

A. M. THREEWITS.
RAILROAD SWITCH AND FROG.
APPLICATION FILED JUNE 25, 1909.

967,268.

Patented Aug. 16, 1910.

3 SHEETS—SHEET 1.

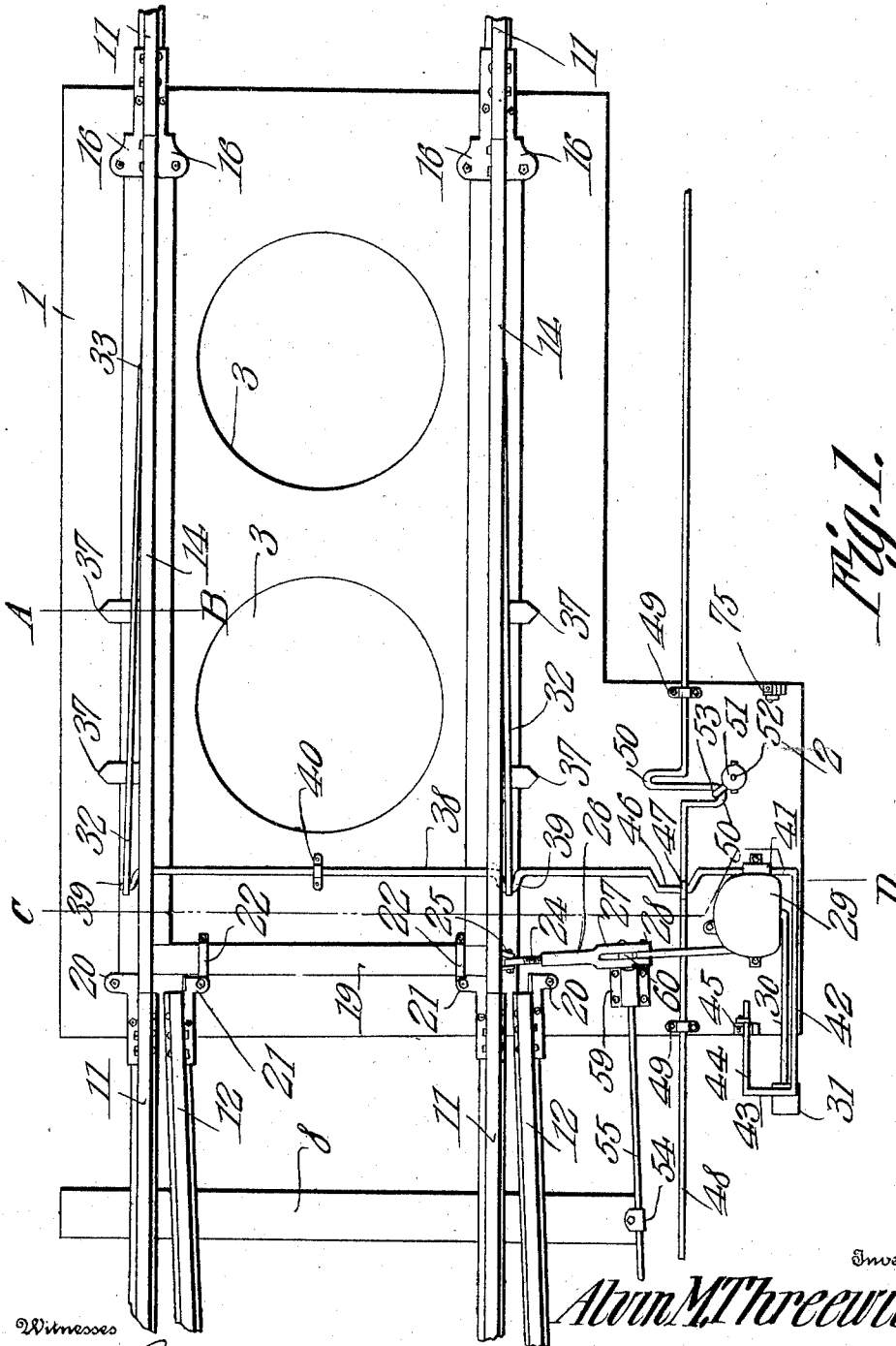


Fig. 1.

