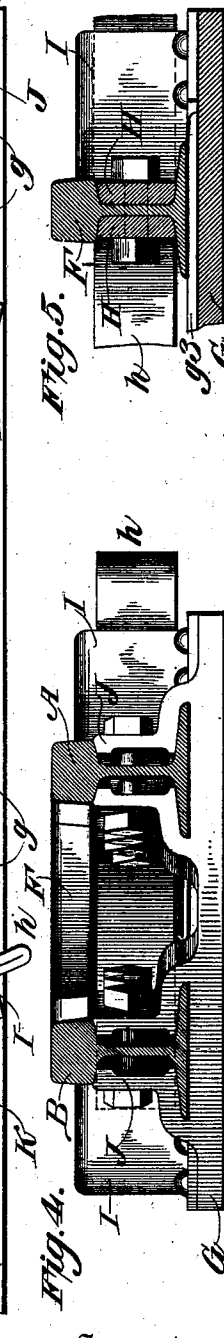
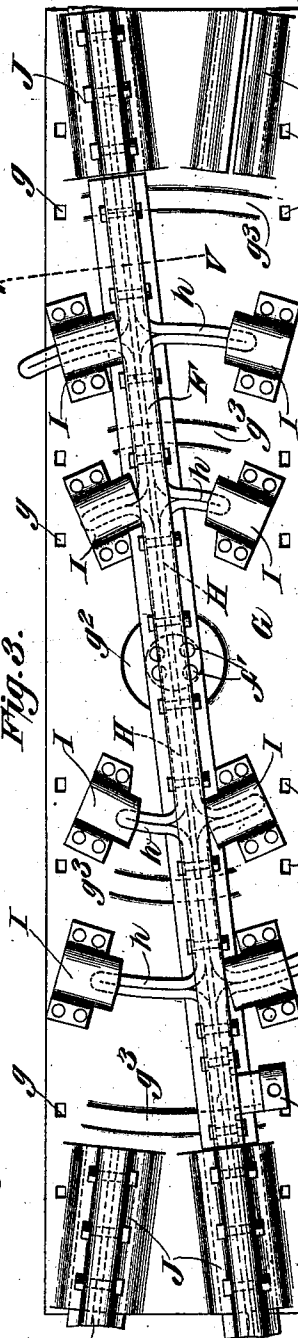
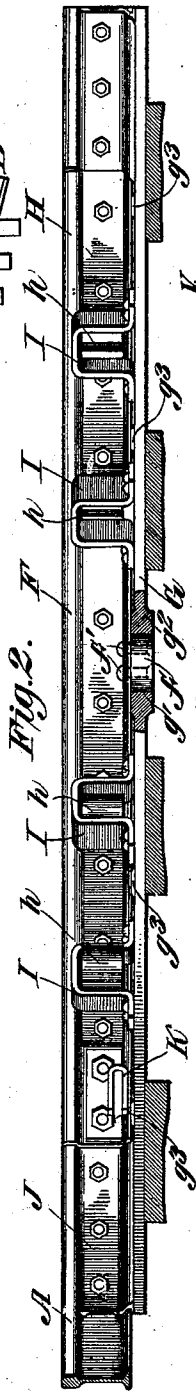
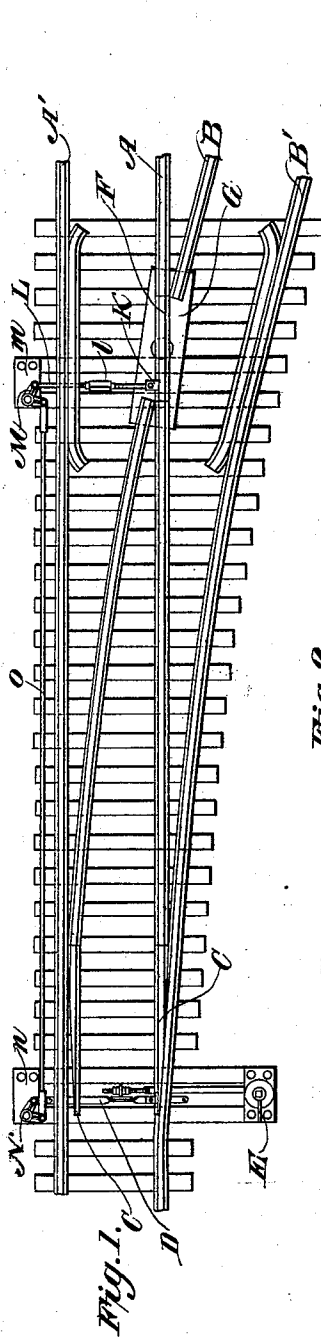


H. R. COLLINS.  
CONTINUOUS RAIL FROG.

(Application filed May 21, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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 His Attorney

No. 692,829.

