Aug. 20, 1929. H. E. MUCHNIC 1,725,410

RAILWAY CROSSING PAVEMENT

Original Filed Nov. 24, 1926 3 Sheets-Sheet 1

Fig. 1.

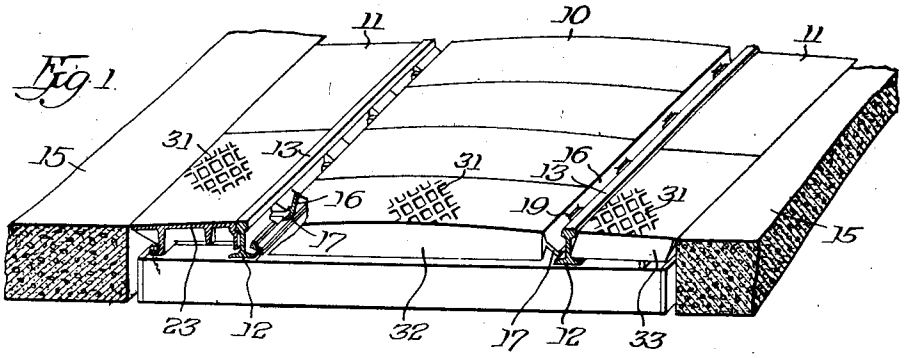


Fig. 2.

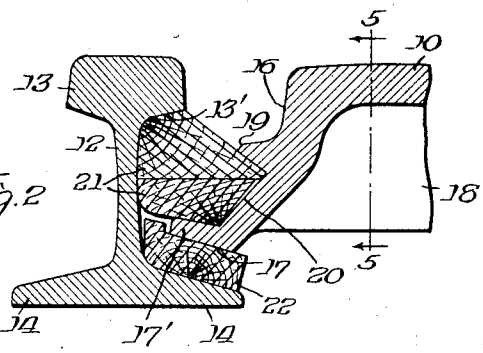


Fig. 4.



Fig. 3.

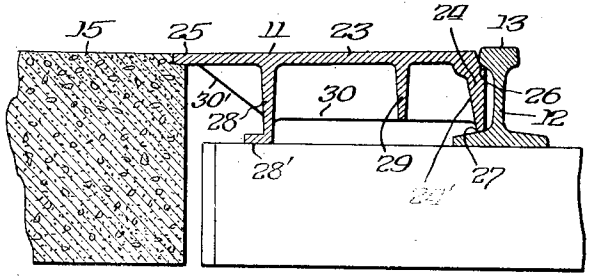
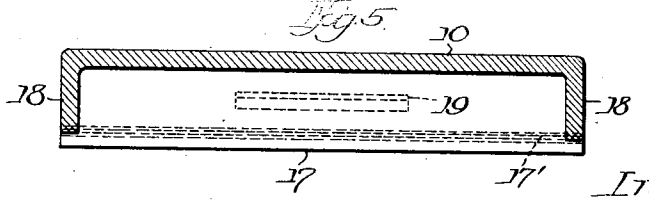


Fig. 5.



Witness:
H. E. Morrison

Inventor
Henry E. Muchnic
By Attorney
Paul Carpenter

Aug. 20, 1929. H. E. MUCHNIC 1,725,410

RAILWAY CROSSING PAVEMENT

Original Filed Nov. 24, 1926 3 Sheets-Sheet 2

Fig. 6.

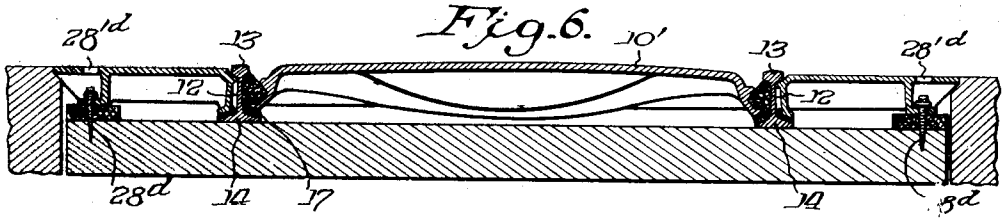


Fig. 7

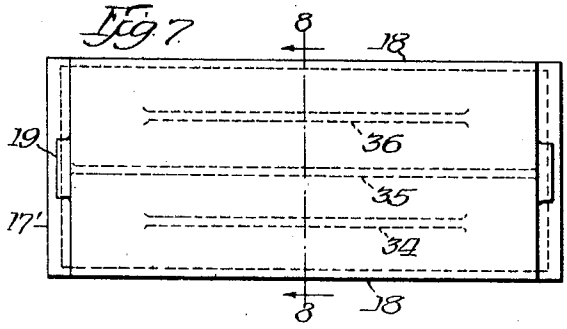


Fig. 8.