Witnesses

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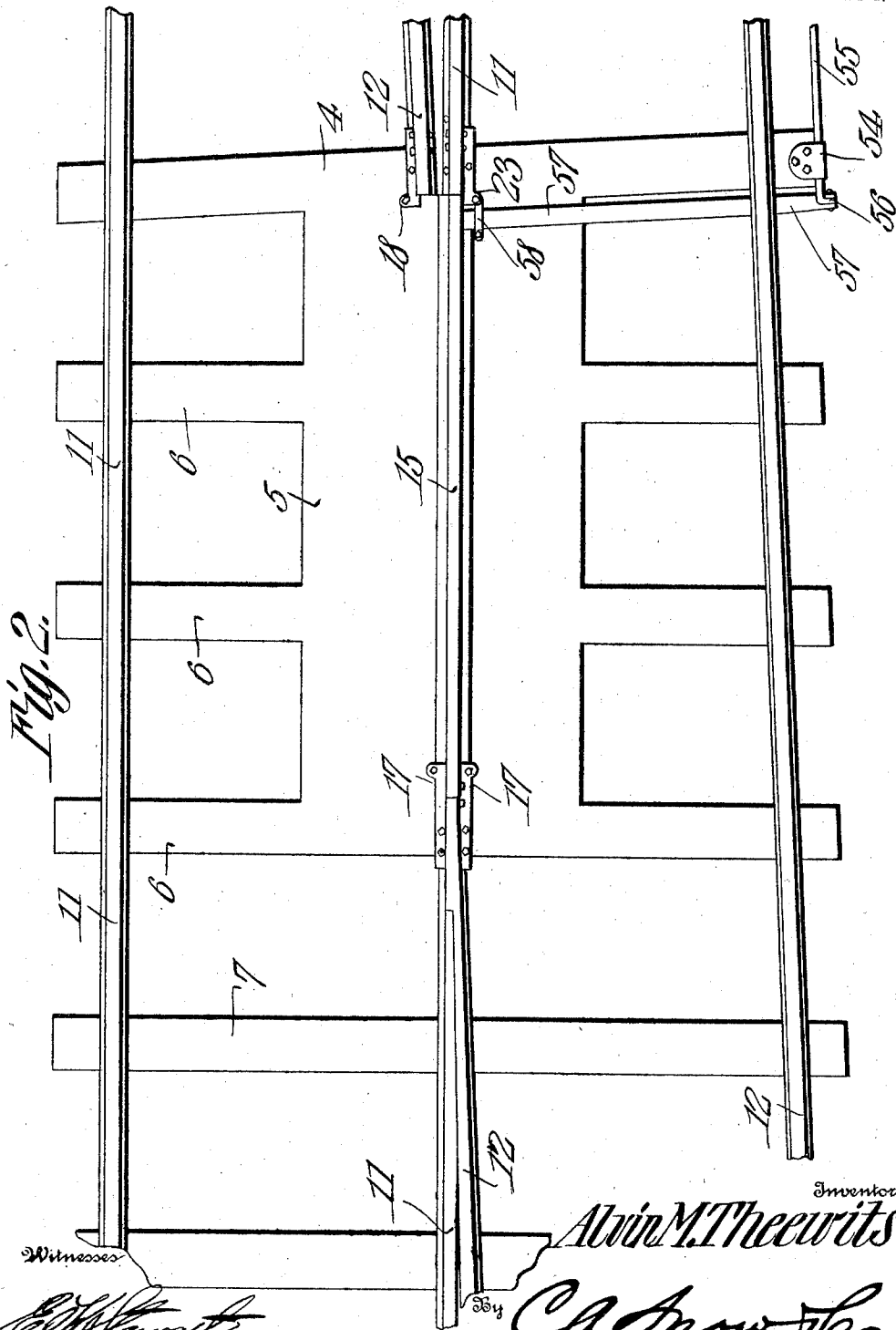


Fig. 2.

