E. S. COBB.

RAILWAY INTERSECTION.

APPLICATION FILED MAR. 1, 1913.

1,074,082.

Patented Sept. 23, 1913.

2 SHEETS—SHEET 1.

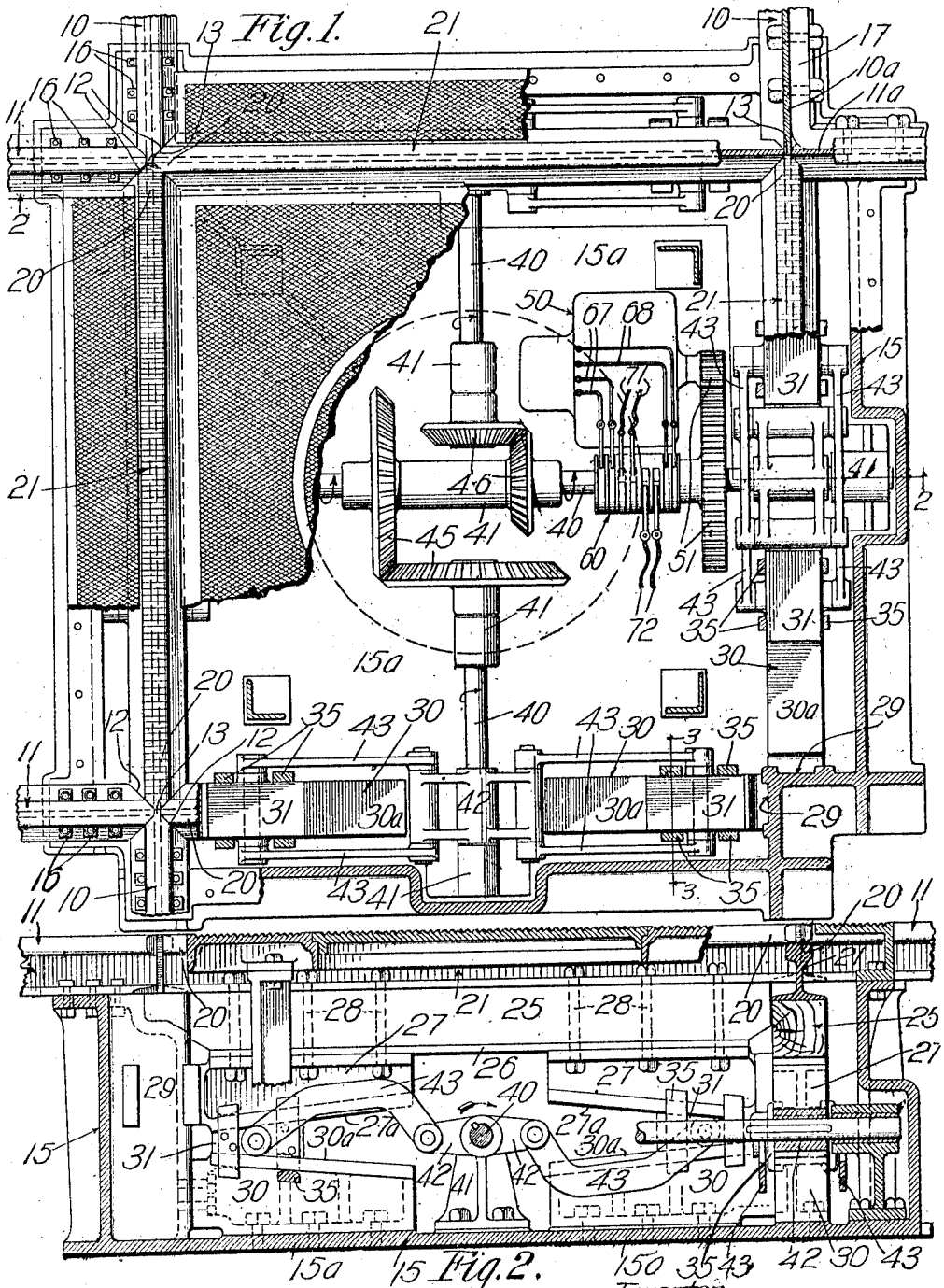


Fig. 1.

