

J. A. T. BIRD.  
Switch-Signals.

No. 158,776.

Patented Jan. 19, 1875.

Fig. 1

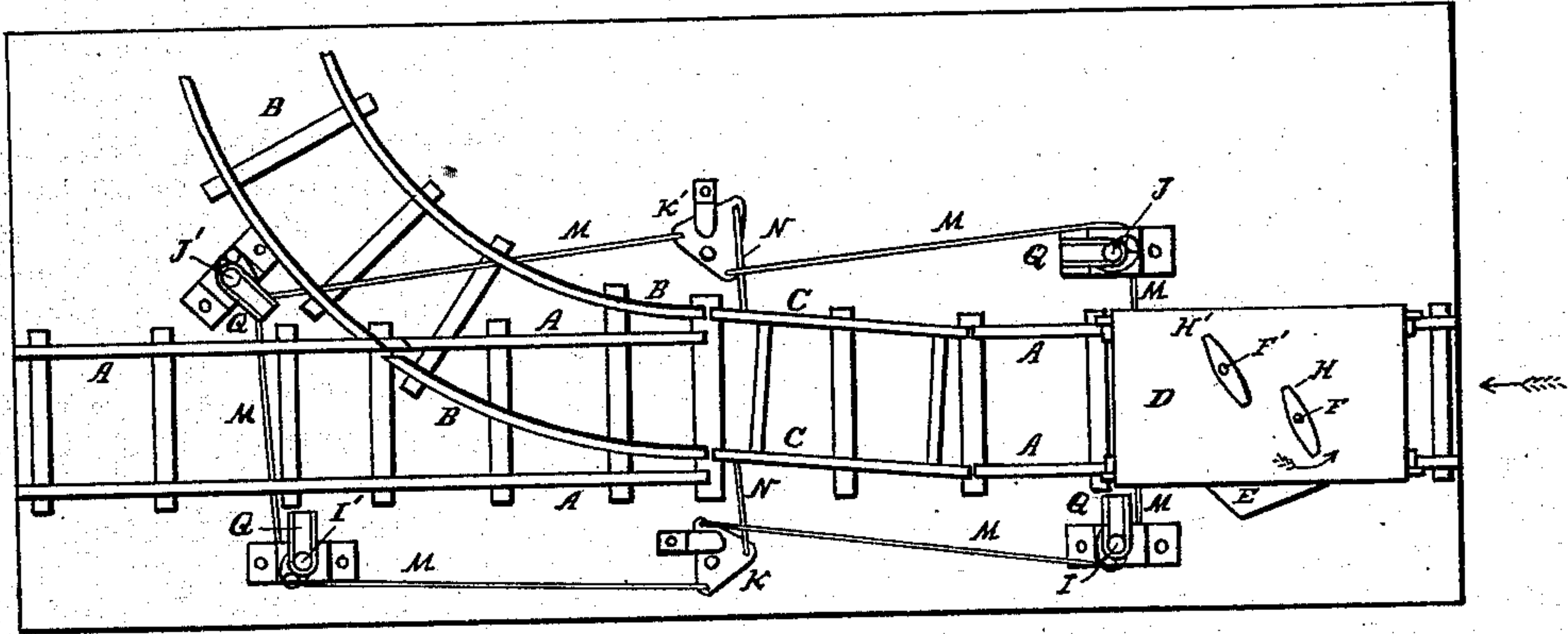


Fig. 2

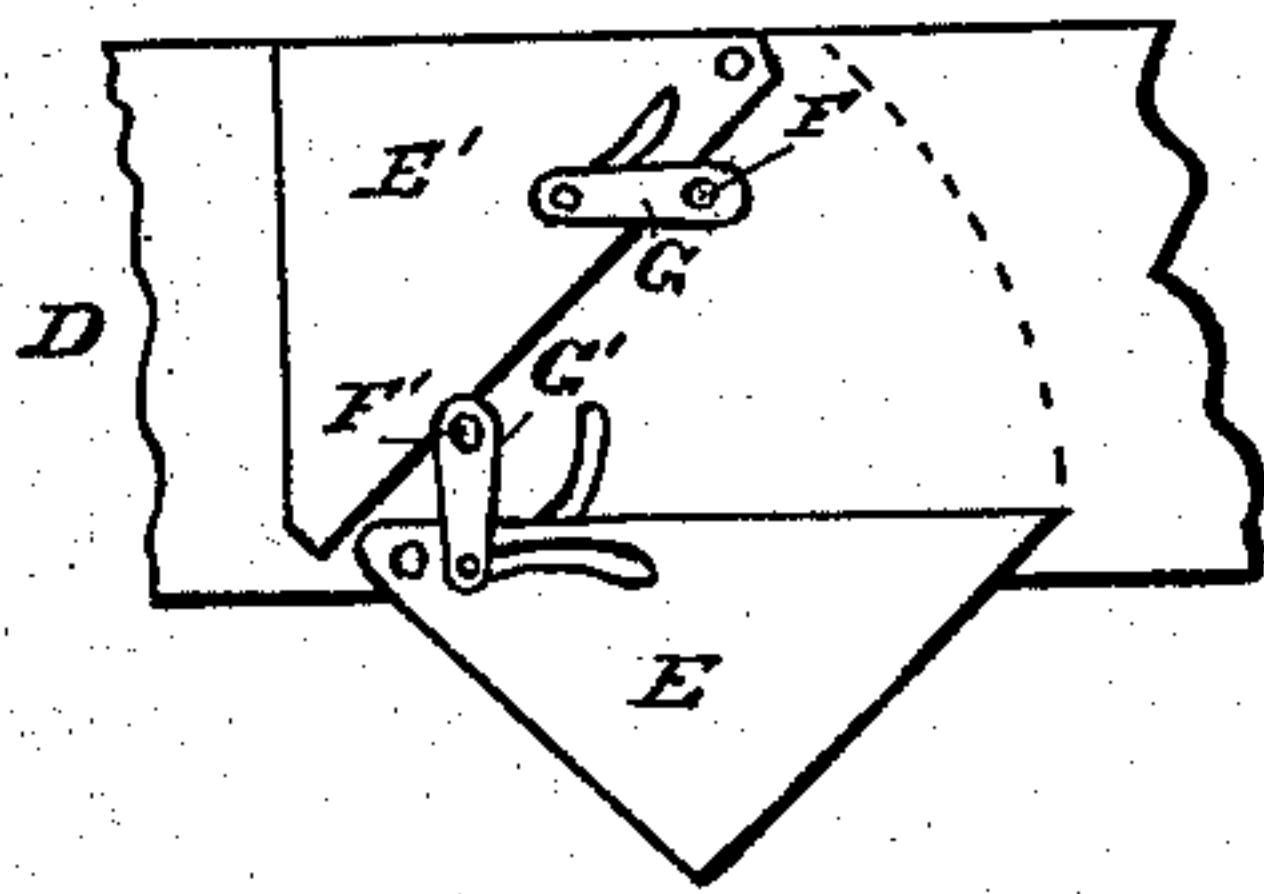


Fig. 3

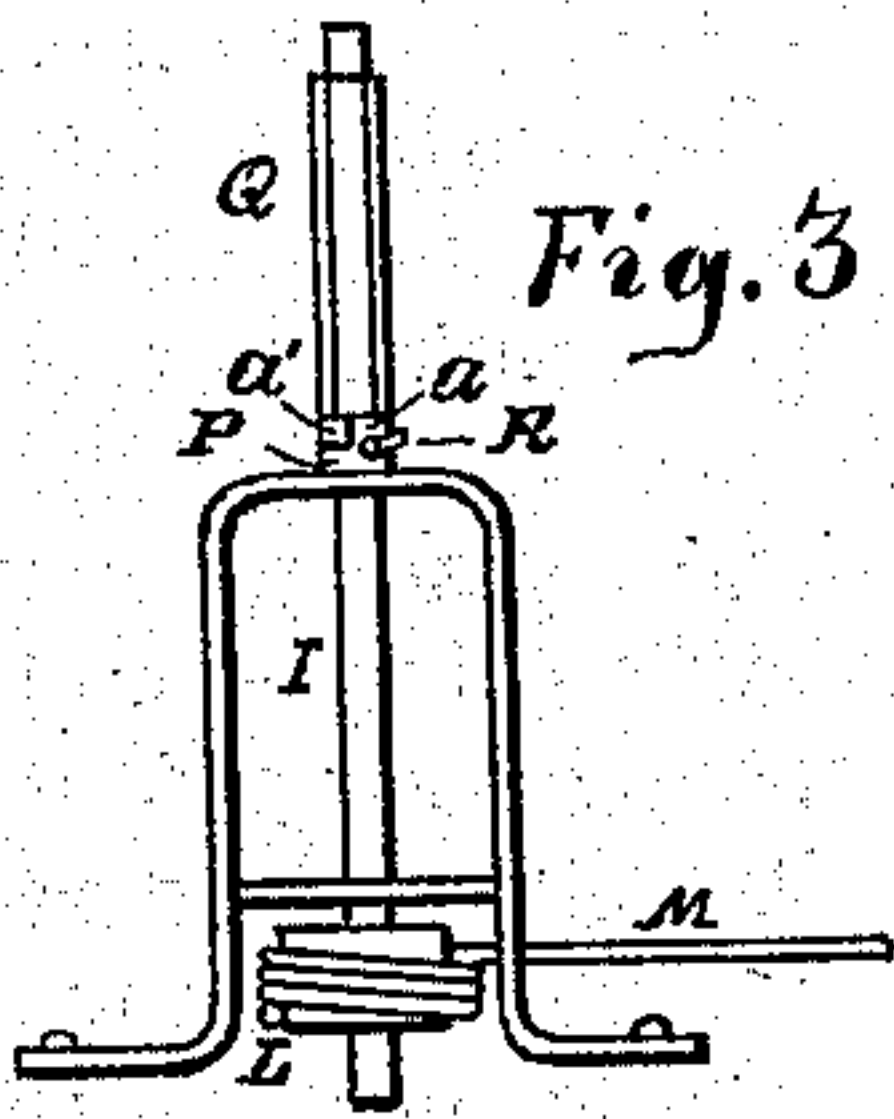
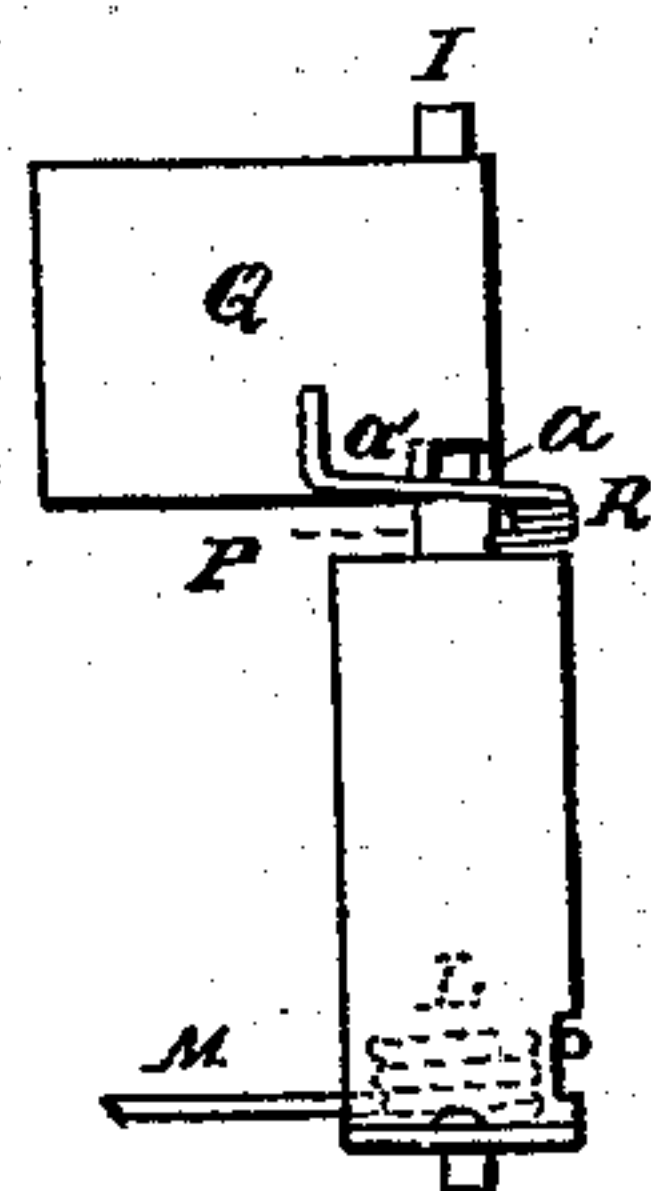


Fig. 4



WITNESSES

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# UNITED STATES PATENT OFFICE.

JAMES A. T. BIRD, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN SWITCH-SIGNALS.

Specification forming part of Letters Patent No. **158,776**, dated January 19, 1875; application filed April 10, 1874.

*To all whom it may concern:*

Be it known that I, JAMES A. T. BIRD, of Chicago, in county of Cook and State of Illinois, have invented a new, useful, and Improved Automatic Railway-Switch, of which the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing, forming a part hereof, and in which—

Figure 1 is a top or plan view of my improved switch; Fig. 2, a bottom view of the push plates or bars; and Figs. 3 and 4 are side elevations of the signal-shaft and its attachments.

Like letters of reference indicate like parts.

The object of my invention is to so improve the construction and operation of railway-switches that they may be operated automatically by means of approaching trains, and so that the switches may be thereby set either to retain the train upon the main track or to conduct it upon a side or branch track, as occasion may require.

