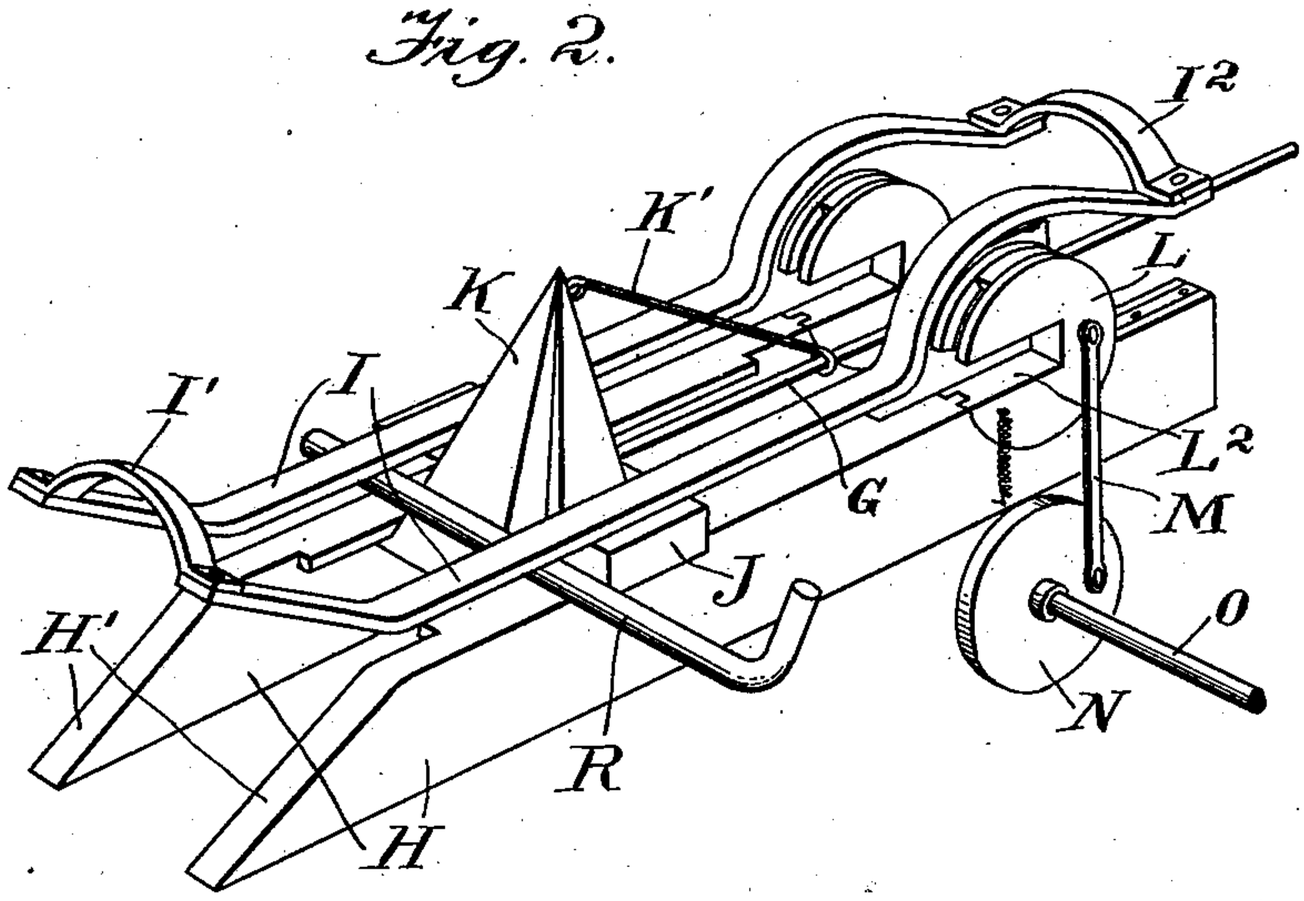


Fig. 3.