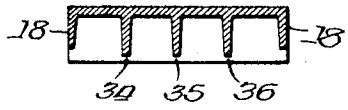


Fig. 9

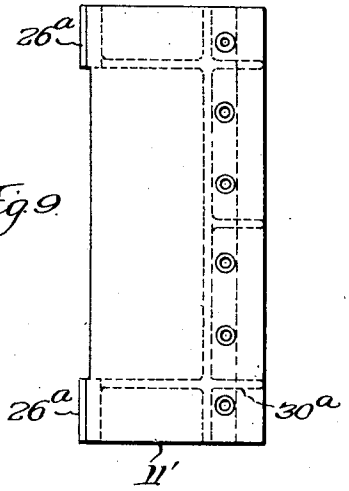
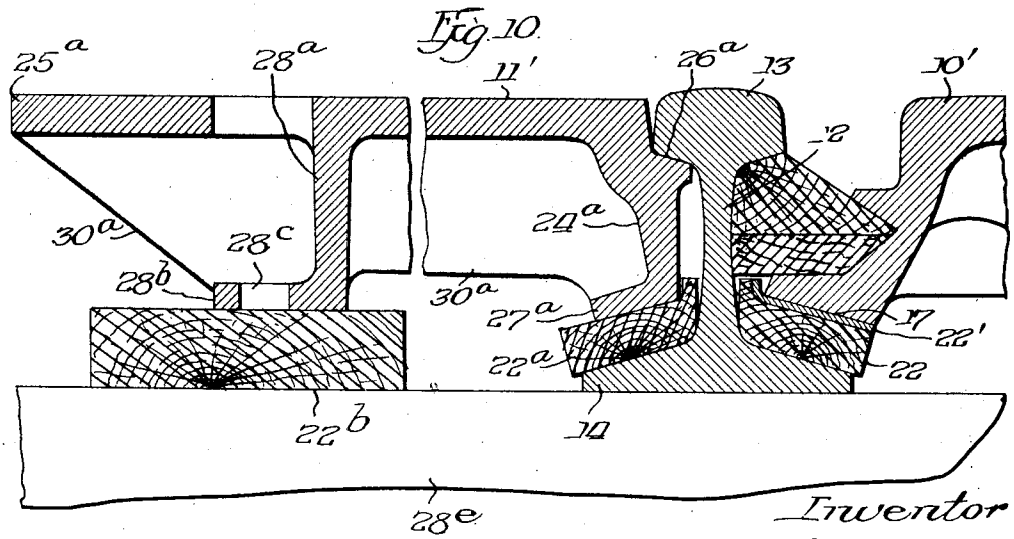


Fig. 10.



Witness:

