

1,044,508.

H. G. ELFBORG.
RAILWAY FROG.
APPLICATION FILED APR. 21, 1911.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

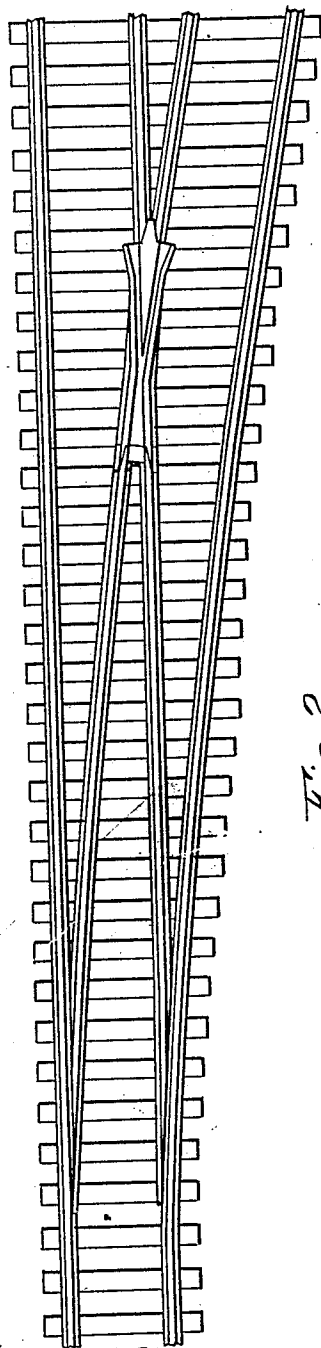
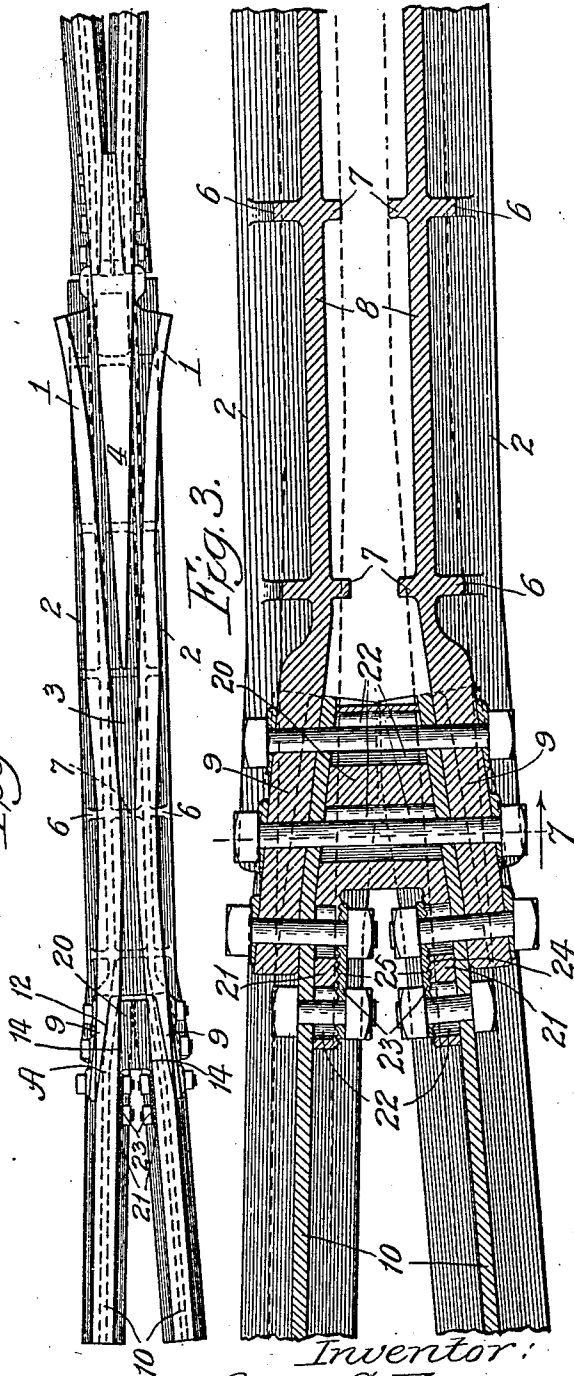


Fig. 2.



