

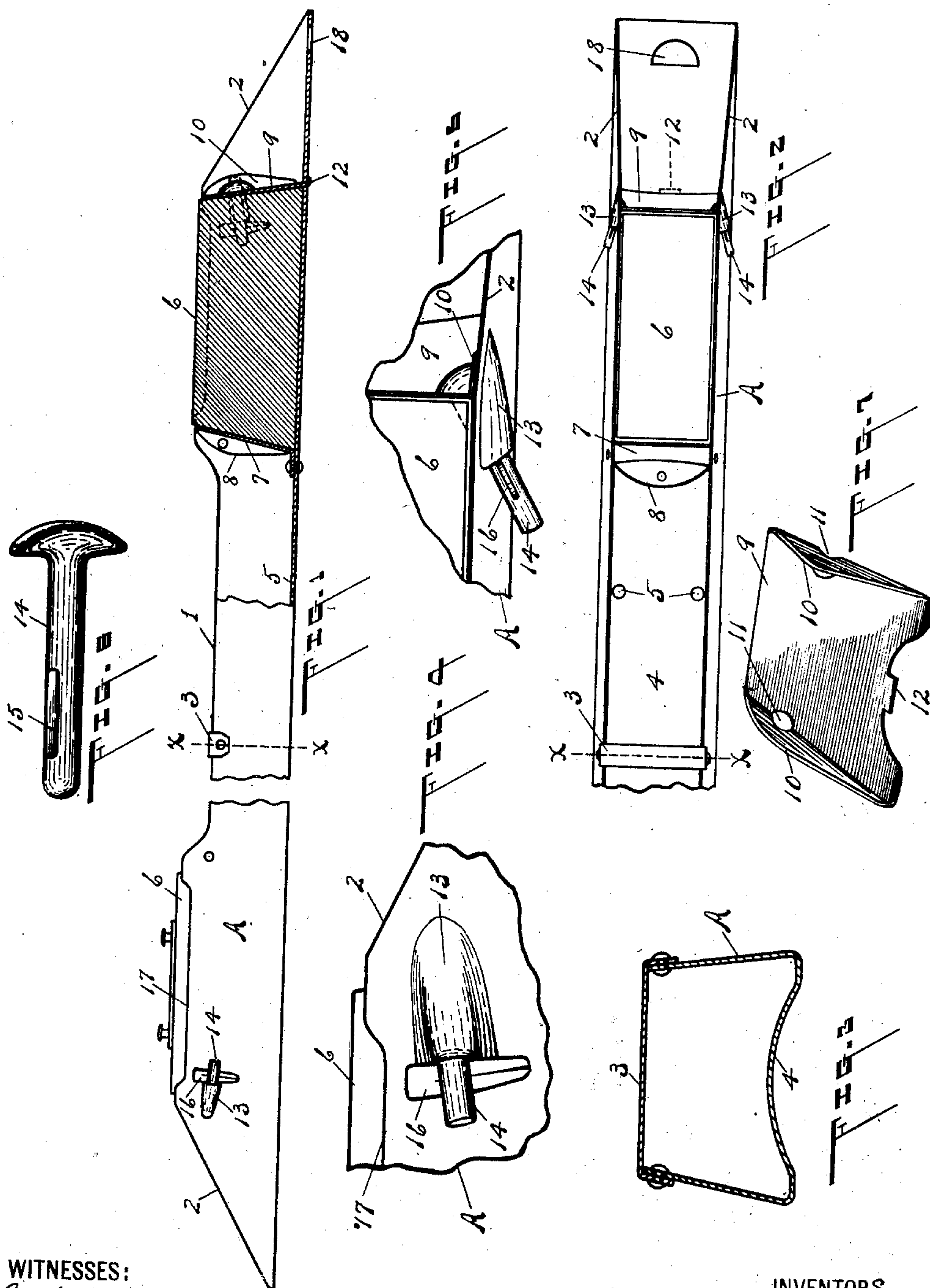
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N. J. MOLEAN & E. SWANSON.

RAILWAY TIE.

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WITNESSES:

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RAILWAY-TIE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, NORMAN J. McLEAN and ERNEST SWANSON, citizens of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Railway-Ties; and we 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.

This invention relates to railway-ties, and more particularly to that class of ties wherein the use of wood or other cushioning substance is economized as far as possible.