Inventor

Henry E. Muchnic

by Attorney

Paul Carpenter

Aug. 20, 1929. H. E. MUCHNIC 1,725,410

RAILWAY CROSSING PAVEMENT

Original Filed Nov. 24, 1926 3 Sheets-Sheet 3

Fig. 11

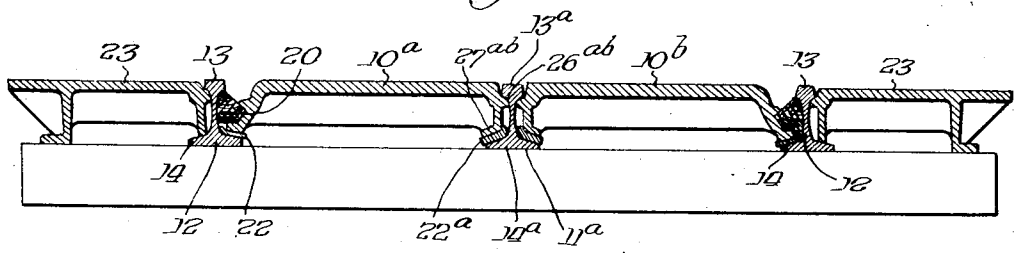


Fig. 12

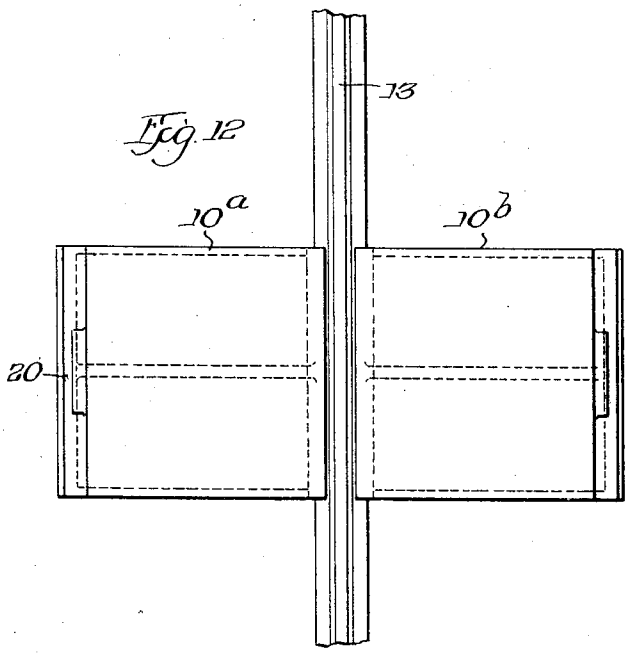
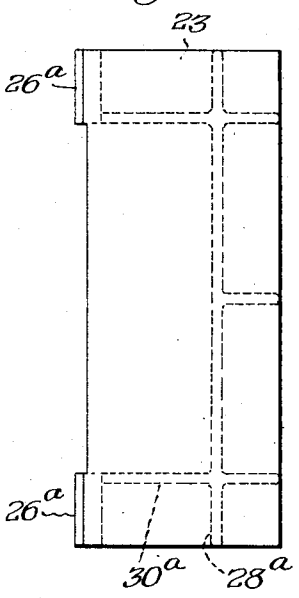


Fig. 13



Witness:
Fred C. Dorsey

Inventor
Henry E. Muchnic
By Attorney
Paul Carpenter

Patented Aug. 20, 1929. 1,725,410

UNITED STATES PATENT OFFICE.

HENRY E. MUCHNIC, OF ATCHISON, KANSAS, ASSIGNOR TO THE LOCOMOTIVE FINISHED MATERIAL COMPANY, OF ATCHISON, KANSAS, A CORPORATION OF KANSAS.

RAILWAY-CROSSING PAVEMENT.

Original application filed November 24, 1926, Serial No. 150,491. Patent No. 1,703,686, dated February 26, 1929. Divided and this application filed August 1, 1927. Serial No. 209,911.

This invention relates to an improvement in railway crossings, particularly pavements at railway crossings and has for an object thereof the provision of metal structure so-called grade crossings forming with a railway road bed a continuous surface for readily permitting the passage thereover of the vehicular traffic.

Among its objects, my invention resides in the provision of metal structure suitable for combining with a railway road bed to provide a pavement thereover for vehicular cross-traffic where highways or the like intersect the railway right of way, so as to provide a crossing of firm and long-wearing characteristics against extremely heavy traffic.

The present application is a division of my application 150,491, filed November 24, 1926, Patent 1,703,686, February 26, 1929.

My invention still further has for another object thereof the provision of a railway crossing to provide a continuous pavement over the railway for vehicles, having the favorable characteristics of being simple to lay, requiring no particular skill or expensive machinery, no predetermined preparation or modification of the railway bed and still be extremely inexpensive and efficient from an economical standpoint.

Where my invention is to be used with an electrified railway system, either for signalling purposes or of the electro-motive power type, my invention still further has for an object thereof the provision of a railway crossing for vehicular traffic of metal structure which may be associated with the railway road bed without interfering with the electrical connections for signalling purposes or motive power.

