No. 676,008. Patented June 11, 1901.

M. D. PRATT.

RAILWAY FROG OR LIKE STRUCTURE.

(Application filed Apr. 13, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

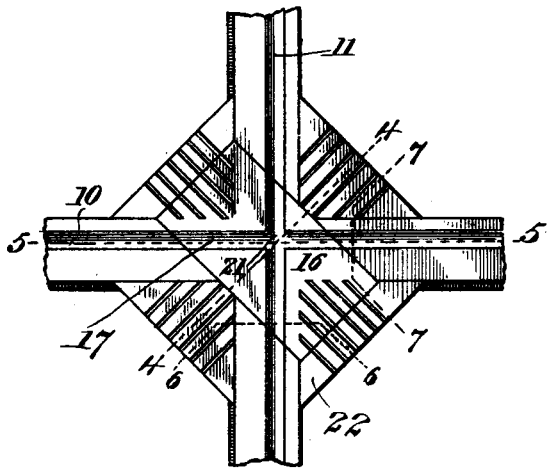



Fig. 2.

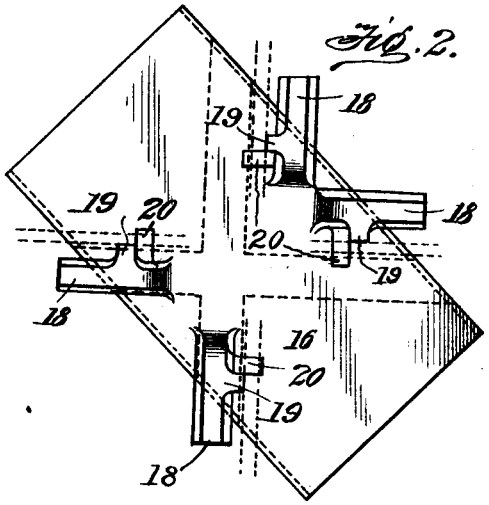



Fig. 4.

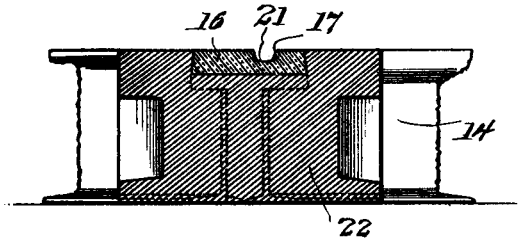



Fig. 3.

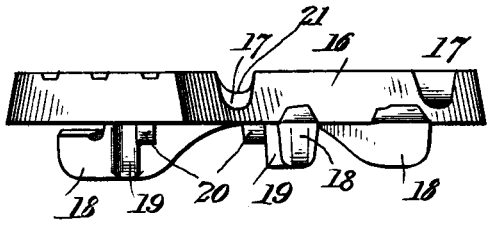



Fig. 5.

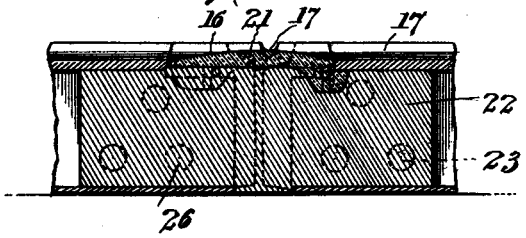
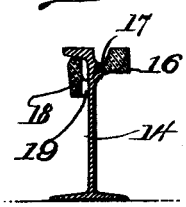



Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 7.

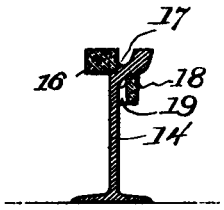



Fig. 8.

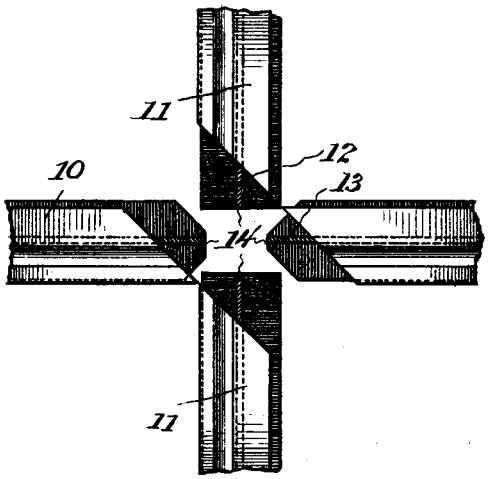



Fig. 9.

