Oct. 18, 1927. 1,646,170

E. S. SEAVEY

SPLICE BAR AND METHOD OF MANUFACTURE

Filed March 10, 1926

Fig. 1.

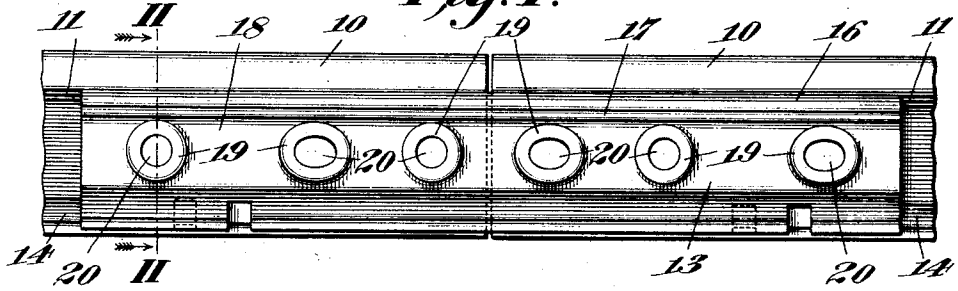


Fig. 2.

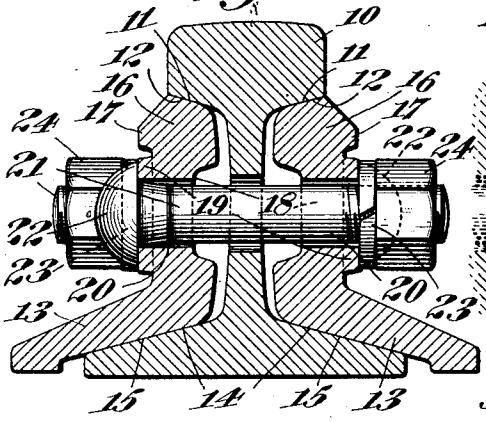


Fig. 3.

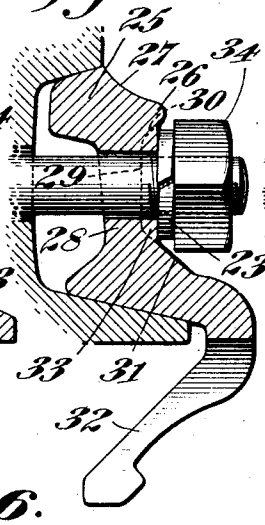


Fig. 4.

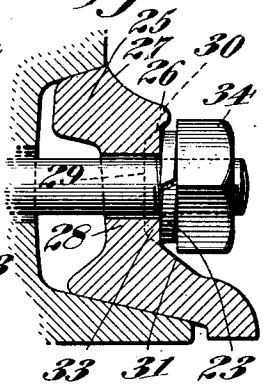


Fig. 5.

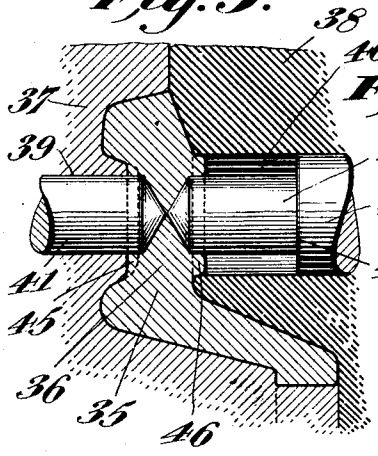


Fig. 6.

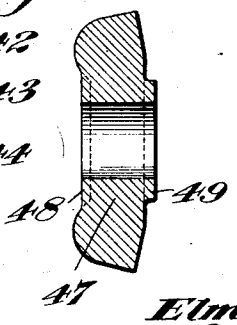
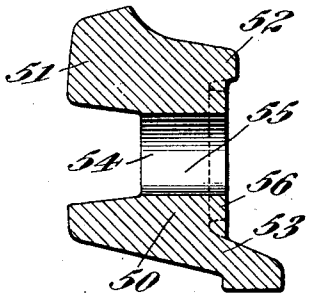


Fig. 7.



