

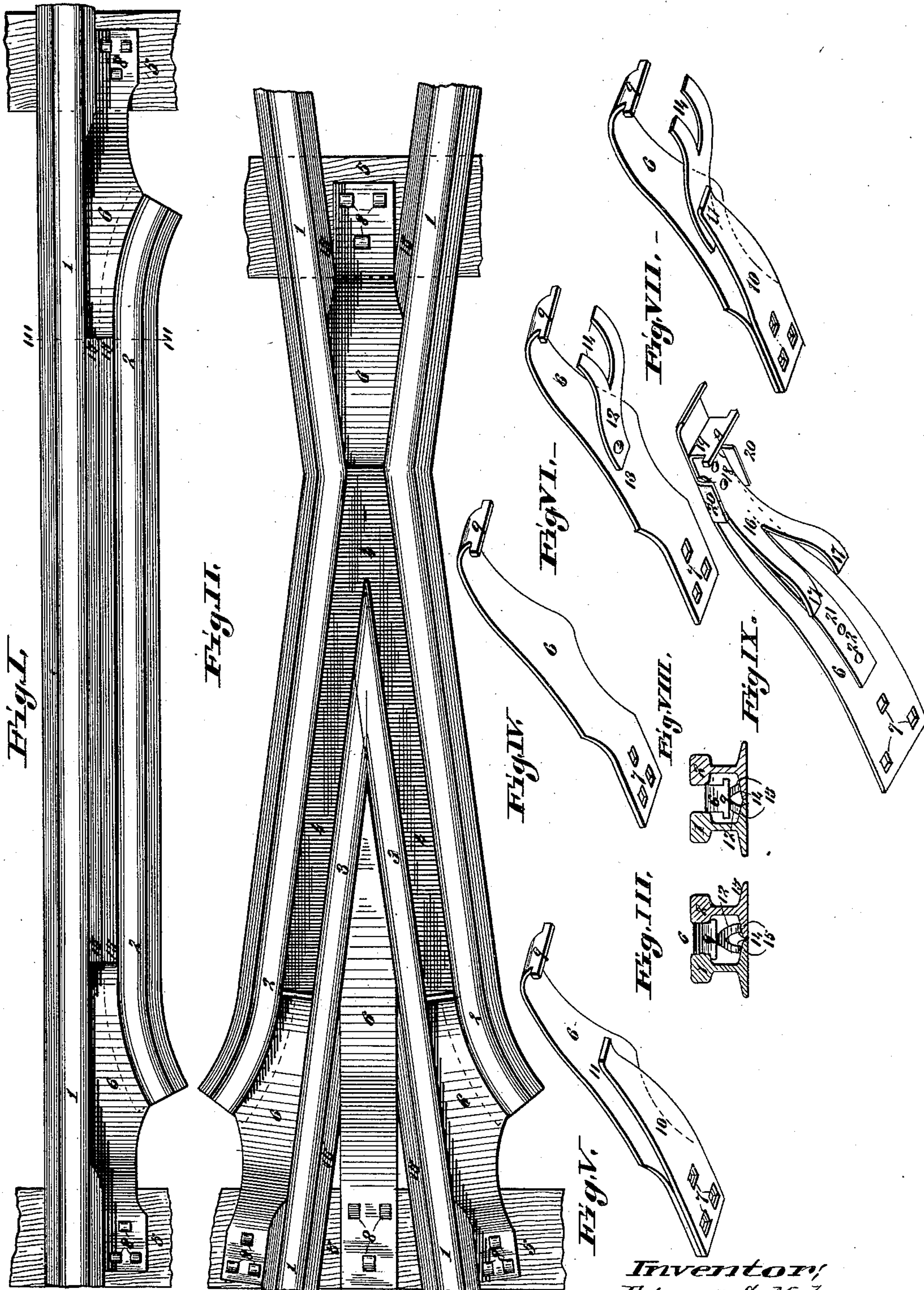
(No Model.)

E. S. MAHONEY.

FOOT GUARD FOR FROGS, GUARD RAILS, AND SWITCHES.