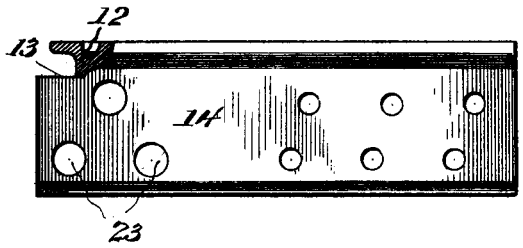
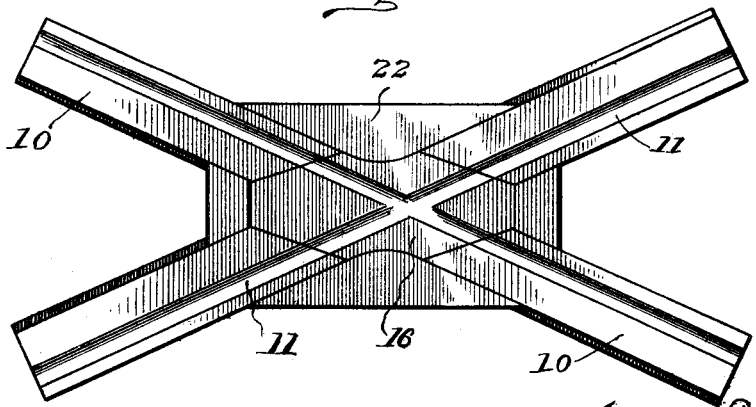



Fig. 10.

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# UNITED STATES PATENT OFFICE.

MASON D. PRATT, OF STEELTON, PENNSYLVANIA.

## RAILWAY-FROG OR LIKE STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 676,008, dated June 11, 1901.

Application filed April 13, 1901. Serial No. 55,666. (No model.)

*To all whom it may concern:*

Be it known that I, MASON D. PRATT, a citizen of the United States, residing at Steelton, in the county of Dauphin, State of Pennsylvania, have invented certain new and useful Improvements in Railway-Frogs or Like Structures, of which the following is a specification.

It has heretofore been common to construct railway-frogs, crossings, and like structures by embedding the adjacent ends of the frog-arms or wing-rails in a solid mass of iron or steel cast about the rails. In the cast portion of the better class of such frogs a depression or pocket is formed at and about the intersecting-point of the gage-lines, and into this depression is fitted a metal plate of hard cast-steel or tempered steel, termed a "hard center plate," having wearing qualities superior to those of the rails. It is well known that the frogs and crossings wear most rapidly at the intersection of the grooves for the wheel-flanges, and it is desirable, therefore, to have this portion of the frog constructed of a harder and tougher metal than the other parts. Owing to the destructive effect of the large body of hot metal on the hardness of the plates heretofore generally used it has been the common practice to fit these plates in a pocket provided for the purpose and secure them in place by means of bolts or wedges and fill the space between the hard center and the walls of the pocket with a soft-metal alloy. The severe pounding which these hard centers receive from the rolling-stock loosens them, thus increasing the destructive effect of the pounding and necessitating constant inspection and involving much expense in resetting them.

The object of my invention is to make the hard center an integral part of the frog, avoiding the use of bolts, wedges, and soft-metal filling, thus securing a more substantial and durable structure. As it is difficult and expensive to machine the hard center plate, it is essential that it be held accurately in line and surface in the position intended. Moreover, the best practice requires that the joint between the hard center and abutting rail ends be made oblique to the gage-line. Without suitable means to prevent movement such a joint would tend to displace the hard center when the rails expand with the heat imparted by the body of cast metal in casting.

The object of the invention is accomplished, first, by using for the hard center a cast plate of self-hardening steel or one in which the hardness and toughness are not affected by the heat received from the large body of cast-iron used in holding the several parts together, and, second, by providing this hard center plate with lugs so disposed and so formed as to interlock with the rails in a manner effectually preventing its displacement by the expansion of that portion of the wing-rails enveloped by the body of cast-iron in the process of casting.

In the accompanying drawings, Figure 1 is a plan view of a right-angled frog embodying the invention. Fig. 2 is a bottom plan view of a center plate for such a frog, showing the interlocking lugs. Fig. 3 is a side view of the center plate, taken at right angles to one of the rails. Figs. 4, 5, 6, and 7 are sections taken, respectively, on the lines 4 4, 5 5, 6 6, and 7 7 of Fig. 1. Fig. 8 is a plan view showing the manner in which the meeting ends of the rails are prepared and arranged to receive the center plate. Fig. 9 is a side elevation of one of the wing-rails, and Fig. 10 is a plan view of a center plate for an acute-angled frog.