Patented Feb. 11, 1902.

H. R. COLLINS.  
CONTINUOUS RAIL FROG.

(Application filed May 21, 1901.)

(No Model.)

2 Sheets—Sheet 2.

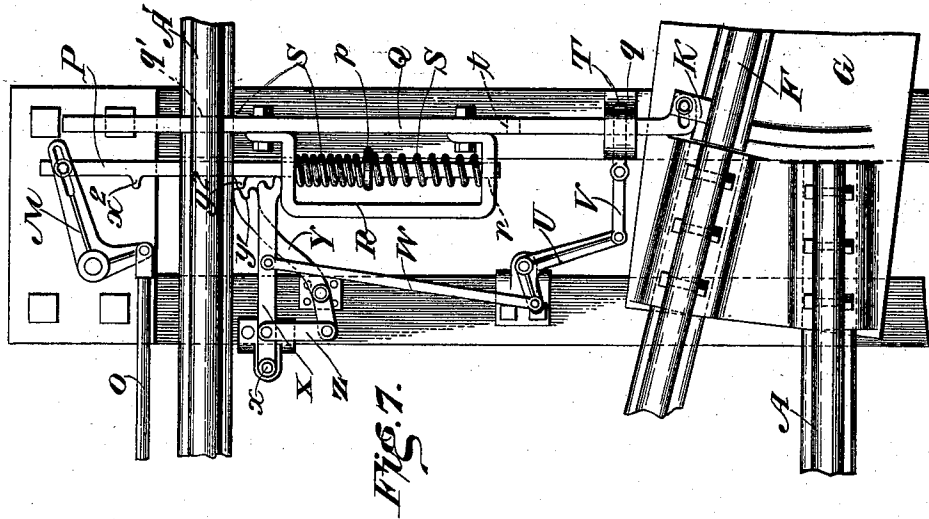


FIG. 7.