No. 427,884.

Patented May 13, 1890.



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UNITED STATES PATENT OFFICE.

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TO JOSEPH J. MILLER, OF SAME PLACE.

FOOT-GUARD FOR FROGS, GUARD-RAILS, AND SWITCHES.

SPECIFICATION forming part of Letters Patent No. 427,884, dated May 13, 1890.

Application filed February 3, 1890. Serial No. 339,013. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. MAHONEY, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Foot-Guards for Frogs, Guard-Rails, Switches, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This invention relates to devices for sealing or closing the foot-traps that are presented by the tapering apertures that are necessary to the formation of frogs, guard-rails, switches, &c., the devised spring-steel foot-
15 guards being sprung down by the flanges of the wheels of passing trains and springing up again instantaneously after the passage of the train; and the invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a top view of the guard-rails with my foot-guard secured in position to seal the traps thereto. Fig. II is a top view of a frog with my foot-guards secured thereto, and shows the guard-plate secured between the crotch-rails. Fig. III is a vertical section taken on line III III, Fig. I, and also shows the foot-guard spring in its normal elevated position about flush with the top of the rails.
30 Fig. IV is an enlarged perspective view of one of my foot-guards, as shown in Fig. I, and made of sufficiently heavy spring-steel to require no additional spring, and shows the laterally-extending flange on the forward end thereof that rests when depressed by the flange of the wheel on the foot-flange of the rail. Fig. V is a like view and shows a re-enforcing spring that projects forward beneath the foot-guard, as shown on each side
40 the crotch-rail in the frog view in Fig. II. Fig. VI is also a like view to Fig. IV, and shows a bifurcated re-enforce spring riveted to the foot-guard plate beneath the same, its forked ends arranged to slide under pressure on the foot-flanges of the respective frog-rails. Fig. VII is also a similar view and shows a combination of the forwardly-presenting re-enforce springs shown in Figs. V and VI. Fig. VIII is a like vertical sectional view to
50 that of Fig. III and taken on the same line, and shows the spring foot-guard in the posi-

tion to which it is forced under the pressure of the wheel-flanges of the passing train; and Fig. IX is an enlarged perspective view of the foot-guard that seals the foot-trap in front
55 of the point-rails of the frog, and shows its rearwardly-tending bifurcated re-enforce spring with the T-flange that hangs pendent from its forward end.

Referring to the drawings, 1 represents the
60 line-rails; 2, the guard-rails; 3, the point-rails or frog; 4, the filling that embeds the frog, and 5 the ties.

6 represents the foot-guards, which are preferably made of spring-steel. 7 are the spike-
65 holes in the attachment-base of said foot-guards, and 8 are the spikes by which said foot-guards are secured to the ties, and 9 are the laterally-extending T-flanges at or near the forward ends of said foot-guards, which, when
70 the foot-guard is depressed by the flange of the wheels of passing trains, rests on the foot-flanges of the rails and stiffens the spring of said foot-guard, and also said T-flange prevents the elevation of the foot-guard above
75 its required normal position flush with the summit of the rail, so that it is thus securely held from projection above the rails, and therefore cannot trip the switchman.

The foot-guards may be made, as shown in
80 Fig. IV, of a single integral piece of spring-steel, or may be constructed, as shown in Figs. V, VI, VII, and IX, with supplemental springs beneath them to re-enforce their stiffness. When formed of a single piece of
85 spring-steel, the foot-guard is preferably made of somewhat heavier material. It may be about three-eighths of an inch in thickness; but when supplemental springs are attached its thickness may be reduced about one-
90 third—that is, to about one-quarter of an inch. The length of the foot-guards as at present constructed is about twenty-five inches, more or less, except with those located in front of the frog and between the point V-rails of the
95 same, which, especially the latter, are of necessity of somewhat longer dimensions—the first-named about thirty-six and the latter forty-four inches long, more or less.

