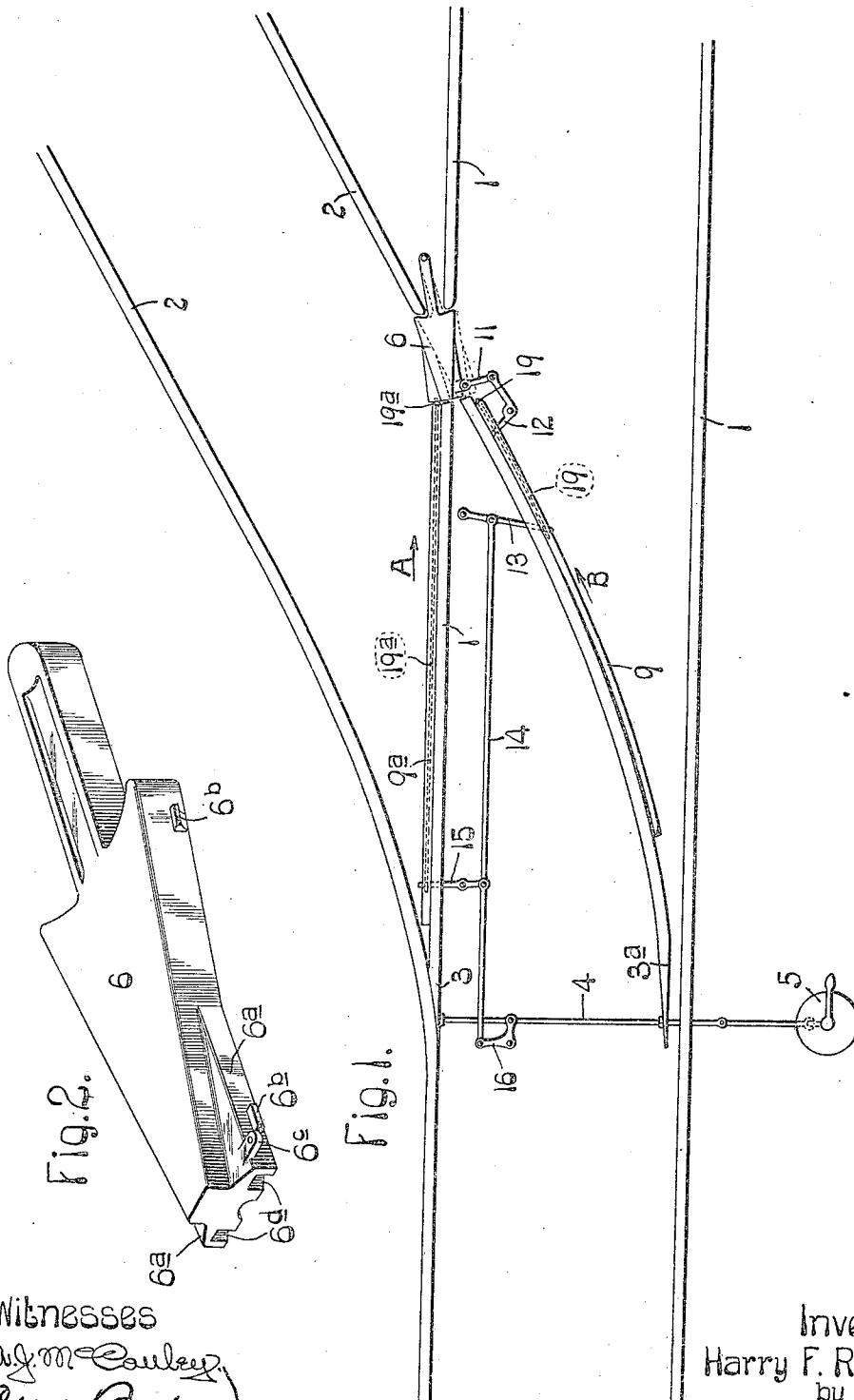


961,534.

