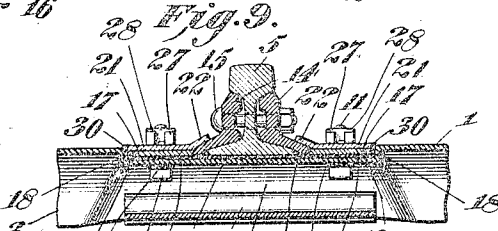
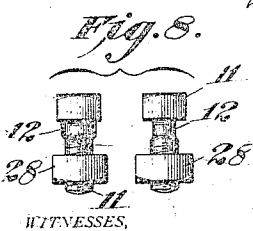
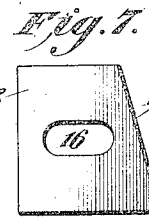
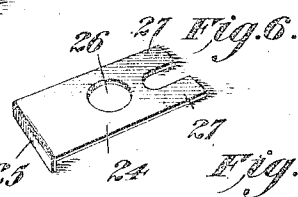
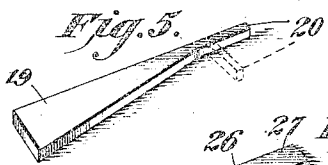
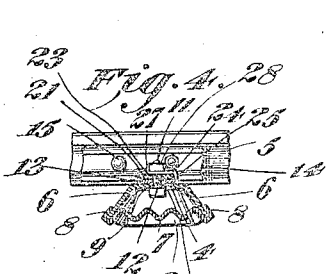
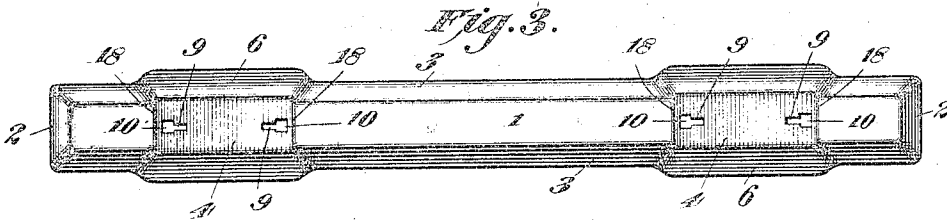
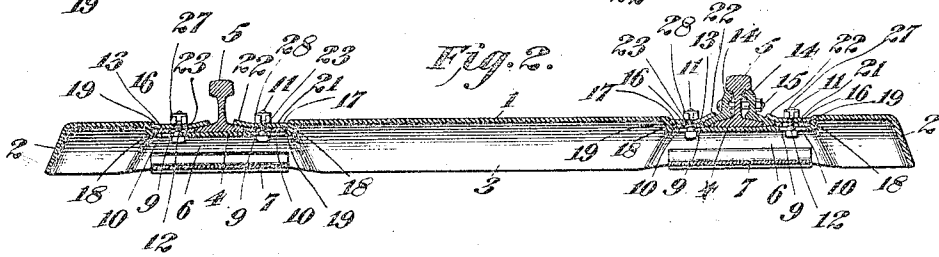
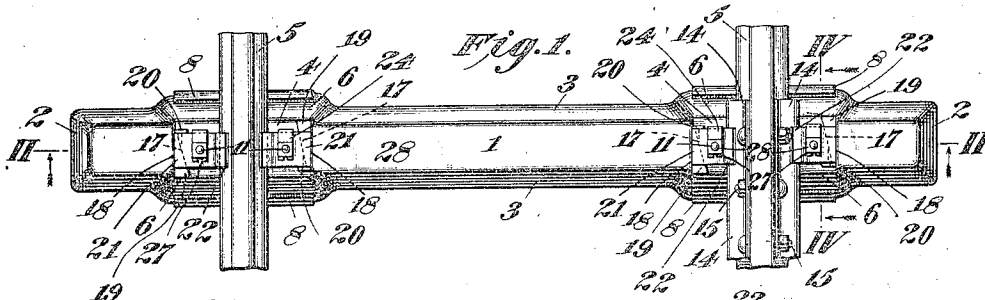


W. C. FRANK.
 METAL RAILWAY TIE.
 APPLICATION FILED MAY 2, 1912.

1,031,994.

Patented July 9, 1912.



WITNESSES.
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UNITED STATES PATENT OFFICE.

WILLIAM C. FRANK, OF JOHNSTOWN, PENNSYLVANIA.

METAL RAILWAY-TIE.

1,031,994.

Specification of Letters Patent.

Patented July 9, 1912.

Application filed May 2, 1912. Serial No. 694,704.

To all whom it may concern:

Be it known that I, WILLIAM C. FRANK, a citizen of the United States, residing in the city of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Metal Railway-Ties; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in railway ties and fastenings and refers more particularly to ties made of pressed metal.

