Dec. 21, 1943. S. J. REDDICK 2,337,497

RAILROAD TRACK CONSTRUCTION

Filed Oct. 20, 1941 2 Sheets-Sheet 1

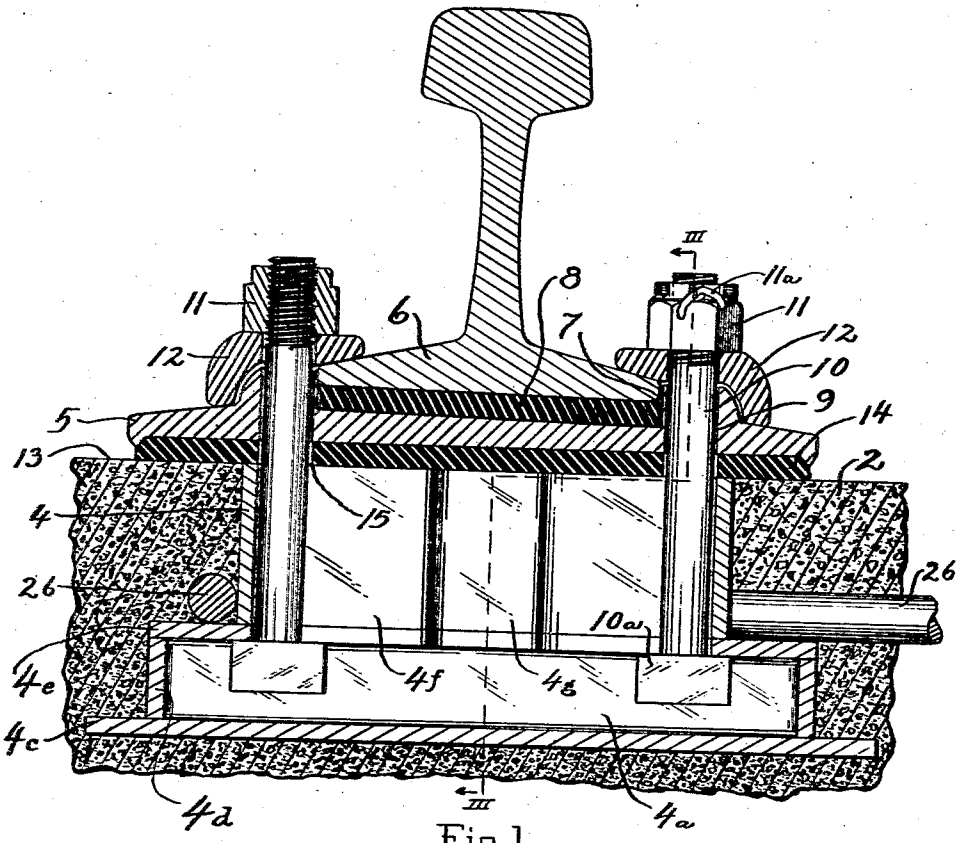

Fig. 1

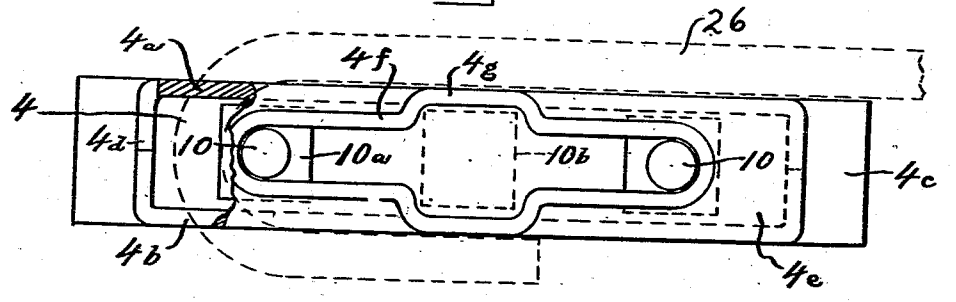

Fig. 2

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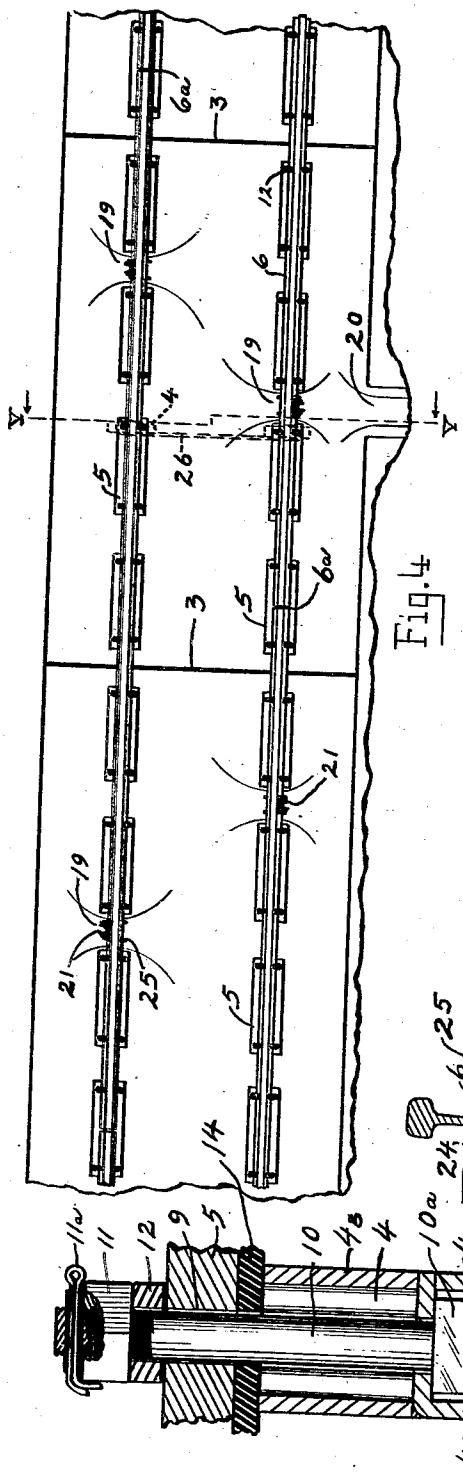

Fig. 4

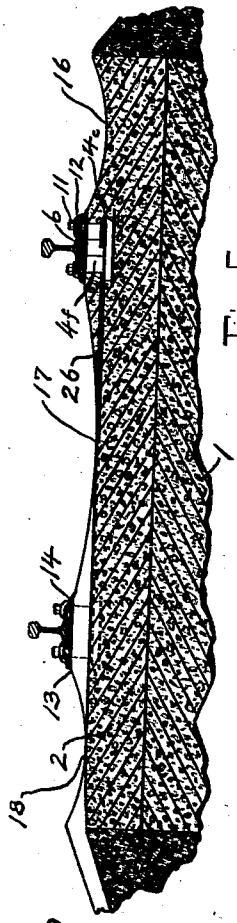

Fig. 5

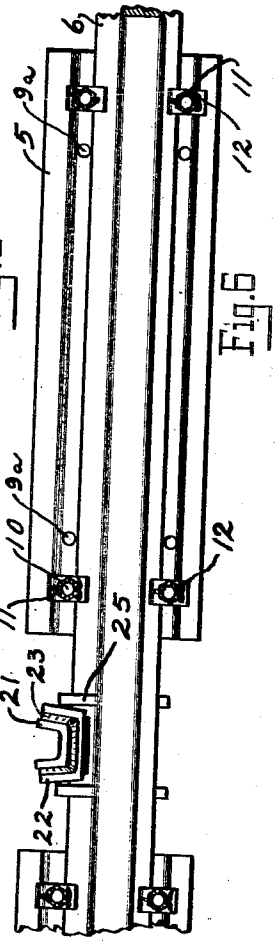

Fig. 6

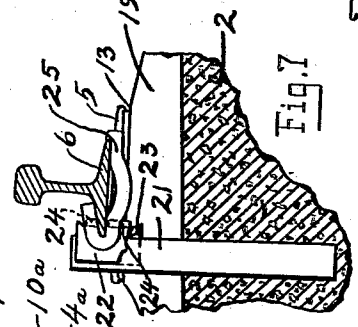

Fig. 7

Fig. 3

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RAILROAD TRACK CONSTRUCTION

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Application October 20, 1941, Serial No. 415,746

2 Claims. (Cl. 238—7)

This invention relates to the construction of the roadbed and securing means for rails and it has for its primary object the provision of a permanent support to which the rails may be securely fastened. A further object of the invention is to avoid the many disadvantages due to the use of wooden railway ties and to eliminate the undulatory movements and swaying caused by the movement of ties in the ballast. A still further object of the invention is to provide a form of track support in which the entire weight imposed upon the rails will be distributed over a wide area of the roadbed, in which the alinement of the rails may be made very accurate, in which the surface may be made substantially perfectly smooth, and in which the rails may be cushioned to reduce noise, with a resultant smoothness of ride difficult or impossible to attain with previously used track supports. Further advantages to be obtained by the improved construction herein disclosed are: holding the rails to gauge, reducing wear on rails and rolling stock, greatly reducing the cost of upkeep and replacement, prevention of the growth of grass and weeds, and prevention of creeping of the rails.

Preferred forms of the elements constituting the improved construction are illustrated in the accompanying drawings but it will be evident to those skilled in the art that many changes and modifications may be made in details of design and in the size, proportions, and arrangement of the parts without departing from the invention as claimed.

