(No Model.) 2 Sheets—Sheet 1.

J. M. DEAL.

AUTOMATIC RAILWAY SWITCH.

No. 536,188. Patented Mar. 26, 1895.

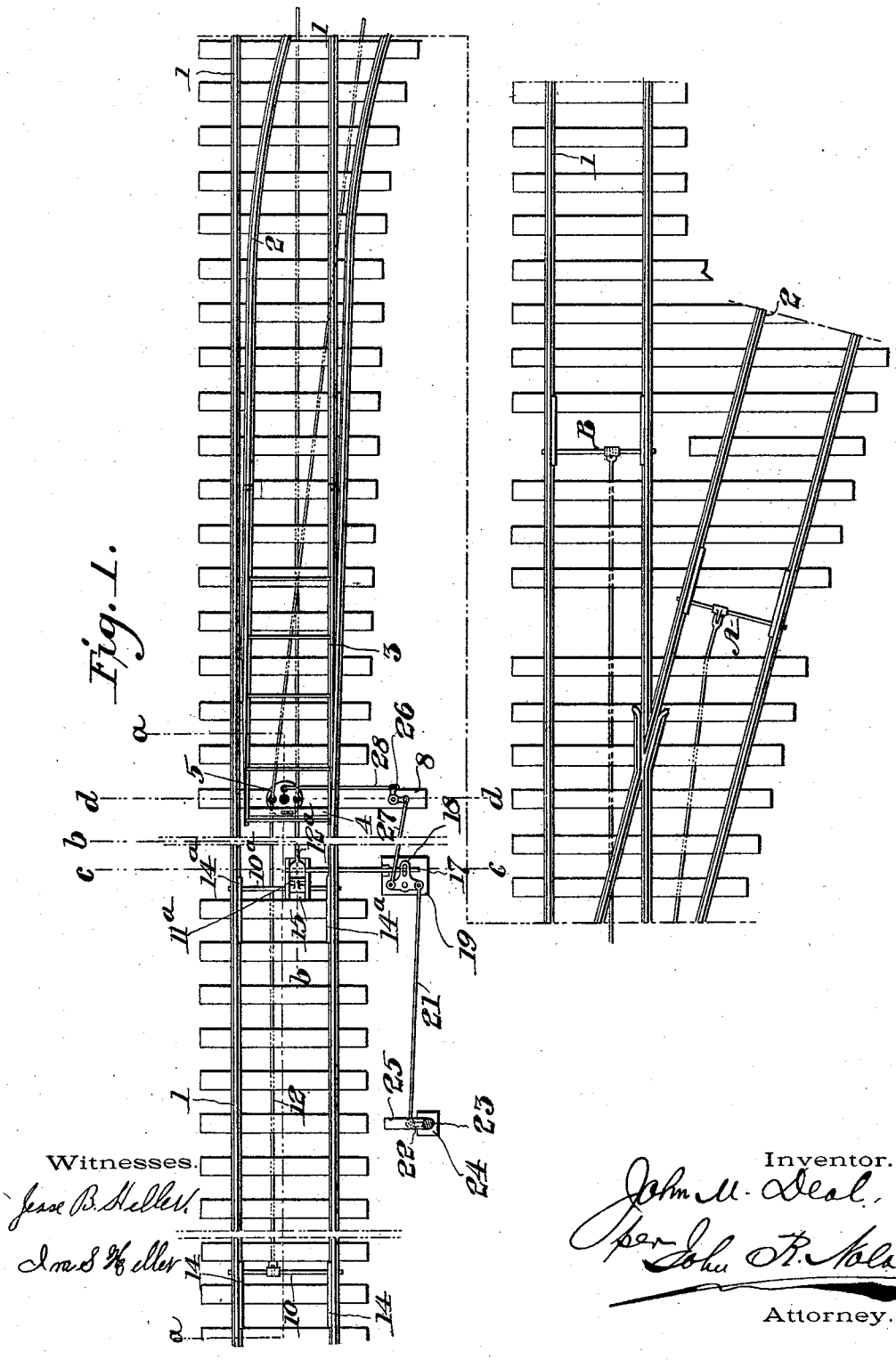

Fig. 1.

