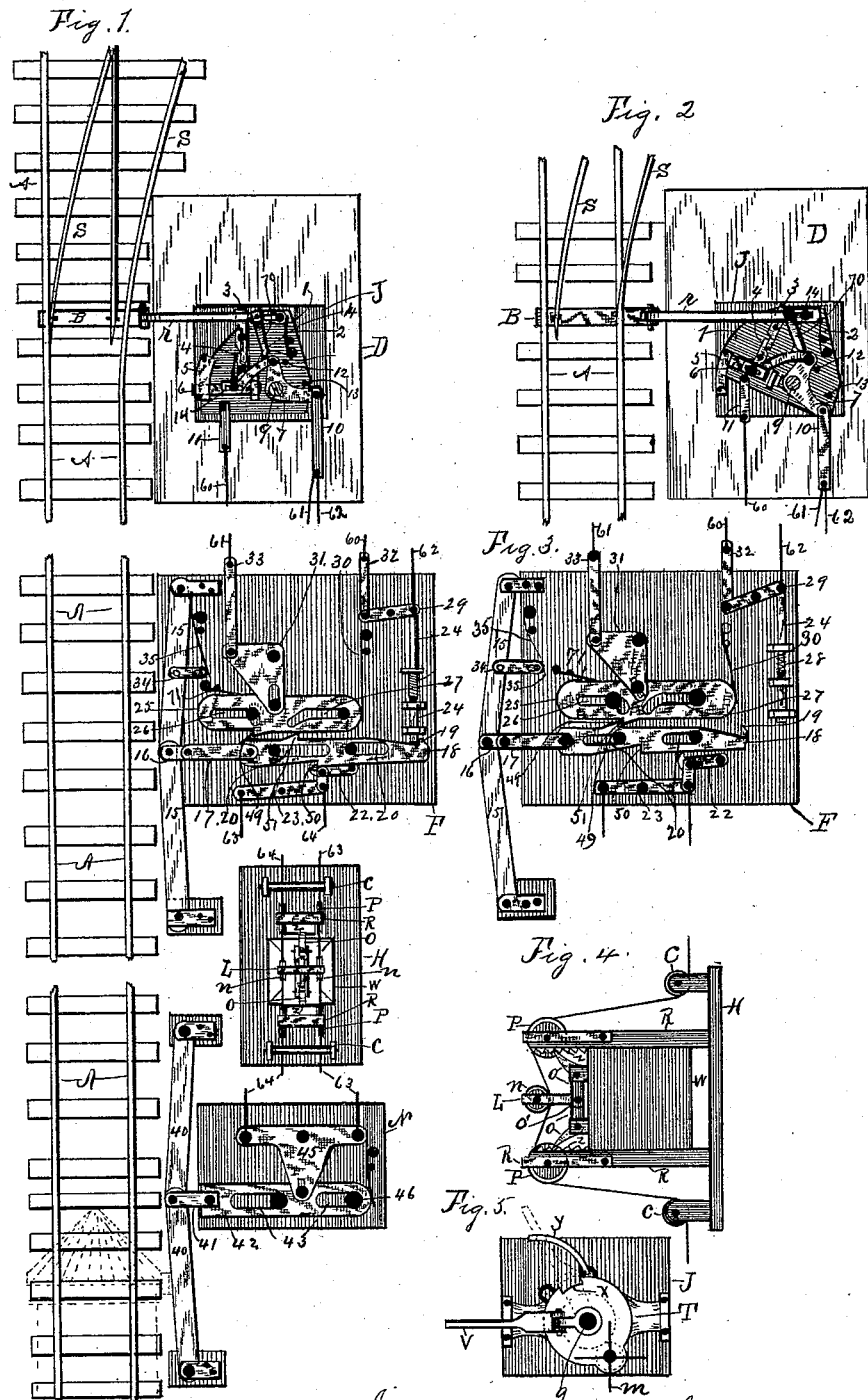


(No Model.)

G. N. EINSELE & G. W. DE GRASSE.
AUTOMATIC RAILROAD SWITCH.

No. 492,790.

Patented Mar. 7, 1893.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE N. EINSELE AND GEORGE W. DE GRASSE, OF CRETE, ILLINOIS.

AUTOMATIC RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 492,790, dated March 7, 1893.

Application filed April 29, 1892. Serial No. 431,100. (No model.)

To all whom it may concern.