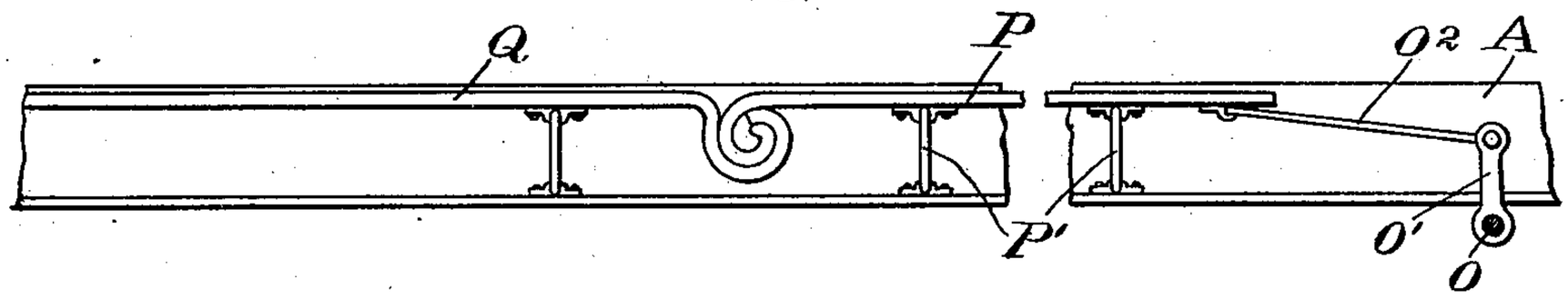
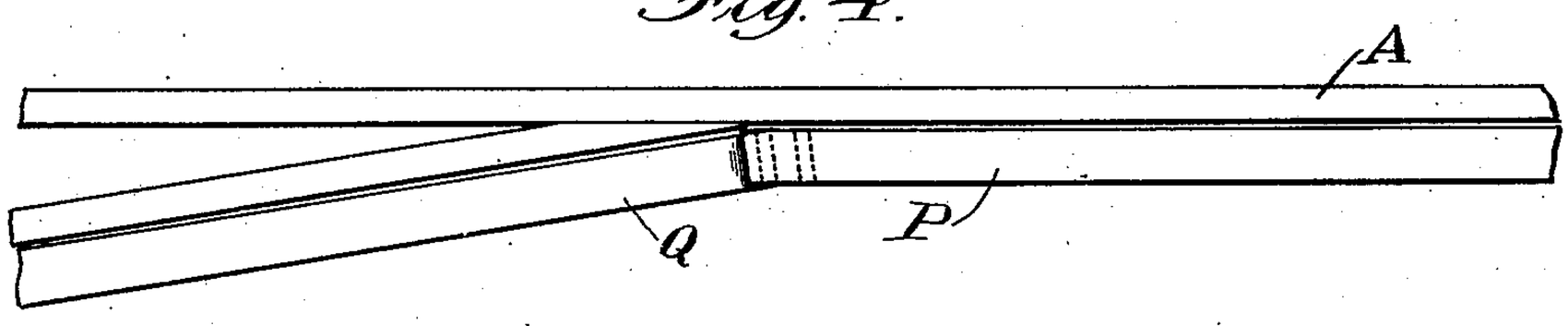