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UNITED STATES PATENT OFFICE.

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SPLICE BAR AND METHOD OF MANUFACTURE.

Application filed March 10, 1926. Serial No. 93,615.

My invention relates to improvements in rail-splices such as are used for connecting the abutting ends of railway track-rails, and more particularly to reinforcing various kinds of splice-bars around the bolt-holes and at the same time forming a surface to seat the head, nut or lock-washer of the ordinary track-bolts now in the use without altering their construction.

Another object of my invention relates to forming the bolt-holes in splice-bars made of rolled metal in such a manner as to produce a splice-bar having a greater vertical stiffness than when the bar is punched by the ordinary methods now in use.

A further object of my invention is to produce bolt-holes in splice-bars while the bar is in a heated and semi-plastic condition by means, which will, in forming the bolt-holes allow the metal to extrude around the punches thereby forming a reinforcing boss either on one or both sides of the bar.

In designing and using splice-bars of various kinds, including those having central downwardly-projecting flanges, it has been found desirable to strengthen the upper part of the splice-bar, that is, the member which fits between the lower surface of the rail-head and the upper surface of the rail-flanges, by an external integral thickening or rib, without however interfering with the flanges of wheels which run on the track, and similarly, it has been considered advisable under certain conditions to add to the metal on the exterior surface of an angle-splice-bar at the junction of the splice-bar portion and the inclined angle portion, this latter portion being that which rests upon and bears against the upper surface of the rail-flange.

In this strengthening of the splice-bar the added metal at the points previously indicated has been put in a form such that when viewed in cross-section the central part of the exterior face of the splice-bar portion is substantially vertical, interposed between two other faces which diverge outwardly therefrom. On account of the small limits within which this construction has to be designed and the comparatively large size of track-bolts or fastenings required to give sufficient strength to the joint, an ordinary nut or bolt-head with a flat bearing surface cannot be used as there is not space enough to allow them to fit properly or the nut to be turned.

Splice-bars having heads formed with strengthening ribs on their exterior faces or having reinforcing fillets at the junction of the head or base flange of the bar have always been considered as producing a much stronger type of bar than those having a plain vertical exterior face on account of a better distribution of the metal, but on account of the difficulty of applying the track-bolts and fastenings thereto and the additional cost incurred this type of bar has not come into extensive universal use.

Various devices have been tried to obviate this difficulty, as by making the track bolts and nuts of special design, or having special formed washers or bearing members. In other cases counterbores or countersunk portions have been made on the face of the splice bars to form bearing surfaces for the head of the track-bolt or nut. This counterboring or the like weakens the bar to a considerable extent depending on the size of the counterbore. In my improved splice-bar I form bosses of sufficient height to make it possible to form the bar with an outwardly extending ribbed head and reinforced foot member and at the same time secure a good bearing surface for the flat side of the heads or nuts of the track bolts, and this forms another important feature of my invention.

It will be noted, however, that my invention is applicable to any form of splice bar as it greatly increases the stiffness of the bar without adding materially to the cost or weight of the bar.

Other objects of my invention will appear hereinafter.

Having thus given a general description of my invention, I will now, in order to make the same more clear, refer to the accompanying one sheet of drawings in which like characters of references indicate like parts.

Fig. 1 is a side elevation showing one form of a rail-splice-bar I may use applied to the abutting ends of two rails and formed in ac-

cordance with my invention, the bolts being omitted to more clearly illustrate the reinforcing bosses on the outside face of the bar;

Fig. 2 is a cross section of the finished rail-splice taken on the line II—II of Fig. 1, the figure being drawn on a larger scale than that shown in Fig. 1;

Fig. 3 is a vertical cross-section of an angle-splice-bar applied to a rail, having a channel-shaped outer face with a depending flange;

Fig. 4 is a vertical cross-section of an angle-splice-bar similar to Fig. 3, but without the depending flange;

Fig. 5 illustrates the manner of punching a well known form of splice-bar and forming bosses around the boltholes on each side of the bar;

Fig. 6 is another form of splice-bar showing reinforcing bosses on each side of the bar around the bolt-holes; and,

Fig. 7 illustrates another form of splice-bar having a large head and base with a reinforcing boss around the bolt-hole on the outer side of the bar.

