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AUTOMATIC RAILWAY SWITCH ADJUSTER.

APPLICATION FILED JUNE 15, 1904.

NO MODEL.

Fig. 1.

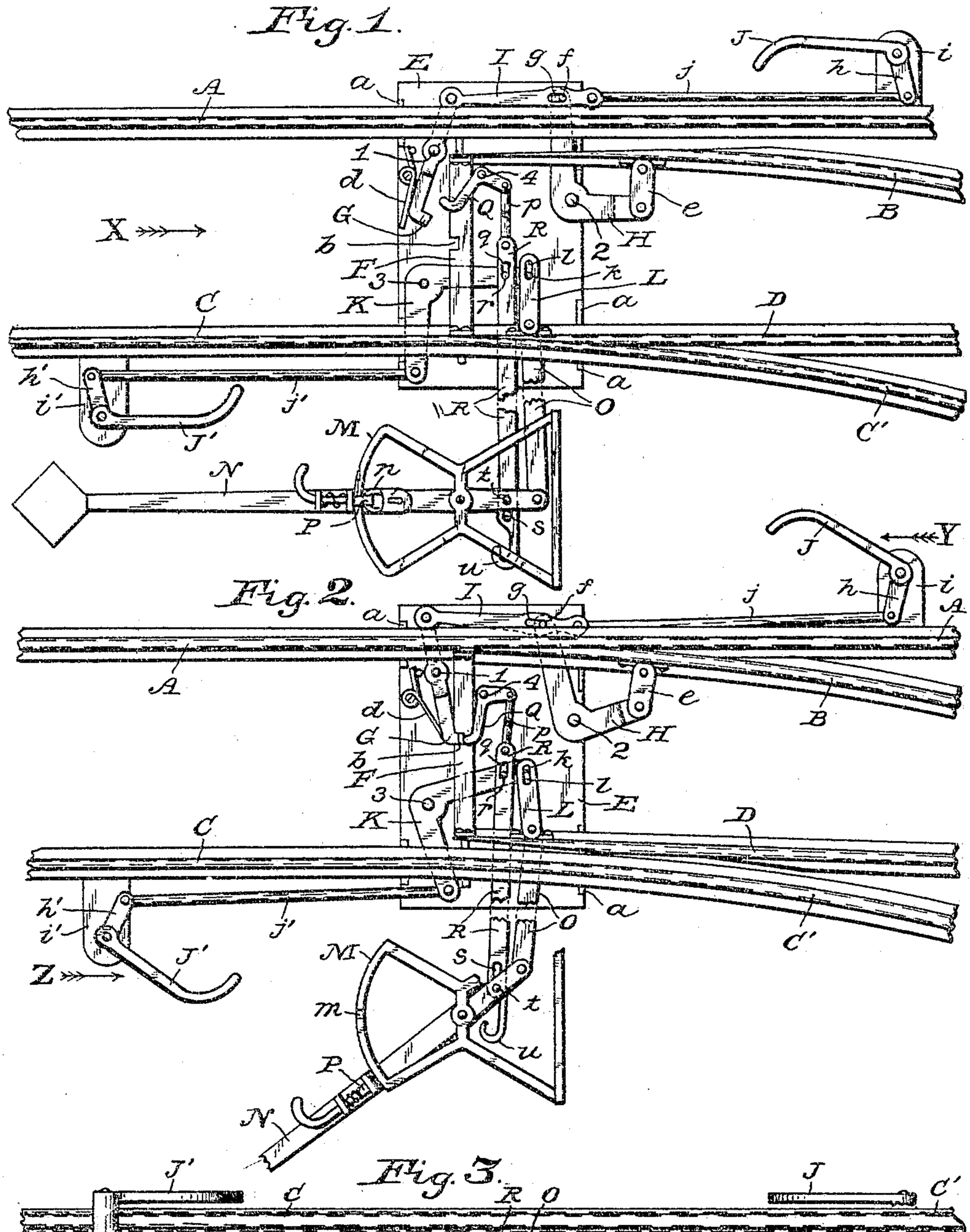

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC RAILWAY-SWITCH ADJUSTER.

SPECIFICATION forming part of Letters Patent No. 775,064, dated November 15, 1904.

Application filed June 15, 1904. Serial No. 212,625. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. HARRIS, a citizen of the United States, residing at Ellettsville, in the county of Monroe and State of Indiana, have invented new and useful Improvements in Automatic Railway-Switch Adjusters; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to railway-switches; and it has reference particularly to apparatus for automatically throwing switches from sidings to main tracks by means of suitable devices that may be carried by moving locomotives or motor-cars; and the invention has reference also to improved apparatus whereby the switches may be operated by hand.

