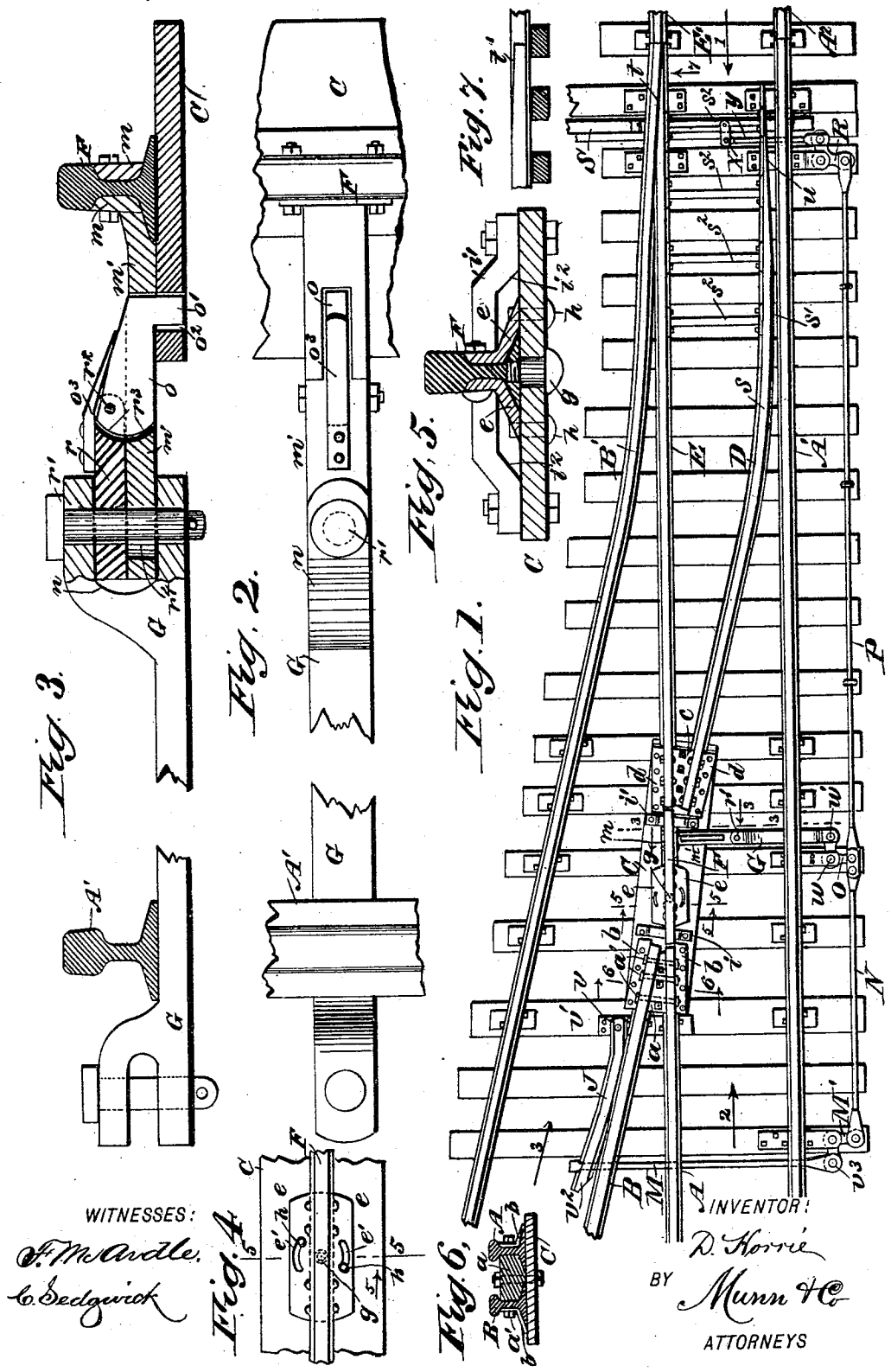
(No Model.)

D. HORRIE.

RAILROAD FROG AND SWITCH COMBINED.