Owing to the growing scarcity of wood and its high price, the expense of equipping and renewing a road-bed with ties, even where they have been treated to resist decay, is very considerable, and many attempts have been made to provide an inexpensive tie, either of metal or plastic substance, which will prove a satisfactory substitute for the wooden ties. The great majority of such substitutes have failed to prove themselves satisfactory, owing to the number of requirements necessary. In the first place, a tie must have a certain yielding or cushioning resistance to the pounding of the wheels of a train on the metals. Again, in winter the frost often upheaves the rails, loosening them relative to the ties or raising both ties and rails at various points not in a uniform manner, but here and there, and if the track is not immediately repaired grave dangers result; or in constructing the track the rails may not be laid exactly parallel, the rails themselves not being in alinement, causing what are known as "kinks," and it becomes necessary to ease the rails over in one direction or the other to bring the ends of the rails into alinement and even the track. Kinks may also develop after the track has been laid. Furthermore, it is desirable that the ties substituted for the wooden ones be as easily handled as the wooden ties and that the rails may be as expeditiously secured to and removed from the substitute ties as from the wooden ones. Also the substitute ties must be capable of receiving rails of varying gage.

This invention is intended to accomplish all the advantages attained by the use of the wooden ties, while effecting a great saving in expense, ties made in accordance with our invention lasting much longer than the wooden ties and being much less expensive

to replace, since the body portion of the tie is practically indestructible, while the wearing portions of the ties may be renewed singly or together at any time. The substitution of new wearing portions for the old ones is effected in much less time and at a great saving in expense over the replacing of the wooden ties, and our ties are more stable in the bed, since they are practically covered by the material of which the bed is composed, nor do they require as bold an embankment, owing to their end formation, as do the wooden ties.

The invention also has for an object the provision of novel means for removably retaining the wearing portions of the tie in place in such manner that access is easily obtained thereto.

To the foregoing and other ends, therefore, this invention consists in certain novel features and combinations of parts, together with their equivalents, such as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, illustrating one embodiment of the invention, Figure 1 is a side view of our invention, partly in section. Fig. 2 is a top plan view of a portion of a tie. Fig. 3 is a cross-sectional view on the lines *xx* of Figs. 1 and 2. Fig. 4 is an enlarged detail side view of the removable fastening for retaining the end plates in position. Fig. 5 is a top plan view of the same. Fig. 6 is a detail view of the bolt alone, and Fig. 7 is a detail perspective view of the removable plate.

A indicates the body portion of the tie, comprising, in effect, a metallic trough cut away, as at 1, between its ends, the ends of the trough being reduced or inclined, as at 2 2. This trough is embedded in the road-bed and is cut away centrally of its length in order that the ballast may be filled in between the rails, covering the sides of the trough completely, thereby forming an even walk intermediate the rails and preventing the engagement of dragging brake-rods and the like with the trough. The opposite ends of the trough are inclined, so as to reduce the face of the embankment as much as possible and effect a saving in expense and labor in maintaining the same. We may also employ a brace, as 3, extending across between the upper edges of the sides of the trough intermediate the ends thereof.

The bottom of the trough is preferably

raised or arched in order that the ballast may be tamped beneath it more easily and to give it a broad firm foundation to prevent it from slipping laterally, the side walls of the trough being inclined or converging toward each other, as shown. We also perforate the bottom of the trough, as shown at 5 5, to permit moisture to drain out.

Intermediate the reduced ends of the trough and the cut-away portion 1 at the highest points of the trough we insert the cushioning-blocks 6 6, which may be of wood or pulp, as preferred, the length of each block being but a fraction of the length of the trough. The sides of the block incline toward each other to conform to the cross-sectional area of the trough, the blocks being slipped in endwise of the trough. The ends of the blocks are also inclined toward each other, imparting to the block a truncated pyramidal shape, broadest at the base. The inner ends of the blocks abut the stationary inclined plates 7 7; secured in the trough in any suitable manner, as by means of flanges 8 8, fastened to the sides and bottom of the trough, and are thus held against inward movement.

The outer ends of the blocks are covered and the blocks prevented from outward movement by means of the removable plates 9 9, flanged on opposite sides, as at 10 10, and having perforations 11 11, formed through the angles where the flanges join the plate. The lower edges of the plates conform to the contour of the trough and are each provided with bent tongues 12, adapted to pass through apertures in the arch of the trough to hold the lower portions of the plates stationary and enable them to resist any tendency of the blocks to spread apart, the tongues preferably being curved or bent, as shown.

The apertures 11 11 in the upper portions of the plates are arranged to lie opposite the protruding apertured lugs 13 13, formed in the trough, the apertures and the lugs adapted to receive the bolts 14 14, the heads of which conform to the angle formed by the plate 9 and the flanges 10 10, the stems of the bolts being slotted, as at 15 15, to receive the wedge-shaped split keys 16 16. The bolts pass through or engage the corners of the outer ends of the blocks 6 6, and by reason of the downward incline imparted to the lugs or ears 13 13 the bolts as they are drawn tight by the wedges serve to impart an inward and downward stress to the blocks to hold them firmly seated, besides clamping the blocks. The walls of the trough are recessed, as at 17 17, on opposite sides of the blocks to permit a certain amount of wear of the block before the rail secured thereon engages the walls of the trough. Also in order to facilitate handling and positioning the ties we provide holes 18 18 at the opposite ends thereof, the holes designed to receive the pick ends of the track layers, whereby the ties may be pulled end-

wise in laying the track to bring them into position.