In the preferred embodiment, my invention has for an object thereof the provision of metallic blocks arranged to engage standard rails, forming with the I-beam structure thereof key or locking engagement to form a continuation of the vehicular road bed with the railway road bed and is held in this position against horizontal stresses as well as vibratory action of rolling stock thereover, the engagement of the blocks being of the character such as will not require predetermined preparation of the railway road bed or railway ties but may be assembled therewith without the use of special tools or machinery or without in any way interfering with the railway road bed. More particularly I prefer to make metallic blocks or elements having rail engaging portions and supported upon the rails and spaced therefrom as well as from the railway ties, providing ready drainage thereunder and avoiding the accumulation of mud or débris which may ordinarily displace the metal structure or otherwise interfere with the long life or intended operation of an electrified railway system.

The general characteristics of the elements forming the railway crossing are plates or blocks which include a surface portion having end railway engaging or key portions and downwardly disposed flanges having support on a rail, the blocks including bridging portions across railway ties or intervening space between rails, providing a block having highest economy so far as weight of metal is concerned, of strength to support the normal loads encountered but sufficiently spaced from the railway road bed to be free from interference due to accumulation of mud and débris and permitting the free drainage of water thereunder.

Among its further objects, my invention resides in the provision of metal railway crossing paving elements having rail engaging portions requiring the minimum amount of machining, finishing or the like and which are arranged to engage the rails without in any way modifying the same and which elements may be laid without predeterminedly preparing the railway road bed to hold the same in their intended position. More particular features reside in the provision of railway crossing blocks or elements having locking and keying engagement with the ball and flange of the rail but without in any way coming in contact with the tie or road bed, each block or element being a complete unit, being independently held in position for individual adjustment, partial access to the under portion thereof, and of a size permitting use at curved portions of a railway road bed. Still more particularly, the railway blocks or elements are provided with rail engaging portions resiliently disposed upon the flange of the rail, resisting shock due to vibration of cross

traffic thereover and permitting expansion due to temperature variations, atmospheric conditions, or the like.

Other features of my invention reside in the provision of railway crossing pavement elements or blocks having locking or engaging means with standard rails so that in a still further particular embodiment the blocks may be reduced in size to bridge only partially the space between parallel rails avoiding castings or plates of unusual size and weight by omitting the downwardly depending longitudinal ribs or flanges. In this embodiment, my invention has for its object the provision of an intermediate rail between the rails ordinarily provided but of the character which requires no modification of the keying or engaging portion so that a standard rail may be used intermediate the railway road bed rails. The other features of this embodiment reside in the provision of an intermediate rail suitable for use with electrified systems for signalling or motive power, without interfering in any way with their intended function.

To attain these objects and such further objects as may appear herein or be hereinafter pointed out, I make reference to the accompanying drawings forming a part hereof in which—

Figure 1 is a perspective view, partly broken away, showing a railway road bed and crossing embodying my invention;

Figure 2 is a vertical section of a detail drawn to an enlarged scale of a portion of the structure showing the locking engagement of a block and a rail;

Figure 3 is a vertical section drawn to an enlarged scale of the approach side of a rail;

Figure 4 is a perspective view of a pair of coacting wedge blocks;

Figure 5 is a section taken on a line 5—5 of Figure 2;

Figure 6 is a transverse section across the railway road bed disclosing a modification;

Figure 7 is a plan view of a block or element for use intermediate the rails;

Figure 8 is a section taken on a line 8—8 of Figure 7;

Figure 9 is a plan view of an approach plate element shown in transverse section in Figure 6;

Figure 10 is a transverse section drawn to an enlarged scale of the engagement of approach plate elements and intermediate rail elements;

Figure 11 is a transverse section across a road bed of a still further modification;

Figure 12 is a plan view drawn to an enlarged scale showing railway blocks when associated with an intermediate rail;

Figure 13 is a plan view of an approach plate as shown in Figure 11.

Referring to the drawings, it will be observed that a railway crossing pavement contemplated by my invention comprises generally intermediate plates 10 and approach plates 11 each arranged to engage stock form of rails 12 in locking engagement with the ball portion 13 and the flange portion 14 of said rail. Adjacent plates, plural in number, arranged end to end, are disposed to form a substantially continuous surface with the vehicular road bed 15 of the type normally encountered at grade crossings, street intersections, etc., such as concrete, macadam, asphalt, dirt or the like.