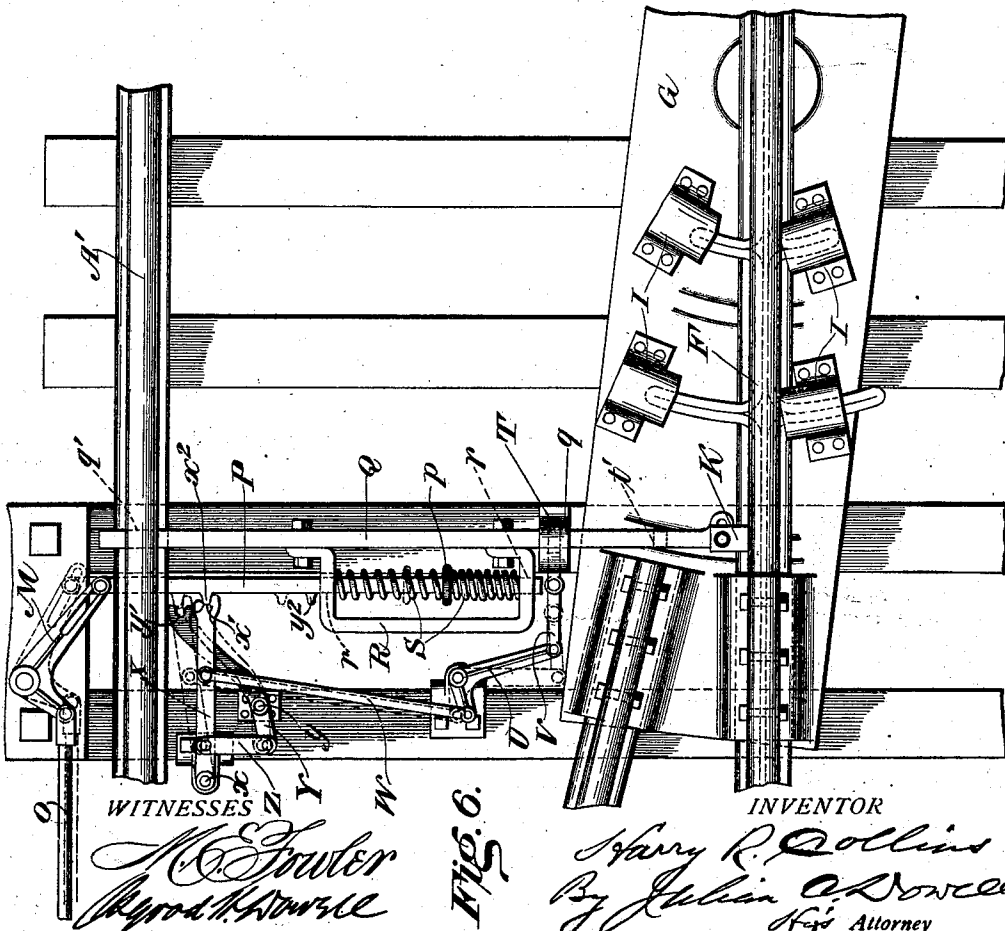


FIG. 6.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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## CONTINUOUS-RAIL FROG.

SPECIFICATION forming part of Letters Patent No. 692,829, dated February 11, 1902.

Application filed May 21, 1901. Serial No. 61,294. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY RAYMOND COL-  
LINS, a citizen of the United States, residing at  
South Bethlehem, in the county of Northamp-  
5 ton and State of Pennsylvania, have invented  
certain new and useful Improvements in Con-  
tinuous-Rail Frogs; and I do hereby declare  
the following to be a full, clear, and exact de-  
scription of the invention, such as will en-  
10 able others skilled in the art to which it ap-  
pertains to make and use the same.

This invention relates to railway-frogs,  
and more particularly to the class known as  
"movable" rail-frogs.

15 The ordinary solid and spring frogs now in  
common use in connection with railway-  
switches, besides often causing derailment of  
the cars by reason of stones or other foreign  
bodies becoming lodged or wedged in the  
20 channels for the guidance of the wheel-  
flanges, are more or less expensive to main-  
tain on account of the hard blows received  
from the wheels passing over them and con-  
sequent wear on the frog-points, and, further,  
25 cause heavy jarring and jolting of the roll-  
ing-stock and consequent wear of the jour-  
nals, wheel-trucks, and other running-gear.

The primary object of my invention is to  
produce a simple, inexpensive, and substan-  
30 tial movable rail-frog for the point of inter-  
section of the rails of two or more diverging  
tracks, whereby a continuous or unbroken  
rail bearing is provided for the wheels of a  
car moving on either line or track; thus over-  
35 coming the danger of derailment, obviating  
all jarring and jolting, and consequently re-  
ducing to a minimum the wear both of the  
track and the rolling-stock.

A further object is to provide means for  
40 connecting the frog with the switch-operat-  
ing mechanism and for moving and locking  
the same in position simultaneously with the  
operation of the switch from the switchboard  
or signal-tower.

45 Other objects are to properly guide and  
limit the movements of the movable rail and  
to secure perfect alinement thereof with the  
rail of the main track or line over which the  
cars are passing, to strengthen and reinforce  
50 said movable rail, so as to render the same  
stable, immovable, and free from spreading

or bending under the pressure of the rolling-  
stock, to reduce friction and insure easy ma-  
nipulation of said rail, and to improve gener-  
ally on devices of this same general char- 55  
acter.

With these and other objects in view the  
invention will first be hereinafter more par-  
ticularly described with reference to the ac-  
companying drawings, which form a part of 60  
this specification, and then pointed out in  
the claims at the end of the description.

In said drawings, in which like parts are  
denoted by corresponding letters of refer-  
ence, Figure 1 represents a diagrammatic 65  
plan view of a portion of two diverging lines  
of railway, showing the usual switch and op-  
erating mechanism and in connection there-  
with a movable rail-frog embodying my in-  
vention, illustrating a means of connecting 70  
the frog with the switch-operating mechan-  
ism, so as to be moved simultaneously with  
the switch-points from the switch-stand or  
signal-tower. Fig. 2 is a side elevation of  
the frog. Fig. 3 is a plan view thereof. Fig. 75  
4 is an end elevation. Fig. 5 is a vertical  
section on line V V of Fig. 3, Figs. 2 to 5,  
inclusive, being taken on a larger scale than  
Fig. 1. Fig. 6 is a detail plan view showing  
a preferred form of locking mechanism, and 80  
Fig. 7 is a similar view showing the same in  
a different position.