No. 471,004. Patented Mar. 15, 1892.



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RAILROAD FROG AND SWITCH COMBINED.

SPECIFICATION forming part of Letters Patent No. 471,004, dated March 15, 1892.

Application filed June 24, 1891. Serial No. 397,269. (No model.)

To all whom it may concern:

Be it known that I, DAVID HORRIE, of Antigo, in the county of Langlade and State of Wisconsin, have invented a new and useful Improved Railroad Frog and Switch Combined, of which the following is a full, clear, and exact description.

This invention relates to an improvement in that class of railroad-frogs in which a swinging rail is employed that is adapted to align with a main track and an intersecting side track, and has for its object to provide a swing-rail frog and the shifting rails of an adjacent switch with operating mechanism which will be actuated by a locomotive or cars moving on the main track or siding, so as to automatically adjust the swing-rail of the frog and the laterally-movable rails of the connected switch in alignment with either a main track or a side track, as may be required, in either direction of travel.

A further object is to improve the construction of the swing-rail frog patented by me May 19, 1891, Serial No. 367,393, in which a swing-rail lock is shown and claimed that automatically secures the frog swing-rail in alignment with a main-track rail until released by the manipulation of a connected switch-bar.

To these ends my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of a main track and an intersecting side track and the improvements connected therewith. Fig. 2 is a plan view of the rail-latching device shown in Fig. 3, track-rails shown broken, and a broken transverse bar used to vibrate the latch-hook. Fig. 3 is a side view, broken and partly in section, of a rail-latching device in connection with the swing-rail of a frog, the view being taken on the transverse line 3 3 in Fig. 1 in the direction of arrow 3. Fig. 4 is an enlarged plan view of the base-plate whereon the swing-rail of the frog is seated and the swiveling portion of said swing-rail. Fig. 5 is a transverse section taken on the line 5 5 in Figs. 1 and 4 in direction of the arrow 5. Fig. 6 is a cross-section on the line 6 6 in Fig. 1, and Fig. 7 is a side view of rail ends opposite the arrow 7 in Fig. 1.

As represented in Fig. 1, the main-track rail A and side or crossing track rail B converge and are seated upon the frog base-plate C near one end, and their adjacent ends engaging with an intermediate wedge-shaped spacing-block *a* are thereto secured by the transverse bolts *a'*, said block being bolted fast to the base-plate. On the exterior of the rails A B the angle-plates *b* are affixed, preferably, by the bolts *a'*, that pass through the plates, rails, and blocks, binding them firmly together. At a proper distance from the ends of the rails A B, on the base-plate C, two shifting rails D E have one end of each located, which latter-named rails are secured to a spacing-block *c* and angle-plates *d* similar to those engaging the rail ends A B, the spacing-block between the ends of the rails D E having a bolted or other secure connection with the base-plate. A swinging frog-rail F is provided, which is of such a relative length as will permit it to vibrate freely on the base-plate C between the ends of the rails A B D E when pivoted to said base-plate. At a suitable point, preferably nearer to the rail ends A B than the ends of the other rails D E, the swinging frog-rail F is loosely connected to the base-plate C, such a connection of parts being indicated in Figs. 4 and 5, wherein is shown two angle-plates *e*, that are bolted or riveted to the web of the rail F opposite to each other, having their ends equally distant from the pivot-bolt *g*, which latter is inserted in a neatly-fitting perforation of the base-plate and is screwed into or otherwise firmly attached to the base-flange of the swinging rail. The flanges of the angle-plates *e* that are seated upon the base-plate C have sufficient breadth to afford a foot-piece for the rail, which will sustain it laterally, and in these seating-flanges curved slots *e'* are formed, through which the vertical studs *h* are projected, said studs being firmly affixed in the base-plate at such points as will allow them to have a sliding contact with the slots they project through when the rail F is swung on the base-plate. Near each end of the swinging rail F transverse slots are cut through the web of said rail to permit the insertion of the guide-

bars $i\,i'$ through the rail and have their downwardly-bent ends secured to the base-plate. The guide-bars $i\,i'$ serve to keep the rail ends they engage in loose contact with the base-plate C, and also prevent these ends from having too great a lateral movement by reason of their contact with the shoulders i^2. (Shown in Fig. 5.)

