March 17, 1925. 1,530,174

W. F. HART

RAIL SPRING AND METHOD OF MAKING THE SAME

Filed Nov. 24, 1924

Fig 1

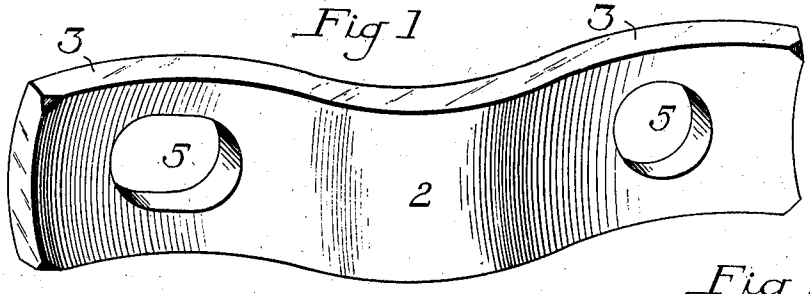


Fig 2

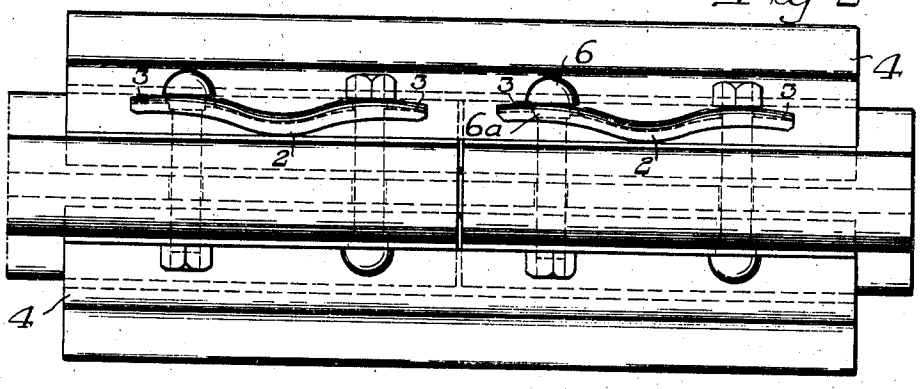


Fig 3

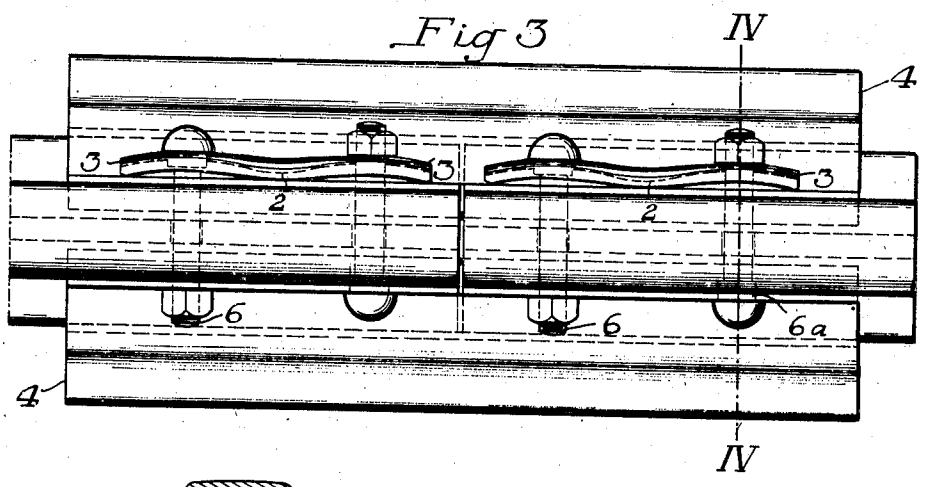
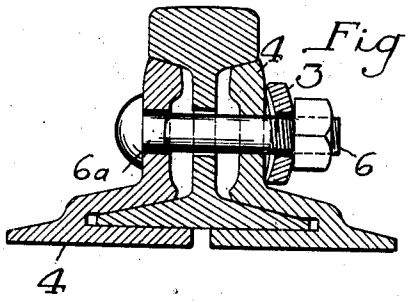


Fig 4



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UNITED STATES PATENT OFFICE.

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RAIL SPRING AND METHOD OF MAKING THE SAME.

Application filed November 24, 1924. Serial No. 751,841.

To all whom it may concern:

Be it known that I, WILLIAM F. HART, a citizen of the United States, residing at Pittsburgh, Allegheny County, Pennsylvania, have invented a new and useful Improvement in Rail Springs and Methods of Making the Same, of which the following is a full, clear, and exact description.

The present invention relates broadly to rail springs, and more particularly to that class of springs generally referred to as the "leaf type," and is designed to provide an improved spring bridging at least two bolts for holding splice bars in the desired position by yielding pressure, to take up wear and to reduce the battering of the rail ends.

It has heretofore been proposed, as shown for example in Patents Nos. 1,416,152 issued May 16, 1922, and 1,443,160, issued January 23, 1923, to Emanuel Woodings, to provide rail springs having a compound longitudinal curvature with enclosed elongated holes adjacent each end thereof. The present invention relates specifically to springs of this type and to improvements not only assisting in centering the springs and holding them in the desired position, but to means for imparting a greater strength to certain portions thereof.