Fig. 4.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 5

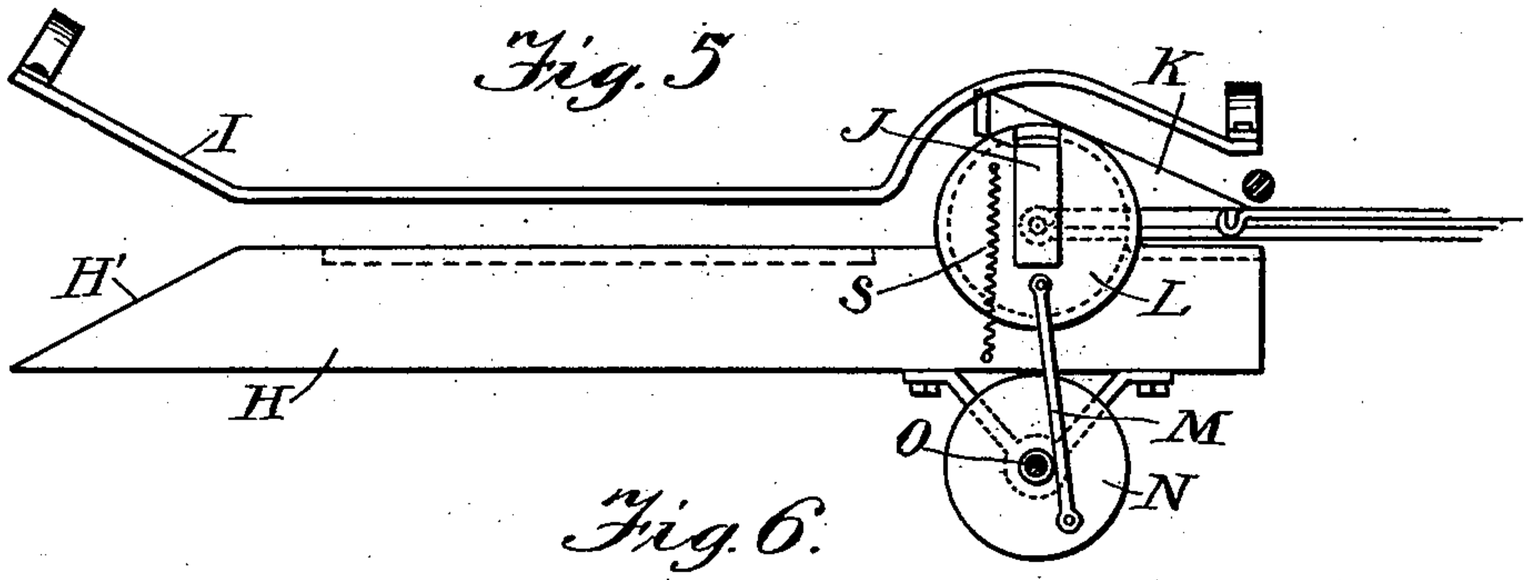


Fig. 6.

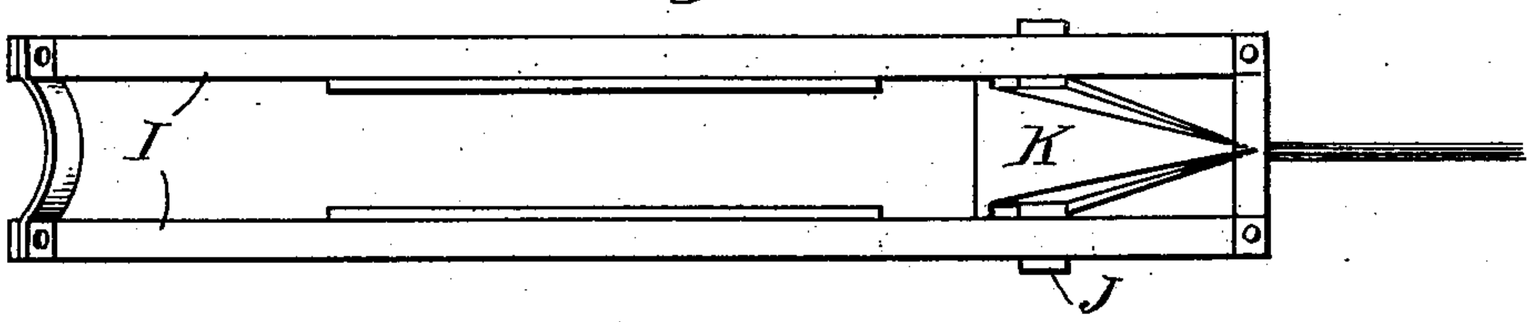


Fig. 7.

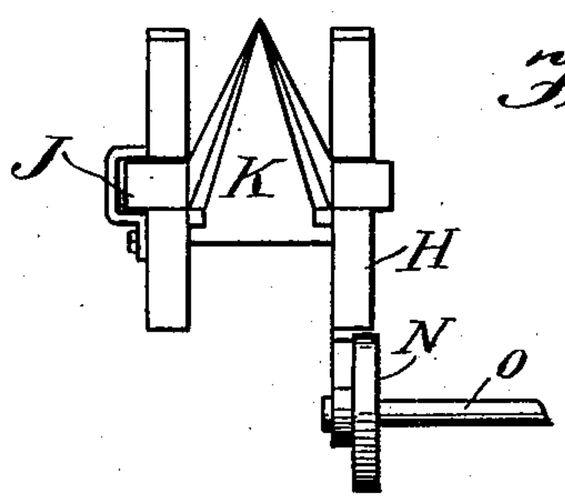


Fig. 8.