Between the reinforcing angle-plates e and the transverse guide-bar i' two opposite bracket-plates m are affixed to the web of the swinging rail F. One of said plates is laterally prolonged a sufficient length to form a limb m', that is pivotally secured to the end of the draft-bar G, that extends between the rail F and an outer main-track rail A′, below which the draft-bar projects to be connected outside of the main-track rail with other parts that will be described. The portion m' of the bracket-plate m that extends to have connection with the bifurcated end n of the draft-bar G is longitudinally slotted to receive a latch-dog o, the toe o' of which enters a mating hole o^2 in the base-plate C. The jaws of the bifurcated end portion n on the draft-bar G are sufficiently separated to allow the insertion between them of the end portion of the limb m' and also of a link-plate r, that is placed on the limb, both parts being held in connection with the draft-bar end by a bolt r', which is inserted in aligning perforations therein. The latch-dog o is pivoted at r^2 upon an end portion of the link-plate r, that is slotted to receive its end. The shoulders r^3, which are the terminals of the slots in the limb and link-plate, are adapted to conform in curvature with the curved adjacent end of the latch-dog. Upon the latch-dog o a finger-spring o^3 is caused to elastically bear and hold it normally depressed, said spring being affixed upon the link-plate r by one end, so as to permit the free end portion of the finger-spring to press upon the dog, as stated. The aperture r^4 in the limb m', which receives the bolt r', is sufficiently elongated to permit a longitudinal movement of the bolt therein when the draft-bar is moved endwise toward the outer main rail A′, so as to cause the upward rocking movement of the latch-dog o and its release from the base-plate C, and when this is effected produce a swinging movement of the rail F at the end engaged by the bracket-plate m and its extended limb m'. The shifting-rail D is made to diverge from the other rail it is connected with until a point s is reached that is a suitable distance from the spacing-block c, where a curve is formed in the rail named, so as to dispose the further extension of the same in a plane parallel to the main-track rails A A′, the straight rail E forming a continuation of the main-track rail A, as indicated in Fig. 1. The degree of divergence of the rail D from the rail E disposes the portion of the shifting rail D that lies between the bend s and spacing-block c in alignment with the side-track rail B, of which it is a continuation, and upon the outside of the main-track rail A E a side-track rail B′ is secured, which is bent to lie parallel with the side-track rail B D.

The portions D E of the main track and side track are given such a proportionate width between them where they extend in parallel planes that a space for their lateral movement will be afforded, as at s' in Fig. 1, and transverse stay-bars s^2 are secured to the webs of the rails by their ends, so as to retain the rails properly spaced apart. The end portion of the straight shifting rail E, where it has contact with the outer side-track rail B′, is cut away on the adjacent side to taper said end portion t, so that the tapered rail end will have its inner edge in alignment with the inner edge of a joined rail E′, that is a part of a main track beyond the switch, a similar rail A^2 having alignment with the main-track rail A′, so that a main track is extended onward from the terminals of the side-track rail B′ and main-track rail A′.

The joined shifting rails D E are, as their name implies, designed to be moved a limited distance laterally, so that their parallel portions may be made to approach either the side-track rail B′ or main-track rail A′. To facilitate the operation of the switch formed by these movable rails the bent rail D is sloped away on the end of its parallel portion, as indicated at u in Fig. 1, thereby producing an entering-throat for the flanges of car-wheels or of a locomotive, and it is important that there should be a sufficient opening allowed between the free end of the rail D and the adjacent side of the head of the main-track rail A′, so that a wheel-flange will enter between them when a car or locomotive is moving in the direction of the arrow 1 in Fig. 1. Between the inner side-track rail B and outer side-track rail B′ a short track-rail J is pivoted at one end v on the cross-tie v' or similar support, a wear-plate being placed between the engaged parts, as shown in Fig. 1. The pivoted rail J is bent away from the track-rail B at each end, as shown, thereby affording an entrance-throat at its free end v^2, which is also cut sloping on the inner corner to avoid interference with an entering flange on a car-wheel. Near the end v^2 of the bent pivot-rail J a pusher-bar M is attached loosely, so that it may swing slightly at its point of connection therewith, and at the other end of the pusher-bar, which is extended laterally below the track-rails A A′ and outside of the latter, a pivotal connection is produced, as at v^3, with a horizontal bell-crank lever M′, the other limb of said bell-crank being similarly connected with a pusher-rod N, which lies parallel to the main-track rail A′. The pusher-rod N has its remaining end pivotally attached to one limb of a bell-crank lever O, which is fulcrumed to swing in a horizontal plane, as at w, its other limb having a pivotal connection at w' with the outer end of the draft-bar G. The end portion of the bell-crank O that is loosely connected with the pusher-rod N is