One of the objects of my invention is to construct a tie, the bases of which, under the rails, are broadened to provide ample bearings on the ballast or road-bed.

Another object of my invention is to provide a structure which will be properly seated in the road-bed when placed in position, while the two rail seats formed in its upper surface can adjust themselves to conform with the motions of the rail under its passing loads. This latter action is brought about by the corrugated metal plates or bearers attached to the base of the tie under each rail, which, while serving to distribute the load over the ballast, also act in a measure as springs to allow slight vertical and tilting motions to conform with the flexure of the rails and also prevent hammering and jarring, thereby making an easy riding track.

Another object of my invention is to securely hold the rail against any lateral forces tending to increase or decrease the gage of the track. This is accomplished by forming depressed rail seats, thus providing abutments in the tie itself, between which abutments and the base flanges of the rails or splices, adjustable fastening devices are located for holding the rails in laterally locked positions.

Other objects of my invention are to construct the tie in such a manner as to provide for perfect drainage and to have all parts thereof requiring inspection, easily accessible, so as to be seen by the track inspector while standing. The construction of the tie also provides for a simple and effective means for insulating the rails, when it is desired to use them as electric conductors;

and still another object is my improved manner of fastening the rails to the tie, by means of which they are fixed permanently and require no further adjustment.

This invention also consists in the novel construction, combination and arrangement of parts such as will be hereinafter more fully described and pointed out in the appended claims.

Referring now to the drawings which form part of this specification and in which similar reference characters designate corresponding parts:—Figure 1 is a top plan view of the tie with portions of the rails attached thereto, the righthand end of the tie showing the style and arrangement of the fastening devices where a pair of angle splice-bars is used to splice the rails near a tie. The lefthand end of this view shows the intermediate or unspliced part of a rail mounted on the tie. Fig. 2 is a vertical longitudinal section taken on the line II—II of Fig. 1. Fig. 3 is a top plan view of the tie itself, with the corrugated base plates and fastening devices removed. Fig. 4 is a vertical transverse section taken on the line IV—IV of Fig. 1. Fig. 5 is a perspective view of one of the adjusting wedges. Fig. 6 is a perspective view of one of the nut-lock plates. Fig. 7 is a top plan view of one of the adjustable fastening plates. Fig. 8 shows detail views of the fastening bolts. Fig. 9 is a vertical longitudinal section through one side of a tie and its fastenings showing the manner by which the rails may be insulated.

My improved tie is formed of a plate of metal bent or pressed into substantially trough-shape, having a flat intermediate top portion 1, with downwardly extending inclined ends 2, and sides 3. Depressions 4 in the top of the tie form seats for the rails and the flaring downwardly extending sides are embossed at these points as shown at 6 with their lower edges connected together by a corrugated plate 7 having upwardly extending flanges 8 which are bent around the lower edges of the embossed portions. The depressed rail seats 4, formed in the top of the tie, are so arranged and proportioned that the depression of the metal in pressing at this point provides an excess which extends sidewise and of sufficient quantity to form the wider embossed por-

tions under the rail seats, as shown. By means of this construction and arrangement, the tie is enlarged under the rail seats at the points where enlarged bearings are required, and substantial rail seats with side abutments are provided, all without any waste or loss of material. The corrugated plates 7 in connection with the wider portions of the tie serve to form wide and substantial bearings on the road-bed to distribute the load thereon, and the corrugated plates also act as springs.

The recesses or depressions 4 in the upper surface of the tie are provided to form rail seats in which the rails are firmly secured to the tie, making the rails and ties to act together as a unit. Connection between the rails and ties is made by means of fastenings comprising fillers and wedges secured as shown between the extremities of the base flanges of the rails or splice-bars and the sides of the depressions in the rail seats, which sides serve as abutments against which to secure the rails in place. By reason of this construction any lateral motion must be in the track structure as a whole and cannot occur in the separate parts thereof, which conduces to permanence and safety. It should also be noted that the means for fastening the rails places no direct dependence on either of the bolts or the clamps of the rail fastenings, as all the lateral thrust of traffic is transferred quite directly from the rail flanges to the tie itself.

A pair of longitudinal slots 9 is formed in each rail seat, each having an enlarged opening 10 through which the head of the bolt 11 is passed and then pushed into the slot 9, the narrow elongated neck portion 12 of the bolt preventing it from turning or falling out. Fastening plates 13 are located on either side of the base flanges of the rail 5 and in contact with their outer edges, or in cases where a rail-joint occurs, they are arranged to be in contact with the outer edges of the splice-bars 14, which connect the lengths of rails together in the usual manner by means of bolts 15, as clearly shown in the drawings. The fastening plates 13 have elongated holes 16 and inclined outer edges 17.