The main object of the invention is to provide improved switch-adjusting apparatus whereby accidents may be prevented at side tracks when switches may have been carelessly left so as to lead passing trains onto the sidings where they might collide with other trains or cars. Other objects are to provide improved latching devices for the switches adapted to permit automatic adjustments thereof and latching devices to coöperate with the hand-operating apparatus.

With the above-mentioned objects in view the invention consists in the novel parts and the combinations and arrangements of parts, as hereinafter particularly described and claimed.

Referring to the drawings, in which similar reference characters designate like parts, Figure 1 is a plan view showing the apparatus in connection with a section of a railway-track and a switch, the latter being set for the main track; Fig. 2, a view similar to Fig. 1, with the difference that the switch is set for the siding; and Fig. 3 is a fragmentary side elevation of the track and parts of the adjusting apparatus. The switch-stand and hand-lever appear horizontally for diagrammatic purposes, but in practice will usually be in upright positions.

In the drawings, A designates one of the main-track rails; B, the switch-point that is movable to coöperate with the rail A; C, the other main-track rail, which is bent opposite the ends of the switch-points and forms also the curved lead-rail C′, connected with one of the siding-rails; and D is the other switch-point that is connected with the main-track rail in alinement with the rail C.

A metallic head-block E supports the principal parts of the apparatus, and chairs *a* are mounted on the head-block supporting the track-rails somewhat above the top of the head-block, so that levers and operating-rods may perform their functions beneath the rails. The rails in practice will also be supported on cross-ties, as usual.

The ends of the switch-points B and D are connected together by a tie-bar F, having a a notch *b* in one side thereof, and other tie-bars of ordinary form will also connect the switch-points together, as usual. A latch G is mounted on a pivot 1, attached to the head-block E, and is normally pressed into the notch *b* by means of a spring *d*, supported by the head-block E, when the switch is set for the siding, as will appear in Fig. 2. An arm of the latch G extends under the rail A.

Near the switch-point B a pivot 2 is supported by the head-block E and supports a bell-crank lever H (or lever having two arms) at the junction of its two arms, one arm of the lever being connected, by means of a link *e*, to the switch-point B. The other arm of the lever H extends under the switch-point B and the rail A and is provided with a pivot-pin *f* at its end. A connecting-rod I is pivoted to the arm of the latch G and has a slot *g*, receiving the pivot-pin *f*, whereby the rod I is connected to the arm of the bell-crank lever H.

At a suitable distance from the head-block E a contact-lever J, having an arm *h*, is pivoted to a stationary base *i*, and a connecting-rod *j* is pivoted to the arm *h* and also to the rod I.

Near the rail C a pivot 3 is supported by the head-block E and supports a bell-crank lever K, one arm thereof extending under the rail C and being connected by a rod *j*′, that is connected to the arm *h*′ of a contact-lever

J′, pivoted on a base *i*′, situated at a suitable distance from the head-block E at the opposite side thereof from the base *i* and also at the opposite side of the track from the base *i*. The other arm of the lever K extends to a link L, that is pivoted to the switch-point D, and is connected to the link by means of a pivot *k*, attached thereto and extending through a slot *l* in the link.

A switch-stand M of suitable design is situated in the usual position relative to the switch-points and has a suitable hand-lever N, carrying a target, as is customary. The stand has a notch or opening *m* to receive a suitable latch. The lower end of the lever N has a switch-rod O pivoted thereto, that is connected to the switch-point D, as is usual, so that the switch may be shifted or thrown by hand by means of the lever N in the customary manner. The lever N is provided with a latch P, that is spring-pressed toward the curved part of the switch-stand that has the notch *m*, the latch being adapted to slide on the curved part and to drop into the notch when moved thereto by the lever N. The latch is adapted to receive a padlock *n* to prevent its withdrawal from the notch.

Adjacent to the bar F a trip-lever Q of bell-crank shape is mounted on a pivot 4, secured to the head-block E. A connecting-rod *p* is pivoted to one arm of the lever Q, the other arm of the lever being adapted to engage and force the latch G out of the notch *b*. A pull-rod R is connected to the rod *p* (or may be integral therewith) and is connected to the arm of the lever K, that is connected to the link L by means of a slot *q* in the rod R and a pivot-pin *r*, attached to the arm and extending into the slot. The rod R extends to the switch-lever N and is connected thereto by means of a slot *s* in the bar and a pivot-pin *t*, attached to the lever and extending through the slot. The end of the rod R has a hand-hold *u*, by which the rod may be pulled by hand. It will be understood that in practice the rod R may be connected to the same pivot that connects the rod O to the lever N, or, if desired, the outer end of the rod R may be suitably supported by any other means than the lever N, the latter, however, being a simple means of support for the bar.