Fig. 2.

Witnesses
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2 SHEETS—SHEET 2.

Fig. 4.

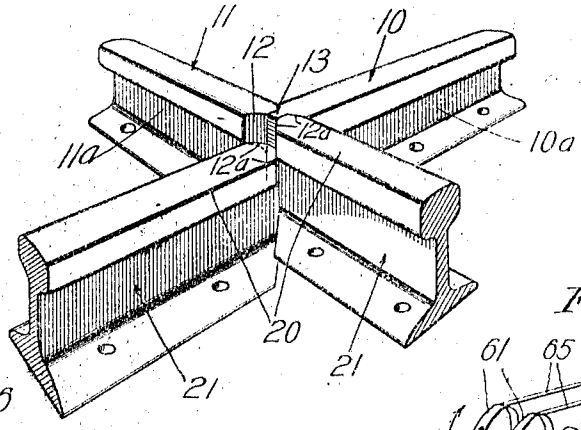


Fig. 3.

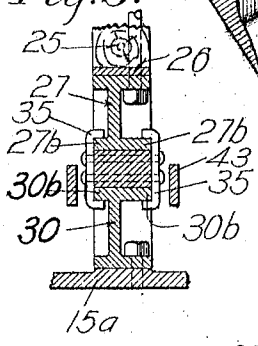


Fig. 6.

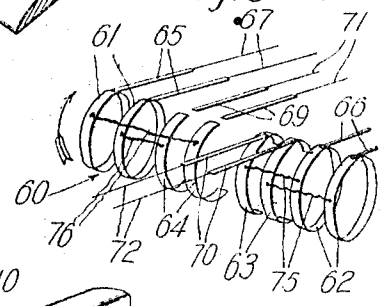


Fig. 5.

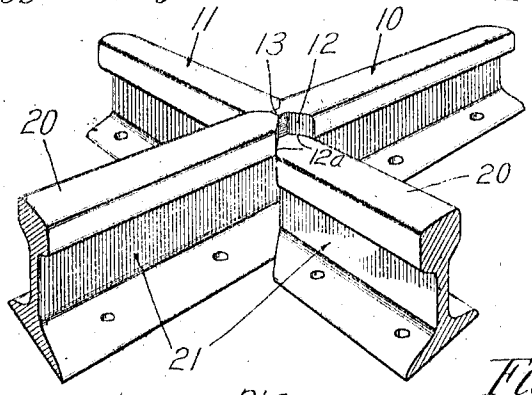


Fig. 7.

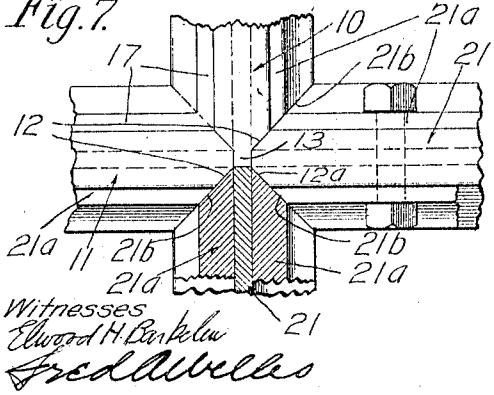
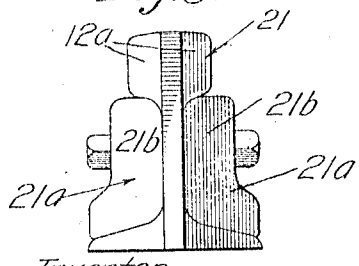


Fig. 8.



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UNITED STATES PATENT OFFICE.

EDWARD S. COBB, OF WHITTIER, CALIFORNIA.

RAILWAY INTERSECTION.

1,074,082. Specification of Letters Patent. Patented Sept. 23, 1913.

Application filed March 1, 1913. Serial No. 751,477.

To all whom it may concern:

Be it known that I, EDWARD S. COBB, a citizen of the United States, residing at Whittier, in the county of Los Angeles, State of California, have invented new and useful Improvements in Railway Intersections, of which the following is a specification.