At each end of the depressions or rail seats 4, abutments 18 are formed, between which and the inclined outer edges 17, is inserted a wedge-shaped key 19 provided with an outwardly projecting thin angular portion 20 which is bent at right angles to the key body after it has been inserted in place to prevent it from being withdrawn, as shown in Figs. 1 and 5.

21 indicates a clamping clip or plate, one end of which is bent slightly upwardly as at 22 to embrace the base flanges of the rail or the bottom outwardly extending flange of the splice-bars as the case may be. This clamp-

ing clip 21 has a central perforation 23 through which the threaded ends of the bolts 11 are passed.

24 is a nut-lock plate formed with one of its ends 25 bent downwardly at right angles to the body of the plate, and when in position, the end 25 extends over the side edge of the clamping clip 21. Each of the nut-lock plates 24 has a central hole 26 through which the threaded end of the bolt 11 passes, and the bifurcated end portion 27 is bent upward at right angles to the body of the plate 24 against the side of the nut 28 on the bolt 11 after it has been placed thereon and screwed down tightly.

Where it is desired to insulate the rail from the tie, this may be done as shown in Fig. 9 in which a thin flat strip of insulation 29 is placed in the depression 4 with its ends bent upwardly at right angles on the faces of the abutments 18 as shown at 30, in addition to which, insulating washers 31 are placed between the heads of the bolts 11 and the tie. In cases where insulation is used, this will also act as a sound deadener and on account of the construction and arrangement of the tie, the insulation is generally out of view and well protected from deterioration.

The tie and the rails may be secured together as follows:—The tie is placed under the rails in substantially the position shown in Figs. 1 and 2 of the drawings, but without the fastening devices attached thereto. The heads of the bolts 11 are then passed through the enlarged openings 10 and on account of their narrow elongated neck portions they can be inserted in the narrow slots 9 which are of less widths than the diameters of the bolt ends, and the bolts will thereby be held in position. The fastening plates 13 are then placed in position, the bolts 11 passing through the elongated slots 16 therein, the key wedges 19 are then placed back of the fastening plates 13 between their inclined outer edges and the abutments 18 formed in the tie; the clamping clips 21 are then placed in position over the fastening plates 13 and the key wedges 19. Nut locking plates 24 are put on over the threaded ends of the bolts 11, the nuts 28 placed thereon and screwed down tight against the nut-lock plates 24 and the bifurcated ends 27 bent upward at right angles against the sides of the nuts 28 as shown in Figs. 1, 2, 4 and 9 of the drawings. After this is done, the end 20 of each key wedge 19 is bent at right angles to the body of the wedge against the end of the plates 13 and the work of securing the tie to the rail is completed. The gaging of the track can be varied as desired, by adjusting the wedges 19, as will be readily understood.

From the above description it will be seen that my invention is extremely simple, 130

cheaply and easily constructed and far more durable and lasting than the wooden ties now in use. The inverted trough-shape gives to the tie the advantage of packing and retaining the ballast by reason of its flared sides, and the downwardly bent ends of the tie, together with the embossed and enlarged flaring sides, prevents the tie from creeping or shifting in the road-bed. The lower edges of these embossed or enlarged portions of the tie are connected together by a corrugated elastic plate which will yield slightly and then recover as the train passes over it, making an easy riding track, and the conformation of the corrugated plate is such that, having become firmly buried in the ballast, it makes a very stable track. When the loads come on the tie, the side flanges 6 of the embossed portions move outwardly to a slight extent, which movement is elastically resisted by the corrugated plate 7, as the corrugations thereof will elongate under the load and then contract after the load has passed. The fastening devices are such as can be easily manufactured and absolutely prevent the alteration of the gage of the track after once being placed in position.

The inverted trough-shape of this tie, with its downwardly and outwardly flaring sides and ends, is such that it offers no resistance to the free discharge of water from the ballast or road-bed, which is a condition to be desired.

By reason of the wider bearings under the rail seats and the shape and conformation thereof, the train loads will thereby be transmitted directly to the ballast within and below said enlarged portions, under which the better ballast, such as broken stone, may be used; whereas gravel, earth, sand or other cheaper filling may be used at the intermediate portion of the tie, which does not carry the loads.

Although I have shown and described my improvements 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 pointed out in the claims.

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

1. A railway tie of inverted trough section, with downwardly flaring sides and resilient base plates attached to the lower edges of said sides below the rail seats.

2. A metallic railway tie of substantially inverted trough-shape with downwardly flaring sides and a pair of resilient base plates attached to the lower edges of the trough, below the rail seats.

3. A metallic railway tie of substantially

inverted trough-shape with downwardly flaring sides and ends and a pair of resilient base plates attached to the lower edges of the sides of the trough below the rail seats.