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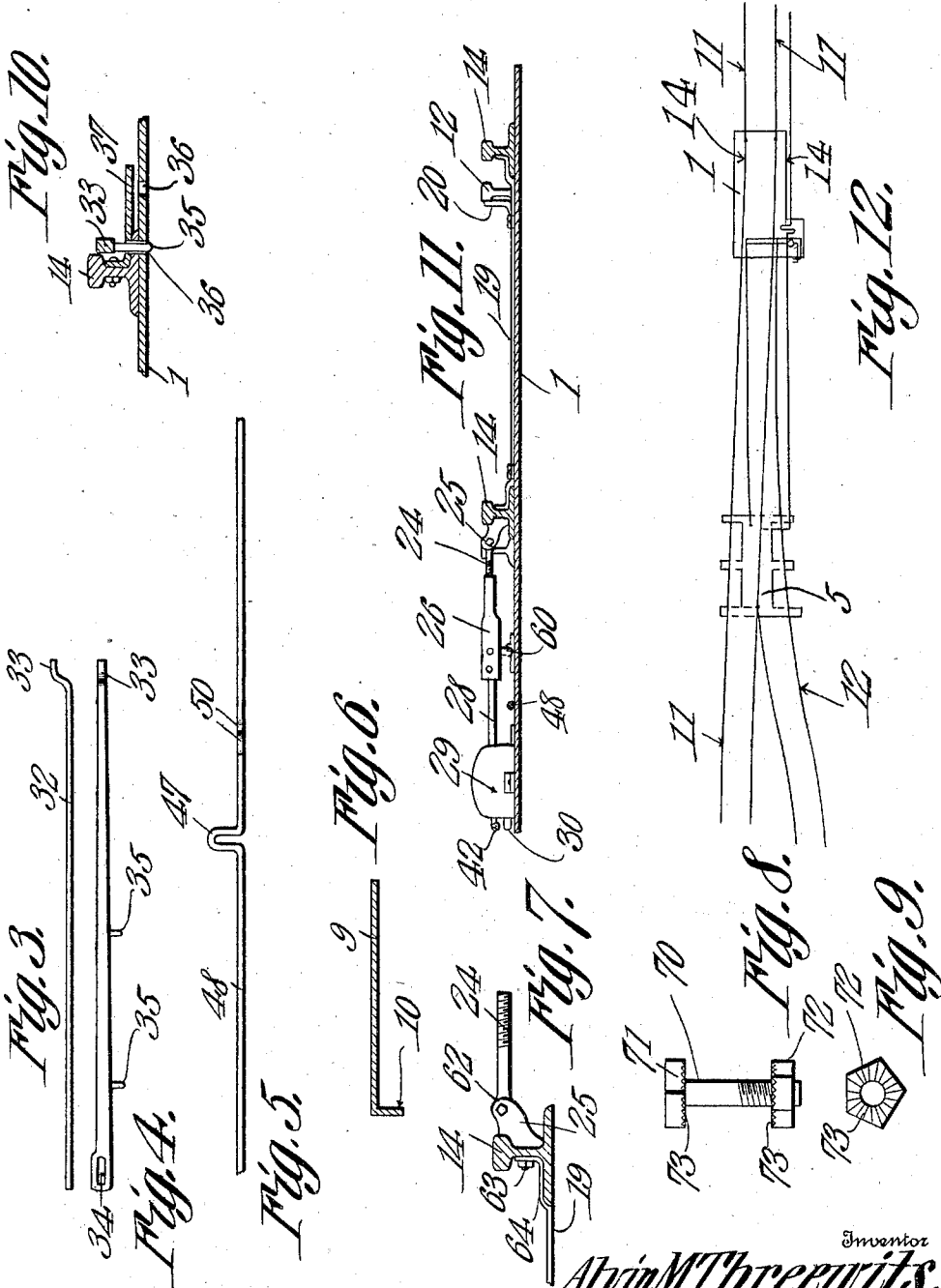
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3 SHEETS—SHEET 3.



Witnesses
[Signature]
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UNITED STATES PATENT OFFICE.

ALVIN M. THREEWITS, OF CENTERVILLE, INDIANA.

RAILROAD SWITCH AND FROG.

967,268.

Specification of Letters Patent.

Patented Aug. 16, 1910.

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To all whom it may concern:

Be it known that I, ALVIN M. THREEWITS, a citizen of the United States, residing at Centerville, in the county of Wayne and State of Indiana, have invented a new and useful Railroad Switch and Frog, of which the following is a specification.

The objects of the invention are, generally, the provision in a merchantable form, of a device of the class above mentioned, which shall be inexpensive to manufacture, facile in operation, and devoid of complicated parts; specifically, the provision of movable switch rails and frog rails of novel and improved construction; of novel means for locking the switch rails and the frog rails; of novel means for operating the switch rails and the frog rails; the perfection of the switchstand and signal connections; the provision of improved means for supporting the device upon a right of way; the provision of novel means for uniting and assembling the component parts of the device; other and further objects being made manifest hereinafter as the description of the invention progresses.

The invention consists in the novel construction and arrangement of parts herein-after described, delineated in the accompanying drawings, and particularly pointed out in that portion of this instrument wherein patentable novelty is claimed for certain distinctive and peculiar features of the device, it being understood, that, within the scope of what hereinafter thus is claimed, divers changes in the form, proportions, size, and minor details of the structure may be made, without departing from the spirit or sacrificing any of the advantages of the invention.

Similar numerals of reference are employed to denote corresponding parts throughout the several figures of the drawings.