10 represents a forwardly-projecting rear-
100 attached re-enforcing spring, (see Figs. V and VII,) which is secured in position beneath the

foot-guard by the same spikes that hold said guard, which pass through registering spike-holes in the re-enforce spring and alike numbered with those of the foot-guard, and the said spikes being driven into the ties, both the foot-guard and its re-enforce spring are thus firmly held in position, and the curvilinear saddle 11 at near the forward end of said re-enforce spring re-enforces and stiffens the spring of the foot-guard under pressure as it rides thereon.

12 represents a forwardly-presenting bifurcated spring, whose rear end is secured, preferably, at about the middle of the foot-guard and beneath the same by the rivet or rivets 13. The forwardly-projecting sprawl-forks 14 of said spring (when the foot-guard is depressed by the flanges of the wheels of the passing trains) slide along on the foot-flanges 15 of the rails, so as to stiffen the foot-guard under its extreme pressure. (See Fig. VI, in which said bifurcated re-enforce spring is shown attached by itself beneath the foot-guard, and Fig. VII, in which it has the coadjutant assistance of the rear attached spring 10, heretofore described.)

The foot-guard that seals the foot-trap between the approaching rails in front of the point-rails of the frog is of necessity of somewhat different construction to those at the guard-rails and other points, for the filling ahead of said foot-guard between the guard-rails and the frog-point might prevent the downward movement of the T-flanges if placed at the extreme forward end of said foot-guard, and also the slide movement of the straddle-forks of the re-enforce spring on the foot-flanges of the rails if they had a forward projection would be buffer-stayed by the same impediment. To avoid said interference the foot-guard that faces the V-point of the frog has a bifurcated re-enforce spring 16, with a rearward instead of forward projection, its forked end 17 sliding backward instead of forward on the foot-flanges of the rails. The said re-enforce spring is secured beneath and to said foot-guard by the rivets 18. A forward extension 19 of the re-enforce spring-plate is turned down pendent from the foot-guard, and at its lower extremity carries a T-flange similar to that on the forward end of other foot-guards and alike numbered, which, when the foot-guard is depressed by the flange of the wheels of the passing train, rests on the foot-flanges of the rails out of interference with the filling-block that embeds the point-rails of the frog, and said T-flange holds the guard captive from springing upward above said rails. Pendent wings 20, turned down at a right angle from the above-described foot-guard, (shown in Fig. IX,) laterally hold the re-enforce spring in position, and thus re-enforce its riveted attachment, and at the same time add stiffness to the foot-guard.

A rear supplemental spring-plate 21 is secured at its rear end beneath the foot-guard

by the rivets 22. The forward end of said spring-plate passes between the foot-guard and its re-enforce spring and stiffens both. 70

The foot-guard that seals the trap presented by the aperture between the point-rails of the frog, as said aperture is of a more acute angle, is of necessity longer than the others above described. Like all the other foot-guards, its normal position is flush with the surface track, but, unlike them, its normal position may be its constant position also, for it is not required to spring down under the pressure of the flange of the wheels of passing trains, as are they, as it is located on the reverse side of the rails to that traveled by said flanges, and its forward point may rest on the bevel edge of the point-rails or be supported by any suitable means. As this latter foot-guard has no spring movement, it need not be made of steel or other spring material, but may be constructed of iron or any other suitable material that will not succumb under the pressure of the switchman's or employé's foot or that of any other man. The formation of said foot-guard and its means of attachment, however, are substantially the same as are those previously described, and are alike numbered. 95

The spring-steel foot-guards are all capable of sustaining a weight of about three hundred pounds without depression below the surface flush-line of the rails, and may be made to sustain a heavier weight, if desired; but it is scarcely possible that any employes on the track will ever go above that weight. On the other hand, when the flanges of the wheels of the passing trains ride over the foot-guard, it readily springs down the two inches, or thereabout, that constitute the depth of said flange without injury to the foot-guard, and as readily, after the passage of the train, springs upward to its normal position. 105