The letters A and A' in the drawings de-  
note the rails of a main track or railway, and  
B and B' the rails of a diverging or side track. 85  
C denotes the movable switch-points, and D  
the switch-bar connected to the latter and to  
the lever E at the switch-stand for operating  
the switch, all of which parts may be of the  
usual or any desired construction. 90

At the point of intersection of the two in-  
ner rails A and B of the diverging railways  
the said rails terminate a suitable and an  
equal distance away from said point on both  
sides thereof, preferably in the usual stub 95  
ends, and a short rail-section F of a length  
substantially equal to the distance between  
the terminals of each rail A and B is pivot-  
ally supported at said point of intersection  
and may be moved or turned to connect the 100  
said terminals or toes of either of said rails,  
so as to secure a continuous or unbroken rail-

bearing for the wheels of a car passing along either track. The said movable or pivotal rail F is preferably supported upon a bed-plate G, having suitable apertures  $g$  for the insertion of spikes or other fastenings into the rail-ties, and provided with a central bore  $g'$  to receive the pivot or journal  $f$  of said rail, which pivot may be secured to the under side of the rail by means of rivets  $f'$ , passing through suitable apertures in the pivot or journal and in the lower flanges of the rail or in any desired manner. The bore  $g'$  is preferably formed in an enlarged or thickened portion or boss  $g^2$  of the bed-plate, which provides a sufficient bearing for the journal and also raises the rail, which may be further supported at its ends and intermediate portions upon suitable slides or curved projections  $g^3$  on the top of the bed-plate, the contacting surfaces of the rail and bed-plate being thus reduced, thereby diminishing friction, preventing obstruction from the accumulation of dirt or other substances, and insuring free pivotal movement of the rail.

To prevent spreading, bending, or overturning under lateral pressure from the car-wheels, the rail F is preferably provided at each side with reinforcing pieces or bars II, closely fitted between the head and base or upper and lower flanges of the rail (see Fig. 5) and securely fastened together by bolts and lock-nuts or in any suitable manner, and said bars or reinforcing pieces are provided at suitable intervals with outwardly-projecting arms or slides  $h$ , curved from the axis or pivot of the rail and slidably fitted in guides or yokes I, firmly riveted or otherwise secured to the bed-plate, and it will be observed that besides the functions noted the said arms in connection with the collars or yokes I serve to anchor the movable rail to the bed-plate and prevent displacement or upward movement of either end thereof and also to guide and steady the said rail in its pivotal movements. The said collars or sleeves I also serve as stops or abutments for the rail, being so disposed and of such formation as to limit the movement of the rail in exact alinement with the main rail over which the car is passing.

As a further means of securing exact alinement of the main rails and movable or pivotal rail and to hold the former firmly in position the ends of said main rails A and B may be supported and rigidly fastened in proper position upon the bed-plate, and preferably said rails are inserted and bolted or otherwise secured in pockets or chairs J, upstanding at each end of the bed-plate. Said pockets, which are of suitable shape to fit closely about the rail, (see Fig. 4,) may be cast integrally with the bed-plate, as shown, or formed separately and riveted or secured thereto in any suitable manner.

To connect the frog with the switch-operating mechanism, the rail F may be provided at one side with a lug K, to which is pivoted one member of an adjustable or extensible

rod L, (see Fig. 1,) the two members of the rod being oppositely screw-threaded at their adjacent ends and connected by a turnbuckle  $l$  or other suitable adjusting device. The other end of the rod L may be connected to one arm or member of a bell-crank lever M, the other arm of which is connected by means of a rod O to a second bell-crank lever N, which is in turn connected by its remaining arm to the switch-bar D, the arrangement being such that the movements of the adjustable rod L and the rail F are made to conform to the movements of the switch-bar and the switch-points C, respectively. The bell-crank levers M and N may be pivotally mounted upon plates  $m$  and  $n$ , respectively, or other supports suitably secured to the rail-ties at the side of the main track. The movable rail F being fixed to stand normally in alinement with the rail A of the main track, it will be observed that when the switch is operated to shunt the cars to the diverging or side track the said rail F will simultaneously move into alinement with the rail B of said diverging line, and when the switch is closed the said rail will be simultaneously moved back into the normal position.

