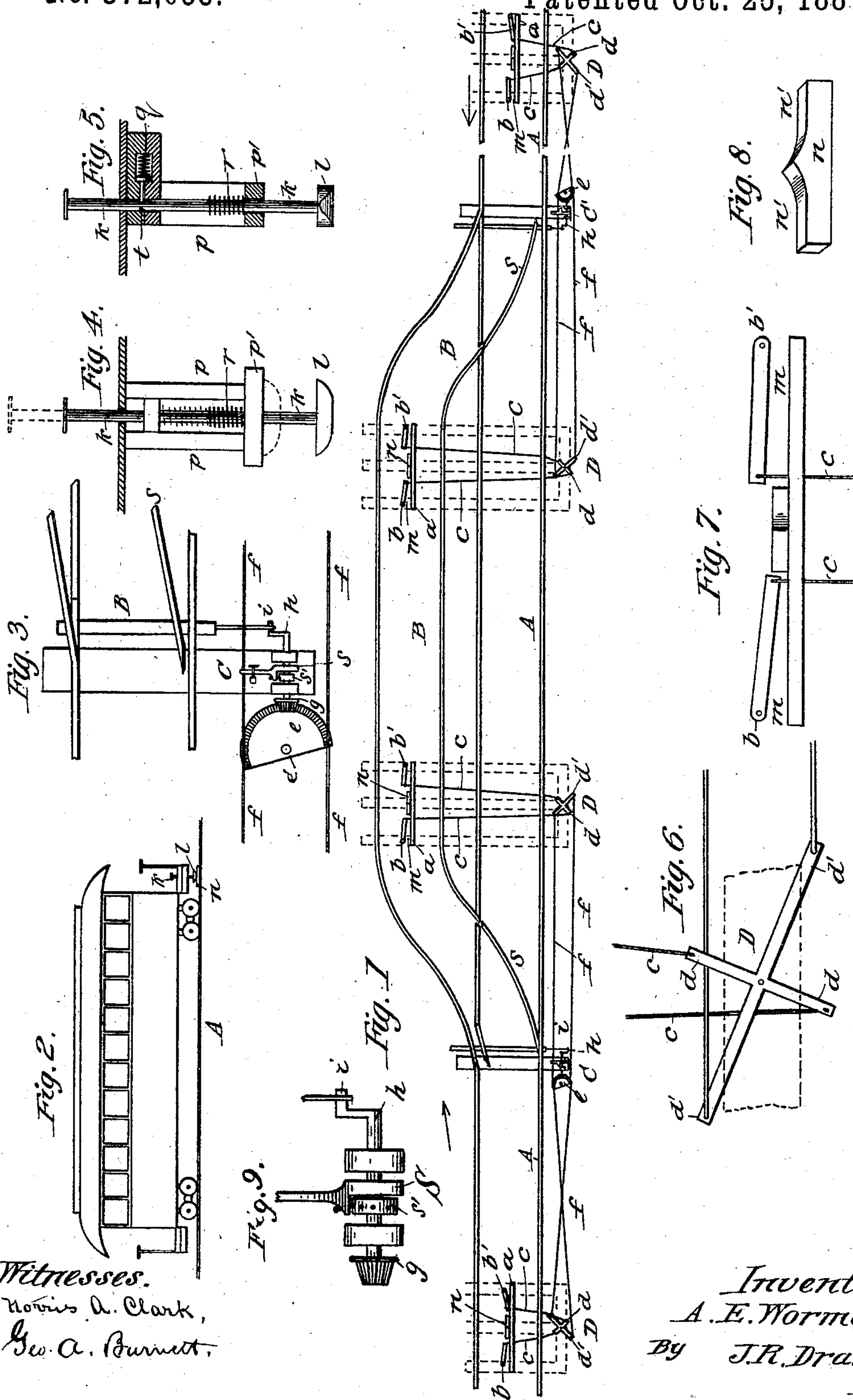


(No Model.)

A. E. WORMER.
DEVICE TO OPEN AND CLOSE RAILROAD SWITCHES AUTOMATICALLY
FROM A MOVING TRAIN.

No. 372,053.

Patented Oct. 25, 1887.