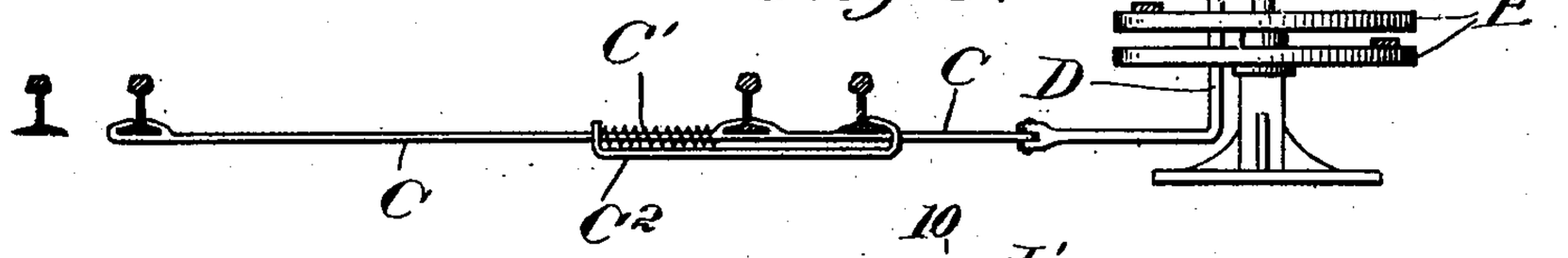


Fig 10.

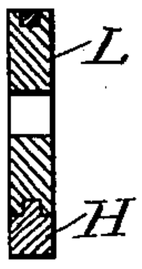
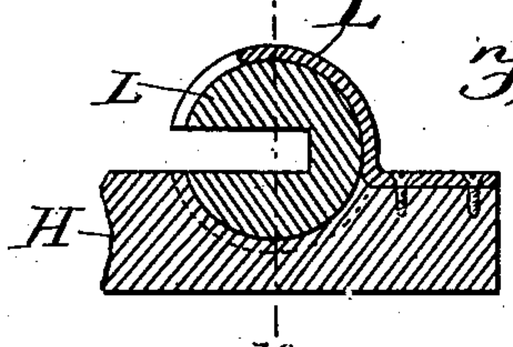


Fig. 9.



Witnesses:
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Atty.

No. 756,081. Patented March 29, 1904.

UNITED STATES PATENT OFFICE.

SAMUEL C. TUSSING, OF LEIPSIC, OHIO.

AUTOMATIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 756,081, dated March 29, 1904.

Application filed June 30, 1903. Serial No. 163,827. (No model.)

To all whom it may concern.

Be it known that I, SAMUEL C. TUSSING, a citizen of the United States, residing at Leipsic, county of Putnam, and State of Ohio, have invented a certain new and useful Improvement in Automatic Switches, of which the following is a specification.

My invention relates to a new and useful improvement in automatic switches, and has for its object to provide a switch and mechanism for automatically throwing the same to be applied to all forms of railways, the switch designed to be operated from the locomotive while the same is traveling, and a further object of my improvement is to so construct all the apparatus that while it is exceedingly simple and efficient it will be very durable and withstand hard usage.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a plan view of a portion of a railway-track, including the switch, showing my improved mechanism applied thereto; Fig. 2, a perspective view of the actuating mechanism, showing the same in its normal position; Fig. 3, a side elevation of the movable strips placed alongside of the rail, which hold the switch turned until the train has passed over the same; Fig. 4, a plan view of Fig. 3; Fig. 5, a side elevation of the actuating mechanism, showing the same in its position when actuated; Fig. 6, a plan view of Fig. 5; Fig. 7, an end view of the actuating mechanism; Fig. 8, a cross-section through the main rails and switch-rails, showing the tie-rod and the signal apparatus in elevation; Fig. 9, a longitudinal section through one of the trip-wheels, and Fig. 10 a section on the line 10 10 of Fig. 9.