Be it known that we, GEORGE N. EINSELE, and GEORGE W. DE GRASSE, citizens of the United States of America, residing at Crete, in the county of Willand State of Illinois, have invented certain new and useful Improvements in Automatic Railroad-Switches, of which the following is a specification, reference being had therein to the accompanying drawings and the letters and figures of reference thereon, forming a part of this specification, in which—

Figure 1 is a plan view of a section of a main rail road track and switch track, and of the switch operating devices arranged along the side of the tracks, sections of the rails being removed so as to contract the length of the tracks and bring the switch operating devices nearer each other to show their operation more clearly. Fig. 2 is a plan view of a section of the main track of a rail road, and of the switch track, and of the base of the switch stand and its operating parts, the top of the switch stand, and its operating lever being removed to more clearly show the parts below them, which are in the reverse position from that shown in Fig. 1 and as they would appear when the switch is closed. Fig. 3. is a plan view of a pair of toggle bars and their slide and bell crank mechanism connected with the switch stand mechanism by means of cables or rods for moving the switch rails by means of the said toggle bars being engaged by a passing train. Fig. 4 is a side view of a weight mechanism for holding taut cables or rods connecting the mechanism shown in Fig. 3 with a bell crank and toggle arm mechanism shown at the bottom of Fig. 1, and Fig. 5 is a top plan view of the switch stand its mechanism connecting it with the switch rails being omitted.

This invention relates to certain improvements in "automatic rail road switches," of the class wherein an approaching locomotive or car moves the switch rails by means of engaging mechanism connected with the switch stand, and located at considerable distance therefrom which improvements are fully set forth and explained in the following specification and claims.

Referring to the drawings A is an ordinary rail road track and S is an ordinary point

rail switch connected by means of the switch bar B, and connecting rod r, with the switch stand mechanism.

The switch stand mechanism is shown at the upper end of Fig. 1, as it would appear when the switch is open and is shown in Fig. 2 as it would appear when the switch is closed, and is constructed as follows:

D represents a floor or platform on which rests and is securely fastened the base plate J of the stand.

9 is the switch stand shaft having its lower end stepped in said base plate its upper end being journaled in the frame T of the stand shown in Fig. 5 and is provided on its upper end with the jointed arm V adapted to fall in the notch X and held and locked therein by means of the hasp Y for locking the switch. 1 is a segmental plate that lies on base plate J and is boxed on the lower end of shaft 9, loosely so it can oscillate to the limit permitted by the pins 12 and 13 secured in its upper face as they alternately are engaged by bell crank 7 secured on shaft 9 immediately above plate 1.

6 is a sliding bolt connected with the inner arm of the bell crank 7 by means of the link 14, by means of which connection said bolt is moved forward to pass through the catch 5 secured to plate J as shown in Fig. 1 when the switch is open to secure it open.

3 and 4 are a pair of levers pivotally connected to plate 1. The outer end of lever 3 passes under connecting rod r in a notch in its under side. Lever 4 has its outer end connected with bolt 6, and its inner end engages the inner end of lever 3, so that when the switch stand mechanism is in the position shown in Fig. 1 said levers move the connecting rod r and the switch rails forward. Said rod r is provided with a slot at its inner end as shown through which a wrist bolt connects it with oscillating plate 1 and said rod has movement on said plate within the limits of said slot, and has behind it a spring 2 for spring pressing it forward. The object of giving said connecting rod such movement within the limits of said slot is to permit the switch to be locked by means of bolt 6 in case some obstruction should prevent the switch rails from moving the full distance required, the said spring and levers however serving to ex-

ert a constant pressure to move the switch rails to their proper place and overcome such obstruction if possible. The plate 1 is oscillated in either direction by means of the bell crank 7 coming in contact with pins 12 and 13 alternately as it moves in either direction to open or close the switch.

The object of Fig. 2 is to show the reverse position of all the parts of the switch stand when the switch is closed.