Patented June 14, 1910.

2 SHEETS—SHEET 1.



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961,534.

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 2 SHEETS—SHEET 2.

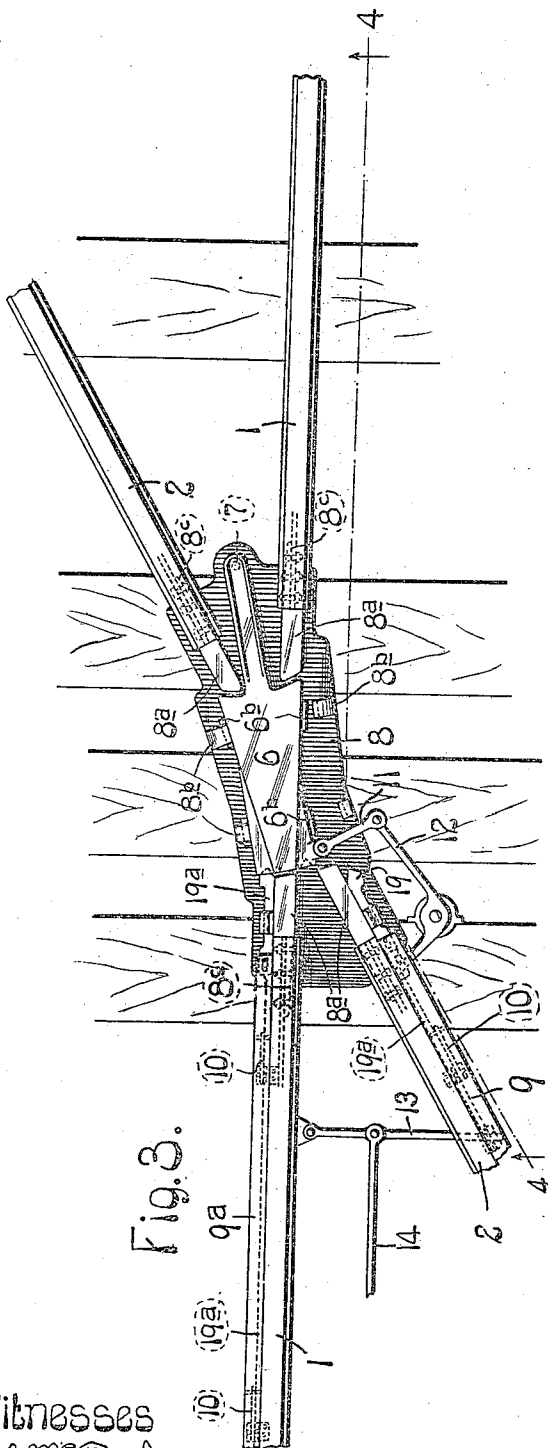


Fig. 3.

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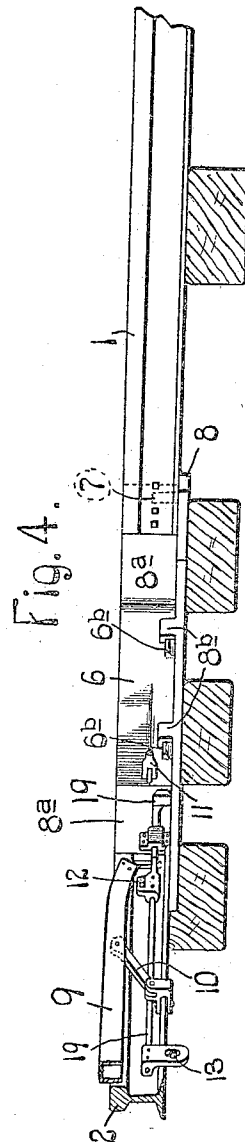


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SWITCH-FROG.

961,534.

Specification of Letters Patent. Patented June 14, 1910.

Application filed November 26, 1907. Serial No. 403,960.