Witnesses.
Jesse B. Keller.
Ira S. Keller

Inventor.
John M. Deal.
per John R. Nolan
Attorney.

(No Model.) 2 Sheets—Sheet 2.

J. M. DEAL.

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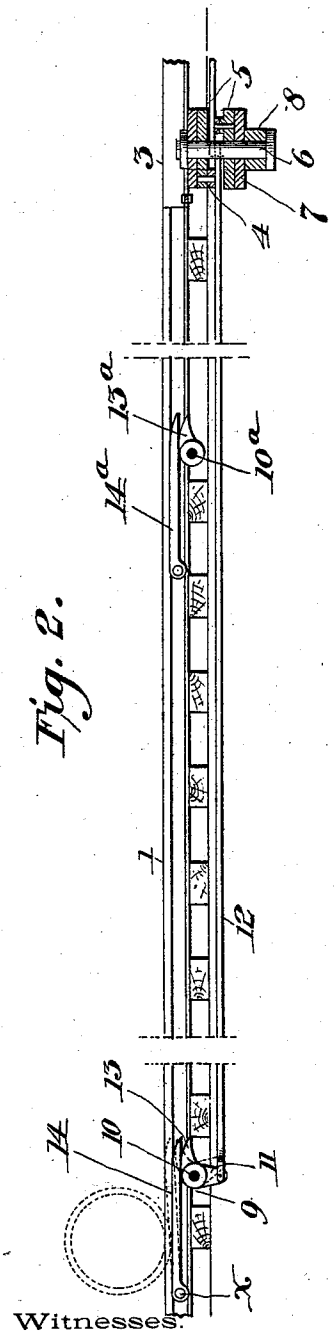

Fig. 2.

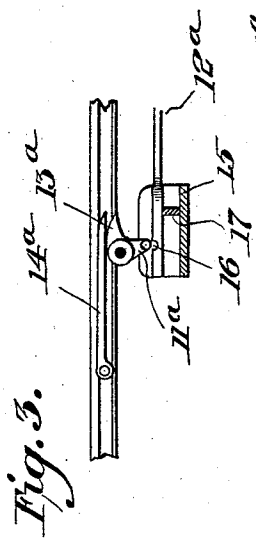

Fig. 3.

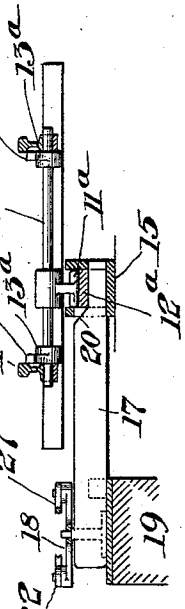

Fig. 4.

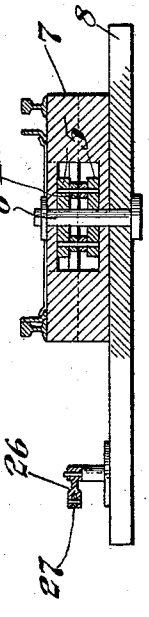

Fig. 5.

Witnesses:
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Ira S. Keller,

Inventor.
John M. Deal
per John R. Nolan
Attorney.

UNITED STATES PATENT OFFICE.

JOHN M. DEAL, OF FERNWOOD, ASSIGNOR TO WILLIAM BARTRAM, OF LANSDOWNE, PENNSYLVANIA.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 536,188, dated March 26, 1895.

Application filed July 6, 1894. Serial No. 516,723. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. DEAL, a citizen of the United States, residing at Fernwood, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Railway-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to that class of railway switches termed "automatic safety switches," in which are provisions whereby the switch is automatically operated by approaching trains; and the object of the invention is to provide a simple and efficient construction and arrangement of mechanism whereby the operation of the switch shall be effected under all conditions, as will hereinafter appear.