Referring now to the characters of reference on the drawings, and first more especially to Figs. 1 and 2, the numeral 10 indicates railway-rails shown in this case as of T-section, although other sections may be used; 11 the under face of the rail-head against which the upper inclined face 12 of the splice bar 13 engages, and 14 the upper face of the rail-base-flanges against which the lower surface 15 of the angle portion of the splice-bar contacts. The heads 16 of the splice-bars have outwardly extending reinforcing ribs 17, while the webs 18 of the splice bars, have bosses 19, extending outwardly around the bolt-holes 20, through which bolts 21 extend for clamping the splice-bars in position against the sides of the rails. As shown in Figs. 1 and 2, these bosses 19 extend outwardly with their outer faces substantially in vertical alignment with the outer edges of the reinforcing ribs 17, thereby forming seat bearing surfaces for the head 22 of the bolts 21 or for the usual lock-washer 23 against which the nut 24 engages when screwed tight upon the screw-threaded end of the bolt.

In Fig. 3 I have shown another form of splice-bar having a strengthened upper head portion 25 formed with a reinforcing rib 26, and a concaved upper outer face 27 with a vertical web 28, having the central part of its exterior face 29 substantially vertical and interposed between two other diverging faces 30 and 31. This bar is also provided centrally with a depending flange 32 which extends below the rail flanges and further reinforces the bar. In this bar the reinforcing boss 33 around the bolt-holes increases the thickness of the vertical web 28 on its exterior face 29 to such an extent that the outer surface of the boss extends nearly to the outer edge of the rib 26 thereby greatly increasing the vertical width of the central part of the exterior face 29, thereby allowing sufficient bearing surface for the flat inner side of a track bolt head, or the usual lock-washer 23 against which a nut 34 can be tightly screwed without interference with the rib or side of the bar.

In Fig. 4 I have shown a similar splice-bar to that illustrated and described in Fig. 3 but with the depending flange 32 omitted, otherwise the shape of the bar is the same as in Fig. 3 and the same reference numbers will apply to the different parts.

In Fig. 5 I have illustrated a well known form of splice-bar and a method of punching the same to form integral bosses around the bolt-holes on both sides of the bar. In this figure the splice-bar is indicated generally at 35 having a vertical web 36. The bar is clamped between dies 37 and 38, which are made on their inner faces to conform in contour with the sides of the splice-bar, and to confine the bar therebetween. These clamping dies 37 and 38 have holes 39 and 40, respectively, which are in alignment with each other on opposite sides of the splice-bar for the passage of punches 41 and 42. The hole 40 in the die 38 is of larger diameter than the hole 39 to admit the enlarged portion 43 of the punch 42, the forward end face 44 of which engages the extruded metal on the outside of the splice-bar, thereby compressing it and forming bosses 45 and 46 on the inside and outside of the splice-bar, respectively.

In punching and forming bosses on the bar as illustrated in Fig. 5 or, in fact, in any of the splice-bars illustrated in this application, I prefer to advance both of the punches simultaneously by fluid-pressure until the ends of the punches come incontact with each other, then continuing to advance one of the punches while retracting the other punch while the ends of the punches are still in contact with each other. As shown in Fig. 5, punch 41 has advanced to the end of its working stroke while punch 42 has advanced until its pointed end has come in contact with the pointed end of punch 41, which is substantially in the center of the web of the splice bar.

Punch 42 continues to advance until the enlarged end 44 comes in contact with the extruded metal around the punch 42 and compresses it forming a boss with a smooth outer surface. At the same time punch 41 is retracted by the advancing movement of punch 42.