A represents the stationary rails, and B the movable rails. The movable rails B are connected together by a tie-rod C, as shown in Figs. 1 and 8, and these movable rails are always normally held in such a position that if the switch is not thrown the train will travel along the main track. This is accomplished by means of a spring C′, which spring is interposed between the inside of the outside movable rail and a stationary iron C^2. This iron may be made stationary in any suitable manner; but I prefer to run the same underneath the rails and secure it to the outside of the outside stationary rail, as shown in Fig. 8. The tie-rod C extends underneath the outside stationary and movable rails and is connected to a crank-arm D, which crank-arm is secured to the upright signal-post E. Pivoted loosely upon this signal-post E are two disks E′, which disks are slotted, as indicated at E^2 in Fig. 1, said slot being formed concentric with the post E. The crank-arm D is provided with a vertical portion which extends upward through the slots E^2 in both of the disks E′, so that when one of the disks E′ is rotated it will actuate the crank-arm and rock the same without moving the other disk.

F and F′ are links, one connected to one disk E′ and the other to the other disk upon opposites sides of the center and extending in opposite directions. These links form the connection between the actuating mechanism and the mechanism for operating the tie-rod.

In Fig. 1 I have shown only one actuating mechanism; but of course it is understood that there will be two at each switch—one to operate when the train is traveling in one direction and the other when the train is traveling in the opposite direction. In Fig. 1 the actuating mechanism which is shown is supposed to be actuated when the train is traveling in the direction of the arrow. The other end of the link F is connected to a disk F^2 at a distance from the center of said disk, and the disk is pivoted upon a vertical spindle and connected to said disk. On the opposite side from the link connection is a rod G, which extends to the actuating mechanism. If desired, the link F could extend directly to the actuating mechanism without the intervening disk F^2. The actuating mechanism consists of the two side pieces H, which are beveled at their rear ends,

as illustrated at H'. Arranged at a slight distance above these side pieces and in alinement with the same are guide-strips I, which guide-strips are bent upward at the rear end at an opposite angle to the bevel H' upon the side pieces, as illustrated at I'. The side pieces H rest upon the ground, and the strips I are supported by the side pieces by means of a connection J, located upon the side of the actuating mechanism farthest from the rails, and this connection J is secured to both the strip I and the side piece H upon that side, and the opposite strip is separated from the other strip by means of cross connections I^2. A cover is designed to fit over the whole apparatus above the strips I, which is not shown in the drawings, and if desired the cover could be utilized for securing the strips I together. J is a cross-piece extending across the mechanism and adapted to slide in the space between the side pieces H and the strips I and may be guided against lateral motion in any suitable manner. Secured to this cross-piece J between the two side pieces H is a trip K, pyramidical in shape. The rod G is secured to the cross-piece J by a hinge-joint, and a rod K extends from the apex of the trip K, where it is secured by hinge-joint, and the other end of this rod K is adapted to slide upon the rod G. In the forward end of each of the side pieces H are located trip-wheels L, which are adapted to revolve within the side pieces, and these trip-wheels are formed, as shown in Fig. 10, with an annular groove surrounding the same, and the pieces H have a tongue formed in the bearing adapted to enter this annular groove and prevent lateral motion of the trip-wheels, and to prevent the trip-wheels from rising out of their bearing in the side pieces H a strap L' is curved partially around and over the trip-wheels lying within the annular groove, and this strap is secured to the forward end of the pieces H.

The guide-strips I are curved upward over the trip-wheels L, so as to leave comparatively the same distance between said strips and the wheels as there is between the strips and side pieces H. The trip-wheels L have slots L^2 cut in the same, said slots being slightly longer than the width of the cross-piece J and the slots being of substantially the same width as the thickness of the cross-piece. One of the trip-wheels L has connected eccentrically thereto a pitman M, which is also connected eccentrically to a wheel N, which is secured upon one end of a shaft O, which shaft extends underneath the rails and has upon its other end the crank-arm O', which crank-arm is connected by means of a link O^2 with a strip P, which extends alongside of the inside of one of the rails, and this strip is so pivoted by means of links P' that when the crank-arm O' pushes upon the strip the strip will be given a parallel movement and by rocking upon its pivots will be lowered. A similar strip Q is carried by one of the movable rails B, and these two strips P and Q are so formed upon their opposing ends, as shown in Fig. 3, that when the movable rail is thrown against the stationary rail these two strips will interlock one with the other and operate as one continuous strip.