The ends of the intermediate plates or the approach plates previously described are provided with downwardly disposed flanges and rail engaging portions. In the case of the intermediate plates 10, each element is provided with a downwardly disposed flange 16 having a rail flange engaging portion 17 and an interposed bridging side rib 18. The rail flange engaging portion 17 is extended angularly and upwardly at 17′, conforming in contour substantially to the flange 14 of the rail. The outer face of the flange 16 is also provided with an extended abutment 19 cooperating with the extended portion 17′ to form a socket 20 for the pairs of wedge blocks 21, shown in detail in Figure 4. It will be observed that these wedge blocks are formed in general contour at one portion thereof so as to snugly engage the ball 13 of the rail at its under surface 13′.

Generally, the intermediate plates 10 have overall dimensions lengthwise thereof, that is, between the extended portions 17′, substantially less than the distance between the vertical webs of the rails, permitting the insertion thereof without in any way modifying or moving the rails, assembly being permissible without in any way modifying the railway road bed. The overall dimensions in length of this intermediate plate are greater than the distance between the ball portions 13 of the rails, for purposes which will hereinafter appear. It is preferred to position an intermediate plate and rest the same upon the flanges 14, interposing, however, a resilient filler block 22 serving to coact with the wedge blocks 21 to resiliently dispose and hold the plate against vertical thrusts, as well as end thrusts, the filler block also serving as an insulator for the conducting metallic plate between pairs of rails 12.

It will be observed that an intermediate plate may be positioned between the pairs of rails 12 by first arranging the filler block 22 upon the rail flanges 14. The angularly disposed relationship of the blocks will serve to center the intermediate plate when proper horizontal adjustment is made. End and vertical take-up is obtained by positioning in the socket 20 the pairs of wedge blocks 21 and as each intermediate plate has its ends provided with these sockets 20, individual

adjustment may be had by simply driving the wedges relative to each other until a position substantially as shown in Figure 4 is obtained, whereupon the position of a spike or nail 21′ will prevent any reversal of movement. It will thus be observed that by disposing the end of the plate 10 between the wedge blocks 21 and the filler block 22 I obtain at a single operation locking engagement both in a vertical direction as well as in a horizontal direction, and where I use filler blocks such as made of wood, hard rubber or other insulating material, I effectively prevent the short circuiting of any electric current between the rails 12. It will also be observed that as the plate is raised substantially above the rail flanges 14, clearance is provided to prevent the accumulation of débris on the under side of the plate, whereas the angularly depending flange 16 provides suitable clearance for the wheel flanges, serving also as a guard therefor.

It will be further observed that by disposing the plates upon the filler blocks 22 and holding the same in position by means of the wedge blocks 21, particularly where these members are made of hard wood or similar material, I may substantially reduce the cost of the intermediate plate by avoiding the unnecessary finish of the engaging portions of the plates, the resiliency of these blocks serving to take up any irregularity in the casting and still obtain proper positioning and leveling of the plates.

The intermediate plates above described are suitable for use between pairs of rails such as 12, which may be provided for the rolling stock or between adjacent rails where more than one set of tracks are to be used. At the outside of the rails, however, it is preferred to provide approach plates 11 which have a surface portion 23, a rail engaging portion 24 at one end and a highway aligning terminal 25. The rail engaging portion 24 comprises a downwardly disposed flange 24′ including an offset portion adapted to engage the rail 12 under the ball 13 as at 26 whereas the lower extremity 27 serves as a leg or rest engaging the flange portion 14 of the rail. It is preferred to adjust the dimensions of the flange 24′ in accordance with the size of the web 12 of the rail, so that the end of the plate not only snugly engages the ball and flange but is wedged therebetween upon downward movement of the terminal portion 25, the portion 26 acting as a fulcrum. The plate is further provided with a longitudinally disposed leg 28 having an outwardly turned anchoring flange. An auxiliary longitudinal rib 29 is provided to add stiffness and rigidity to the surface plate, whereas a transverse rib 30, supplied in numbers as desired, not only further stiffens the plate but also acts as a tie for the legs 24 and 28. The angular brace flange 30′ supports the terminal 25 and still further stiffens the plate so that fairly thin material may be used for economy and lightness of weight. It will be observed that the ribs 29 and 30 are formed for a depth to give sufficient rigidity but to provide clearance over the roadbed ties and the space between the legs 24 and 28, for the purpose as described in the consideration of the intermediate plate 10.