also pivoted to the end portion of a pusher-rod P, that is prolonged sufficiently to have its opposite end loosely jointed to the end of a limb of the bell-crank lever R, that is adapted to swing in the same horizontal plane with the other bell-cranks M′ O.

Beneath the track-rails A′, D, E, and B′, near the terminal end of the shifting rails D and E, a transverse switch-rod S is located, which rod is provided with a lateral arm *x*, that projects therefrom at a proper point between the shifting rails, and is pivoted at its outer end to a connecting-rod *y*, which latter is jointed at its opposite end to the adjacent remaining end of the bell-crank lever R. The switch rod or bar S is attached by any proper means to one of the transverse stay-bars s^2, so that a longitudinal movement of the switch-bar will actuate the shifting rails D E correspondingly, and it may be here mentioned that the switch-bar named, which is shown broken at one end, may be laterally extended to a proper point and be connected with a switch of any approved form, (not shown,) which is provided with a lever that will afford means to manually adjust the shifting rails D E, should this be necessary.

To enable the proper travel of cars entering the switch in the direction of the arrow 1, the top surface and head portion of the sloped ends on the rails D E are cut away on an incline, as shown at *t′* in Fig. 7, so that the treads of the car-wheels will not rest on the extremities of said rails, while the flanges thereon may engage with the side of the rail end D, so as to crowd said rail and the attached rail E laterally.

In operation, when a locomotive or car is traversing the side track composed of the rails B B′ and in the direction of the arrow 3, the leading wheel-flange will move the pivot-rail J away from the rail B, draw on the pusher-bar M, vibrate the bell-crank lever M′, and longitudinally move the rod N, that will correspondingly vibrate the bell-crank O and slide the draft-rod G endwise and outwardly a sufficient distance to first release the latch-dog *o* and then vibrate the longest end of the swinging rail F, so as to align it with the side-track rails B D. The movement of the swinging rail F, as just stated, will also cause the bell-crank lever R to be rocked a proper degree, which latter, by its connection with the shifting rails D E, will simultaneously draw them toward the main-track rail A′ and close the throat between the rails D and A′ enough to allow the treads of car-wheels moving on the side-track rails to pass therefrom onto the main-track extension beyond the switch at the right side of the view in Fig. 1. If the swinging frog-rail is left in alignment with the side-track rails, as just described, and a locomotive or cars are moved on the main track to pass the frog and switch in the direction of the arrow 2, the rail F will be engaged by the outer portion of the wheel-tread that is in the lead and said wheel be thereby sustained, the flange on said wheel meanwhile crowding the swing-rail into alignment with the main-track rail A and its continuation E when the wheel of the car has passed the pivot *g* of the swinging rail, the location of this pivot-bolt near to the spacing-block *a* facilitating such an automatic adjustment of the swinging rail F. In all cases when the train or locomotive passes over the main track in the direction of arrow 2 the adjustment of the swinging rail F, as has been explained, will cause the latch-dog *o* to be entered and locked in the orifice o^2, formed in the base plate C, thereby securing the swinging rail properly aligned with the main track for travel thereon in direction of arrow 1. Should a train move on the side track in direction of arrow 3 and pass off of the main line at a point removed from the frog and switch, (shown in Fig 1,) thus leaving the shifting rails D E swung toward the main track-rail A′, a car or locomotive moved in the direction of arrow 1 subsequently will ride on the end portions of the side-track rail B′ and the main-track rail A′ until the flange of the car-wheel or locomotive-wheel has thrown the shifting rails D E over toward the side-track rail B′, and thus open a throat for the traverse of the wheel-flanges between the rails D and A′, the top slope *t′* on the end portions of the rails D and E allowing such a lateral movement of the shifting rails to be effected.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a main track and a side track, of a swinging-rail frog, two connected switch-rails joined in sequence with the frog, having their free ends sloped from the top and also on one side of each, a device that will lock the frog-rail, and mechanism which will release said rail and simultaneously vibrate the frog-rail and switch-rails when actuated by the lateral impact of a wheel-flange, substantially as described.