In the annexed drawings—Figure 1 is a plan of a switch mechansim embodying my invention, the view being shown in two parts. Figs. 2 and 3 are longitudinal sections, as on the lines *a*—*a*, and *b*—*b*, of Fig. 1, respectively. Figs. 4 and 5 are transverse sections, as on the lines *c*—*c* and *d*—*d*, respectively.

The numeral 1 denotes the main trackway, 2 the siding or branch trackway, and 3 the switch, the several parts being supported and relatively arranged in the usual manner.

The switch rails are connected, near their points, by means of a bar 4, which is, in turn, connected eccentrically with a centrally-disposed head 5. This head is constructed in two parts, which are concentrically mounted on a vertical stud 6 fixed to and between an open frame 7, the latter being firmly supported upon a suitably located cross-tie 8. The connection of the two-part head with the bar is such that if the former be partially turned, to the right or left, the bar, and, perforce, the switch rails will be moved toward or from the adjacent rails, respectively, for the purpose of opening or closing the switch, as desired.

Fixed to the bases of the rails of the main track, a suitable distance in advance of the switch points, are boxes 9 in which is mounted a transverse rock-shaft 10 provided with a depending crank-arm 11. This arm is connected eccentrically with the head by means of a rod 12, whereby when the shaft is properly turned the switch, if open, will be closed to preserve the continuity of the main track. On the shaft 10, adjacent to the inner sides of the respective rails, are forwardly extending arms 13 upon which rest the free ends of levers 14 pivotally connected at their opposite ends with the webs of the rails respectively, as at *x*. The parts are so constructed and relatively arranged that when the switch is open the arms extend upwardly and maintain the ends of the levers at a level with the treads of the adjacent rails, or nearly so. Hence the flanges of the wheels of a train approaching the switch will bear upon and depress said levers, and, in consequence, through the intermediate connections, they will positively close said switch. The head 5 is similarly connected with corresponding controlling devices A, B, located in the siding, and in the main track beyond the switch, respectively, whereby if a train be approaching the switch, from the rear, and the switch be open, the flanges of the wheels will bear upon the levers of the devices B and effect the closing of the switch. The several connections are such that the levers occupy the raised or active positions to meet the respective requirements mentioned.

By the described construction it will be seen that a train approaching the points of the switch will close the latter. Now, in order that the switch may be opened by the next approaching train, if desired, I provide the following mechanism, viz: Located in the main trackway intermediate the rock-shaft 10 and the points of the switch, is a similar shaft 10^a, the distance between said shafts being somewhat greater than the length of the longest train. The shaft 10^a is provided with arms 13^a similarly to the first described shaft, upon which arm levers 14^a correspondingly rest. Depending from the shaft is an arm 11^a which is provided with a laterally extended lower end, as seen. Normally the levers 14^a are depressed and the arm 11^a depends forwardly. Located directly below the rock shaft, so as to embrace the lower end of the arm 13^a is a U-shaped box 15, upon the bottom of which rests the expanded end of a

rod 12^a, the other end of which is eccentrically connected with the head 5. The expanded portion of this rod is provided with a transverse groove 16, which lies immediately beneath the lower end of the arm 13^a when the switch is closed, to the end that this portion of the rod may be raised to engage its groove with the arm, as hereinafter described. Fitted to the box is the inner or free end of a bar 17, the other end of which extends laterally beyond the trackway and is connected with one limb of a three-armed lever 18 which is mounted in a suitable base 19. The inner end of the bar is provided with a beveled step or cam portion 20, which is normally out of engagement with the rod 12^a. When, however, the cam-bar, as it may be termed, is forced inward, by properly moving the lever 18, the step takes against the opposed edge of the rod and raises the grooved portion of the latter into engagement with the arm. At the same time it moves the arm slightly upward and, perforce, elevates the lateral levers to the level of the treads of the rails, or practically so. Hence the wheel flanges of an approaching train will depress these levers, and, through the intermediate connections, open the switch.

