

J. C. RUSSELL.  
METALLIC TIE AND FASTENER.  
APPLICATION FILED JAN. 10, 1912.

1,044,085.

Patented Nov. 12, 1912.

2 SHEETS—SHEET 1.

FIG. 1.

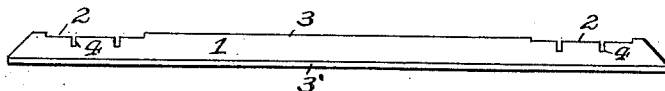


FIG. 2.

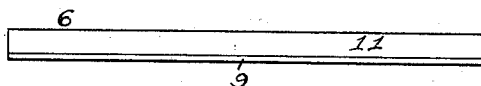


FIG. 3.

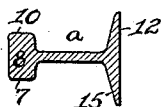


FIG. 4.

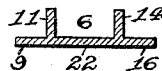


FIG. 5.

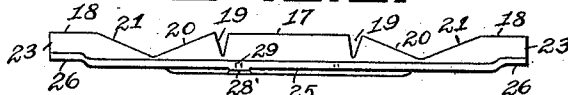


FIG. 6.

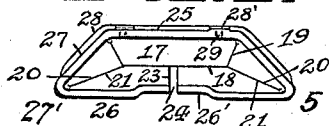
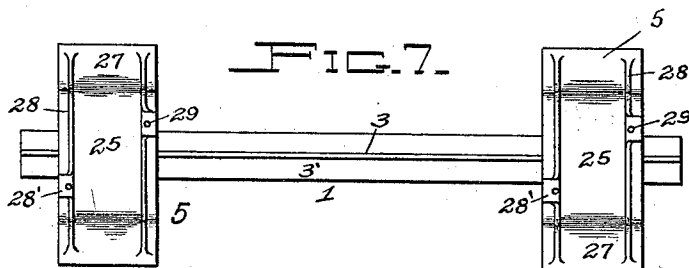


FIG. 7.



Witnesses:  
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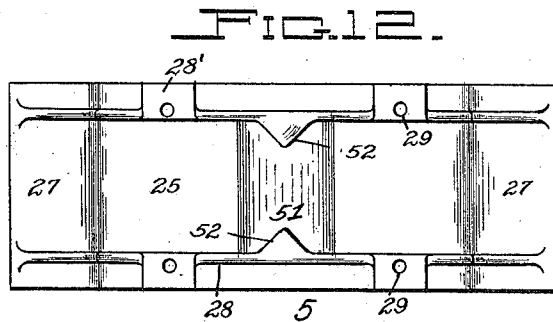
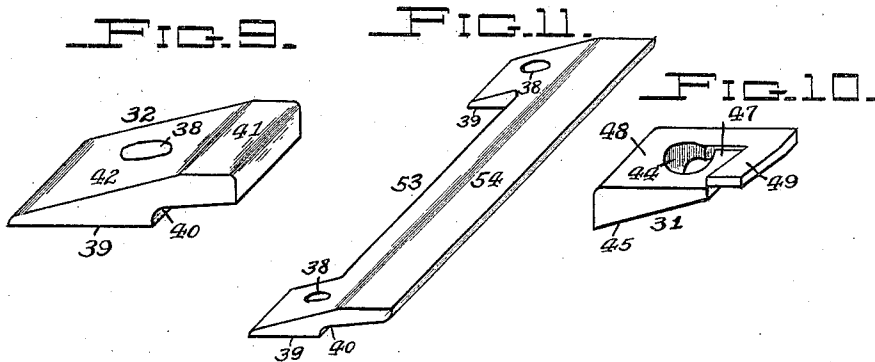
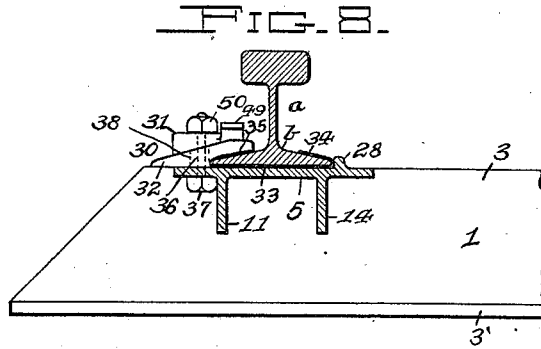
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METALLIC TIE AND FASTENER.  
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

JAMES C. RUSSELL, OF PITTSBURGH, PENNSYLVANIA.

## METALLIC TIE AND FASTENER.

1,044,085.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed January 10, 1912. Serial No. 670,435.

*To all whom it may concern:*

Be it known that I, JAMES C. RUSSELL, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Metallic Ties and Fasteners; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to railroad ties, and has special reference to such a tie as is composed of metal such as steel and will form a cushion for the rail.