As the plates 11 are preferably arranged to bridge adjacent ties on the road bed, they are larger than the intermediate plates 10 which are wholly supported upon the flanges of the rails. The plates are provided, if desired, with grained surfaced portions to increase the traction or frictional contact for vehicles passing thereover.

The plates 10 and 11 which are located at the edge of the highway are provided with a downwardly disposed apron 32, to each side for purposes of deflecting pendent portions such as coupler heads, chains or the like which may possibly be suspended from the railway cars, and thus deflect them and prevent engagement with the metal plates.

In the construction shown in Figure 6 the intermediate plate 10′ is formed with rail engaging portions similar to those shown in Figure 1 except, however, where it is desired to increase the resilient binding action between the ball and flange of the rail, the intermediate plate extension member 17 is disposed to rest upon a filler block 22 having a covering of insulating material of high nonconducting characteristics 22′. This type of construction not only gives increased resilience to the vibratory action of passing vehicular traffic but is also useful where high tension current is used between rails. This is more clearly illustrated in the detailed view shown in Figure 10.

For purposes of decreasing the weight and at the same time retaining the necessary rigidity, the intermediate casting 10′ has its under-surface formed with longitudinally disposed bracing ribs 34, 35 and 36, arcuately disposed to give maximum stiffness at the central portion and still supply clearance adjacent the rails. Thus, at the portion where maximum insulation is desired, there will be freedom of movement of débris, water or the like, permitting free passage without unduly affecting the insulating qualities of the wooden wedge blocks 21 and the filler block 22.

Figures 6 to 10 further illustrate modified forms of the approach plate. As shown at 11′, the rail engaging portion 24^a includes an offset portion 26^a similar to that shown in Figure 1, but the downwardly disposed portion is of a length less than the web of the rail and in this case is provided with an inwardly disposed lower extremity 27^a, an-

gularly positioned in general contour to the flange 14 of the rail. It will be observed that the offset portion 26^a may be supplied for the full length of the approach plate 11′ but, in order to avoid unnecessary machining and for purposes which will hereinafter appear, these offset portions are provided only for a portion of the length, as more particularly illustrated in Figure 9. Transversely across its under-surface, bracing ribs 30^a are provided, intersecting the longitudinally disposed web 28^a, still further serving to longitudinally reinforce the plate 11′. The lower extremity of the web 28^a is outwardly turned to form an anchoring flange 28^b, also serving to form with the upper surface of the plate a channel member. This flange 28^b is provided with a plurality of spike holes 28^c for receiving the anchoring screw spikes 28^d, more specifically illustrated in Figure 6, an orifice being provided in the surface of the plate at $28'^d$ to permit passage of the spike for anchoring through the hole 28^c. The terminal of the plate 25^a has the brace 30^a formed angularly serving to brace the terminal in the manner as described in connection with the modification shown in Figure 1.

Instead of directly positioning the approach plate 11′ upon the cross ties and the flange 14, it is preferred to dispose this type of construction upon a filler block 22^a and an adjuster block 22^b. It will be observed that, as described in connection with Figure 1, the rail engaging end of the approach plate is positioned so that the offset portion 26^a acts as a fulcrum upon the ball of the rail so that when a filler strip 22^a is positioned so as to be slightly oversize, downward movement by the terminal 25^a will serve to wedge the engaging end of the approach plate to securely hold the same in contact with the rail. The wedging action may be increased by variations in the height of the adjuster block 22^b. When proper engagement is obtained, an anchoring screw spike 28^d is driven through the holes 28^c and passes through the block 22^a to engage the tie 28^e, as shown in Figure 6.

It will thus be observed that I have provided a railway pavement crossing which is not only resiliently disposed to absorb shock of vehicular traffic passing thereover but permits the use of metallic plates between rails which may be electrified for signalling or motive power purposes.