The operation of the device is as follows: A bar R (shown in Fig. 2) is carried by the locomotive and may be secured to the same in any suitable manner so that the same may be thrown down in an operating position and normally carried in such a position as not to actuate the mechanism. When it is desired to throw the switch, the bar R is thrown downward or outward into the operative position, and this bar will then enter the actuating mechanism between the inclined ends I' of the strips I and the beveled surfaces H' of the side pieces H and pass into the space between the strips I and the side pieces H and come in contact with the base of the trip K, and the movement of this bar R will then force the trip K and the cross-piece J forward and in doing so will push upon the rod G, which in turn will communicate the motion to the link F and rotate one of the disks E', which in turn will rock the crank-arm D, which crank-arm in turn will impart the motion to the tie-rod C, which will throw the switch against the tension of the spring C'. By forcing the cross-piece J forward it will enter the slot L^2, which is normally in position to receive the same, and of course when this cross-piece J impinges against the end of the slot the motion of the cross-piece J will be arrested and the bar R will then pass upward around the wheels L and in doing so will travel upward upon the inclined surface of the trip K and tend to rock the same downward, and in rocking this trip K downward to the position shown in Fig. 5 the cross-piece J will necessarily turn with the same, and this will turn the wheels L one-quarter of a turn, and the bar R will then be free to pass out through the forward end of the actuating mechanism, as shown in Fig. 5, and the wheels L in turning will impart the motion through the link M to the wheel N, thereby rocking the shaft O, and this shaft will rock the crank-arm O' and actuate the strips P and Q, as before described, and these strips P and Q being lowered by this action will be in a position to allow the flange of the car-wheel to run upon the same before the bar R has left the actuating mechanism. Thereby the flange of the car-wheel will prevent the raising of the strips and will hold all of the mechanism in its actuated position, and thereby hold the switch closed until the train has passed the switch, and then in running off the strip Q will allow the spring C' to act so as to throw the movable switch-rails back to their normal position and open the switch, and this movement of the tie-rod will at the same time re-

turn the disk E′ to its normal position, and this disk in returning will communicate the motion through the link F, disk F², and rod G, so as to return the cross-piece H and trip K to their normal position. The spring S, connected at one end eccentrically to the wheels L and at the other end to the side piece H, has in the meantime revolved the wheels L so as to turn the trip K upright and place the cross-piece J in position to be slid back by the bar G, and the wheels L in turning will, through the link M, wheel N, shaft O, crank-arm O′, and link O², raise the strips P and Q to their normal position. Thus it will be seen that the switch will be closed and held closed by the train itself until said train has passed the switch, and then the switch will be automatically opened and all parts will return automatically to their normal position. Of course a train coming in the opposite direction will actuate the mechanism in precisely the same manner, except that the other disk E′ will be the one that is rocked. Upon the upper end of the post E is secured the usual signal denoting whether the switch is open or closed.

Of course I do not wish to be limited to the exact construction here shown, as slight modifications could be made without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is—

1. In an automatic switch for railways, the combination of the stationary rails and movable rails, with a tie-rod connecting the movable rails together, a spring for holding the rails in their normal position, an actuating mechanism, a horizontally-sliding element carried by the actuated mechanism and connected to the tie-rod for moving the switch-rail, a bar carried by the locomotive for moving the sliding bar, wheels carried by the actuating mechanism adapted to be revolved by the forward movement of the bar, depressible strips arranged parallel with the stationary and switch rails, and means connected with the wheels in the actuating mechanism for depressing said strips, and a spring for returning the wheels in the actuating mechanism to their normal position, as and for the purpose specified.