This invention relates to an intersection construction for railways and the like; and relates particularly to a method and construction of forming a continuous rail and causing continuous track action at any sort of intersection.

It is a prime object of my invention to provide a construction which will at once be simple and efficient, amply strong and durable, and which will provide continuous rail action at any and all crossings and provide rail intersection joints of such nature as to avoid all shock, wear and deformation of both the rails and the wheels passing over them.

The fundamental of this particular invention is the provision of vertically movable rail portions directly adjacent individual rail intersections, these movable rail portions directly abutting the ends of the rails at their junctions. I provide suitable means for bodily moving the said rail portions up and down; the uppermost position being that in which the tread of the rail portion is on a level with the tread of the intersecting rails, and the lowermost position being below all of the rails. My means of operation preferably includes mechanisms for coöperatively moving the movable rail portions, so that when one set is in its uppermost position, the other is in its lowermost position; and my operating mechanism also includes a means for locking the movable rails in their respective positions in such substantial manner that they are supported at least as solidly as the intersecting rails themselves. It will be seen that my construction affords opportunity for great solidity and accuracy of construction and operation; that there are very few working parts and wearing parts apt to become disordered, and that the joints between the stationary and movable parts of the rails may be made to fit very tightly and to thereby avoid completely all deformation at the joint.

I will describe a preferred form of this invention in the following specification and I have shown such a form in the accompanying drawings, in which:

Figure 1 is a sectional plan of an ordinary right angle crossing equipped with my invention. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a detail section taken as indicated by line 3—3 of Fig. 1. Figs. 4 and 5 are perspectives illustrating the form of joint preferably used in my construction and showing the different positions assumed by the movable rail portions. Fig. 6 is a diagrammatic perspective illustrating a form of electrical control for the operating mechanism. Figs. 7 and 8 are details illustrating the broad bearing surfaces at the movable rail joints.

Although I illustrate my invention as applied to a right angle intersection of two pairs of parallel rails each, it will be understood that my invention may be applied to an intersection or crossing of any character. It will be seen, from the following detailed description, that it is only a matter of adaptation to apply my invention at any angle to a crossing of any number of tracks or rails.

In the accompanying drawings 10 and 11 may designate rails of an intersecting pair, each of the rails 10 and 11 terminating in the individual rail junctions at the four corners of the track intersection. I prefer to make these rail junctions generally as shown in the drawings, the intersecting rails terminating on a surface or surfaces 12 which may be approximately at right angles to the plane bisecting the angle between the intersecting rails. I prefer however, to have a portion 13 of one of the intersecting rails project beyond the surfaces 12, so as to avoid any sharp points which might be deformed by the pressure of the wheels passing over the rails. This portion 13 I prefer to make of the same thickness as the webs, 10^a and 11^a of the rails, the lower parts of the portions 13 being formed of the web itself and the upper parts being those portions of the heads of the rails which extend directly above the web. Thus it will be seen that the metal at the junction itself is well supported; and that, although in general the junction planes are at an angle there are no acute projections of metal which would be apt to be battered out of shape by wheels passing over the joint.

I provide for my construction a suitable box foundation 15 which is properly designed and formed to afford supports for the ends of the rails 10 and 11 at their junction. The rails 10 and 11 may be suitably bolts as at 16, to the box foundation 15 and they may be secured together by a heavy angle strap 17, serving to hold them in close engagement with each other and serving to give great solidity to the construction. (This construction is shown at one corner of Fig. 1 and in Fig. 7.) It is of great importance that the individual rails be held solidly, so that the end surfaces 12, against which the movable portions of the rails engage and abut, will always be rigidly fixed in position. With the rails rigidly held in position, it is possible to make a very tight joint between the rails themselves and the movable rail portions, so that there is, to all intents and purposes, no opening at all at the joint. It will be observed that the rails 10 and 11 are bolted to platforms or flanges which are supported by suitable brackets extending beneath the flanges to the base 15^a of the foundation. This base 15^a may be mounted upon any suitable foundation for rigidly supporting the whole crossing construction in its proper alinement.