In either closed or open position of the switch the movable rail-section will of course be retained in its corresponding side-track or main-track position by virtue of the rigid connections between the two, or any suitable means may be employed for locking the rail-section F from a nearby point in either its normal position (shown in Figs. 1 and 6) or its adjusted or side-track position, (shown in Fig. 7,) the switch being correspondingly retained in position by virtue of the aforesaid rigid connections, such latter arrangement being preferable because the rail is thereby held immovable, and all liability of its being jarred or thrown out of true alinement by rolling-stock is entirely obviated.

In Figs. 6 and 7 are illustrated a preferred means whereby the frog is locked automatically in either position into which it may be moved by operating the switch, the connection between the rod O and the movable rail-section F being slightly modified to embody said locking devices. In the construction referred to the adjustable rod L may be dispensed with, and the connection between the said rod O and the movable rail-section F is preferably effected by means of two parallel bars or rods P and Q, movably secured together in such manner that one of said bars P, which is suitably secured, as by a pivot-and-slot connection, to the bell-crank lever M, is capable of a certain amount of independent endwise motion both before and after imparting movement to the bar Q, which latter bar is suitably secured to the movable rail-section F or the lug K thereof, and may slide in suitable guides or yokes  $q$  and  $q'$ , the latter of which guides may consist of an opening in the web of the rail A', as indicated. The bar P, which may be referred to as the

"actuator-bar," and the bar Q, which may be termed the "shift-bar," may be properly secured together by passing the former through suitable supporting-guides carried by the latter or in any other desired manner, said guides being represented here by dotted lines at  $r$   $r$  as openings in the opposite ends of a bracket or yoke R, secured to the bar Q, and by means of a projection or lug  $p$ , formed or provided on the bar P between the said guides or openings  $r$   $r$  and intervening springs S, movement may be imparted to the bar Q after the bar P has moved a certain distance in either direction, said springs serving to impart a gradual pressure from the bar P to the bar Q and permitting an independent motion of the bar P both before and after imparting motion to the bar Q.

The lock for the movable rail-section F may consist of a lock-pin T, which enters a suitable aperture in the yoke or collar  $q$ , and a registering aperture  $t$  or  $t'$  in the bar Q when the rail is in its normal position, Fig. 6, or in its adjusted or side-track position, Fig. 7, respectively, the said aperture in the yoke  $q$  and the apertures  $t$  and  $t'$  being indicated by dotted lines. The lock-pin T may be suitably connected to a bell-crank lever U, preferably to the longer arm thereof, and through the medium of a link V, the other or shorter arm of said bell-crank lever being suitably connected to one end of a bar or rod W, the other end of which is connected to a lever X, pivotally supported at one end, as at  $x$ , upon one of the rail-ties or other support. When the lever X is moved or rocked in one direction or the other, the bell-crank lever will of course be correspondingly operated to insert or withdraw the lock-pin T. To actuate the said lever X automatically when the switch is operated, the free end of said lever may be formed or provided with a suitable notch, as at  $x'$ , which is adapted to be engaged at a proper time by a lug or teat  $x^2$  on the bar P, and a second lever Y, so connected to the lever X as to move the same in a direction opposite to its own motion, may be provided with a similarly-notched end, as at  $y'$ , adapted to be engaged at a different period by a second lug or teat  $y^2$ , carried by the bar P at a point nearer the rail-section F than the lug  $x^2$ . As here shown, the lever Y is pivoted at an intermediate portion thereof, as at  $y$ , upon the rail-tie at a point nearer the frog than the pivot of the lever X, being connected to said lever X by a link Z, connected to its short arm, and the free notched end of said lever Y is curved or bent under the corresponding end of the lever X, so that it will be engaged by the lug  $y^2$  only at the proper time; but these details of arrangement and construction may, however, be variously modified as found necessary or desirable under different conditions of use.