The object of my invention is to provide a cheap, simple and efficient form of railroad tie and rail fastener which can be rolled from scrapped rails and like material, and which will be very inexpensive to construct, while at the same time it will be impossible to break the same, and its strength and durability will be far in excess of any of the steel ties now in use.

My invention consists, generally stated, in the novel arrangement, construction and combination of parts as hereinafter more specifically set forth and described and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to construct and use my improved railroad tie and fasteners I will describe the same more fully, referring to the accompanying drawing in which:—

Figure 1 is a side elevation of the cross beam employed. Fig. 2 is a side elevation of the rail after being rolled to form the bar. Fig. 3 is a cross-sectional view of a railroad rail showing how the rail is rolled to make the bar shown in Fig. 2. Fig. 4 is a cross-sectional view of the bar shown in Fig. 2. Fig. 5 is a side elevation of the bar after being pressed to the desired shape. Fig. 6 is a side view of the bar after being folded to form the rail seat. Fig. 7 is a plan view of the assembled tie. Fig. 8 is a view partly in cross-section showing the rail attached to the tie. Fig. 9 is a detail perspective view of one of the parts of the fastener. Fig. 10 is a like view of the other part. Fig. 11 is a perspective view of the lower block used at the joint. Fig. 12 is a plan view of the arched rail seat used at the joint of the rails.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

It is a well known fact that the introduc-

tion of steel ties for railroads has proved an advantage in many ways, but many of the difficulties arising from the use of the same have not as yet been overcome, and in my invention several serious defects in the average tie are eliminated so that with the use of my improved railroad tie the particular difficulty of the breaking of the same will be entirely overcome, while the cost which has been a great drawback in the introduction of steel ties will be reduced considerably on account of using old railroad rails to form the same.

After the tie is formed, as later explained herein, the same is preferably treated by the process described and explained in my U. S. Letters Patent No. 993,410, granted May 30, 1911, and U. S. Letters Patent No. 1,008,674, granted November 14, 1911, which treatment will, as explained in said patents, harden the article treated therein, while at the same time it will toughen the same so that any great jar or impact will not break the same nor distort the original shape thereof. Practical demonstrations and experiments have shown articles treated by this method to withstand great shocks such as would break the ordinary steel rail or bar without even so much as distorting the shape of the same.

As illustrated in the drawings, 1 represents the cross beam which is rolled to suit and is of the ordinary length, while at a position near each end of the same and whose centers conform with the distance of the standard gages is a seat or recess 2, and such seat is depressed into the upright leg 3 of the beam 1, which is of T-shape, and has a base plate 3' thereon. The seat or recess 2 is provided with a pair of slots 4 which extend about half way down the leg 3 and are adapted to receive flanges on the rail seat 5, as hereinafter explained.

To form the rail seat 5 I take an ordinary steel railroad rail which has become worn and unfit for use and place the same in rolls after due heating so that it is rolled into bars or sections 6, such as shown in Fig. 4. By reference to the Figs. 3 and 4 the rail *a* is rolled so that the lower part 7 of the head 8 forms the flange 9, and the upper part 10 of the head 8 forms the flange or leg 11. The upper part 12 of the rail flange 13 forms the flange or leg 14, while the lower part 15 of said rail flange forms the flange 16 of the bar, as shown in Figs. 2 and 4, with the web *a'* of the rail forming

the intermediate portion 22 of the bar. The bar thus formed consists of a straight plate having two perpendicular ribs 11 and 14 and such bar is now cut in multiples to enable the same to be formed with arches for the rail seat 5 and is then heated and pressed to obtain the longitudinal shoulders or ribs 28 and fastener pads 28' thereon for folding into such a box like shape as shown in Fig. 5; the central portion 17 being adapted to abut against the straight end portions 18, while the V-shaped grooves 19 will be closed so that the legs 11 and 14 will thus be continuous. In thus forming the seat 5 the flanges 9 and 16 and intermediate portions 22 will form a surrounding outer portion 27' on said seat with inclined end portions 27, while inclined end portions 20 on the legs 11 and 14 will abut against the inclined portions 21 so that said portions together with the central portion 17 and straight end portions 18 will provide two walls between the bent flanges 9 and 16 and the intermediate portion 22 forming the bottom face of the seat and inclose a chamber between the same and the straight portion 22, when folded, as shown in Fig. 6. The ends 23 of the bar are not quite joined so that there will be a slot 24 between the same, and such slot is adapted to engage with the leg 3 of the cross beam just below the slots 4 of the same, while the slots 4 of said leg are adapted to fit over the central portions 17 of the legs 11 and 14 of the rail seat 5, while the flanges 9 and 16 and the intermediate portion 22 at the top face 25 of the rail seat will fit into the seat 2 on the leg 3 of the cross beam 1.