A machine for operating punches in the above stated manner forms no part of this application, as this is shown and described in my co-pending application, Serial No. 93,614, filed March 10, 1926.

In Fig. 6 I have shown a cross-section of an ordinary plain splice-bar 47, having bosses 48 and 49 formed on its inside and outside respectively, and in Fig. 7, I have illustrated a splice bar 50 having an enlarged head 51 with reinforcing rib 52 and angular base portion 53, connected by a vertical web 54 with bolt-hole 55, surrounded by a boss 56 on the outer face of the vertical web 54 of the bar. In this construction the boss 56 may extend to and connect the reinforcing rib 52 with the base portion 53 as indicated on the drawing.

It will be noted that all of the splice-bars shown in the drawings are of well known approved standard shapes, and that by forming the bolt-holes with bosses around the same in the manner specified, I not only make a much stronger bar, but where ribs are formed on the outside face of the bar, I am able to form a good gripping or bearing surface for the head, nut or lock-washer of any of the standard track-bolts now in use, without special attachments or alterations, and I also wish it understood that although I have illustrated splice-bars of well known cross-section, my invention could be used with any other shape equally as well.

Although I have shown and described my invention in considerable detail, I do not wish to be limited to the exact and specific details shown and described, but may use such substitutions, modifications or equivalents thereof as are embraced within the scope of my invention or as are pointed out in the claims.

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

1. A splice-bar for railway-rails, comprising a rolled metal bar having upset forged reinforcement formed around the bolt-holes.

2. A splice-bar for railway-rails, comprising a rolled metal bar having its web reinforced around the bolt-holes with an annular boss.

3. A splice-bar for railway-rails having an upset forged annulated reinforcement formed around the bolt-holes.

4. A splice-bar for railway-rails, comprising a rolled metal bar of uniform cross sectional area having its web upset and reinforced around the bolt-holes to form a bearing surface.

5. A splice-bar for railway-rails, comprising a rolled metal bar of uniform cross sectional area throughout its length and having forged upset bosses formed around the bolt-holes on the outside of the bar.

6. A splice-bar for railway-rails, comprising a rolled metal bar, having forged upset reinforcing bosses formed around the bolt-holes on the outside of the bar.

7. A splice-bar for railway-rails, comprising a rolled metal bar of uniform cross sectional area having its web upset and reinforced around the bolt-holes on both sides of the bar.

8. A splice-bar for railway-rails, comprising a rolled metal bar of uniform cross sectional area having its web upset and reinforced around the bolt-holes on the outside of the bar to form a bearing surface.

9. A splice-bar comprising a metal bar having forged reinforcing bosses formed around the bolt-holes on both sides of the bar.

10. A splice-bar for railway-rails, comprising a rolled bar of uniform cross sectional area throughout its length having a web portion with an external longitudinal grooved outer face, bolt-holes formed in the web portion and forged upset reinforcing bosses formed around the bolt-holes on the outside of the bar.

11. A splice-bar for railway-rails, comprising a rolled metal bar of uniform cross sectional area having a web portion with an external longitudinal grooved outer face, bolt-holes formed in the web portion and forged upset reinforcing bosses formed around the bolt-holes on the inside and outside of the bar.

12. A splice-bar for railway-rails, comprising a rolled metal bar having enlarged head and base portions, a web connecting the head and base portions, bolt-holes formed in the web, forged upset reinforcing bosses formed on the outside of the bar around the bolt-holes adapted to form bearing surfaces.

13. A splice-bar for railway-rails, comprising a rolled metal bar having enlarged head and base portions, a relatively thin web connecting the enlarged head and base portions, bolt-holes formed in the web, forged upset reinforcing bosses formed on the inside and outside of the web of the bar around the bolt-holes, the bosses formed on the outside of the bar adapted to form bearing surfaces.

In testimony whereof I hereunto affix my signature this 25th day of February, 1926.

ELMER S. SEAVEY.