2. In an automatic switch for railways, the combination of stationary rails and movable switch-rails with a tie-rod connecting the movable rails together, and adapted to actuate the same, a spring normally holding the switch open, a bar carried by the locomotive, actuating mechanism arranged alongside of the track adapted to be actuated by the bar from the locomotive, said actuating mechanism connected with the tie-rod so as to close the switch, depressible strips arranged upon the inside of the stationary and movable rails, means for connecting the strip upon the movable rail with the strip upon the stationary rail when the switch is closed, and means extending from the actuating mechanism for primarily depressing said strips, the strips thereafter adapted to be held downward by the flange of the car-wheel, said strips being so connected to the actuating mechanism that the switch will be held closed as long as the strips are depressed, and springs for returning the mechanism to its normal position when the train has run from off the strips, as and for the purpose specified.

3. In an automatic railway-switch, stationary main rails, movable switch-rails, a tie-rod connecting the switch-rails together and adapted to move the same, a spring normally holding the switch open, an upright signal-post, two disks journaled loosely upon said signal-post, each of said disks provided with a slot formed concentric with the post, a crank-arm connected to the tie-rod and extending from the signal-post, said crank-arm extending upward through the slots in the disk, one link connected to each disk eccentrically, two actuating mechanisms located alongside of the track upon opposite sides of the signal-post, one link connected to the other actuating mechanism, a horizontal sliding trip-bar carried by the actuating mechanism, guides for said trip-bar, an actuating-bar carried by the locomotive adapted to slide the trip-bar forward, the link extending from the disks upon the signal-post connected to said trip-bar so as to revolve said disks and thereby close the switch when the trip-bar is forced forward, wheels carried by the actuating mechanism adapted to be partially revolved by the forward movement of the actuating-bar carried by the locomotive, depressible strips arranged upon the inside of the rails, mechanism extending from the wheels in the actuating mechanism to said strips, adapted to primarily depress the same, said strips thereafter being held downward by the flange of the car-wheel and preventing the opening of the switch and the return of the parts to their normal position until the strips are allowed to rise, and springs for returning the parts to their normal position, as specified.

4. In combination with stationary rails, movable switch-rails with an actuating mechanism adapted to move the movable switch-rails, said actuating mechanism consisting of side pieces H beveled at their rear ends, guide-strips arranged and supported at a distance above the side pieces and being bent upward at their rear ends, a cross-piece adapted to slide between the side pieces and the guide-strips, a pyramidical trip carried by the cross-piece, a bar extending from said cross-piece to the tie-bar for actuating the same, wheels partially embedded and journaled in the forward end of the side pieces, said wheels being provided with slots adapted to receive the ends of the cross-piece, springs for normally holding the wheels in position to receive the cross-

piece upon the forward movement of the same, the guide-strips being curved upward and over the wheels at a distance from the same, an actuating-bar carried by the locomotive adapted to enter the space between the side pieces and the guide-strips and force the cross-piece and trip forward into the trip-wheels, said actuating-bar then adapted to pass upward and over the slots and thereby press the trip downward so as to revolve the wheels one-quarter of a revolution, the actuating-bar then adapted to pass outward from the forward end of the actuating mechanism, depressible strips adapted to be primarily depressed by the turning of the wheels, and thereafter held depressed by the flange of the car-wheels, thereby holding the switch closed and preventing the return of the parts to their normal position until the train has passed off of these depressible strips, as and for the purpose specified.

5. In an automatic railway-switch, the combination of stationary rails, movable switch-rails, actuating mechanism, a bar carried by the locomotive, and springs for returning the parts to their normal position with depressible strips arranged inside and parallel with the stationary and movable rails, said strips being pivoted to the rails by several links so that they will be depressed throughout their length by any longitudinal movement imparted to the strips, means extending from said strips to the actuating mechanism for primarily depressing the strips, said strips thereafter adapted to be held downward by the flange of the car-wheel so as to prevent the opening of the switch and the return of the parts to their normal position, the opposing ends of the strip upon the movable rail and the strips upon the stationary rail being coiled so as to interlock one with the other when the switch is closed, as and for the purpose specified.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

SAMUEL C. TUSSING.

Witnesses:

JASPER H. LOUB,

H. C. HUMMON.