Witnesses.
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UNITED STATES PATENT OFFICE.

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DEVICE TO OPEN AND CLOSE RAILROAD-SWITCHES AUTOMATICALLY FROM A MOVING TRAIN.

SPECIFICATION forming part of Letters Patent No. 372,053, dated October 25, 1887.

Application filed March 17, 1887. Serial No. 231,261. (No model.)

To all whom it may concern:

Be it known that I, ANDREW E. WORMER, a citizen of the United States, residing at Holland, in the county of Erie and State of New York, have invented certain new and useful Improvements in Devices to Open and Close Railroad-Switches Automatically from a Moving Train; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The object of this invention is to open and close railroad switches automatically from a train when in motion, doing away with the services of a switchman, when the train is going on or off a "siding;" and the invention consists in the arrangement and construction of the various parts, and will be understood by reference to the following specification and claims.

In the drawings, Figure 1 is a plan of a section of railroad and a siding having all my devices in connection therewith, except the switch-operator; Fig. 2, a side elevation of a car on a track, showing the switch-operator on said car; Fig. 3, a detail enlarged top plan of the switch-head, &c.; Fig. 4, a side elevation, detached, of the switch-operator; Fig. 5, a front view of same, partly in vertical cross-section, forced down ready to open or close the switch. Fig. 6 is an enlarged plan view of the pivoted cross-arms; Fig. 7, a top plan of the devices which operate the cross-arms in connection therewith and with the track, &c. Fig. 8 is a perspective of the center block, enlarged, and removed from its position to show its shape. Fig. 9 is an enlarged view of the hand-operating mechanism.

A A represent the main track of a railroad, and B the siding in connection therewith.

C and C' are the switch-heads. About sixty or ninety feet from each switch-head is arranged in the center of the main track some of the devices for operating the switch from a train at a distance, as follows: First, a stationary guide-piece, *a*, about twelve feet long,

is fastened to a ground frame-work, (shown in dotted lines,) and opposite to it are two arms, *b b'*, pivoted at their outer ends, a space being left between the arms and the guide *a*, and also between the two inner ends of the arms, as shown in Figs. 1 and 7, the object to be presently explained. Each arm *b b'* has a rod, *c*, attached to its movable end, said rods running under the track and both attached to the shorter arms, *d*, of a cross-piece, D, pivoted in its center to a ground-frame, as shown in dotted lines, Figs. 1 and 6. To the ends of the other arms, *d'*, are attached cables *f f*, leading therefrom and at the side of the track and crossed, as shown, and thence to the switch-heads C C'. Here the two ends of the cable are fastened to a longitudinally-working beveled gear-wheel, *e*, (made preferably semicircular, as shown,) and which is pivoted at *e'* into a frame underneath. (Not shown.) The cables *f f* then continue therefrom to the long arms *d'* of a similar cross-piece, D, as above described, and at about the same distance from the switch-heads C C' as the first cross-piece D described. The beveled gear works in connection with a smaller beveled gear, *g*, (see Fig. 3,) on the end of a crank-shaft, *h*, to the other end of which is connected the rod *i* that operates the moving rails S of the switch or siding.

The siding is provided near each end with exactly the same devices as heretofore described in connection with the main track for opening and closing the switches, so that they are operated therefrom the same as from the main track, (see Fig. 1,) all in connection with an additional device now to be described.

On the engine or a car, or both, in the most convenient place, is arranged a vertical rod, *k*, extending down beneath the car or engine, having at the bottom a longitudinal extension or foot, *l*, which is the switch-operator proper. It is rounded up from the bottom and pointed at both ends. (See Figs. 4 and 5.) This rod is worked up and down by a lever, or by the foot or other simple means at the top. When not in use, it is up so that the foot-piece *l* clears the rails, guide, &c.; but when it is to be used to operate a switch it is forced down so that the part *l* enters into the space *m*, (see Fig. 7.)

between the guide *a* and the first pivoted arm, *b*, pushing the inner end of the arm away, and consequently operating the rods *c c*, the cross-piece *D*, cables *f f*, and the switch-head devices, which open the switch and the train runs onto the siding.