When either of the blocks 6 has become worn out, all that is necessary is to remove the ballast from the reduced end of the trough and from around the wedge-shaped keys 16 16, knock out the keys, draw the bolts 14 14, and tilt the removable plate 9, so that the tongue may be drawn out of the aperture in the base of the trough, after which the rail may be loosened from the block, the latter driven out of the trough by a smart blow, a new block inserted, and the parts replaced. It is obvious that either block can be renewed independently of the other in case of unequal wear thereon, thus effecting a saving over the old form of tie, which had to be entirely removed. This renewal of the blocks is accomplished without raising the rail. In case of kinks the rails may be loosened from the blocks and eased over to bring the track into alinement, after which the rail is again spiked to the blocks, which latter are made long enough to accommodate tracks of different gages and rails of different sizes. Where the track is heaved by frost or other means, so that the rails adjacent the heaved portions are raised from the ties, all that is necessary is to place shims of wood or pulp between the raised rails and the ties, as in the old forms of ties, or if the ties and rails have both been raised out of the road-bed, the ballast is tamped beneath the ties so raised.

The base of the tie is perfectly smooth and unobstructed by flanges or the like, thus permitting the tie to be readily drawn into or out of position, the tie being given the usual eight-foot bearing of the wooden tie, and owing to the bevel or inclination given the sides of the blocks they cannot work loose in the boxes or move upwardly, and this is furthermore strengthened by the provision of the bolts and keys. Should the blocks warp or shrink, all that is necessary is to drive the keys farther into the slots, the bolts being slotted throughout such a portion of their length that the keys engage the outer ends of the lugs as well as the outer ends of the slots.

It is evident that we have produced a tie combining the advantages of the old wooden ties with those of the composite or metallic ties, at the same time considerably simplifying and improving the constructions previously on the market, and as many changes might be made in the form and arrangements of the several parts described we do not wish to limit ourselves to the exact construction herein set forth.

Having thus fully disclosed our invention, what we claim as new is—

1. A tie comprising a trough-shaped body portion, cushioning-blocks received in the trough, means for preventing movement of

the blocks in one direction, removable plates for preventing movement of the blocks in the opposite direction, flanges on the plates and fastening means passing through the flanges and the walls of the trough for maintaining the plates in position.

2. A tie comprising a trough-shaped body portion, the bottom of which is arched, cushioning means received in the trough, means for preventing movement of the cushioning means toward each other, removable plates for preventing movement of the cushioning means away from each other, the lower edges of the plates being cut away to conform to the shape of the bottom of the trough and fastening means passing through the plates and the walls of the trough for retaining the plates in position.

3. A tie comprising a trough, the walls of which are inclined toward each other, cushioning-blocks received endwise in the trough between the walls, the blocks being in the shape of a truncated pyramid, stationary inclined plates secured within the trough against which the inner ends of the blocks bear, removable plates located at the outer ends of the blocks, and fastening means passing through the removable plates and the sides of the trough respectively to retain the plates in position.

4. A tie comprising a metallic trough, cushioning-blocks received in the trough near the opposite ends thereof, removable plates for retaining the blocks against movement in one direction, the plates each provided with a tongue passing through an ap-

erture in the trough, and fastening means passing through the plates and the sides of the trough respectively for retaining the plates in position.

5. A tie comprising a metallic trough, cushioning-blocks located near the opposite ends of the trough, removable plates for preventing movement of the blocks in one direction, apertured flanges on the plates, apertured lugs projecting from the walls of the trough, slotted fastening means passing through the plates and lugs, and wedge-shaped keys received in the slots, the keys engaging the lugs to hold the fastening means tightly in place.

6. A tie comprising a metallic trough, cushioning-blocks received therein, removable apertured plates for retaining the blocks in place, apertured downwardly-inclined lugs projecting from the walls of the trough and fastening means passing through the plates and lugs.

7. A tie comprising a metallic trough, cushioning-blocks received therein, removable apertured plates for retaining the blocks in place, apertured lugs projecting from the walls of the trough and fastening means passing through the plates and lugs.

In testimony whereof we affix our signatures in presence of two witnesses.

NORMAN J. McLEAN.
ERNEST SWANSON.

Witnesses:

A. A. EASTERLY,
RALPH S. WARFIELD.