Referring to the drawings, 10 indicates the rails of one track, and 11 indicates the rails of the intersecting track. Figs. 8 and 9 illustrate the manner in which the adjacent ends of these rails are prepared to receive the center plate and the molten metal constituting the body of the frog. A portion of the head of each rail is cut away, the vertical cut being preferably on an inclined line 12 and the horizontal cut being at the upper edge 13 of the web 14. The adjacent ends of all the rails are thus prepared as shown in Fig. 8.

As shown, the self-hardening steel center 16 is so shaped that its edges are adapted to fit against the inclined ends 12 of the rails. On the upper side of the center are intersecting grooves 17 for the wheel-flanges, the gage-lines of the grooves being arranged to correspond with the gage-lines of the rails. On the under side of the center plate are four lugs 18, adapted to extend under the heads of the rails, respectively, as shown in Figs. 6

and 7, the lug for each rail being arranged to fit against the under side of the head of the rail at its longest edge—that is, under the side of the head on which the inclined face 12 makes an acute angle with the outside line of the rail-head. Each of the lugs 18 has an abutment 19, which fits against the side of the web of the rail, and a bearing 20, which rests on the edge 13 of the cut portion of the web. The floors 21 of the grooves 17 are preferably inclined upwardly from the edges of the center plate to the point of intersection, as shown in Fig. 5, so that at the intersecting-point the wheel-flanges will ride on the floors and prevent the treads of the wheels from battering the angles of the grooves.

The rails and the center are assembled by moving the rails longitudinally into engagement with the interlocking parts of the center. When so assembled, the hard center is positively held against vertical or lateral movement with relation to the rails. Thus the center is held against vertical movement by the engagement of the parts 20 with the web edges 13 and of the lugs 18 with the under surfaces of the heads of the rails. Each rail is held against relative lateral movement in one direction by the inclined end of the head fitting against the edge of the plate and against movement in the opposite direction by the abutment 19 fitting against the web of the rail. It follows that when the four wing-rails 10 11 are secured in position and properly interlocked with the center plate the latter will be immovably held in the position which it is to occupy in the finished frog. The wing-rails with the hard center adjusted in place, as described, are secured to a suitable frame embedded in the floor of the foundry. While the parts are thus held in position a body 22 of cast iron or steel is formed by pouring the metal into a suitable mold arranged around the adjacent ends of the rails and the center plate. All of the parts are thus practically made integral. To more securely unite the molten metal to the rails, the latter are provided with perforations 23. The plate 16 is preferably wider at the bottom than at the top, thus forming a dove-tailed joint with the frog-body, as shown in Fig. 4.

My invention is not limited to the specific form and arrangement of interlocking devices illustrated in the drawings, as it is manifest the same may be varied in detail largely within the province of ordinary mechanical skill. Furthermore, the invention is applicable to frogs of all angles and to any similar devices used in railway construction. The invention is also applicable to rails of different sections.

The self-hardening steel center is preferably formed exactly as it is to exist in the finished frog to obviate the expense of shaping it after the frog parts are united. The several parts when constructed and fitted according to this invention maintain their proper relation exactly during the casting operation, and very little finishing is required thereafter.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A railway-frog or like structure comprising a center plate of self-hardening steel, a series of wing-rails interlocked with said center, and a cast-metal body formed about said center plate and wing-rails.

2. A railway-frog or like structure comprising a center plate of self-hardening steel, a series of wing-rails, and a cast-metal body, said center plate and wing-rails having mutually-interlocking projections and recesses, and said body being cast about said center plate and rails.

3. A railway-frog or similar structure comprising a series of rails having the adjacent ends of their heads cut away on diagonal lines, in combination with a hard center plate of self-hardening steel having its edges fitting against the inclined ends of the rail-heads, and means for uniting all of said parts securely.

4. In a railway-frog or similar structure, a hard center plate having a series of laterally-extending lugs adapted to engage the adjacent ends of the rails, for the purpose set forth.

5. A railway-frog or similar structure comprising a series of rails having the adjacent ends of their heads cut away on diagonal lines, in combination with a hard center plate having lugs adapted to fit under the rail-heads and abutments adapted to fit against the rail-webs, whereby the hard center is held in position during the process of casting.

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

MASON D. PRATT.

Witnesses:
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C. E. FINK.