For each one of the individual rail intersections I provide a vertically movable rail portion 20 having its end shaped in complementary relation to the ends of the rails 10 and 11, so that the rails 10 and 11 and the two movable portions 20, together form a solid junction. It is a characteristic of my present invention that the portions 20, for each of the individual rail junctions, shall be vertically movable; so that one of them may be raised to form a continuous track on one of the rails 10 or 11 and the other may be lowered to afford space for the passage of a wheel flange inside the rail which is thus made continuous. Although it is not absolutely essential to my invention to do so, I prefer to make portions 20 incorporated in pairs in movable rail sections 21, these rail sections 21 including all of that portion of the rail which ordinarily extends between the individual rail intersections. These movable rail sections 21 I make vertically movable as a whole; that is, they are bodily translatable in a vertical direction. This movement of vertical translation makes the joint between the movable rail portions and the permanent rail portions of a vertically sliding nature; and I provide a mechanism of sufficient power to move the rail portions 21 even if the joints are very tight. In fact, I propose to make these joints fit as tightly as can be without excessive binding and friction.

It will be seen that my arrangement of single one-piece rail portions between the intersections and the peculiar interlocking arrangement at the intersecting makes for great rigidity and solidness. It is impossible to displace any of the movable rail portions either longitudinally or laterally, absolute confinemtn being had to vertical motion. This is an important feature of my invention, a feature which depends upon the peculiar manner in which the rails meet at the individual rail junctions.

In Figs. 7 and 8 I have illustrated my preferred provision of broad bearing surfaces between the relatively moving parts of the rail joints. On the rails 10 and 11 and the movable sections 21 I fasten bearing blocks 21^a (shown only in these figures, for clarity of illustration) which have diagonal end surfaces 21^b bearing against each other. These diagonal surfaces are substantially continuous enlargements of the diagonal end faces 12 of the rails; and altogether there is thus provided ample bearing surface to insure long wear. These ample bearing surfaces also promote great solidity at the rail joints and make it impossible to force a rail out of alinement.

I will now explain the mechanism for moving the individual rail parts 21 and will then explain their coöperation.

Each of the parts 21 is mounted directly upon a preferably wooden supporting block 25, to give the desired elasticity similar to that of a rail on wooden ties; which block in turn is mounted upon a plate 26 and upon a pair of inclined plane blocks 27. All of these parts are secured together by bolts or other means 28, so that all the parts are held together as a single member and with great rigidity. The inclined-plane blocks 27 are situated one at each end of the construction, and their ends operate in suitable vertical ways 29 within the box foundation 15. Below each of the inclined-plane blocks 27 is a similar block 30 substantially secured to the base 15^a of box foundation 15, the arrangement being such that the inclined faces 30^a and 27^a of the blocks 30 and 27 oppose each other and may be engaged by the opposite faces of a horizontally traveling wedge 31. The arrangement is such that when the wedges 31 are farthest apart from each other the blocks 27 and the rail sections 21 carried thereby are all raised to their uppermost positions; and upon movement of the wedges 31 toward each other the sections 21 are lowered. The blocks 27 and 30 have longitudinal flanges 27^b and 30^b which are overhung by members 35 secured to and carried by the wedges 31, the action being such that the faces 27^a and 30^a of the blocks 27 and 30 are always kept in engagement with the wedge, or that blocks 27 are forced down, instead of merely being allowed to fall, when the wedges are moved toward each other. The wedges 31 are operated from a shaft 40 carried in suit-

able bearings 41. A double armed member 42 is mounted upon the shaft 40 and suitable connecting links 43 connect between the member 42 and the wedges 31; the links 43 are of such configuration as to allow a half rotation of the shaft 40 and member 42 without interference by the links; and the design is such that a half rotation of shaft 40 in the direction indicated by the arrow in Fig. 2 will cause the retraction of the wedges 31 sufficiently to drop the rail sections 21 to the position shown in Figs. 4 and 5 and in section at the right hand portion of Fig. 2. When the parts are in the position shown in elevation in Fig. 2, the rail part 21 is raised to its uppermost position, and its tread surface will then be in alinement with the tread surface of the rails 10 or 11. In this position of the mechanism, it will be seen that the various centers of connection of the links 43 will all be approximately in a single plane; so that any tendency of downward pressure on the rail parts 21 to move the wedges inwardly will result in no tendency to rotate the shaft 40. This will effectually lock the rails in their operating position.