2. The combination, with a main track and a side track, of a swinging-rail frog having its rail pivoted nearer one end, a locking device therefor, a bent pivoted rail at its longer end, and connections between the pivoted rail and the locking device which will transfer motion received from lateral impact of a wheel-flange on the pivoted rail and thereby release the locking device, substantially as described.

3. The combination, with a swing-rail frog, a switch, a main track, and a side track, of a bent pivoted rail near one side-track rail, a locking device for the frog-rail, and mechanism connecting these parts that will be moved to set the frog-rail in alignment with the side-track rail and one switch-rail when the bent rail is impinged by a wheel-flange traveling on the side track toward the frog, substantially as described.

4. The combination, with a main track and

a side track, a swinging-rail frog, and two switch-rails connected in sequence with said frog, having their free ends laterally sloped on their outer sides, of a short track-rail laterally bent and pivoted near one end, a series of pusher-bars and bell-cranks, a draft-bar, a latch-dog pivoted in a slot in the draft-bar, a spring therefor, a switch-bar, and a connecting-rod which joins the switch-rails to the switch-rod and also to the pusher-rods and bell-cranks, substantially as described.

5. The combination, with a main track and a side track, of an intermediate swinging-rail frog, two laterally-movable switch-rails joined in sequence to the frog by one end of each rail, a latch-dog adapted to interlock with an aperture in the frog base-plate, a finger-spring therefor which holds the dog interlocked when the frog-rail is aligned with the main track, a draft-bar, a lateral limb loosely connected to the draft-bar and firmly secured to the end of the frog-rail, a pivoted laterally-bent rail which may be moved sidewise by the flange of a car-wheel running on the side track, and pusher-bars, bell-cranks, and means to connect these parts to the pivoted rail, frog-rail, and free ends of the switch-rails, so as to release the latch-dog and concurrently move the frog-rail and switch-rails, substantially as described.

6. The combination, with a frog base-plate, a swinging rail thereon pivoted thereto near one end of the rail, a main-track rail on the frog base-plate at one end, a converging side-track rail secured to the base-plate at the side of the main-track rail, and a spacing-block between an outer main-track rail and an outer side-track rail, of two switch-rails secured by one end of each on the opposite end of the frog base-plate, a pivoted rail adjacent to the inner side-track rail, bent to form a throat between at the free end of the pivoted rail, and mechanism that is connected with the pivoted rail and adapted to lock the swinging frog-rail when it is aligned with the main track and to release said swinging rail when the pivoted rail is actuated by a car-wheel flange, substantially as described.

7. The combination, with a frog having a swinging rail on its base-plate pivoted near one of its ends thereto, a straight outer main-track rail, a parallel inner main-track rail, a bent outer side-track rail, a converging inner side-track rail, and the inner main rail and converging side rail secured together and spaced apart on one end of the frog base-plate, of a locking device for the swinging frog-rail, a releasing device connected thereto and also to a bent pivoted rail adjacent to the inner side-track rail, two shifting switch-rails, one bent, the other straight, and both located between the outer track-rails and joined to the opposite end of the frog base-plate and at their other parallel ends to intervening stay-bars, and a device connecting the switch-rails with the locking and releasing mechanism for the frog-rail, to be actuated in unison therewith, substantially as described.

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Witnesses:
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