Witnesses:
John Enders
Henry A. Parks

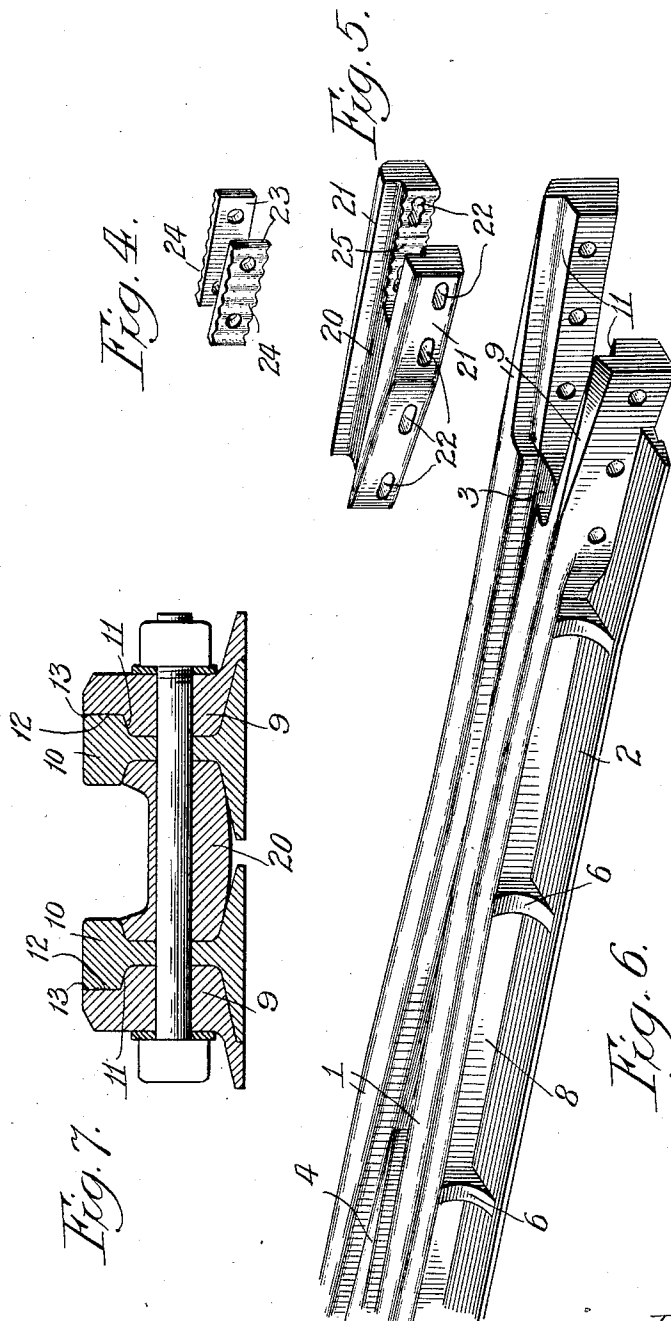
Inventor:
Henry G. Elfborg,
by Sheridan, Wilkinson, Scott & Richmond
Attys.

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UNITED STATES PATENT OFFICE.

HENRY G. ELFBORG, OF CHICAGO, ILLINOIS, ASSIGNOR TO AJAX FORGE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RAILWAY-FROG.

1,044,508.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed April 21, 1911. Serial No. 622,497.

To all whom it may concern:

Be it known that I, HENRY G. ELFBORG, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-Frogs, of which the following is a specification.

The object of my invention is to provide certain improvements in the type of railway frog described and claimed in my Patent 940,863, granted November 23, 1909. The general purpose of the structure described in said patent is to provide a railway frog constructed of hard metal, such as man-
ganese-steel, or other suitable alloy, the frog being so constructed as to provide a junction with the rails of such form that the passage of the wheels thereover will not result in rapid wear; and to provide means whereby the frog and rails may be assembled and laid in place with the minimum amount of labor.

The particular object of the invention described and claimed herein relates to the wedge at the toe end of the frog and to means for securing the wedge in the position to which it is adjusted.

Figure 1 is a plan view of a section of railway track with a switch track showing my improved frog in place. Fig. 2 is a plan view on a larger scale of my improved frog and the connected parts of the track rails. Fig. 3 is a horizontal sectional view showing the toe end of the frog, the wedge, connected track rails, bolts, and bolt plates. Figs. 4, 5 and 6 are perspective views of the bolt plate, the wedge and the toe end of the frog, respectively. Fig. 7 is a vertical section on the line 7 of Fig. 3.

As stated in my previous patent above referred to the wear upon railway frogs is much more rapid, as the result of the violent blows to which they are subjected, than upon other parts of a railway track. In order to overcome this difficulty it has previously been proposed to construct the frog point and some of the adjacent parts of manganese-steel, or other hard alloy, but the use of such devices has developed other difficulties at the point of junction between the hard alloy and steel rails, and the assemblage of the parts in some instances leads to more or less difficulty on account of their complicated form.