F is a bed plate designed to be located at a considerable distance from the switch stand along side the track and is designed to support a pair of toggle bars adapted to be engaged and moved laterally by a passing car and also to support the mechanism connecting said toggle bars with the switch stand mechanism. The mechanism referred to and used in connection with said toggle bars consists of the slide 18 attached to bed plate F, by means of stud bolts passing through its two slots 20 and is connected with toggle bars 15 by means of the link 17, and by means of which link and toggle arms said slide is reciprocated within the limits of said slots. Said toggle bars are spring pressed forward toward the track by means of the spring 35 connected thereto by means of the arm 34. Said slide 18 is provided on one side with a hook 50 for being engaged by a hook 22 to secure said slide in its rearward position, and is provided on its opposite side in advance of hook 50 with a hook 51 for engaging with a similar hook 49 on the side of the parallel slide 25 for moving slide 25 rearward within the limits of its slots 26 and 27. Said slide 18 is also provided at its rear end with the side hook 19 for engagement with the spring bolt 24 for the purpose of securing said slide in the position shown in Fig. 1 when the switch is closed. Said switch is always opened by means of an operator turning the shaft 9, with bell crank 7 of the switch stand by means of arm V shown in Fig. 5, and as said spring bolt 24 is connected with said bell crank 7 by means of the cable 62, said bolt at such time is withdrawn from contact with hook 19 of slide 18 and so remains until a passing train engages the toggle bars as set forth and operates the switch stand mechanism to close the switch, return bell crank 7, and slacken cable 62 and permit said sliding bolt 24 to move forward to be engaged by hook 19 of slide 18 as said slide moves backward to the position shown in Fig. 1 for the purpose of securing said slide in case hook 22 should by accident become disengaged from said slide and permit the toggle bars connected to slide 18 to move out at the wrong time. Said sliding bolt 24 will so remain in contact with slide 18 until the switch rails are again opened as before stated, when said bolt 24 will again be withdrawn from contact with slide 18 so it will be free to be operated by a passing train as set forth.

The form of slot 26 in slide 25 permits its

hook 49 to be engaged with hook 51 of slide 18 when said slide moves forward to the position shown in Fig. 3. Said slide 25 is spring pressed forward by means of the spring 30, and is connected to the bell crank 31, which is pivotally connected to bed plate F. Said bell crank is connected with bell crank 7 of the switch stand through the medium of the cable 61 and links 10 and 33 so that when slide 25 moves rearward, it will through the medium of said bell crank and cable operate the switch mechanism. A lever 29 is pivotally attached at about its center to the bed plate F and has one end pivotally connected to the outer end of said spring bolt 24, while its opposite end is connected to the oscillating plate 1 of the switch stand through the medium of the cable 60 and links 11 and 32, which is for the purpose of taking up the slack in cables 61 and 62.

23 is a lever pivotally connected at about its center to the bed plate F, and is connected at one end with the hook 22, which engages with hook 50 of slide 18. Said lever 23 is connected by means of the cables 63 and 64 with the double bell crank 45 pivotally attached to a bed plate N, located at a considerable distance from bed plate F along the track. Said double bell crank 45 is pivotally attached to a slide 42 connected by means of a link 41 with a pair of toggle arms 40 for reciprocating said slide 42 within the limits of its slots 43, through which stud bolts 46 pass to attach said slide to said bed plate. Said cables 63 and 64 are to be crossed between said double bell crank and lever 23, and between their ends said cables are weighted to keep them taut and insure prompt action. These cables are shown as passing under rollers C over sheaves P and under sheave *n* from the frame L of which is suspended the weight W through the medium of the pawls O which engage racks in the posts R, at each side of said weight to prevent the weight from being bounded upward when the cables are suddenly operated upon by a passing train. These pawls are angular in form and pivoted at their angles to studs on the upper side of said weight, and are pivotally connected as shown to the frame L of sheave *n* so that the weight W will hold them engaged with their ratchets Z as shown. In the drawings one weight serves to weight the two cables, but if for any reason it is desirable, a separate weight may be used to keep taut each separate cable.

The toggle bars 15 and 40 are respectively pivoted at their outer ends to suitable foundations so that when engaged by a passing car they will not be moved out of place and are intended to be arranged at the side of the main track and near enough to it so that they may be engaged by suitable mechanism on a locomotive or car. In Fig. 1 a portion of a locomotive is shown having a sliding bar arranged on the side of the cow catcher frame adapted to be reciprocated up or down by

means of rod and leverage mechanism extending into the cab and not necessary to be shown.

