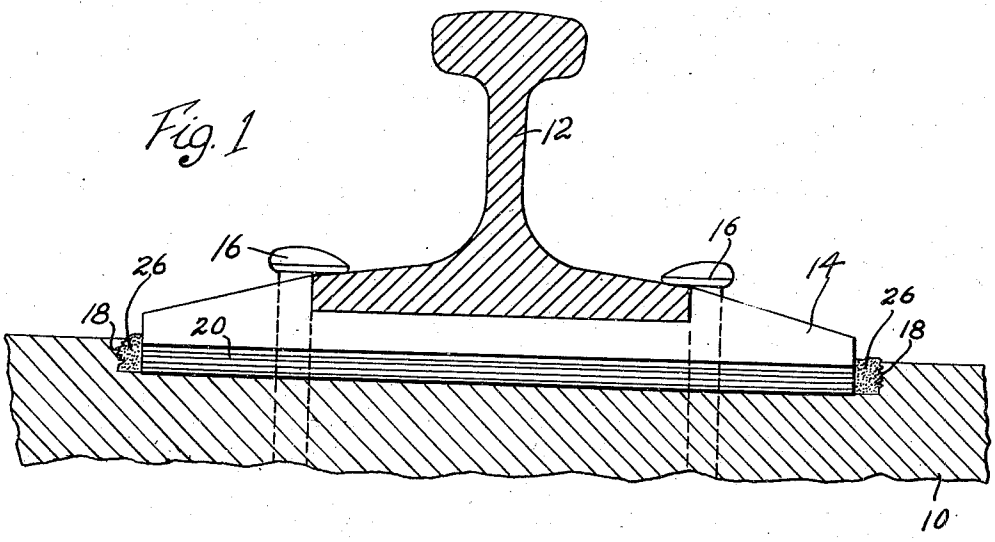
June 3, 1947. J. H. DOOLING 2,421,602

EXPANSION REPAIR PLATE FOR WORN RAILWAY TIES

Filed Jan. 15, 1944

Fig. 1



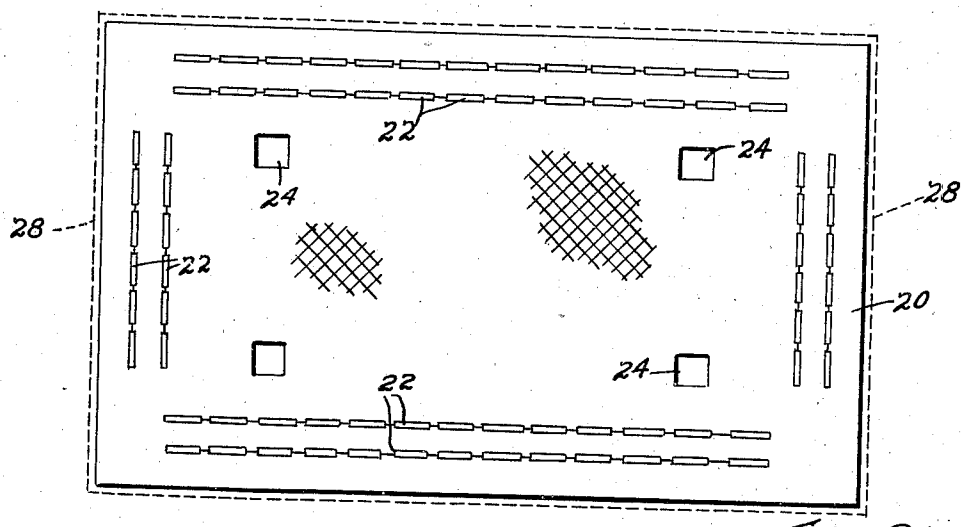


Fig. 2

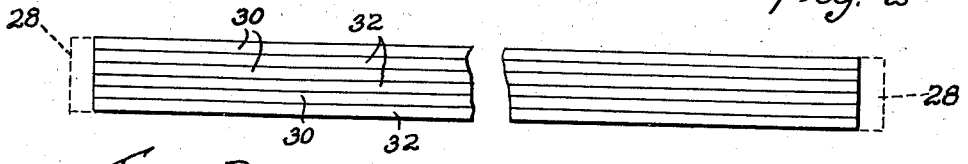


Fig. 3

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EXPANSION REPAIR PLATE FOR WORN RAILWAY TIES

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2 Claims. (Cl. 238—283)

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This invention relates to expansion bearing plates for repairing worn and cut areas in railway ties.