As clearly shown in Fig. 2 of the draw-

ings and other views, I construct the hard metal frog in a single integral piece, the wing rails and point rails terminating at the ends thereof, and substitute for the wing rails integral wing flanges 1, cast upon and forming part of the frog. Taken in its entirety, my improved frog includes in a single integral structure base flanges 2, vertical webs 8, connected by a floor plate 3, a point 4, wing flanges 1, transverse strengthening webs 6 extending between the base flanges and wing flanges, transverse strengthening webs 7 extending between the vertical webs 8, and end extensions for the attachment of the rails.

At the toe end of the frog,—that is the left end as viewed in Fig. 2,—the wing flanges 1 are continued beyond the base of the frog, forming extensions 9 between which the ends of the rails 10—10 are received. The extensions 9—9 are recessed, forming shoulders 11 adapted to lie directly beneath the heads of the rails and support the same and the outer side of the rail head is planed away at 12 sufficiently to form a right angle at 13 for the purpose of forming a tight junction with the extension 9, thus avoiding the difficulty of fitting said extension over the rounded top corner of the rail head. The extensions 9 are tapered on their inner faces from the body of the frog outwardly, for the purpose of forming a diagonal junction with the attached rails which are received between said extensions.

The rails 10 are prepared for attachment to the frog by first bending them at about the point indicated at A in Fig. 2. The inner side of the rail head is then planed away at 14 to make the gage line of the bent part of the rail continuous with that of the remainder of the rail. The extent of the bend in the rail is such that the planing away at 14 to straighten the gage line cuts the head substantially down to the web at the end of the rail, as shown in Fig. 2. As previously explained, the outer side of the rail head is planed off at 12 for the purpose of making a square joint with the extension 9. Owing to the bending of the rail the edge 12 lies on a diagonal line corresponding to the inside taper on the extension 9, thus forming a diagonal joint therewith.

The effect of the diagonal joint along the line 12 is to cause the tread of a passing wheel to pass gradually from the steel rail

to the hardened frog, thus avoiding the shock incident to riding over a square transverse joint. Furthermore, the shoulder 11 lying beneath the rail head, firmly supports the rail and keeps the upper surface of the extension 9 in the same plane with the head of the rail. By this means a smooth surface at the joint is assured, and all possibility of the rail and frog settling or wearing out of alinement is avoided.

In order to force the rails 10 into firm contact with the extensions 9 of the frog, I provide a wedge 20 having projections 21 at each side of its larger end. Each of the projections 21 is formed on its outer side to fit between the base flange and head of the connected track rail, and transverse bolt holes 22 are formed in said projections and in the form illustrated in the drawings similar bolt holes are formed in the body of the wedge. Registering bolt holes are formed in the track rails and in the frog projections 9.

In order to permit the bolts to be inserted in the bolt holes in any position of the wedge within its range of adjustment, the bolt holes in the wedge are of elongated cross section and have their long diameters extending longitudinally of the wedge. The form of the bolt holes in the different parts may be varied, it being necessary only that they be of such form and size as to permit longitudinal adjustment of the wedge without interfering with registry of the bolt holes in the wedge and coacting parts.

Owing to the heavy shocks to which the frog and connected rails are subjected it sometimes becomes necessary after a period of use to drive the wedge farther in, and owing to this fact and the difficulty of proportioning the parts with sufficient exactness to secure registry of the bolt holes when the wedge is driven to home position in the first assemblage of the structure, I have found it necessary to enlarge the bolt holes as above described for the purpose of permitting the bolts to be inserted in place in any position to which it may be found necessary to adjust the wedge.

Unless further means than those above described be provided there would be no means for holding the wedge in its adjusted position other than the pressure set up by screwing the nuts in place upon the bolts. The frictional resistance set up by the pressure on the outer sides of the wedge would not in all cases be sufficient for this purpose. I, therefore, provide bolt plates 23 which have fluted surfaces 24 meshing with correspondingly fluted surfaces 25 upon the wedge. The plates 23 are provided with bolt holes of the same size as the bolts, and the coacting fluted surfaces on the plates and wedge permits the plates, after the wedge is driven home, to be fixedly positioned upon the

wedge with the fluted surfaces of the plates and wedge in mesh and with the bolt holes in the plate in registry with the coacting bolt holes in the rails and frog projections. The flutings upon the plates 23 and upon the wedge may be of any desired degree of fineness in order to secure as fine a degree of adjustment of the plates upon the wedge as is necessary.