While it has been truly stated that spring-steel is preferably used in the construction of the foot-guards, yet I do not confine myself to the use of that material, for plow-steel or any other suitable material may be used; also, while the preferred length of the guard-rail foot-guard is about twenty-five inches, of that facing the frog-point about thirty-six inches, and of that within said point forty-four inches, yet to accommodate certain constructions of frogs and guard-rails, &c., the length may be considerably increased or diminished without any departure from the essential features of the invention. 115

The danger to life and limb of the "deadly" frog, as it is aptly termed by railway employes who have witnessed so many of their fellow-workmen fatally trapped thereby as the advancing train runs over them, is thus avoided. 125

The filling very commonly used in States where there are statutory provisions to enforce the use of foot-guards, having, like all unyielding attachments, to stop short by two inches of the summit of the rails to allow the 130

passage of the wheel-flanges, is frequently found worse than useless, as it allows abundant latitude for the sole of the employé's shoe to be tightly clamped between the filling 5 and the top flange of the rail, while, unlike my spring foot-guard, the very filling meant for a safeguard prevents the lowering and dislodgment of the foot.

As yard-master of the St. Louis and San Francisco road, and previously in other yards 10 during the last seventeen years, I have lost thirteen men whose lives might have been preserved had this foot-guard then been in use; but the above fatal accidents that I have 15 personally witnessed are but few comparatively to those occurring along the various lines of rail. Thus, according to the record of the Switchmen's Association of the United States, two hundred and two employés have 20 been thus trapped and run over within the last seven years, besides accidents that have occurred in foreign territory.

It is hoped that the Office will excuse this concluding statement, made to show the necessity of the invention—a necessity that is 25 generally acknowledged by railroad men.

I claim as my invention—

1. In a foot-guard for frogs, &c., the combination, with the converging rails, of the spring 30 guard-plate arranged between said rails and provided with a forward T-flange bearing normally against the under side of the rail-heads and adapted to rest on the rail-flanges to stiffen the spring when the latter is depressed, substantially as set forth. 35

2. In a foot-guard for frogs, guard-rails, switches, &c., the combination of the spring foot-guard plate 6, provided with the forward integral T-flange 9, that when said plate is 40 depressed rides the foot-flanges of the rails and stiffens said guard-plate, and limits its elevation when it comes in contact with the ball of the rail, and the converging rails, the foot-trap between which said foot-guard stops 45 or seals, substantially as and for the purpose set forth.

3. In a foot-guard for frogs, guard-rails,

switches, &c., the combination of the spring foot-guard plate 6, provided with the forward integral T-flange 9, the rear attached re-en- 50 force spring 10, and the converging rails, the foot-trap between which said foot-guard stops or seals, substantially as and for the purpose set forth.

4. In a foot-guard for frogs, guard-rails, 55 switches, &c., the combination of the spring foot-guard plate 6, provided with the forward integral T-flange 9, the rear attached re-enforce spring 10, the bifurcated centrally-attached re-enforce spring 12, the forwardly- 60 projecting forks of which springs 12 are arranged to ride the foot-flanges of the rails when the foot-guard is depressed, and the converging rails, the foot-trap between which the said foot-guard stops and seals, substan- 65 tially as and for the purpose set forth.

5. In a foot-guard for frogs, guard-rails, switches, &c., the combination of the spring foot-guard plate 6, provided with a T-flange, 70 and the bifurcated re-enforce spring arranged under plate 6, said T-flange arranged to ride the foot-flanges of the rails when said foot-guard is depressed by the flange of the wheels of passing trains and limit its elevation when 75 it comes in contact with the ball of the rail, and the converging rails of the frog, &c., the foot-trap between which the said foot-guard stops or seals, substantially as and for the purpose set forth.

6. In a foot-guard for frogs, guard-rails, 80 switches, &c., the combination of the spring foot-guard plate 6, tapered to fit the aperture of the frog, &c., provided with an extension T-flange, and the bifurcated re-enforce spring riveted to the under side of said spring foot- 85 guard, with the converging rails of the frog, &c., the foot-trap between which the said foot-guard stops or seals, substantially as and for the purpose set forth.

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In presence of—

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