In the accompanying drawings, Figure 1 is a top plan showing that part of the device which is adjacent the switch point, the movable switch rails and the manually-operated means whereby the device is actuated, being shown, the movable switch rails being set for the main line; Fig. 2 is a top plan of that portion of the device which is adjacent the frog rail, the immediate means whereby the frog rail is actuated, being there shown; Fig. 3 is a top plan of one of

the latch bars; Fig. 4 is a side elevation of one of the latch bars; Fig. 5 is a side elevation showing a portion of the switch signal rod; Fig. 6 is a vertical transverse section showing the ties and the arms of the frog plate; Fig. 7 is a side elevation of the ultimate means whereby the operating mechanism is assembled with the movable switch rails, the switch rail proper, being shown in vertical transverse section; Fig. 8 is a side elevation of one of the bolts whereby the component parts of the device are assembled; Fig. 9 is a bottom plan of the nut which is shown assembled with the bolt in Fig. 8; Fig. 10 is a fragmental transverse section upon the line A—B of Fig. 1, adapted to show the coöperation between the latch-bar and the supporting element; Fig. 11 is a transverse section of the device, upon the line C—D of Fig. 1, the cutting plane being passed between the members 19 and 38 of Fig. 1; and Fig. 12 is a top plan of the device upon a reduced scale, showing the gradual divergence of the lateral curvature in the siding which the use of my device makes possible.

The sub-structure upon which the improved switch and frog of my invention are adapted to rest, comprises the switch bedplate 1, the frog bedplate 4, and the ties 7 and 8 which are disposed between the switch bedplate and the frog bedplate. In the present instance, the switch bedplate 1 is given an approximately rectangular contour, the same being provided, however, adjacent one end, with a laterally protruding extension 2. If desired, the switch bedplate 1 may be, for lightness, centrally cut away as denoted by the numeral 3.

The frog bedplate 4 comprises a central, body portion 5 extending longitudinally of the track, and provided upon either side, with laterally extending arms 6, corresponding to the long ties which are commonly disposed beneath the frog.

Fig. 6 is a transverse sectional detail equally applicable to the arms 6 of the frog bedplate 4, and to the ties 7 and 8, and it will there be seen, that these elements, which preferably are fashioned from steel plates, comprise a top portion 9, one edge of which is downbent to form a flange 10.

The plates from which the switch bedplate 1, the frog bedplate 4, and the ties, are fashioned, are relatively thin, the ob-

ject being, that these elements shall have a slight resiliency so that they may yield to a minor degree, under the weight of the passing trains. By giving to the frog plate, the switch plate, and the ties, a slight resiliency, the quick, percussive rebound incident to the use of heavy metal ties, is obviated, an improvement which materially lengthens the life of the rolling stock, and at the same time, preserves the condition of the road-bed. The elements whereon the rails and the operating mechanism are superposed, are adapted to be tamped, in the usual manner, the flange 10 with which these elements are provided, serving to retain the ballast beneath them.

In the accompanying drawings, the main line rail has been denoted by the numeral 11, the numeral 12 indicating the siding rails, the numeral 14 the movable switch rails, and the numeral 15 the movable frog rail. As clearly shown in the drawings, the movable switch rails 14 are made relatively broad and heavy in the flange, and the web is thickened accordingly, the ball, of necessity, being retained of a standard size. By thus increasing the dimensions of certain parts of the movable switch rails, the strength of these members, of necessity subjected to severe strain and to much wear and tear, may be greatly increased, and, since these members are made stronger, they may be unusually long, thereby giving the siding a gradual divergence from the main line.

Referring to Fig. 1, it will be seen that the movable switch rails 14 are pivotally assembled with the main line rails 11 by means of hinge-plates 16, which are assembled with the aforesaid rails in any suitable manner. Other hinge-plates 17, similar to the hinge-plates 16 employed at the switch, unite, pivotally, the frog rail 15 with the point of the frog, as shown in Fig. 2. Stop-plates 18 and 23 are assembled with those portions of the main line rail 11 and the siding rail 12, which are adjacent the movable end of the frog rail 15, the functions of these elements 18 and 23 being to limit the lateral, pivotal movement of the frog rail 15 to positions in alinement with the main line rail 11, and the siding rail 12.

Referring to Fig. 1, it will be seen that stop-plates 20 and 21 are provided adapted to limit the lateral movement of the movable switch rails 14, these stop-plates 20 and 21 being similar in construction to the stop-plates 18 and 23 employed, as hereinbefore pointed out, in connection with the frog rail 15, all of said stop-plates, being rigidly assembled with the foundation elements beneath them, by means of bolts. The movable ends of the switch rails 14 are united by a coupling bar 19, as shown in Figs. 1

with the switch bed plate by means of transverse straps 22, each of which, at one end, is mounted upon the bolt whereby the stop-plate 21 is assembled with the switch bed plate 1.