To all whom it may concern:

Be it known that I, HARRY F. ROACH, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Switch-Frogs, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is a plan view of my improved switch-frog; Fig. 2 is a detail view of the tongue of the switch-frog; Fig. 3 is an enlarged plan view of said switch-frog; and Fig. 4 is a side elevational view of the construction shown in Fig. 3.

This invention relates to a new and useful improvement in switch-frogs, the object being to construct a frog in such manner that the movable tongue thereof will cooperate with the main rail or siding rail, as the case may be, forming practically a continuous rail, depending upon whether the train is moving on the main rail or siding, thus dispensing with the necessity of guard rails.

Means operated by the train are provided for throwing the tongue of the switch-frog to open the main line or siding depending upon whether the train travels on one or the other. Means are also provided to lock the switch tongue in either position to which it may be thrown. In addition to the train-operated means for throwing the tongue, connections with the hand- or power-operated switch are also provided so that operation of the main switch to throw the train onto the siding will appropriately operate the tongue of the switch-frog.

In the drawings, 1 indicates the rail of the main track and 2 the rails of the siding.

3 and 3^a are the tongues of the switch, which tongues are connected by a rod 4, said rod in this instance being operable by a hand lever 5.

When the parts are in the position shown in Fig. 1, the main line is open. Should the lever 5 be operated and the tongues 3 and 3^a moved, the main line would be closed and the siding open.

6 indicates the tongue of my improved switch-frog, which, as shown in Fig. 2, is substantially in the shape of an arrow head, the shank of which receives a pivot pin 7 mounted in a base plate 8. By referring to

Fig. 3 it will be observed that the pivotal pin 7 of the tongue of the switch-frog is located beyond the terminals of the main and siding rails 1 and 2. In this manner the point and heel portions of the tongue 6 are both located on the same side of the axis of movement, so that in service the strains and loads of passing trains can be well taken care of. The point of the tongue is preferably so shaped that it cooperates with the oblique ends of the tread portions 8^a constituting the terminals of the main and siding rails so that the treads of passing wheels bridge the space between the parts, and in this manner the wheels are supported at all times. It will also be noted that the heel portion of the tongue makes an oblique connection with the tread portions 8^a so that the tread of the wheel passing over the joints at these points is always supported.

Tongue 6 is provided with a flared-out portion 6^a at its point so as to increase the bearing area of the point, thus giving a wider base and more rigid support for the load superimposed upon the tongue. Tongue 6 is also provided with lugs or projections 6^b which cooperate with overhanging stops 8^b on the base plate 8, so that when the tongue 6 is moved to either extreme position it will be backed-up by the overhanging lugs 8^b. The overhanging portions of lugs 8^b prevent the tongue 6 from tilting or canting under load. Tongue 6 is also provided with recesses 6^d in its end for cooperating with locking projections, and with lugs or ears 6^c for the attachment of operating levers.

Tongue 6 is not designed to be primarily operated from moving trains, but I provide depressible bars alongside of the rails 1 and 2, which bars are connected by appropriate levers to the tongue 6 to throw said tongue in the proper direction according to the track on which the train is to lock the tongue and also compel a full and complete movement of the tongue if the tongue is not home. As these bars are all substantially of the same construction I shall describe but one of them. 9 indicates a channel-shaped bar whose ends, as shown in Fig. 4, are preferably bent down. Bars 9 are mounted upon links 10, which links are pivotally supported by the base flanges of the rails 1 and 2, as the case may be. Links 10 are obliquely disposed so that when pressure is applied to the bar 9 said bar will swing

on the axis of movement of the links 10 and move bodily in a longitudinal direction.