In Figures 11, 12 and 13, the intermediate plates of the character shown in Figures 1–10 may be similarly constructed in so far as their rail engaging ends are concerned. However, for purposes of decreasing the weight of the material or for further purposes of repair and access to the railway road bed, the intermediate plates take on the form of plural sections 10^a and 10^b, supported at the mid-portion by an intermediate or auxiliary rail 11^a. The primary rail engaging ends of these plates are of the form illustrated in connection with Figures 1–10, more particularly shown in Figure 2. The oppositely disposed end engaging the auxiliary or intermediate rail 11^a preferably takes on the form of the rail engaging end shown and illustrated in connection with approach plates in either of the forms shown in Figures 3 or 10.

For the purpose of positioning the intermediate plates 10^a and 10^b there is first disposed upon the flange 14^a a filler block 22^a. The flange similar to that shown in Figure 10 and numbered 24^a has its extended portion 27^{ab} disposed upon the filler block 22^a and the offset portion 26^{ab} is arranged to engage the under portion of the ball of the rail 13^a. Thus, with the offset portion acting as a fulcrum upon the ball of the rail, the plate 10^a may be made to snugly engage the rail 11^a until the opposite end corresponding to the edge 17 (Figures 1 and 6) seats upon the rail 12 upon the filler block 22 in the manner as described in connection with Figure 2 or modified in the form shown in Figure 10. Wedge blocks 21 are driven into position between the rail ball 13 and the channel 20 provided in this end of the intermediate plate 10^a. As it is preferred to have this end of the plate of substantially the same construction as shown in Figures 1–10, these parts have been given corresponding numerals.

It will thus be observed that I have provided a railway crossing or highway grade crossing having permanency, durability and flexibility of construction by being resistant to the vibratory action of vehicular traffic passing thereover, characteristics of simplicity of maintenance, ease of repair and access to the railway road bed, a long life under all temperature and atmospheric conditions and adaptability to railways using electric signalling or motive power.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is—

1. In a railway crossing, a series of cross ties and main track rails, a set of plates between the main rails adapted to form a continuous surface thereover, each plate comprising a flat body portion and engaging and supporting members at its ends resting on the base flanges of the rails and shock insulating means interposed between the ends of the plates and the rails.

2. In a railway crossing, a series of cross ties and main track rails, a set of plates between the main rails adapted to form a continuous surface thereover, each plate comprising a flat body portion and engaging

and supporting members at its ends resting on the base flanges of the rails and shock insulating means interposed between the ends of the plates upon which said plates rest and means for holding the plates in position engaging the ball portion of said rails.

3. In a railway crossing a series of cross ties and main track rails, a set of plates between the main rails adapted to form a continuous surface thereover, each plate comprising a flat body portion and engaging and supporting flanges at its ends resting on the base flanges of the rails and shock insulating means interposed between the ends of the plates upon which said plates rest and means for holding the plates in position engaging the ball portion of said rails, said last mentioned means comprising a pair of wedge blocks.

4. A plate for railway crossings comprising a surface portion and a depending member at one end thereof constructed and arranged to engage a rail between the base flange and ball thereof against vertical displacement and supported upon the base flange and means engaging the flange of said rail adapted to prevent lateral displacement.

5. An approach plate for railway crossings comprising a substantially flat body portion, a depending flange at one end, constructed and arranged to engage a rail between the ball and flange portion thereof to hold the same against vertical displacement and supported upon the base flange and means adapted to prevent lateral displacement in relation to the rail.

6. An approach plate for rail crossings comprising a substantially flat body portion having a depending flange at one end thereof, said depending flange being formed with an offset portion arranged to engage the ball portion of the rail to wedge the flange between said portion and the flange of the rail to prevent vertical displacement and means adapted to prevent lateral displacement.

7. A plate for rail crossings comprising a substantially flat body portion having a depending flange at one end thereof, said flange being formed with a rail ball engaging portion and a rail flange seating portion arranged to prevent vertical displacement of said plate and means adapted to prevent lateral displacement.

8. A crossing plate for railways adapted to form a continuous surface thereover, said plate having depending flanges at ends thereof formed to engage a rail between the ball and base flange portion thereof to hold the same against displacement and a bracing rib longitudinally disposed arranged to support loads normally encountered in use, said rib being formed to clear the railway road bed.

In testimony whereof I have hereunto signed my name this 14th day of July, 1927.

HENRY E. MUCHNIC.