The bolts which assemble the rail sections 11 and 12 with the bed plates pass through the hinge plates 16 and 17 and through the stop plates 20, 21, 18 and 23, through the flange of the rail and into the bed plates, engaging threaded apertures arranged for their reception in the bed plates. I prefer that, as shown, there be two bolts in each of the members 16, 20, 21, 18 and 23, including the bolt which is carried by the laterally protruding extension of those members the element 17 being provided with three of the attaching bolts, including the one which is carried by extension of the member 17.

As shown in Figs. 1 and 7, the coupling bar 19 which unites the switch rails 14 at their movable ends, is upbent to form a head 64, extending along the upper face of the flange of the rail, and along the web thereof. Upon the opposite side of the switch rail, is mounted a bracket 25, having an integral threaded stud, which, extending through the web of the rail, and through the head 64 of the coupling bar 19, serves to assemble the bracket 25, the switch rail 14, and the head 64 of the coupling bar 19, said stud being indicated in Fig. 7, by the numeral 63. This bracket 25 is vertically slotted, to form arms, in which is transversely mounted a bolt 62, upon which is pivotally mounted one end of a rod 24, the opposite end of which is threaded to engage a sleeve 26, slotted at its other end to form arms 27, between which is pivoted one extremity of a rod 28, the other end of which is disposed within the switch-stand 29. This switch stand 29 is rigidly bolted to the extension 2 of the switch bed plate 1, and is provided with a lever 30, the lower end of which is journaled for rotation in the switch-stand 29, the upper end thereof being free to move in a vertical arc, in a plane substantially parallel to the plane of the main line rails 11 of the track. The lever 30 is provided at its movable end, with the usual head 31, and the switch-stand 29 contains suitable mechanism, assembling the lower end of the lever 30 with the rod 28, whereby, when the lever 30 is moved in a vertical arc, the rod 28 will be reciprocated in a direction substantially at right angles to the line of the track. This reciprocatory movement of the element 28, being communicated to the switch rails 14 through the sleeve 26, the rod 24, and the bracket 25, will cause the said switch rails 14 to move from the position shown in Fig. 1, in alinement with the main line rails 11, to a position in alinement with the siding rails 12, when the lever 30 is thrown over, past the vertical,

into a position oppositely disposed from that which it occupies in Fig. 1. The sleeve 26 which is threaded to engage the element 24, serves as a means whereby the positions of the switch rails 14 may be adjusted, whereby a perfect alinement between the rails 14, and the rails 11 and 12 may be obtained.

Having thus described the means whereby the switch rails 14 are operated, I will proceed to describe the mechanism whereby the said switch rails are locked in successive positions, and to point out the coöperation between these locking means, and the means whereby the switch rails 14 are operated.

In Fig. 1, I have shown latch-bars 32, and, since these latch-bars are shown in detail in Figs. 3 and 4, the several figures last above-mentioned may profitably be scanned together, in connection with the following description: The latch-bars 32, are located upon the outside of the switch rails 14, and are provided at one end with bent arms 33, which are adapted to be inserted in suitable apertures in the webs of the switch rails 14, relatively near to the point of pivotal union between the said switch rails 14 and the main line rails 11. These arms 33 so unite the latch-bars 32 with the switch rails 14, that the said latch-bars may be moved vertically, pivoting upon the arms 33. From the lower face of the latch-bar 32, project studs 35, of which there may be two. These studs 35 extend downward through apertures in the flange of the switch rail 14, into engagement with apertures 36 in the bed plate 1. For each one of these studs 35 there are provided two of the apertures 36, alined transversely of the track, and so spaced apart, that, when the stud is in one of them, the switch rail will be locked in alinement with the main line rail 11, and when the said stud is in the other of them, the switch rail 14 will be locked in alinement with the siding rail 12. In order that these apertures 36 may not become clogged by refuse, and in order that they may not be maliciously plugged up, cover-plates 37 are provided, which, projecting laterally from the flange of the switch-rail 14, at all times cover the said apertures 36, it being understood, of course, that these cover-plates 37, like the bed plate 1 and the flange of the switch rail 14, are apertured for the passage of the studs 35.

Passing now to the means whereby the latch-bars 32 are lifted at one end, to withdraw the studs 35 from the apertures 36, it will be seen, that the latch-bar 32 is provided at one end with an enlarged head, carrying a longitudinally disposed slot 34. A locking rod 38 is journaled for rotation in the webs of the switch rails 14, the same being provided, upon the exterior of the switch rails 14, with cranks 39 adapted to engage the slots 34 in the latch-bars 32.