It will be understood that in railroad-yards the type of switch-levers known as "ground-throw" levers may be employed in lieu of the upright stand and lever illustrated, and various minor modifications may fairly be made within the scope of the invention—such, for instance, as adapting the apparatus for use in connection with sidings at the opposite side of the track from that shown.

For the automatic operation of the switches the locomotives or motor-cars will be provided with suitable trip devices, somewhat similar to those heretofore employed for automatically adjusting switches, that will be always in the path of the contact-levers J or J′ unless purposely withdrawn from such position by the man in charge of the locomotive or motor-car, many of such trip devices being known and suitable for the purpose and are not shown herein. It will be understood that in order to operate in both directions and with both right-hand and left-hand switches each locomotive or motor-car will have two trip devices, one at either side of the track, and in case the engineer or motorman does not notice that a switch is set for a siding or notices the fact too late to stop the trip device will engage the contact-lever J or J′ and right the switch or throw it properly for the passage of the train on the main track. The apparatus is not designed to change the switch automatically from the main track to the sidings, as will be obvious.

In practical use it may be assumed that a switch is properly adjusted or set for the main track and locked in such position by means of a switch-lock of the common type, as in Fig. 1. Now supposing that a train is to enter the siding, the lever N may be unlocked and the lock *n* removed from the latch P. The latter then being withdrawn from the notch *m*, the lever N may be moved by hand, as usual, pushing the rod O, the switch-point D, the tie-bar F, and the switch-point B until the latter engages the rail A and the switch-point D separates from the rail C, the switch being then set for the siding, as in Fig. 2. During the movements above described the link L will move the lever K, and consequently the rod *j*′ and the lever J′, so that the latter will stand in the path of the trip devices carried by the locomotives. Also the lever H will move the rod *j* and the lever J, the rod I, and latch G together some distance until the switch-point B engages the rail A, and then the spring *d* will force the latch G into the notch *b*, the latch pushing the trip-lever Q out of its way and causing the rod R and the lever K to move somewhat farther, as shown in Fig. 2, the lever J′ being fully thrown out to its proper position, and by reason of the latch G drawing the rod I the lever J will be fully thrown out to its proper position to be engaged by a moving trip device. It will now be seen that the switch is securely latched in open position by means of the tie-bar F and the latch G seated by the spring *d*. If now a train is to pass onto the siding, the trip devices carried by the train must be temporarily moved from their normal positions, so that they may not have contact with the lever J′. In order to reset the switch by hand for the main track, the rod R must first be pulled outwardly, so as to force the latch G from the notch *b*, the slots *q* and *s* permitting such movement with respect to the pivot-pins *r* and *t*. Then the lever N may be operated to shift the switch-points in the usual manner by means of the rod O, the operation of course changing the positions

of the levers J and J′, so they may not be engaged by the moving trip devices.

Assuming that the switch has been carelessly left open, as in Fig. 2, and that a train approaches carrying a trip device positioned, as at the arrow Z, so as to engage the lever J′, the lever will be moved toward the track, closing the switch or setting it for the main track. The first slight movement of the lever J′ will of course move the lever K, which will move the rod R outwardly, the slots *s* and *l*, permitting such movement, causing the lever Q to force the latch G from the notch *b*, the slot *g* permitting the latch to move without resistance by the lever H. After the rod F is thus released the lever K will have carried the pin *k* to the opposite end of the slot *l*, so as to engage the link L and force the switch-point D against the rail C and the point B away from the rail A, the rod O forcing the lever N to move until the latch P drops into the notch *m*, thus temporarily securing the switch against accidental displacement, after which the switch-lock *n* may be applied as usual. In Fig. 1 the several parts appear as they would after the switch had been set by a train moving as indicated by the arrow X; but in case the switch had been set by hand for the main track the pin *k* would be found at the opposite end of the slot *l* and the levers K and J′ would be in slightly different positions without affecting subsequent operations.

Again assuming that the switch has been left as in Fig. 2 and that a train approaches carrying a trip device positioned so as to strike the lever J, as at the arrow Y, and push the lever toward the track-rail A. In the first movement of the lever J the slot *g* will permit the rod I to move without restraint by the pin *f*, causing the latch G to be withdrawn from the notch *b*, after which the further movement of the lever J will move the lever H, and consequently the switch-points B and D, thus closing the switch or setting it for the main track, so that the train may pass without injuring the switch or perhaps being derailed. In this case the lever K would be in a slightly different position, as when the switch has been set by hand, as above mentioned, and also when the lever J is disengaged the spring *d* acting on the latch G causes the rod I to pull against the pin *f*.