In operation when the train is approaching the switch from the direction shown in Fig. 1 if the switch should be open which will be indicated by an ordinary semaphore *m* on the switch stand, the sliding bar or other mechanism on the engine is intended to be set in the proper position to engage the side of toggle arms 40 next the track and move their jointed ends laterally from the track for the purpose of operating the slide 42 and the double bell crank 45 pivoted thereto and release hook 22 from slide 18 so as to permit it to move forward to the position shown in Fig. 3 and so its hook 51 will engage hook 49 of slide 25 which is permitted by the form of slot 26 in said slide. The spring 71 bearing against the back of slide 25 permitting a yielding lateral movement of said slide so said hooks may engage each other as shown in Fig. 3. As before stated the bolt 24 is free from slide 18 at the time the switch is open so as to permit such forward movement of slide 18. When the engine moves nearer to the switch it in a similar manner engages the toggle bars 15 slide 18 and also slide 25 which are moved rearward until the form of slot 27 of slide 25 causes the two engaging hooks 49 and 51 to be disengaged, when the spring 30 will return slide 25 to its first position and slide 18 will also have been returned to its first position and held by hook 22 and bolt 24 as shown in Fig. 1 as at such time said bolt can engage said slide hook 19 as the switch has been closed by means of its connection with the bell crank 31 attached to slide 25 through the medium of cable 61 connecting said bell crank with bell crank 7 of the switch mechanism so that in case the switch should be open a train approaching on the main track will automatically close the switch so that the train may pass in safety on the main track. This device may be duplicated so that one may be arranged at each side of the switch to operate it from either direction if desired.

The working parts described are all intended to be covered to protect them from the weather and insure their proper action.

The toggle bars are intended to be quite long so that their lateral movement will not be sudden to break the devices to which they attach.

The shaft 9 of the switch stand is provided with a pinion near its upper end which meshes with a pinion on the shaft of the semaphore *m* for turning the semaphore when the switch stand is operated which pinions are shown in broken lines in Fig. 5. In case the engine was coming from the opposite direction on the main track when the switch is open as shown in Fig. 1 the flanges of the wheels will move the switch to the position

shown in Fig. 2. In such case the slot in the rod *r* will permit it to move backward to the end of said slot before it moves plate 1. and by such movement draws bolt 6 by means of the levers 3 and 4, and after said bolt is drawn arm 70 on rod *r* will engage bell crank as shown in Fig. 2 and move it to the position shown in said figure and hold it in such position till the switch is set back to the position shown in Fig. 1.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is as follows, to wit:

1. In an automatic rail road switch the combination with the main and switch rails, the connecting bar B, connecting rod *r*, spring 2 oscillating plate 1, shaft 9, bell crank 7, sliding bolt 6, link 14 levers 3 and 4, stops 12 and 13, switch stand T, having the notch X, and lock hasp Y, semaphore *m*, and jointed lever V, substantially as and for the purpose set forth.

2. In an automatic rail road switch the combination with the main and switch rails, the connecting bar B, connecting rod *r*, spring 2, oscillating plate 1, shaft 9, semaphore *m*, bell crank 7, sliding bolt 6, link 14, levers 3 and 4, stops 12 and 13, switch stand T, jointed lever V, toggle bars 15, link 17, slide 18, having the hooks 19, 50, and 51, and slots 20, slide 25, having slots 26 and 27, and hook 49, bell crank 31, springs 30 35 and 71, lever 29, spring bolt 24 links 10, 11, 32 and 33, and cables, 60 61, and 62 all arranged to operate substantially as and for the purpose set forth.

3. In an automatic rail road switch, the combination with the main and switch tracks, the connecting bar B, connecting rod *r*, spring, 2, oscillating plate 1, shaft 9, having the jointed lever V, semaphore *m*, bell crank 7, sliding bolt 6, link 14, levers 3 and 4, stops 12 and 13, switch stand T toggle bars 15, link 17, slide 18, having hooks 19, 50, and 51, and slots 20, slide 25, having slots 26 and 27, and hook 49 bell crank 31, springs 30, 35 and 71, lever 29 spring bolt 24, links 10, 11, 32 and 33, cables 60, 61, and 62. toggle bars 40, link, 41, slide 42 having slots 43, double bell crank 45, weighted cables 63, and 64 lever 23 and hook 22 all arranged to operate substantially as and for the purpose set forth.

4. In an automatic rail road switch the combination of the toggle bars 15, slide 18 having the hooks 19, 50, and 51, slide 25 having hook 49, links 17 and 34, hook 22, springs 30, 35, and 71, bell crank 31, and spring bolt 24, all arranged to operate substantially as and for the purpose set forth.

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