In the accompanying drawings, there is shown for the purpose of illustration only one embodiment of the present invention, it being understood that the drawings do not define the limits of the invention, as changes may be made in the construction and operation therein disclosed without departing from the spirit and scope of my invention as defined in the appended claims.

In the drawings:

Figure 1 is a perspective view of an improved rail spring embodying the present invention;

Figure 2 is a top plan view showing the spring in position, before tightening the bolts;

Figure 3 is a view similar to Figure 2, showing the spring in clamping and tightened position;

Figure 4 is a cross section on the line IV—IV of Figure 3.

In accordance with the preferred embodiment of the present invention, the spring, which is advantageously formed of a rolled strip of spring steel, is curved both longitudinally and transversely. The longitudinal curvature is of a compound character, providing a central portion 2, projecting inwardly, and side portions 3, 3, extending outwardly from the central portion and then inwardly at the ends in a reverse curve. The spring is also preferably curved transversely so that its inner surface next to the splice bar 4 is slightly concave, while its outer surface is correspondingly convex.

The greatest inward bend longitudinally of the spring is at approximately the center, as shown, this having been found to give improved results.

The longitudinal curving of the spring is preferably sufficient so that when tightened in use, it takes a partial permanent set by carrying the metal past the elastic limit in straightening. Consequently, when the spring is taken off, it does not return to its original shape, but takes a configuration between such original shape and the shape assumed in use.

This has been found to aid materially in giving the spring its desired characteristics in holding the splice bars firmly in position and reducing the battering of the rail ends.

The spring is of a length greater than the distance between two adjacent bolt holes and is formed with enclosed holes 5, adjacent its ends, these holes being formed in the side portions 3, 3, between the central inward bend and the reversely bent ends.

The bolts now ordinarily used on rail joints are wing bolts, that is, the stem of each bolt immediately under the head is elongated in a horizontal direction on both sides. With an ordinary bolt 6, the wing portions 6^a project for an appreciable distance from the sides of the bolts. Good practice dictates the staggering or reversing of the bolts so that the head of one bolt of each pair is on one side and the head of the other bolt of such pair is on the opposite side. This provides a bolt body of substantially circular cross section for cooperation with one end of the spring and a bolt body of elongated cross section for cooperation with the other end of the spring. Under these conditions, it is undesirable, for most efficient results, to provide uniform openings 5 in the ends of the springs. I accordingly preferably form one of these holes substantially circular in outline to coop-

erate with the threaded end of one bolt, and the other hole elongated in outline to cooperate with the wings of the other bolt.

The holes must be carefully formed in order to leave sufficient stock in the metal of the spring, and at the same time provide the necessary clearance for easy application of the springs and for their subsequent endwise movement as pressure is applied by the tightening up of the bolts. In obtaining these results, I have found that there is a great advantage in punching the holes after the spring blank has been given its curved shape. I therefore first preferably press a heated blank into substantially final form, and thereafter punch the holes for the bolts. In this manner, the sides of the holes extend straight and substantially parallel to the sides of the bolts, while if they were formed before shaping, the metal would be stretched and deformed during the shaping operation.

By punching the holes after the spring has been shaped, considerable stock is saved in both ends of the spring, while by forming one of the holes substantially circular in outline, considerable additional stock is saved at one end of each spring. In practice, these circular holes serve to initially position the springs and positively insure a staggering of the bolts. The openings are so punched that before pressure is applied by tightening up the bolts, the end clearance provided by the elongated hole is inside the two bolts, as clearly shown by dotted lines in Figure 2, thereby permitting the spring to flatten out without interference as the bolts are tightened. The circular hole cooperates directly with the nut and as the nut is turned down against the surface of the spring, it will be apparent that it is desirable to provide a maximum amount of metal in this end of the spring. The shape of the opening inherently answers this requirement.

The advantages of the present invention arise from the provision of a spring curved longitudinally and transversely, from a spring having a compound curvature with the openings punched after the spring is shaped, and broadly, from the provision of a leaf spring having a circular opening adjacent one end and an elongated opening adjacent the other end.

I claim:

1. A rail joint spring of the leaf type having an elongated closed opening adjacent one end, and a substantially circular closed opening adjacent the other end, substantially as described.

2. A longitudinally curved rail spring adapted to be forced against the surface of a splice bar, said spring having an elongated enclosed bolt hole in one end and a substantially circular enclosed bolt hole in the opposite end, substantially as described.

3. A curved rail spring having a substantially circular enclosed bolt hole in one end arranged to receive the threaded end of a bolt, and an elongated enclosed bolt hole in the opposite end arranged to engage a wing bolt adjacent the head thereof and prevent turning while permitting sliding relatively to the bolt when the spring is flattened, substantially as described.

4. A rail spring having both longitudinal and transverse curvatures, said spring being provided near one end with an enclosed substantially circular bolt-receiving opening and in the other end with an elongated enclosed bolt-receiving opening, substantially as described.

In testimony whereof I have hereunto set my hand.

WM. F. HART.