Suitable boxings 40 and 41 assemble the locking rod 38 in sliding relation with the switch bed plate 1, the former of said boxings being located between the switch rails 14, the latter being located adjacent the switch-stand 29. The locking rod 38, extending beyond the boxing 41 is bent at right angles to form a lever 42. This lever 42 is bent substantially parallel to the locking rod 38 as denoted by the numeral 43, and this portion 43 of the lever is adapted to reciprocate in a direction at right angles to the line of the track, and to rest upon the head 31 of the switch lever 30. Beyond the portion 43, the lever is terminally bent as denoted by the numeral 44, into substantial parallelism with the body 42 of the said lever. The extremity of this portion 44 extends upon the portion 2 of the switch bed plate 1, and catches 45, 75 having double walls to prevent the lateral movement of the lever and of any approved, and ordinary type, are rigidly assembled with the extension 2 of the bed plate, for its reception. As will be seen by reference to Fig. 1, there are two of these latches oppositely disposed upon the extension 2 of the bed plate.

Passing now to the means whereby the switch signal, and the block, or other remote signals, are operated, it will be seen, that, intermediate the boxing 41 and the crank 39, the locking rod 38 is bent to form a crank 46, adapted, when the locking rod 38 is rocked, to engage an upstanding loop 47, which is bent into the switch signal rod 48. This switch signal rod 48 is mounted for sliding movement in a direction parallel with the track, in bearings 49 which are assembled with the extension 2 of the switch bedplate 1 adjacent the edges thereof. With the remote end of the switch signal rod 48, may be assembled, block signals, or other devices, designed to be operated when the switch is thrown. Intermediate the crank 46 and the edge of the extension 2 of the bed plate, the switch signal rod 48 is bent upon itself to form oppositely extending arms 50. These arms 50 lie flat upon the extension 2 of the bedplate, and one of their functions is to maintain the switch signal rod against rotation, such rotation promoting an improper mechanical relation between the crank 46 of the locking rod 38, and the loop 47 of the switch signal rod with which it coöperates.

The switch signal stand is rigidly assembled with the extension 2 of the bedplate, after the manner set out in connection with the switch-stand 29. The signal stand 51 carries an upright shaft 52 the lower extremity of which is journaled for rotation in the extension 2 of the bedplate. This shaft 52 is provided at its upper extremity with the usual signal lights and boards, and, adjacent its lower extremity, is provided

with a radially extending arm 53 which engages one of the arms 50 of the switch signal rod 48.

The ties 8 which are located between the switch bedplate 1 and the frog bedplate 4, are terminally provided with bearings 54 in which is journaled for rotation, the frog-actuating rod 55. The frog-actuating rod is provided at its frog end, with a lever 56, the extremity of which is pivotally assembled with one end of the coupling rod 57, the other end of which, passing beneath the strap 58, is pivotally assembled with the frog rail 15. The strap 58 is securely bolted to the frog bedplate 4, one end thereof being mounted upon the bolt whereby the stop-plate 23 is assembled with the frog plate 4. The frog-actuating rod 55, extending in parallel relation to the siding rails 12, terminates upon the extension 2 of the switch bedplate, a bearing 59 rigidly assembled with the extension 2, being arranged to carry rotatably, the end of the frog-actuating rod 55. The member 55 is terminally provided with an upstanding arm 60, which, being assembled pivotally between the arms 27 of the sleeve 26, forms the ultimate connecting member between the means whereby the frog rail 15 is operated, and the means whereby the switch rails 14 are moved from a position in alinement with the main line rails, to a position in alinement with the siding rails.

In Figs. 8 and 9, I have shown a means peculiarly adapted for assembling devices of this class, comprising a bolt 70, provided with a pentagonal head 71, and with a pentagonal nut 72. The adjacent faces of the nut and bolt head are radially serrated as denoted by the numeral 73, so that they may securely grip and firmly hold the elements which are disposed between them. By making the head of the bolt and the nut, pentagonal in outline, a special wrench will be required to loosen any of the bolts, since the head of the bolt and nut, have no two of their lateral faces parallel, whereby they might readily be grasped by an ordinary wrench or spanner. When the device of my invention is assembled by means of the bolt shown in Figs. 8 and 9, it will be extremely difficult for evil-minded persons to tamper with, and disassociate, the parts, except they be provided with special tools for the purpose. This pentagonally headed retaining element I employ universally throughout the device, whether to assemble the rails with the bed plates, or to assemble the operating parts with each other.

I regard as of importance the enlarged cross section which I give to the movable switch rails 14. By increasing the cross sectional areas of these members, not only can they be made longer and stronger to give a gradual turn to the siding, but, as well,

since the flanges are relatively broad, the switch rails are not likely to be overturned by the lateral pressure of the wheels of the rolling stock as the train takes the siding.