Referring to Fig. 3, it will be observed that the lug 6^c of tongue 6 has a link 11 connected therewith, to the outer end of which link is connected a bell crank lever 12. The opposite end of this bell crank lever is connected to a bar 19 which is adjacent the siding rail 2. This bar 19 is guided in suitable bearings connected to the rail and its end adjacent the tongue 6 is formed as a V-shaped locking head designed to cooperate with one of the recesses 6^d in the tongue 6. Bar 19 is connected by a lever 13 to a rod 14, see Fig. 1, which rod is connected by a lever 15 to a bar 19^a similar to the bar 19, but which is adjacent the main track rail 1. Bar 19^a is also formed with a V-shaped locking head which cooperates with one of the recesses 6^d in the tongue 6. Located over the bars 19 and 19^a are channel-shaped depressible bars 9 and 9^a mounted on links 10. When the locking bars 19 and 19^a are retracted from engagement with the tongue 6, the depressible bars 9 or 9^a are elevated as shown in Figs. 3 and 4. When in an elevated position they are capable of being depressed by a train, and when so depressed they will, if their cooperating bar 19 or 19^a is not in locking engagement with the tongue, force said bar into locking engagement with the tongue, and incidentally move the tongue to a home position, should the tongue not have been thrown to a home position by the switch. Bars 9 or 9^a also prevent the switch and the tongue 6 from being operated when either one of said bars is held depressed by a train. The V-shape of the locking heads and of the recesses 6^d in the tongue tends to force the tongue 6 home in the event that the tongue is not fully home when either of the heads on the locking bars 19 or 19^a is forced into its recess. The V-shape of these cooperating parts also enables the tongue to be operated by the switch without interference from the locking devices. Bar 14 before referred to is connected by a bell crank lever 16 to the switch-operating rod 4, and whenever the switch is thrown the rods 19 and 19^a are moved in opposite directions, and the tongue 6 thrown from one position to the other. When the bar 19^a is moved in the direction of the arrow A, Fig. 1, it will be observed that through the lever 13, the bar 19 and bell crank lever 12 the tongue 6 is moved so as to form a continuous tread-bearing for the wheels traveling on the rails of track 1. When the bar 19 is moved in the direction of the arrow B it will cause the tongue to be moved over, as indicated by dotted lines in Fig. 1, and through the members 13—14—15 the bar 19^a will be retracted.

Tongues 3, 3^a and 6 which have been heretofore described as being operated by hand-

operated switch 5, may, of course, be moved by mechanical power such as electricity, compressed air, etc., and be operated from some distance, as from a switch tower. Whenever the switch is thrown to open the main line the tongue 6 is moved to the position shown in Fig. 1 and locked in such position, and when the tongues 3 and 3^a are shifted so as to switch a train from the main line onto the siding the tongue 6 will be moved to the position indicated by dotted lines in Fig. 1. The depressible bars 9 and 9^a insure a complete and full movement of the tongues 3, 3^a and 6. If rod 4 were not fully thrown it will be obvious that pressure on either bar 9 or 9^a will force tongues 3 and 3^a to their proper home position.

Base plate 8 heretofore referred to is preferably made in the form of a casting with tread portions 8^a constituting terminals of the main and siding rails, cast integral therewith. It is obvious, however, that plate 8 may be rolled and the treads bolted thereto. In this manner these terminals always bear a fixed relation to the movable tongue and there can be no interference with the movement of the tongue from creepage of the rails. These cast tread portions are preferably provided with tongue extensions 8^c to which the webs of the rails may be bolted. The flanges of the rails, however, may be bolted to the base of the casting 8, and in fact this form of connection might be sufficient to prevent creeping movement of the rails if the tread extensions 8^a were dispensed with. I prefer, however, to use the tread extensions 8^a because they offer solid abutments and easy means of attachment for the ends of the rails.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a switch-frog, a one-piece tongue having a point and heel portion on the same side of its pivotal point, a switch operatively connected to move said tongue, and reciprocating devices operated by said switch for locking said tongue in its different positions; substantially as described.

2. In a switch-frog, a base plate having rail terminals secured thereto, the ends of said rail terminals being obliquely disposed, a tongue pivotally mounted on said base plate and having point and heel portions on the same side of its axis of movement, said tongue and heel portions cooperating with the ends of said rail terminals, and locking devices operable by a passing train and cooperating with the free end of said tongue to lock the same in its different positions; substantially as described.