At the ends of the bar forming the rail seat 5 there is an offset 26 in the flanges 9 and 16, and the intermediate portion 22 forming the bottom 26', and such offset is adapted to be in depth about the same dimension as the thickness of the base plate 3', so that when the rail seat 5 is assembled with the cross beam 1 the bottom of the same will form a smooth surface which will be welded or riveted in order to form the complete tie. The inclined faces 27 formed by a portion of the flanges 9 and 16 and the intermediate portion 22 are provided with shoulders or ribs 28 which extend from the bottom of the same and partially across the face 25 of the rail seat and are located one on each of the flanges 9 and 16, while in each of said ribs and at opposite ends thereof is a pad 28' which is lower than said rib and extends to the outer edge of the flanges 9 and 16, and such pads are at opposite ends of the face 25 of the rail seat 5, and each of said pads is provided with a hole 29 which is directly in line with the rib in its respective flange. The distance between the ribs on the face 25 of the rail seat 5 is the same as the width of the flange on the ordi-

nary railroad rail so that when the rail is laid on said seat it will be prevented from wobbling or slipping from the same.

Fig. 8 shows the fastener 30, which consists of the upper block 31, and the lower block 32, and such fastener is composed of steel, which will make it very durable and unlikely to get out of order.

The rail *a* is first placed upon the rail seat 5, and an insulating pad 33 is placed around the flange *b* of the same in order to protect the same from contact with said seat. This pad is formed of two overlapping sheets of insulation, 34 and 35, which overlap each other centrally under the rail flange *b* and will conform to the position of said rail. The bolt 36 is now placed through the hole 29 so that it will be prevented from turning on account of the square head 37 of the same resting by one of its sides against the leg 11 or 14.

The lower block 32 is provided with a slotted hole 38 which fits onto the bolt 36 and has a flat bottom 39 which rests on the pad 28' of the rail seat 5, while beyond said bottom is a cut out portion 40 which is adapted to be the shape of the flange *b* and fits snugly against the same. The upper face of the block 32 has a flat portion 41 thereon and extending a short distance from the inner end of the same, while an inclined face 42 extends from said flat portion to the outer end of the same so as to decrease the thickness of the material at that point. If desired the inclined face 42 may be provided with teeth in order to prevent the same from slipping when in contact with the upper block 31.

The upper block 31 is composed of spring steel and a hole 44 extends through the same in order to engage with the bolt 36. The under face of the block 31 is provided with an inclined face 45 which is adapted to engage with the inclined face 42 on the lower block 32, and such face may be provided with small teeth if desired. The hole 44 is cut at the rear of the block 31 and at the end of the inclined face 45, and the shoulder 47 thus formed will be at a position slightly lower than the upper face 48 of said block, while said face terminates at the rear thereof in a wing 49 which is upwardly inclined and of springy nature. When the bolt 36 is provided with the nut 50 such nut will tend to equalize the surfaces of the shoulder 47 and the face 48 of said block, and as the block is made of tough spring steel a great pressure will be exerted against the nut at all times. The distance between the edge of the hole 44 and the wing 49 will be just sufficient to allow the flat sides of the nut 50 to slip down over the wing 49, whereupon said wing will spring upward and prevent the nut from being loosened, while the next successive point between two sides of the nut

will be able to ride on the wing 49 and thus lower the same as explained. This will form a lock which it will be impossible to loosen except by pressing the wing downward so that there will be no danger of the rail becoming unfastened, while at the same time the nut may be tightened at any time without the slightest inconvenience.

Where the joint of the rails occurs the rail seat used is longer than that ordinarily used, and is shown at Fig. 12. In such cases the pads 28' will be four in number and located two directly opposite each other in order that the rail may be securely held at the joint, while the seat will be dished out at the center 51 so that the cushioning effect will be obtained and the jarring in case of a solid joint eliminated. At each side of the rail seat there is a lug 52 which is of any desired shape and against which the rails are adapted to rest by having their flanges cut out to fit the same.

Fig. 11 shows the block 53 which will be used in place of the lower block 32 at the joint of the rails, and such block is provided with a connecting bar 54.

If desired an oak or other hard wood block may be substituted on the top of the rail seat 5 and below the rail flange 6 in place of the insulation sheets, and in such a case the insulation will only be used to extend around the upper side of the rail flanges.

It will be readily seen that with the use of my improved railroad tie and fastener the rail will be held in close engagement with the tie at all times and such tie will be very easy to place, and the base plate of the same will prevent the same from becoming loose or being removed when the ballast is placed thereon, while the simplicity of the entire construction will at once recommend it to even the most unskilled persons.