Having thus described the invention, what I claim as new is—

1. Railway-switch-adjusting apparatus including a switch-stand, a hand-lever mounted on the switch-stand and operatively connected positively with the switch-points, a latch cooperating to latch the switch in open position independently of the hand-lever and the switch-stand, a pivoted bell-crank lever for shifting the switch and having operative connection with the hand-lever, a pivoted contact-lever coöperating with the bell-crank lever for first releasing the latch and then to shift the switch, and operative connections between the bell-crank lever and the latch.

2. Railway-switch-adjusting apparatus including a switch-stand, a hand-lever mounted on the switch-stand, a rod connected to the hand-lever and also to one of the switch-points, a pivoted bell-crank lever, a link connecting the bell-crank lever to one of the switch-points, a tie-bar connected to both of the switch-points, a latch coöperating with the tie-bar to latch the switch in closed position independently of the hand-lever, an operative connection between the latch and the bell-crank lever, a contact-lever connected operatively with the bell-crank lever, and a latch carried by the hand-lever coöperating automatically with the switch-stand to latch the switch in closed position.

3. Railway-switch-adjusting apparatus including a switch-stand, a hand-lever pivoted to the switch-stand, an automatic latch carried by the hand-lever and adapted to engage the switch-stand when the switch is closed, means for preventing the automatic latch from engaging the switch-stand when the switch is in open position, a rod connecting the hand-lever to one of the switch-points, a pivoted bell-crank lever operatively connected to the switch-points, a tie-bar connected to the switch-points, a latch coöperating with the tie-bar, a trip-lever coöperating with the latch, a connection between the trip-lever and the bell-crank lever, and a contact-lever operatively connected with the bell-crank lever.

4. Railway-switch-adjusting apparatus including a latch coöperating to latch the switch in open position, a trip-lever coöperating with the latch, a switch-lever connected with the switch and free to move therewith, a contact-lever adapted to be operated by a moving trip device, a bell-crank lever connected with the contact-lever and also with the switch to automatically close the same, connections between the contact-lever and the latch to release the latch in advance of the movement of the bell-crank lever and the switch, an automatic latch coöperating with the switch-lever to latch the switch after the closing thereof, and a pull-rod connected with the trip-lever coöperating to release the first-described latch and shift the contact-lever in advance of the hand operation of the switch-lever.

5. Railway-switch-adjusting apparatus including a pair of pivoted bell-crank levers connected with the switch-points and indirectly connected together, a pair of contact-levers each connected with a bell-crank lever, a latch connected with one of the contact-levers and coöperating to latch the switch in open position, a trip-lever coöperating with the latch and operatively connected with the other one of the contact-levers, a switch-lever connected to the switch, a latch operating to automatically latch the switch in closed position, and a pull-rod connected with the trip-

lever coöperating to release the first-described latch and shift the pair of contact-levers in advance of the movement of the switch when closed by hand.

6. In switch-adjusting apparatus, the combination with a switch having a pair of movable points, of a head-block, a bell-crank lever pivoted to the head-block, a tie-bar having a stop device and connected to both of the switch-points, a link operatively connecting the bell-crank lever with one of the switch-points, a pivoted contact-lever operatively connected to the bell-crank lever, a latch pivoted to the head-block and adapted to coöperate with the stop device of the tie-bar, a trip-lever pivoted on the head-block and coöperating with the latch, and a hand-lever connected with one of the switch-points.

7. In switch-adjusting apparatus, the combination with a switch having a pair of movable points, of a head-block, a bell-crank lever pivoted on the head-block, a link connected to the bell-crank lever and also to one of the switch-points, a tie-bar having a stop device and connected to both of the switch-points, a spring-pressed latch coöperating with the stop device of the tie-bar, a pivoted contact-lever, connections between the contact-lever and also the bell-crank lever and the latch, a trip-lever pivoted on the head-block and coöperating with the latch, a pull-rod connected to the trip-lever, and a hand-lever connected to one of the switch-points.

8. In switch-adjusting apparatus, the combination with a switch having a pair of movable points, of a head-block, a pair of bell-crank levers pivoted on the head-block and having operative connection with the switch-points, contact-levers having operative connections with the bell-crank levers separately, a tie-bar connected to the switch-points and having a notch therein, a latch pivoted on the head-block, a spring normally pressing the latch into the notch in the tie-bar, a trip-lever coöperating to force the latch from the notch, operative connections between the trip-lever and one of the bell-crank levers, a link connecting the other one of the bell-crank levers with the latch, a pull-rod connected with the trip-lever, a switch-stand, a hand-lever mounted on the switch-stand and connected with one of the switch-points, and a latch carried by the hand-lever coöperating with the switch-stand.

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

WILLIAM T. HARRIS.

Witnesses:
H. U. GRANT,
SIMPSON SHARP.