3. In a switch-frog, a base plate to which the terminals of rails are connected, a movable tongue in the form of an arrow head pivotally mounted on said base plate, a

switch-operating rod connected to said movable tongue; means for locking said tongue in its different positions, said means being operable by said switch operating means, and train operated means also cooperating with said locking devices; substantially as described.

4. In a switch-frog, a base, a tongue pivotally mounted on said base, means for locking said tongue in position, and a switch-operating means for actuating said tongue and also said locking devices; substantially as described.

5. In a switch-frog, a base plate, a tongue pivotally mounted on said base plate, alternately operable locking devices for cooperating with said tongue, switch-operating mechanism for operating said locking devices and means operable by a passing train for actuating said locking devices; substantially as described.

6. In a switch-frog, main and siding rails, a base plate, a tongue pivotally mounted on said base plate, reciprocating locking devices for said tongue, depressible bars for cooperating with said locking devices and links for supporting said depressible bars in position; substantially as described.

7. In a switch-frog, main and siding rails, a base plate, a tongue pivotally mounted on said base plate, a switch-operating bar for operating said tongue, locking devices for said tongue, and depressible bars occupying the zone between the switch and frog cooperating with said locking devices; substantially as described.

8. In a switch frog, a base plate, a tongue pivotally mounted on said base plate, means for operating said tongue, locking devices for said tongue, which locking devices are operated by mechanism which operates the tongue, and depressible bars mounted on parallel links and operable by a passing train so as to actuate said locking devices independently of the movement of said tongue; substantially as described.

9. The combination of a main track, a siding track, a switch, a movable frog tongue, means connecting the switch and the movable frog tongue for operating the latter when the former is thrown, wheel-operated members occupying an extended zone between the switch and the frog and cooperating with the wheels of a train, and locking devices on said members for preventing the switch and frog from being inappropriately operated.

10. The combination of a main track, a siding track, a switch, a movable frog tongue, means for connectively moving said switch and frog tongue, locking devices for said frog tongue, and means occupying an extended zone between the switch and the

frog tongue for operating said locking devices and preventing their withdrawal during the presence of a train wheel in said zone.

11. The combination of a main track, a siding track, a switch, a movable frog tongue, means for connectively moving said switch and frog tongue, locking devices cooperating with the frog tongue, and means arranged alongside of the inner converging rails throughout an extended zone between the switch and the frog tongue, said means being operable by the wheels of a train and designed to force the locking devices home and prevent the throw of the switch or the frog tongue when a train wheel is in said zone.

12. In a switch-frog, a base plate, a tongue pivotally mounted on said base plate, a switch, a connection between said switch and said tongue whereby the latter is moved when the switch is thrown, and train-operated devices occupying an extended zone between the switch and the tongue for preventing the movement of said switch and tongue when any wheel of the train is in said zone; substantially as described.

13. In a switch-frog, main and siding rails, a base plate, a tongue pivotally mounted on said base plate, locking devices for locking said tongue in different positions, and means in the form of depressible bars arranged alongside of the inner converging rails between the switch and the tongue and operable by a train for forcing said tongue home and said locking devices into operative relation thereto; substantially as described.

14. In a switch-frog, a base plate, a tongue pivotally mounted on said base plate, devices for locking said tongue in its extreme positions, means in the form of depressible bars arranged alongside of the inner converging rails and extending substantially throughout the entire length of said rails from the switch to the frog, said bars being designed to be operated by a train either on the main or siding rails for preventing inappropriate movement of said tongue and the withdrawal of said locking devices, and a switch-operating bar connected to said tongue and locking devices for operating them when said switch is operated; substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this twenty third day of November 1907.

HARRY F. ROACH.

Witnesses:

F. R. CORNWALL,
GEORGE BAKEWELL.