Supposing that, as shown in Figs. 1 and 2, the switch rails 14 are set for the main track 11, the operation of the device is as follows: The catch 45 being opened, the lever 42 is swung to an upright position. By this operation, the locking rod 38 is rotated in the bearings which support it, the cranks 39 causing the free ends of the latch-bars 32 to rise, withdrawing the studs 35 from the apertures 36 provided for their reception in the bedplate 1. This operation unlocks the movable switch rails 14. The switch lever 30 is then moved through an arc of 180°, adjacent the catch 75 which is disposed upon the opposite side of the extension 2 of the switch bed plate, from the latch 45 with which the lever 42 is shown assembled in the drawings. As the switch lever 30 is thus moved through an arc of 180°, the head 31 of the switch lever will pass through the loop formed by the portions 43 and 44 of the lever 42, and drop upon the extension of the switch bed plate. The lever 42 is then thrown from its upright position, to a position in contact with the head 31 of the switch lever, being there engaged by the catch 75 which is adjacent the edge of the plate upon which the levers rest. As the lever 42, dropping to the bedplate, completes its arc, the arm 50 of the switch signal rod 48 will change the signals in the signal stand 51, the said rod 48 being slid in the direction of its length, through the coöperation of the crank 46 of the locking rod 38 and the loop 47 of the switch signal rod 48. When the switch lever 30 has been moved as hereinbefore described, the movable switch rails 14 will be drawn from a position in alinement with the main line rails 11 to a position in alinement with the siding rails 12, the final movement of the lever 42 from an upright to a horizontal position, causing the studs 35 to engage the apertures in the bedplate, securely locking the switch rails 14 in alinement with the siding rails 12. As the elements 26 and 28 move transversely of the track to shift the switch rails from the main line to the siding, the frog-actuating rod 55 will be rotated in its bearings and this rotation will cause the crank 56 to move the member 57 transversely of the track, shifting the free end of the frog-rail 15, from the position shown in Fig. 2, to a position in alinement with the siding rails 12. The stop-plates 18 and 23 will limit the movement of the free end of the frog rail 15, and the length of the crank 56 is such, that, when the frog rail 15 is thrown, it will be held securely against the stop 18 or the stop 23 as may be. The cranks 39 of the locking arm 38 serve not only to actuate the latch-

bars 32, but, to aid in maintaining a correct gage between the switch rails 14 at their movable ends. Since the crank 46 which, through the loop 47 actuates the switch signal rod 48, must slide transversely of the track, in the loop 47, the said element 46 is made relatively long, so that there may be sufficient play at the point of coöperation between the elements 46 and 47.

It will be seen that the loop formed by the portions 43 and 44 of the lever 42, is adapted to engage the portion 31 of the lever 30 when the parts are disposed as shown in Fig. 1 of the drawings, whereby the said lever 30 will be locked in position upon the switch bed-plate 1. After the lever 42 has been tilted into an upright position, to withdraw the studs 35 from the elements beneath them, whereby the latch-bars 32 no longer lock the switch-rails 14, a movement of the lever 30 from a position adjacent the catch 45 to a position adjacent the catch 75, will cause the locking rod 38 to move transversely of the track, whereby the position of the lever 42, then in an upstanding position, will be so altered that the head 31 of the lever 30 may readily pass between the portions 42 and 44 of the lever whereby the locking mechanism for the movable switch rails 14 is actuated.

Having thus described my invention what I claim as new and desire to protect by Letters Patent is:

1. A device of the class described comprising a movable frog rail and movable switch rails; means for actuating simultaneously the switch rails and the frog rail; and means for positively locking the switch rails, the said locking means being arranged to lock the switch and frog rail actuating means.

2. A device of the class described comprising a movable frog rail and a movable switch rail; means for actuating simultaneously the switch rail and the frog rail; a latch-bar pivoted to the switch rail and arranged to lock the same; and means for actuating the latch-bar, the latch-bar actuating means being arranged to lock the switch and frog rail actuating means.

3. In a device of the class described, a movable switch rail; means for operating the switch rail; means for locking the switch rail, the locking means being arranged to lock the operating means and being disposed in the path of the operating means when the locking means is disposed in unlocked position; the operating means being arranged to move the locking means from the path of the operating means.

4. A device of the class described comprising a movable switch rail; means for operating the switch rail; means for locking the switch rail; a lever for actuating the switch operating means, and a lever for actuating the switch locking means, the latter lever be-

ing arranged to engage the former to lock the same; the locking lever being disposed in the path of the operating lever when the former is in unlocked position, and the operating lever being arranged to move the locking lever from the path of the operating lever.

5. A device of the class described comprising a movable switch rail; means for operating the switch rail; means for locking the switch rail; a lever for actuating the switch operating means, and a lever for actuating the switch locking means, the latter lever being bent terminally, to form a loop to engage the former lever to lock the same, the loop of the locking lever being disposed in the path of the operating lever when the former is in unlocked position, and the operating lever being arranged to move the locking lever to permit the passage of the operating lever through the loop of the locking lever.