In the drawing, A represents the main track, and B is a side track. C C are the switch-rails. D represents a car approaching the rails C C. I I' and J J' are vertical posts or shafts turning in bearings near the track. The posts I and I' are upon the same side of the track, and opposite or nearly opposite them, on the other side of the track, are the posts J and J'. The switch-rails lie between the posts I and I', and also between the posts J and J', as shown, and at such a distance therefrom that the switch may be shifted with certainty when the train has reached the posts. K K' are bell-cranks, arranged between the posts I I' and J J', respectively. L L are pulleys rigidly attached to the lower parts of the posts. M M' are ropes wound on the pulleys L L, and attached to the bell-cranks in the manner shown. Each post is connected to the other through the instrumentality of the ropes and bell-cranks. N N are ropes attached to the switch-rails, and to the bell-cranks, as shown. P P are collars rigidly attached to the posts. These collars are cut away so as to form shoulders. Q Q are arms or levers mounted on the posts I, I', J, and J', respectively, to indicate

when the switch is properly set. These arms or levers turn freely on the posts, and are made to extend between the shoulders formed by the part a, as shown at a'. The space between the shoulders formed by the part a is sufficient to admit of the arms Q Q being swung about a quarter of the way around without coming in contact with either of the said shoulders. R R are springs to retain the arms Q Q against one of the said shoulders.

When the main track is open the yielding arms on the posts I and I' should be set at right angles to the track, or nearly so, and the other yielding arms should be parallel, or nearly parallel, thereto. The relation of the parts a and a' to each other should also be such that the yielding arms, if struck by a push-plate on a car approaching the switch, will rotate the posts. The ropes M M should be so wound on the pulleys that the yielding arms on the posts J and J' will be swung at right angles to the track when the other yielding arms are swung parallel thereto, it being understood that the yielding arm on the post J' should be set with relation to the side track.

The manner of attaching the ropes to the bell-cranks and to the switch-rails is clearly shown in Fig. 1. The yielding arms on the same side of the track move in the same direction, and all move simultaneously when any one is moved in connection with the post on which it is mounted. If the yielding arms should be struck by a train when they are not set for that purpose, they will be swung partly around without rotating the posts, and will be returned to their proper position by the springs R R as soon as released by the push-plates.

One of the push-plates—the plate E, for example—should always be thrown out in the manner shown in Fig. 1; and this should be required by the rules of the road, so that uniformity of practice will prevail. If the switch is closed with relation to the main track, the trains will pass in each direction thereon without actuating the switch mechanism; but, if the switch is open with relation to this track, the yielding arms on the post I will be struck by a train approaching the switch in the direction indicated in Fig. 1, and the switch will thus be closed by the time the train reaches it.



When the trains move in the opposite direction the push-plate should extend from the same side of the track as before, so as to strike the yielding arm on the post I' when the switch is open. In this manner trains moving over the main track will always find the switches closed.

The operation of closing the switch for the main track opens it with respect to the side track, but sets the yielding arm on the post J', so that it will be struck by a train approaching the main track, and when this yielding arm is so struck the switch will be carried to the side track, and the yielding arms, operating in connection with the main track, will, at the same time, be set to be struck in the manner described. When the main track is open the cars will pass from it to the side track without actuating the switch-operating mechanism; but, if the main track is closed, the yielding arm on the post J will be in a position to be struck by a train approaching the side track, provided the push-plate on that side of the train is thrown out. If, therefore, it is desired to pass the train from the main track to the side track when the switch is not set for that purpose, the push-plate E' should be thrown out, and the switch will then be carried to the side track, and all the yielding arms will be set in the position shown. The position of the yielding arms will indicate the position of the switch.

In practice I make the yielding arms sufficiently strong to receive the blows of the push-plates without being materially injured thereby. I also deem it preferable, in practice, to employ rag wheels and chains in lieu of the

common pulleys and ropes M M. A chain, however, need be substituted only for that part of the rope which rides on the pulleys; and either a wire rope or connecting-rods may be employed in lieu of the rest of the said ropes. Rods may also be substituted in lieu of the ropes N N.

All the switch-operating mechanism except the yielding arms may be boxed in to be protected from snow, ice, and sand. If the switch becomes accidentally displaced, the yielding arms are thereby so set that it will be replaced by the next passing train.

It will be perceived from the foregoing specification that, by the employment of the means set forth, safety will be insured, and that special switchmen need not be employed.

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

The rotary posts I, I', J, and J', each provided with a shouldered collar and with a pulley or rag-wheel, both rigidly attached thereto, the signal-boards mounted on the said posts, and operating in connection with the said shoulders, the ropes or chains arranged over the said pulleys or wheels, and connected to the bell-cranks, and the switch-rails, also connected to the said bell-cranks, all combined and operating together, in connection with adjustable extensions on the train, substantially as and for the purposes specified.

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Witnesses:

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