4. A metallic railway tie of substantially inverted trough-shape with downwardly flaring sides and ends, the sides having embossed portions adjoining the rail seats and resilient base plates connecting together the opposite lower edges of the embossed side portions.

5. A metal railway tie of inverted trough-shape with integral downwardly flaring sides and ends, depressions in the top of the tie forming rail seats, embossed side portions adjoining said rail seats, and a pair of corrugated elastic base plates having upwardly extending flanges secured to the lower edges of the embossed side portions.

6. A metallic railway tie, comprising a plate of substantially uniform width bent or depressed into trough-shape, having a central longitudinal top portion with rail seat depressions formed therein, a flange extending flaringly downward entirely around the sides and ends of said central longitudinal top portion, said downwardly flaring flange being embossed at points adjoining the rail seat depressions, and resilient base plates connecting the opposite edges of said embossed flanges.

7. A metallic railway tie comprising a plate bent or pressed into trough-shape, having a central horizontal top portion with depressions therein forming rail seats, spliced rails mounted in the aforesaid depressed rail seats, abutments located at each end of the depressions, fastening means located between the rail or splice base and said abutments for securing the rails to the tie, a flange extending flaring downwardly entirely around the sides and ends of said central horizontal top portion, said downwardly flaring flange being embossed at points adjoining the rail seat depressions, and elastic corrugated base plates having upwardly extending flanges connecting the opposite edges of the embossed flanges.

8. In a railway tie, a depressed rail seat thereon of greater width than the top of the tie, abutments at each end of said rail seat, adjustable fastening plates having a straight forward edge contacting with the base of the rail flanges and an inclined rear edge, a tapered key fitted between the rear inclined edge of each fastening plate and the abutments aforesaid, a clamping clip mounted above each fastening plate and key and extending over the base flange of the rail, and means for securing said clip.

9. In a railway tie, a depressed rail seat thereon, abutments at each end of said rail seat, adjustable fastening plates having a straight forward edge contacting with the

outer edge of the base flanges of the rail, and having an inclined rear edge, a wedge-shaped key fitted between the rear inclined edge of the fastening plates and the abutments aforesaid, a clamping clip mounted above the fastening plate and key having an upturned forward end extending over the base flanges of the rails, and means for locking the fastening and clamping clips together on the tie.

10 10. In a railway tie, a depressed rail seat thereon, suitably spaced T-slots in said rail seat for the reception of bolts, abutments at ends of said rail seats, a rail mounted thereon, a pair of adjustable fastening plates, each having a straight forward edge contacting with the outer edge of the base flange of the rail and having an inclined rear edge, a wedge-shaped key fitted between the rear inclined edge of each fastening plate and the abutment aforesaid, and provided with a thin angular projecting portion adapted to be bent at an angle with the body of the key after it has been inserted in place, a pair of clamping clips mounted above each fastening plate and key with their rear ends in contact with the abutments and their forward ends extending over the base flanges of the rail, bolts mounted in the slots aforesaid with their threaded ends extending upwardly through perforations in the fastening plates and clamping clips, a nut placed on the end of each bolt adapted to secure the fastening plates and clamping clips together on the tie and a nut-lock plate adapted to prevent the said nut from turning when in place.

15 11. In a railway tie comprising a plate bent or pressed into trough-shape, a central horizontal top portion with depressions therein forming rail seats, rails mounted thereon with splice-bars attached thereto having flanges extending outwardly and downwardly over the base flanges of the rails, abutments located at each end of the

depressions between which and the base flanges of the splice-bars are adjustable fastening plates, each having a straight forward edge contacting with the outwardly extending base flanges of the splice-bars and an inclined rear edge, a wedge-shaped key fitted between the rear inclined edge of each fastening plate and the abutments aforesaid, and a clamping clip mounted above each fastening plate and key and extending over the base flanges of the splice-bars and means for holding said fastening plates and clips.

20 12. The combination with the rails of a metallic railway tie, comprising a plate bent or pressed into form, having a central horizontal top portion with depressions therein forming rail seats, offset abutments at each end of the said depressions, an insulated strip laid over the depressed portion of the tie with its ends upturned and covering the face of the abutments, and an insulated rail fastening and clamping means adapted to secure the rails to the tie.

25 13. A metallic railway tie, comprising a plate of substantially uniform width bent or pressed into trough form, having a central longitudinal top portion with depressions therein forming rail seats, rails mounted in said seats, fastening plates and clamping members attached to the tie between the flanges of the rails and the abutments aforesaid, a flange extending flaring downwardly around the said central horizontal top portion, the sides of said flanges being embossed or pressed outwardly adjoining the rail seat depressions, and a corrugated base plate connecting the opposite lower edges of the opposite embossed flanges.

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

WILLIAM C. FRANK.

Witnesses:

ELMER SEAVEY,
ROBERT A. BEERS.