Objects of the invention include the provision of a flexible repair pad to replace the wood fiber destroyed in ties due to the downward cutting and abrasive action caused by the action of metal tie plates under dynamic and impact loads of heavy locomotives and loaded cars moving at high speeds; the provision of a repair pad as aforesaid embodying means capable of expanding laterally under pressure to fill and conform to the limits of the depression in the tie caused by wear of the tie plate and to assume all perishable aspects due to wear formerly imposed on the tie itself; and the provision of an expansion repair plate comprising a plurality of laminations impregnated with a preservative substance of a flowable nature which will exude laterally under operating pressures to fill the worn tie depression in addition to the lateral expansion of the body of the repair plate.

Further objects of the invention include generally the provision of method and means for applying flowable pitchy tie preservative material to the depression worn in railway ties by the tie plates, so as to tightly seal all jagged edges and crevices of the depressions and to utilize a repair pad to supply a bearing surface for the replaced tie plate, the pressure of the trains proceeding on the rails forcing the preservative material into the wood to complete the repair of the worn tie.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a view partly in section showing a form of the invention as applied to a worn railway tie;

Fig. 2 is a plan view of a form of the expansion repair plate; and

Fig. 3 is an enlarged side elevational view of the plate of Fig. 2.

As is well known in the art, railway tie plates wear depressions and cut into the ties due to vibration in the rails and the fact that dirt and sand, etc., creep in between the tie plate and the tie, resulting in the mechanical wear of the tie. Also decay and vermin will add to the deterioration of the wood. The depression or hole worn and cut into the tie is larger in area than the bearing surface of the tie plate because of the above mentioned vibration. This invention contemplates an expansion repair plate of a size

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substantially the same as the tie plate and thus smaller than the depression in the tie, which repair plate is set into the worn hole and as explained below absorbs the subsequent wearing action and replacing the wood fiber destroyed so as to render the tie fit for further use, avoiding the necessity of renewing the tie. The present invention is in no sense a device for application to a new tie but is a repair device only.

In Fig. 1 there is shown a tie 10, a rail 12 seated in a tie plate 14 and secured by railway tie spikes 16. As shown, the illustrated tie has been worn and cut down in the region of the tie plate 14 as indicated in Fig. 1. Constant shifting and vibration of the rail and tie plate under the impact of heavy locomotive and moving trains has not only worn or cut a hole in the tie, but has made as hole larger in area than the tie plate.

The edges of the worn hole obviously will be jagged and formed with crevices due to the wearing and the weathering of the wood. The breaks and crevices permit the entrance of vermin and bacteria which greatly accelerate the deterioration of the tie. It will be clear that in due time the tie will become unusable unless the wear is stopped.

The present expansion repair and bearing plate comprises a plurality of laminations which may be formed of woven material, jute, asbestos, or other material, such as thin plastic sheets, etc. The material is first impregnated with a wood preserving material which is flowable under certain pressure and temperature conditions. Such preservative substances applied are pitch, asphalt, resins, mastic, plaster, or the like, but in any case the laminations are thoroughly impregnated, or coated in the case of plastic sheet or sheets, and then assembled into a pad or plate, and rolled and pressed to form a relatively stiff pad which, however, also has flexible properties under conditions of pressure.

The plate so made may be reinforced as by stitching 22 or by wire mesh or other means, and holes 24 are punched for the accommodation of the spikes.

Regardless of the material of the expansion repair plate, the individual laminations of the finished plate will be resistant to or impervious to the passage of the preservative material after pressing and rolling.