Each of the shafts 40 is mounted in suitable bearings 41; and the shafts are so interconnected by gears 45 and 46 that they will simultaneously be rotated in the directions indicated. The arrangements of the connecting links 43 are made so that rotation of one of the shafts 40 in the direction indicated will cause outward movement of the wedges 31 while the simultaneous rotation of the other shaft 40 in the direction indicated will cause inward movement of the corresponding wedges 31. In Fig. 1 the parts corresponding to rails 11 are shown in position to hold the wedges 31 outwardly and to hold the other set of wedges 31 toward each other; thus holding the rail parts 21 up to form continuations of rails 11 and lowering the rail parts 21 which would form continuations of the rails 10.

I may preferably operate my complete mechanism from a suitable electric motor 50 connected by gearing 51 with one of the shafts 40. Motor 50 may be controlled in any suitable manner; by hand or by automatic car operation. Either of these methods is well known and needs no explanation here. I may preferably provide a suitable means of stopping the motor 50 when the parts of the mechanism have reached their limits of travel; and such a provision may be made in connection with one of the shafts 40.

It will be understood that the motor 50 will be first operated in one direction and then in the reverse direction, causing the rotation of the shaft 40 first in one direction and then in the other. The various parts are shown in position for the next rotation of the shaft 40 (the one carrying the commutator 60) in the direction indicated. The commutator 60 may have thereon two pairs of collector rings 61 and 62 and two pairs of segments 63 and 64. Suitable brushes 65 and 66 may engage the collector rings 61 and 62, and from these brushes wires 67 and 68 may lead to the motor 50, being connected thereto in such manner that supply of current through one set of wires will operate the motor in one direction and supply through the other set of wires will operate the motor in the other direction. The segments 63 and 64 may be engaged by suitable brushes 69 and 70 and wires 71 and 72 leading from these brushes will form the means of supplying current to the motor for operating the track intersecting mechanism. In the form shown in the drawings, the shafts 40 require a rotation of approximately 180 degrees, or slightly less; and it will be seen that the segments 63 and 64 are so arranged that, on a travel of the commutator of slightly less than 180 degrees in either direction, one or other of the sets of brushes 69 or 70 will be out of engagement with the corresponding segments. Thus, the arrangement may be such that if current is supplied to the wires 72, it will pass through brushes 70, segments 63, commutator connections 75, collector rings 62, brushes 66 and wires 68 to the motor; which will operate the motor in a direction to turn the shafts and the commutator in the direction indicated by the arrows. This will cause the rotation of the segment 63 under the brushes 70; and when the ends of the segments have passed from under the brushes, the circuit will be broken and the motor will cease operation of the mechanism. During this rotation, the segments 64 will have passed under the brushes 69 and will be thus in electrical contact for the next operation of the motor. The next operation will be caused by sending current through the wires 71, which will supply current to the motor through brushes 69, segments 64, commutator connections 76, collector rings 61, brushes 65, and wires 67; and the motor will then rotate in the direction opposite to that in which it rotated before, and the mechanism and the commutator will be moved back to its former position, the circuit being broken when the ends of the segments 64 pass underneath brushes 69.

Having described my invention, I claim:

1. A railway intersection, comprising two intersecting pairs of parallel rails with each rail terminating at its junction with a rail of another pair, single rail sections extending between the rail intersections and adapted to form continuations of the individual rails, said sections being vertically translatable and said sections and rails all meet-

ing at the junctions along vertical planes diagonal to each of the rails, and means for raising and lowering said rail sections.

2. A railway intersection, comprising two intersecting pairs of parallel rails with each rail terminating at its junction with a rail of another pair, single rail sections extending between the rail intersections and adapted to form continuations of the individual rails, said rails and rail sections all meeting at the junctions along vertical planes diagonal to each of the rails, said sections being vertically translatable and abutting at each end one of the rail ends at a junction, and means for coöperatively raising and lowering said rail sections so that when one pair of said sections is in position to form continuation of one pair of rails the other pair of said sections is lowered below all the rails.

3. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes diagonal to each of the rails.

4. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes which bisect the angles between the rails.

5. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes which bisect the angles between the rails, and bearing blocks having surfaces in said planes to bear against each other at the ends of the rail sections.

6. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes diagonal to each of the rails, and bearing blocks on each of said sections having bearing faces in said planes.

7. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes diagonal to each of the rails, one of said sections having a central projection beyond said planes of intersection and the other sections having complementary end formations to fit against said projection.

8. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes diagonal to each of the rails, one of said sections having a central projection beyond said planes of intersection and the other sections having complementary end formations to fit against said projections, and bearing blocks on each of said sections having bearing faces in said diagonal planes.

9. A rail intersection construction, comprising a plurality of rails ending in a junction, a continuation portion of each of said rails directly abutting the junction of the several rails and vertically movable, a shock absorbing block directly beneath each continuation portion, and means beneath said blocks to bodily raise and lower each of said blocks and rail portions.

10. A rail intersection construction, comprising a plurality of rails ending in a junction, a continuation portion of each of said rails directly abutting the junction of the several rails and vertically movable, inclined plane and wedge mechanism acting longitudinally of each continuation portion to positively raise the respective portions, and means coöperating with said mechanism to positively lower the respective rail portions.

11. In combination, two intersecting rails, the section of each rail on one side of the intersection being stationary and the section of each rail on the opposite side of the intersection being vertically movable, all four of said sections meeting along vertical planes diagonal to each of the rails, and bearing blocks on each of said sections having bearing faces in said planes, said means including an inclined plane and wedge mechanism acting longitudinally of each continuation portion, and means coöperating with each of said mechanisms to positively lower the respective rail portions.

12. In a railway intersection of the character described, a vertically movable rail continuation portion, inclined plane blocks supporting said portion with its inclination axis longitudinal of the rail portion, coöperating stationary inclined plane blocks, wedges adapted to act longitudinally of the rail portion between said inclined planes to raise the rail portions, mechanism for operating said wedges, and coöperating means carried by the blocks and wedges to positively lower the rail portion as the wedges are withdrawn.

13. In a railway intersection of the character described, a vertically movable rail continuation portion, inclined plane blocks supporting said portion with their inclination axes longitudinal of the rail portion, coöperating stationary inclined plane blocks, wedges adapted to act longitudinally of the

rail portions between said inclined planes to raise the rail portions, mechanism for operating said wedges, and coöperating means carried by the blocks and wedges to positively lower the rail portion as the wedges are withdrawn, said means including longitudinal inclined ribs on said blocks and yokes carried by the wedges and engaging around said ribs.

14. In a railway intersection of the character described, a vertically movable rail continuation portion, a wooden shock absorbing block directly supporting said portion, inclined plane blocks supporting said shock absorbing block and said portion and affixed directly thereto, coöperating stationary inclined plane blocks, wedges adapted to act longitudinally of the rail portion between said inclined planes to raise the rail portions, mechanism for operating said wedges, and coöperating means carried by the blocks and wedges to positively lower the rail portion as the wedges are withdrawn, said means including longitudinal inclined ribs on said blocks and yokes carried by the wedges and engaging around said ribs.

15. A railway intersection construction, comprising a foundation box, intersecting pairs of rails supported on the upper outer parts of the box, each of said rails ending at a junction with a rail of another pair, single rail sections extending between the rail intersections forming continuations of the individual rails, said sections being vertically translatable and said sections and rails all meeting at the junctions along vertical planes which bisect the angles between the rails, a wooden shock absorbing block directly supporting each rail continuation portion, inclined plane blocks supporting each wooden block at each end and affixed directly to said wooden blocks and to said rail portions, coöperating stationary inclined plane blocks mounted within the foundation box, wedges adapted to act longitudinally of the respective rail portions between said inclined plane blocks to raise the respective rail portions, mechanism contained within the foundation box for operating the wedges, longitudinal inclined ribs on said blocks, and yokes carried by the wedges and engaging around said ribs.

In witness that I claim the foregoing I have hereunto subscribed my name this 20th day of February, 1913.

EDW. S. COBB.

Witnesses:
JAS. H. BALLAGH,
JAMES T. BARKELEW.