6. A device of the class described comprising a movable switch rail; a latch-bar disposed longitudinally of the rail and pivotally assembled at one end therewith, the said latch-bar being arranged to lock the rail; a locking rod journaled for rotation in the rail and arranged to operate the latch-bar, the operating rod being terminally bent to form a lever; an operating lever and means assembled therewith for moving the switch rail, the lever of the locking rod being arranged to engage the operating lever to lock the same, the lever of the locking rod being disposed in the path of the operating lever when the former is in unlocked position, and the operating lever being arranged to move the lever of the locking rod from the path of the operating lever.

7. A device of the class described comprising a movable switch rail; a latch-bar disposed longitudinally of the rail and pivoted at one end thereto, the latch-bar being arranged to lock the rail; a locking rod journaled for rotation in the rail and arranged to operate the latch-bar, the locking bar being terminally bent to form a locking lever, and the extremity of the locking lever being bent to form a loop; an operating lever and means assembled therewith for moving the switch rail, the loop of the locking lever being arranged to engage the operating lever to hold the same in fixed position, the loop of the locking lever being disposed in the path of the operating lever when the former is disposed in unlocked position, and the operating lever being arranged to move the loop of the locking lever to permit the passage of the operating lever therethrough.

8. In a device of the class described, a supporting element; a movable switch rail assembled with the supporting element and locking mechanism for the switch rail consisting of a latch-bar disposed longitudinally

of said rail and pivotally assembled at one end therewith for movement in a vertical plane, the latch-bar being provided with means arranged to engage the rail and the supporting element.

9. In a device of the class described, a supporting element; a movable switch rail assembled with the supporting element; and locking means for the switch rail comprising a latch-bar disposed longitudinally of the switch rail and pivotally assembled at one end therewith for movement in a vertical plane, the locking bar being provided with a stud to engage the switch rail and the supporting element.

10. In a device of the class described, a supporting element having apertures; a movable switch rail assembled with the supporting element; locking means for the switch rail comprising a latch-bar disposed longitudinally of the switch rail and pivotally assembled at one end therewith for movement in a vertical plane, the latch-bar being provided with a stud to engage the switch rail and to engage successively the apertures in the supporting element; and a cover plate projecting from the switch rail and disposed above the apertures in the supporting element.

11. In a device of the class described, a supporting element; a movable switch rail assembled with the supporting element; a latch-bar pivoted at one end to the rail for movement in a vertical plane and arranged to lock the rail to the supporting element; and a locking rod journaled for rotation in the rail and engaged to lift the free end of the latch-bar to unlock the rail from the supporting element.

12. In a device of the class described, a supporting element; a movable switch rail assembled with the supporting element; a latch-bar disposed longitudinally of the rail and bent at one end to engage the rail, and provided at the opposite end with a slot; and a locking rod journaled for rotation in the rail and having a crank to engage the slot of the latch-rod to lift said latch-rod; and means carried by the latch-rod for locking the rail to the supporting element.

13. In a device of the class described, a

supporting element; movable switch rails assembled with the supporting element; latch-bars disposed without the switch-rails and pivotally assembled at one end therewith for vertical movement, the latch-bars being arranged to lock the rails to the supporting element; a transverse locking rod journaled for rotation in the switch rails and having cranks located in close relation with the outer faces of the rails and arranged to engage the free ends of the latch-bars to unlock the switch rails from the supporting element.

14. In a device of the class described, a supporting element; a movable switch rail assembled with the supporting element; a latch-bar pivoted to the rail and arranged to lock the rail to the supporting element; a locking rod journaled for rotation in the rail and arranged to operate the latch-bar, the rod being terminally bent to form an operating lever.

15. In a device of the class described, a supporting element; a movable rail assembled with the supporting element; a coupling rod terminally connected with the movable rail; a strap for bridging the coupling rod, terminally connected with the supporting element; a stop to limit the movement of the rail, assembled with the strap and the supporting element; and means operatively connected with the coupling rod for actuating the movable rail.

16. In a device of the class described, a supporting element; a fixed rail and a movable rail, each assembled with the supporting element; a coupling rod terminally connected with the movable rail; a strap bridging the coupling rod and terminally connected with the supporting element; a stop to align the movable rail with the fixed rail, assembled with the strap and the fixed rail; and means operatively connected with the coupling rod for actuating the movable rail.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALVIN M. THREEWITS.

Witnesses:

HENRY W. KNOLLENBERG,
HERBERT B. LOPER.