The parts are preferably so arranged that when the movable rail-section F stands in its

normal position, Fig. 6, the lock-pin T being of course inserted through the aperture  $t$ , the spring S, which is nearer the frog, is held by the lug  $p$  under a suitable compression, while the other spring is under less or no compression. Now when the switch is operated to shunt the cars to the side track the rod O, rocking the bell-crank lever M, draws or moves the bar P, and the teat or lug  $x^2$  thereof engages and rocks the lever X in such manner as to operate the bell-crank lever U to withdraw the lock-pin T, the movements of the parts being indicated by dotted lines in Fig. 6. The motion of the bar P continuing, the springs S both come to an equal degree of compression, and by virtue of the bearing or abutment of the spring which is farther from the frog against the end of the bracket R the bar Q is gradually and easily moved until the movable rail-section F is in its adjusted position, Fig. 7. The teat or lug  $x^2$  having passed off from the notched end of the lever X, the bar P continues its motion, compressing said farther spring, and the teat or lug  $y^2$  now reaches and engages the notched end of the lever Y, rocking the same, whereupon the lever X is of course rocked in an opposite direction, thus operating the bell-crank lever U to insert the lock-pin in the second aperture  $t'$  of the bar Q.

When the switch is closed or operated to bring the main track into use again, the lug  $y^2$  carries the lever Y back, serving in a manner now understood to withdraw the lock-pin, and the spring S nearer the frog bearing against the bracket R again moves the movable rail-section F into its normal position, Fig. 6, whereupon the lug  $y^2$  having left the lever Y the lug  $x^2$  engages the lever X and rocks the same in the direction to insert the lock-pin in the aperture  $t$ , and thereby effectually lock the movable rail-section F in place.

I thus provide a very simple, inexpensive, and efficient device whereby the various objections experienced with the ordinary spring and solid frogs now in use are overcome and a safe and smooth unbroken bearing may be had for the wheels of a train moving along either track. It will of course be understood that any suitable means may be employed to establish connection between the frog and switch, or any suitable locking means may be employed, and that the invention is also capable of various modifications without departing from its scope.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A movable rail-frog consisting of a rail-section centrally pivoted between the terminals of two adjacent track-rails so as to fill the intervening gap and form a continuous line of rails at such point; said rail-section having lateral bracing and guiding arms rigidly secured to each side thereof on opposite

sides of its pivot, and guides in which said arms are slidably fitted, substantially as described.

2. A movable rail-frog consisting of a rail-section centrally pivoted between the terminals of two adjacent track-rails so as to fill the intervening gap and form a continuous line of rails at such point; said rail-section having lateral bracing and guiding arms rigidly secured to each side thereof on opposite sides of its pivot, guides in which said arms are slidably fitted, and means for shifting said rail-section so as to connect the terminals of the adjacent side-track rails intersecting said first-mentioned line of rails.

3. A movable rail-frog consisting of a rail-section centrally pivoted between the terminals of two adjacent track-rails so as to fill the intervening gap and form a continuous line of rails at such point; said rail-section having lateral bracing and guiding arms rigidly secured to each side thereof on opposite sides of its pivot, guides in which said arms are slidably fitted, means for shifting said rail-section, and means for automatically locking the same in a fixed position, substantially as described.

4. In a railway-frog, the combination with the diverging tracks and the switch, the inner or intersecting rail of said tracks each terminating at each side of the point of intersection, of the movable rail for connecting the terminals of said intersecting rails pivotally supported at said point of intersection, an extensible rod pivoted at one end to said movable rail-section and at the other end to a bell-crank lever, a rod connecting said bell-crank lever with a second bell-crank lever which is in turn connected with the switch-bar, whereby said movable rail-section may be turned to effect the desired connection simultaneously with the operation of the switch, substantially as described.

5. In a railway-frog, the combination with the diverging stationary rails each terminating at each side of their point of intersection, of a bed-plate having a bore at said point of intersection, a movable rail-section for connecting the terminals of either of the stationary rails having a pivot journaled in said bore, and guiding arms or slides secured to the sides of said rail-section, guides on the bed-plate in which said arms are fitted, said guides also forming abutments for limiting the movements of said rail-section to secure alinement thereof with the stationary rails, substantially as described.