When the parts are assembled, as shown in Figs. 2 and 3, the intermeshing of the fluted surfaces of the plates and wedge and the engagement of the bolts 25 with the bolt holes in the rails 10, frog projections 9 and plates 23 positively lock the wedge against becoming loosened by longitudinal movement. The structure described constitutes means whereby, to state the matter briefly, the wedges are provided with bolt holes adjustable in position, the movement of the plates 23 to different positions along the wedge and the intermeshing of the fluted surfaces thereon have the effect of moving the position of the bolt hole in the wedge, that is, considering for the time being that the plate forms part of the wedge.

It will be obvious, of course, that the precise form of fluted surfaces shown is not essential, but that the essential feature of this part of the structure is the provision of a plurality of interlocking shoulders upon the plates and wedge whereby the plates may be adjusted to several positions upon the wedge and in each position may be locked securely against longitudinal displacement.

It will be obvious that the application of my invention is not dependent upon the precise form of wedge shown or upon the location of the enlarged bolt holes in the wedge as shown, but that the principle of my invention may be applied in mechanism of widely diverging form without departing from the spirit thereof.

I claim:

1. A railway frog having integral projections at one end adapted to embrace the end portions of the coacting rails, a wedge adapted to be driven between the end portions of said rails, said projections, rails and wedge being provided with transverse bolt holes, the bolt holes in one of said parts being of greater diameter horizontally than the bolt used therewith, a plate having a bolt hole adapted to closely fit said bolt, said plate and said part having said bolt holes of greater horizontal diameter being provided with interfitting parts to hold them in fixed relation in any one of several positions.

2. A railway frog having integral projections at one end, a wedge for forcing the end portions of rails against said projections, said parts being provided with bolt holes, the bolt holes in one of said parts

being of sufficient cross sectional size to afford clearance longitudinally of the rails for said bolts, and members extending from said bolts to the part having the clearance
 5 bolt holes for transmitting a longitudinal thrust directly between said part and said bolts.

3. A railway frog having integral projections at one end, a wedge adapted to be driven between said projections to force the end portions of rails thereagainst, a bolt, said wedge being provided with a bolt hole of greater diameter longitudinally of the wedge than said bolt, a plate, means upon
 10 said plate and wedge for positively securing them in a plurality of positions against relative displacement longitudinally of said wedge, said plate being provided with a bolt hole of the same size as said bolt.

4. A railway frog having integral projections at one end, rails adapted to be received between said projections, a wedge adapted to be driven between said rails to force the end portions thereof against said
 20 projections, said wedge being provided with projections at its larger end, said wedge projections and said rails being provided with bolt holes, the bolt holes in said projections on said wedge being of greater diameter
 25 longitudinally of the wedge than said bolts, plates having bolt holes of the same size as said bolts, said plates and the projections upon said wedge having a plurality of inter-engaging shoulders whereby said
 30 plates may be secured in a plurality of positions against longitudinal displacement relative to said projections.

5. A railway frog having integral projections at one end, rails adapted to be received between said projections, a wedge adapted to be driven between said rails to force the end portions thereof against said
 40 projections, said wedge being provided with

projections at its larger end, said wedge projections, frog projections, and said rails
 45 being provided with bolt holes, the bolt holes in said projections on said wedge being of greater diameter longitudinally of the wedge than said bolts, plates having bolt holes of the same size as said bolts, 50 said plates and the projections upon said wedge having a plurality of inter-engaging shoulders whereby said plates may be secured in a plurality of positions against longitudinal displacement relative to said
 55 projections.

6. A railway frog having integral projections at one end, rails adapted to be received between said projections, a wedge adapted to be driven between said rails to force the end portions thereof against said
 60 projections, said wedge being provided with projections at its larger end, said wedge projections, frog projections and said rails being provided with bolt holes, the bolt
 65 holes in said projection on said wedge being of greater diameter longitudinally of the wedge than said bolts, plates having bolt holes of the same size as said bolts, said plates and the projections upon said wedge
 70 having a plurality of inter-engaging shoulders whereby said plates may be secured in a plurality of positions against longitudinal displacement relative to said projections, the body of said wedge also being
 75 provided with bolt holes of greater diameter longitudinally of the wedge than said bolts and coacting bolt holes in said rails and frog projections.

In testimony whereof, I have subscribed
 80 my name.

HENRY G. ELFBORG.

Witnesses:

HENRY A. PARKS,

FLORENCE A. FLORELL.