In the drawings, Figure 1 is a vertical section through a rail and the means by which it is secured to the roadbed; Fig. 2 is a plan view of the securing means; Fig. 3 is a vertical section through the securing means on the line III—III of Fig. 1; the bolt being shown in elevation; Fig. 4 is a plan view of a portion of the roadbed and tracks; Fig. 5 is a transverse section through the roadbed; Fig. 6 is a fragmentary plan view on a larger scale than that of Fig. 4, showing a fragment of a rail, a rail plate, and the devices for preventing creeping of the rail; and Fig. 7 is an elevation with parts in section of the members shown in Fig. 6.

The road bed for a single track railway will preferably consist of a continuous strip of concrete 1, about ten feet wide and nine inches or more thick, on which will rest a series of concrete slabs 2, also ten feet wide and nine inches thick and about sixteen and one-half feet long, with suitable expansion joints 3 between the slabs. The lower strip of concrete, being embedded in the earth and covered with nine inches of concrete slabs will not need expansion joints but will form a substantially unyielding base to support the upper layer of slabs. Within the upper surface of the slabs will be secured a plurality of bolt anchors consisting of sheet metal boxes 4, the tops of which will be carefully alined and set at the proper level or grade and separated in the slabs at the proper distances to register with the bolt openings in the rail plates 5 longitudinally, and transversely to agree with the track gauge.

These rail plates 5 are shown in section in Fig. 1 and in plan in Fig. 6 on a smaller scale. For the standard 100 pound rail having a five and one-half inch base 6, the plates will have a central longitudinal recess 7 which will receive the elastic cushion strip 8 and the base 6 with a small clearance; the plate at the recess is shown as tapering from a thickness of about one-half on the side placed toward the outside of the track to a thickness of about three-eighths on the other side, this taper being for the purpose of tilting the rails slightly inward toward the center of the track. At each side of the recess 7, holes 9 are formed in the thicker portions of the plates for bolts 10 having nuts 11 which engage lugs 12, one end of each lug bearing on the rail base 6 and the other end upon the top of the plate 5.

The metal anchor box 4 may conveniently be formed from a flat sheet metal blank by bending up the sides 4*a* and 4*b* from the bottom 4*c*, bending in end portions of the sides, as at 4*d*, to meet at the centers of the ends, and folding the top portion 4*e* across to lie upon the top of the sides and ends. All the joints are welded together. The ends of the bottom 4*c* will be left projecting to provide additional surface to secure the box in the concrete.

A collar 4*f* having an expanded central portion 4*g* wide enough to permit the passage of a bolt head 10*a* rests upon the top 4*e* and is welded thereto, the top having an opening punched therein registering with the inside of the collar. A bolt introduced into the central opening as indicated by broken lines 10*b* in Fig. 2, with the head beneath the level of the top 4*e*, may be moved to the right or left into one end of the collar and a second bolt may then be inserted in the same way and moved into the other end of the collar. The top 4*e* and the collar 4*f* will thus lie above the sides of the head 10*a* to resist an upward movement. The top of the collar will be flush with a flat surface 13 on the top of the

slab 2. On this flat surface, a cushion strip 14 will be placed, suitable holes 15 being formed in the cushion for the bolts 10. The plate 5 will then be placed on the cushion, the holes 9 receiving the bolts 10. With the cushion 8 in place in the recess 7, the rail base will be set in the recess on the cushion and adjusted longitudinally to its proper location. While the rail base may be in contact with either one of the side walls of the recess 7, it cannot engage the shanks of the bolts 10 which are in the holes 9 spaced a little way from the recess. Every plate will be securely held in place near each end by the bolts of an anchor box, there being two boxes and four bolts for each plate. The lugs 12 will be put in place on the bolts to engage the rail base and the plate and the castellated nuts 11 tightened to draw the bolt heads firmly into contact with the under side of the top 4e and to press the rail down upon its cushion in the plate. While the cushions 8 and 14 may be compressed still more as the wheels of a train pass along a rail, any downward movement of the bolts that can occur will be permitted by the space left between the bottom of the bolt heads and the box bottom 4c. A cotter key 11a may be used to lock the nut 11.

A standard rail is thirty-three feet long and, as shown in Fig. 4, the joint between the ends of two rails comes opposite the center of the rail on the opposite side of the track. In the preferred arrangement illustrated, the plates 5 are eleven inches wide and thirty-six inches long, being spaced apart thirteen and one-half inches. A rail joint is located at the center of a plate and the angle bars do not interfere wth the lugs 12. With this spacing, there are seven intermediate plates between the plates at the rail joints.

As indicated in Fig. 6, some of the rail plates may have additional holes 9a in line with the holes 9 and preferably spaced three inches from center to center, so that the same plate may be used in various places in which the spacing of the anchor boxes has been made different from the normal distances. In the plate illustrated, the distances between bolt centers could be 24 inches, 27 inches, or 30 inches with only the four additional holes 9a.