6. In a railway-frog, the combination with the diverging stationary rails each terminating at each side of the point of intersection, of a bed-plate having a raised portion or boss provided with a bore at said point of intersection, a movable rail-section for effecting connection with one of said stationary rails having a pivot journaled in said bore, and circular bearings or slides formed on the bed-plate concentric with and at each side of said

pivot to support said movable rail, substantially as described.

7. In a railway-frog, the combination with the diverging stationary rails terminating away from their point of intersection, of the movable rail-section pivoted at said point of intersection, and a support therefor, said movable rail-section having projections or slides at the sides thereof, and guides on the support in which said slides are fitted, substantially as described.

8. In a railway-frog, the combination with the diverging stationary rails terminating away from their point of intersection, of the movable rail-section pivotally supported at said point of intersection and having at each side reinforcing-bars provided with curved arms or projections on opposite sides of the pivot, and guides or yokes in which said arms are fitted, whereby said movable rail is held in place and its movements properly guided, substantially as described.

9. In a railway-frog, the combination with the diverging stationary rails each terminating away from their point of intersection, of the movable rail-section pivotally supported at said point of intersection and having arms or projections at the sides thereof, and guides for said arms whereby the movable rail is held in place, said guides also forming stops or abutments for the rail-section so as to properly limit the movements of the same to aline with the stationary rails, substantially as described.

10. In a railway-frog, the combination with the diverging rails each terminating away from the point of intersection, of the bed-plate having pockets or inclosures conforming to the shape of the rail upstanding at each end thereof and in each of which the end of one of said rails is fitted and bolted, a bore in said bed-plate at the point of intersection of the rails, and a movable rail-section having a pivot journaled in said bore, substantially as described.

11. In a movable railway-frog, the combination with the fixed rails, and the bed-plate having a bore, of the movable rail for connecting the terminals of the fixed rails having a pivot on its under side journaled in said bore, said pivot being secured to said movable rail by means of rivets passing therethrough and through the lower flanges of the rail, substantially as described.

12. In a movable railway-frog, the combination with the fixed rails, and the bed plate or support, of the movable rail pivotally supported at the point of intersection of the fixed rails, said movable rail having secured to its sides the reinforcement-bars provided with the curved arms or projections, substantially as and for the purposes described.

13. In combination with the switch and the movable rail-frog for connecting the adjacent terminals of the main-track rail and adjacent terminals of the side-track rail, the two parallel members movably secured together, one

of said members being connected with the switch and one with the frog, a lock for the latter member, and means for actuating said lock by the independent movements of the other member, substantially as described.

14. In combination with the switch, and the movable frog, a shift-bar connected to the frog, a lock therefor, an actuator-bar operatively connected with the switch and movably connected with the shift-bar so as to impart movement thereto and to have independent motion before and after imparting such movement, a lever connected with the lock so as to unlock and lock the same when rocked in opposite directions, and connections with the actuator-bar for effecting movement of the lever to unlock the lock during the first independent motion of said bar, and the opposite movement of the lever during the second independent motion of said bar, substantially as described.

15. In combination with the switch, and the movable frog, a shift-bar connected to the frog, a lock therefor, an actuator-bar operatively connected with the switch and movably connected with the shift-bar so as to impart movement thereto and to have independent motion before and after imparting such movement, a lock-actuating lever adapted to unlock when moved in one direction and to lock when moved in the opposite direction, a second lever connected to the said lock-actuat-

ing lever in such manner as to rock the same oppositely to its own movement, the actuator-bar being adapted to engage the lock-actuating lever during its first independent motion, and to engage the second lever during its second independent motion, thereby automatically unlocking and locking the lock before and after the shifting of the frog, substantially as described.

16. In combination with the switch and the movable frog, a shift-bar connected to the frog, a second bar operatively connected with the switch so as to be moved simultaneously therewith, a lock for the shift-bar, and means for actuating said lock directly by the other bar; one of said bars being movably secured to the other through guides carried by the latter, a lug carried by one bar between said guides and a spring interposed between each of said guides and lug, said springs thus serving to impart gradual pressure to the shift-bar when the other bar is moved so as to permit an independent motion of the latter bar to actuate the lock both before and after moving the shift-bar.

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

HARRY RAYMOND COLLINS.

Witnesses:

R. P. STOUT,  
Wm. S. HERMANY.