By treating the tie with the process described and claimed in my patent above referred to the tie will be of such strength as has heretofore seemed impossible for practicability on account of my being able to reduce the weight of the tie considerably below the weight of any metallic tie ever placed on the market and having an equal amount of bearing surface. This is possible on account of the treatment which is accomplished by means of oil and water, which toughens the fiber of the metal and breaks up the crystalline structure, and practical demonstration has shown rails and articles treated by this method to withstand shocks which have broken and distorted the ordinary steel rails now used throughout the world.

The utilization of waste or scrapped material will recommend my improved tie, as the old rails which have become worn out by long and constant use may by the process explained herein be made into a commercial

and marketable article far surpassing in strength and durability any railroad tie now in use or on the market, while the weight of the same will be reduced to a figure less than any other steel railroad ties in existence and having equal bearing surface.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A railroad tie and fastener comprising a metallic cross-beam having a vertical leg provided with slots therein, a rail seat supported on said leg and provided with flanges fitting into said slots, and means connected to said rail seat and engaging with the rail flange to secure the rail in place.

2. A railroad tie and fastener comprising a metallic cross-beam having a vertical leg provided with slots therein, a rail seat supported on said leg and provided with vertical flanges for fitting into said slots and with side flanges for resting on said leg and for supporting the rail, and means connected to said rail seat and engaging with the rail flange to secure the rail in place.

3. A railroad tie and fastener comprising a metallic cross-beam having a vertical leg provided with slots therein connecting with a recess in the top of said leg, a rail seat supported on said leg and provided with vertical flanges for fitting into said slots and with side flanges for resting in said recess and for supporting the rail, shoulders on the upper side flanges for engaging with the rail flange, and means connected to said rail seat and engaging with the rail flange to secure the rail in place.

4. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein, comprising a structure of box-like shape having surrounding portions forming a top face for the rail and a bottom face, and inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots.

5. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein, comprising a structure of box-like shape having surrounding portions forming a top face for the rail and a bottom face, and inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said walls being slotted to fit around said leg.

6. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein, comprising a structure of box-like shape having surrounding portions forming a top face for the rail and a bottom face, and inner vertical flanges forming walls between

such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said wall being  
 5 slotted to fit around said leg and said face having an offset therein for the reception of said base flange.

7. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 10 said recessed portion and a bottom face, and inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots.

8. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upward therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 25 said recessed portion and a bottom face, and inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said walls being  
 30 slotted to fit around said leg.

9. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 40 said recessed portion and a bottom face, and inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said walls being  
 45 slotted to fit around said leg and said face having an offset therein for the reception of said base flange.

10. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 55 said recessed portion and a bottom face, inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, and ribs on  
 60 said top face for engaging with the rail flange.

11. A rail seat for a cross-beam provided  
 65 with a base flange and a vertical leg extend-

ing upward therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in said recessed portion and a bottom face, inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said walls being  
 70 slotted to fit around said leg, and ribs on said top face for engaging with the rail flange.

12. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 80 said recessed portion and a bottom face, inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said walls being  
 85 slotted to fit around said leg and said face having an offset therein for the reception of said base flange, and ribs on said top face  
 90 for engaging with the rail flange.

13. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 100 said recessed portion and a bottom face, inner vertical flanges forming walls between such portions and providing intermediate portions and side flanges on said portions adapted to fit into said slots, said bottom face and lower portion of said walls being  
 105 slotted to fit around said leg and said face having an offset therein for the reception of said base flange, and ribs on the side flanges of said top face for engaging with the rail flange.

14. A rail seat for a cross-beam provided with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of box-like shape having surrounding portions forming a top face for the rail for fitting in  
 115 said recessed portion, a bottom face and inclined ends, inner vertical flanges forming walls between said portions and providing intermediate portions and side flanges on said portions adapted to fit within said slots, and ribs on said top face for engaging with the rail flange, said ribs extending along  
 120 said inclined ends.

15. A rail seat for a cross-beam provided  
 130

with a base flange and a vertical leg extending upwardly therefrom having slots therein leading from a recessed portion in the top of said leg, comprising a structure of  
5 box-like shape having surrounding portions forming a top face for the rail for fitting in said recessed portion, a bottom face and inclined ends, inner vertical flanges forming walls between said portions and providing  
10 intermediate portions and side flanges on

said portions adapted to fit within said slots, and ribs on the side flanges of said top face for engaging with the rail flange, said ribs extending along said inclined ends.

In testimony whereof, I, the said JAMES C. RUSSELL, have hereunto set my hand. 15

JAMES C. RUSSELL.

Witnesses:

T. B. HUMPHRIES,

J. N. COOKE.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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