While the surface of the top of the concrete slabs 2 is made smooth for at least a width of eleven inches and a length of thirty-six inches at each plate to form a flat, solid bearing for the plate and its cushion 14, the spaces between the rails and between each rail and the outer edge of the slabs is preferably curved to form continuous smooth troughs, 16, 17, and 18, as best shown in Fig. 5. At suitable intervals, cross channels 19 may be formed to connect the central trough 17 with either side trough 16 or 18 and where conditions permit, side channels 20 will be provided to allow water to run off the roadbed.

At a distance of six feet or more longitudinally of the track from the point where a rail joint is to be located, anchor posts 21 made of heavy channel iron with slightly flaring flanges will be secured in the concrete slabs 2 with the central web of the channel closely adjacent to the line of the outer edge of the base of the rail. Slidable upon the outer surface of the posts 21 are slides 22 which flare outward at the top and bottom away from the post as indicated at 23 in Figs. 6 and 7. These slides are notched in their rear webs for engagement with the edge of the base of the rail and lie between the post and the base. Reinforcing blocks 24 may be welded on the rear web of the slide above and below the notch to increase the bearing surface on the rail base.

On each side of the slide 22, a rail anchor 25 of well known construction is sprung upon the base to lie closely in contact with the slide. The anchor posts will thus act to take the longitudinal thrust of the rail to prevent the creeping caused by the friction of the wheels on the rail. The flaring top and bottom of the slides provide spaces for lubricating grease and avoid the wearing of sharp edged notches into the post.

As a means for preventing lateral separation of the anchor boxes in case of cracking of a concrete slab, reinforcing tie rods 26 may be used to connect the boxes of opposite sides of the track, the rods being bent or curved at each of the two ends to engage around the outer end of an anchor box 4. As indicated in broken lines in Fig. 2, the free end may extend only a part of the length of the box, permitting a rusted-out or damaged box to be chiseled out of the concrete and replaced by a new box without cutting or disturbing the reinforcing rod 26.

It will be seen from the foregoing description that this invention provides a heavy, rigid, and durable roadbed having permanent anchoring means for holding the fastening bolts securely in place. The track plates are held in permanent alinement and at a fixed gauge which cannot vary because of any side sway or side thrust upon the rails. There are no wooden ties to wear, rot, or burn; no ballasting of the track; no cutting or burning of weeds or grass in the space between the rails or close to the outside of the rails.

The upkeep of such a roadbed would be very small as compared with the present constructions using wooden ties, and while the first cost would be greater, this would be more than compensated for by the greatly decreased annual cost of maintenance.

In freight yards and in train sheds, the smooth cement surfaces would evidently be much safer, more sanitary, and more easily kept clean. At street crossings, the pavement between the rails would rarely need to be torn up for any repairs or replacements.

While the methods to be used in laying the concrete for such a roadbed form no part of the present invention, it will be obvious that after the anchor boxes have been set along the proper curves or straight lines, with their tops level or on a desired gradient, the upper edges of the collars may serve as screeds to smooth the portions on which the rail plates are to rest, and after the cement surfaces are finished, collapsible cores set within the slabs where anchor posts are to be placed can be removed and the anchor boxes may then serve as fixed points of measurement for the accurate setting of the posts in their exact position with relation to the lines to be occupied by the edges of the rail bases. Plugs flush with the tops of the collars would be used to keep dirt out of the anchor boxes until ready for use, and thus during the whole course of finishing the surfaces, there would be no projecting bolt ends or other metal parts to interfere with easy operation of the finishing tools.

I claim:

1. A railroad track construction comprising a continuous, substantially unyielding concrete roadbed, a plurality of slabs of concrete thereon of a thickness to insulate the roadbed from injurious expansion or contraction due to atmos-

pheric temperature changes, the slabs having suitable expansion joints between their adjacent edges and having formed upon their upper surfaces two parallel series of elevations having flat tops, rail plates upon these flat tops and supported thereby, cushioning means between the plates and the slabs and cushioning means on the upper surfaces of the plates to receive a rail base, and means to secure the plates and the rails to the slabs.

2. In combination, a concrete roadbed having its upper surface formed with a central longitudinal drain trough and parallel elevated portions having flat tops on both sides of the central trough, a series of anchor boxes arranged at intervals along each of the elevated portions below the upper surface thereof, a series of rail plates arranged longitudinally of the elevated portions, each plate being formed with a central longitudinal recess of a width to receive a rail base, a cushion within the recess, rails having their bases within the recesses of the plates and upon the cushions, and means engaging the anchor boxes, the rail plates and the rail bases, to secure the rails to the plates and the plates to the roadbed.

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