A plate as above described is inserted, as shown in Fig. 1, under the tie plate 14 and will thus be located in the depression 18 with its edges stopping short of the limits of the depression.

As trains travel on the rails, pressure will be transmitted to the plate and this will cause the tie preservative to exude or flow from between the laminations so as to fill up the remainder of the depression 18 as indicated at 26. Also the pressure of the rail will cause the plate 20 to further compress and expand approximately as shown in dotted lines at 28 in Figs. 2 and 3. It will thus be seen that a double action is produced to fill the depression 18 and to seal off its jagged edges and crevices.

The expansion repair plate may be made of alternate layers 30 of one type of fabric, such as cotton, with layers of another type of material, such as wool, interposed; and it is preferred that the weave of the fabric should be diagonally disposed to overcome the normal friction and thread fatigue produced in a fabric by heat generated between laminations and cohesion, which when the pressures are released, causes friction by pulling the threads apart.

The method may also be carried out by applying the tie preservative directly to the depression and placing thereon a plate of the nature described, similar repair results being also beneficially occasioned thereby.

It will be clear from the above that this invention provides a laminated repair expansion and bearing plate incorporating a flowable wood preservative having a viscosity permitting the latter to flow or exude laterally outwardly from between the laminations as pressure is applied and at proper temperatures in sufficient quantity to fill all openings and to seal off jagged or crevice areas tightly and completely. It is to be noted that in the manufacture, allowance can be made easily to provide enough preservative for this use; in fact a surplus is preferred since too much preservative will not adversely affect the results. Also, the worn depressions are obviously not all of one size, but a repair plate the size of the tie plate accomplishes the desired results perfectly, as the depressions are always larger than the tie plate.

When a repair plate of the nature described becomes compressed, after long usage, to a point where it begins to fail to carry out its purpose, a new repair plate may be inserted therein, as the old repair plate forms a pocket about the size of the tie plate for reception of a new repair plate.

Certain subject matter disclosed herein is being claimed in a copending application No. 633,716, filed Dec. 8, 1945 of the same inventor.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. An expansible repair plate adapted to be inserted upon a wooden tie beneath a metal tie plate to fill an area which has been worn by the metal tie plate, said repair plate comprising a preformed flexible mat of a size initially slightly less than the worn area, and consisting of a plurality of layers of fabric material, each of said layers being coated with a mastic wood preserving material adapted to be extruded laterally from between the layers and beyond the fabric by downward pressure upon the mat when in use beneath the tie plate so as to completely fill the worn area.

2. An expansible repair plate adapted to be inserted upon a wooden tie beneath a metal tie plate to fill an area which has been worn by the metal tie plate, said repair plate comprising a preformed flexible mat of a size initially slightly less than the worn area, and consisting of a plurality of layers of fibrous base material, each of said layers being coated with flowable pitchy material adapted to be extruded laterally from between the layers and beyond the fabric by downward pressure applied to the mat when in use beneath the tie plate so as to completely fill the worn area.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,905,397	Reynolds	Apr. 25, 1933
491,092	Eaton	Feb. 7, 1893
695,429	Gombar	Mar. 11, 1902
1,128,048	Robbins	Feb. 9, 1915
2,155,155	Stedman	Apr. 18, 1939
2,277,808	Wood	Mar. 31, 1942
1,769,630	Fischer	July 1, 1930
1,961,077	Pater	May 29, 1934
2,352,314	Fischer	June 27, 1944
1,780,396	Kirkbride	Nov. 4, 1930
1,413,085	Wells	Apr. 18, 1922
1,765,796	Kirschbraun	June 24, 1930
1,168,083	Lewis	Jan. 11, 1916
445,325	Wilson	Jan. 27, 1891
1,610,379	Hooper	Dec. 14, 1926
952,591	Ulrich	Mar. 22, 1910

FOREIGN PATENTS

Number	Country	Date
669,003	France	Nov. 9, 1929
223,956	Great Britain	July 20, 1923