In Fig. 1, at the lower or left-hand end, the connections and positions of all the parts are shown as just described, and the position of the same devices on the siding just before the train gets to them. As the train runs on and clears the rails of the main track and beyond the curve of the track *S*, the switch-operator *l* is again pressed down to enter the space *m* between guide *a* and arm *b*, (the same as on main line,) and this pushes back said arm *b*, which had been drawn in by the operation of opening the switch, and throws back all the parts to their original position, thereby resetting the switch and leaving the main line clear. As the train goes off the siding at the other end, the switch operator *l* is again operated, in connection with similar devices near the end of the siding, as shown in Fig. 1, to set the switch for the main line at that end. A train coming in the opposite direction to go onto the siding, the action of the switch and opening and closing devices at that end will be the same as described at the other end, the only difference being that the beveled gears *e g* are reversed in position in relation to the switch-head—that is, face the other way, as shown at *C'*, Fig. 1.

The rod *k* of the switch operator *l* works in a frame, *p p*, attached to the under side of the car or platform or any suitable place, having around the rod a spiral spring, *r*, retained in place by the cross piece *p'* of the frame. In the top cross-piece (see Fig. 5) is a spring-catch, *q*, the point of the catch setting in a slot, *t*, in the rod *k*, as shown. A sharp push on the rod will disengage it, the rod flying up.

Between the guide-rail *a* and the pivoted arms *b b'*, and exactly in the space between the moving ends of the arms *b b'*, is fastened to the ground frame-work a metal block, *n*, (see Figs. 1 and 8,) pointed in the middle at the top and inclined back therefrom to the ends, giving a double inclined surface, as shown in Fig. 8. This is thus constructed so that when the bottom *l* of the switch-operator, after having thrown back the arm *b*, strikes against the block *n*, it will do so gradually and force the spring-catch *q* out of the slot *t*, when the spiral spring *r* will raise the switch-operator back to its normal position and hold it there.

The ground-throw lever is made in two parts, *s s'*, as clearly shown in Fig. 3. The part *s*, instead of being fastened to the shaft *h*, as usual,

is loose thereon, and a part, *s'*, of the base of the lever is separated from the rest and made fast on and moves with the shaft *h*, irrespective of the handle *s*, which is locked down, as shown in Fig. 3, to prevent tampering with the switch, and will only be used when desired to open and close by hand. It is then connected to the part *s'* by a pin (not shown) or other simple means. This construction allows the independent and automatic action of the switch without moving the handle *s*, the objection to its moving being that it might strike some one near the switch unconscious of its automatic action.

I claim—

1. In combination with the main line of rails of a railroad track and the sidings having the usual sliding rails and switch-heads, the switch-operating devices, consisting, essentially, of the stationary guides *a*, the pivoted arms *b b'*, rods *c c*, connected thereto and also to the arms *d*, the pivoted cross-pieces *D*, the cables *f f*, connected with the other arms, *d'*, of cross-piece *D*, the pivoted gear-wheel *e e'*, the beveled gear *g*, the ground-throw shaft *h*, which operates the sliding rails, and the spring-rod *k r* and switch-operator *l*, suitably arranged in connection with the engine or car of a train, and by which the arms *b b'*, and consequently the sliding rails *S*, are operated, all arranged and operating substantially as and for the purpose specified.

2. In combination with the guide *a* and pivoted arms *b b'*, arranged in connection with railroad-tracks, as described, a switch opener, *k l*, operating as set forth, the double inclined block *n n'*, fastened between the guide *a* and arms *b b'*, all substantially as and for the purpose specified.

3. The operating rod *k*, having the curved and pointed foot-piece *l*, the spiral spring *r*, and the notch *t*, and the spring catch *q*, operating in connection with said notch *t*, all substantially as and for the purpose specified.

4. In combination with the sliding rails, the ground-throw lever constructed in two parts, *s s'*, the former, *s*, loose on the shaft *h*, and the latter fast thereon, said shaft having a beveled gear, *g*, on one end, meshing in a beveled gear-wheel, *e*, pivoted in or to a frame and connected to cables *f f*, all as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW E. WORMER.

Witnesses.

J. R. DRAKE,

GEO. A. BURNETT.