One arm of the lever 18 is connected by means of a rod 21 with a crank arm 22 on a standard 23 located adjacent to the track. This standard is mounted in a bearing 24 so as to be partially rotatable, and it is provided with an inwardly-extending operating arm 25. As the train approaches the standard, the engineer projects a tappet arm, or other appropriate device, which, striking the arm 25 of the standard, turns the latter sufficiently to insure the requisite projection of the cam bar.

It will be observed that when the switch is opened, as just described, the switch-controlling levers in the side-track will be caused to assume their down or idle position, in order to permit the passage of the train over the same, and that the switch-controlling levers in the main track will be caused to assume their raised or operative position.

In order that the intermediate or supplemental switch-controlling mechanism shall be released by the operation of an approaching train (running in either direction) on the main line, I arrange, near to the track, a bell-crank lever 26 and connect one arm thereof with the remaining arm of the lever 18 by means of a rod 27, and connect the other arm of the lever 26 with the head 5 by means of a rod 28. Hence when either set of switch-controlling levers on the main track is depressed, the said connections will effect the retraction of the cam-bar, and, perforce, release the rod 12^a from the engaged crank arm 13^a of the supplemental controlling devices.

Rod 26 is joined with the bell crank lever by a pin and slot connection, so as to permit the requisite amount of play or lost motion during the operation of the parts.

I claim—

1. In a railroad switch, the combination with the main trackway, the siding and the switch, of a main switch-controlling mechanism arranged in the main trackway beyond the switch, connected with the latter and constructed to be actuated by the passing train to close the switch, a supplemental normally-inactive switch-controlling mechanism arranged in the main trackway intermediate the switch and the main controlling mechanism, operating devices for said supplemental mechanism located intermediate the latter and the main controlling mechanism, and connections between said operating devices and the supplemental mechanism, said operating devices being constructed to be operated by the train under the circumstances stated to connect the supplemental mechanism operatively with the switch, and said latter mechanism being constructed to be actuated thereupon by the passing train to open the switch, substantially as described.

2. In a railroad switch, the combination, with the main trackway, the siding and the switch, of a set of switch-controlling mechanism arranged in the main trackway forward of the switch, a set arranged therein rearwardly of the switch, and a set arranged in the siding (or branch track), a rotatable head eccentrically connected with the switch and eccentrically connected with each set of switch-controlling mechanism, said mechanism being constructed to be actuated by the passing train at predetermined intervals, a supplemental normally-inactive switch-controlling mechanism arranged in the main trackway intermediate the forward controlling mechanism and the switch, operating devices for said supplemental mechanism located intermediate the latter and the forward controlling mechanism, connections between said operating devices and the supplemental mechanism, said operating devices being constructed to be actuated by the train under the circumstances recited to connect the supplemental mechanism operatively with the switch, and said latter mechanism being constructed to be actuated thereupon by the passing train to open the switch, together with lever and link connections between the said head and the said operating devices constructed to release the operative connection of the supplemental mechanism with the switch under the circumstances stated, substantially as described.

3. In a railroad switch, the combination, with the main trackway, the siding and the switch, of a mechanism connected with the switch and adapted to be actuated to open or close the latter, an intermediate or supplemental switch-controlling mechanism comprising a rock-shaft, arms thereon, levers adapted to actuate said arms, a depending crank-arm on said rock-shaft, a head eccentrically connected with the switch, and a rod connected with said head and extended to the said crank arm, and means for engaging said rod with

the latter and disengaging it therefrom, at predetermined intervals, substantially as described.

4. In a railroad switch, the combination with the trackway and the switch rails, of a supplemental switch-controlling mechanism, comprising a rock-shaft, arms thereon, levers adapted to actuate said arms, a depending crank arm on said shaft, a head eccentrically connected with the switch rails, a rod connected with said head and extended to and below the crank arm, a reciprocative cam-bar adapted to act upon said rod to engage it with the crank-arm, a lever with which said cam-bar is connected, and means for operating said lever at predetermined intervals, substantially as described.

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

JOHN M. DEAL.

Witnesses:

MATTHEW VANDERER,

F. M. LONGSTRETH.