

No. 698,206.

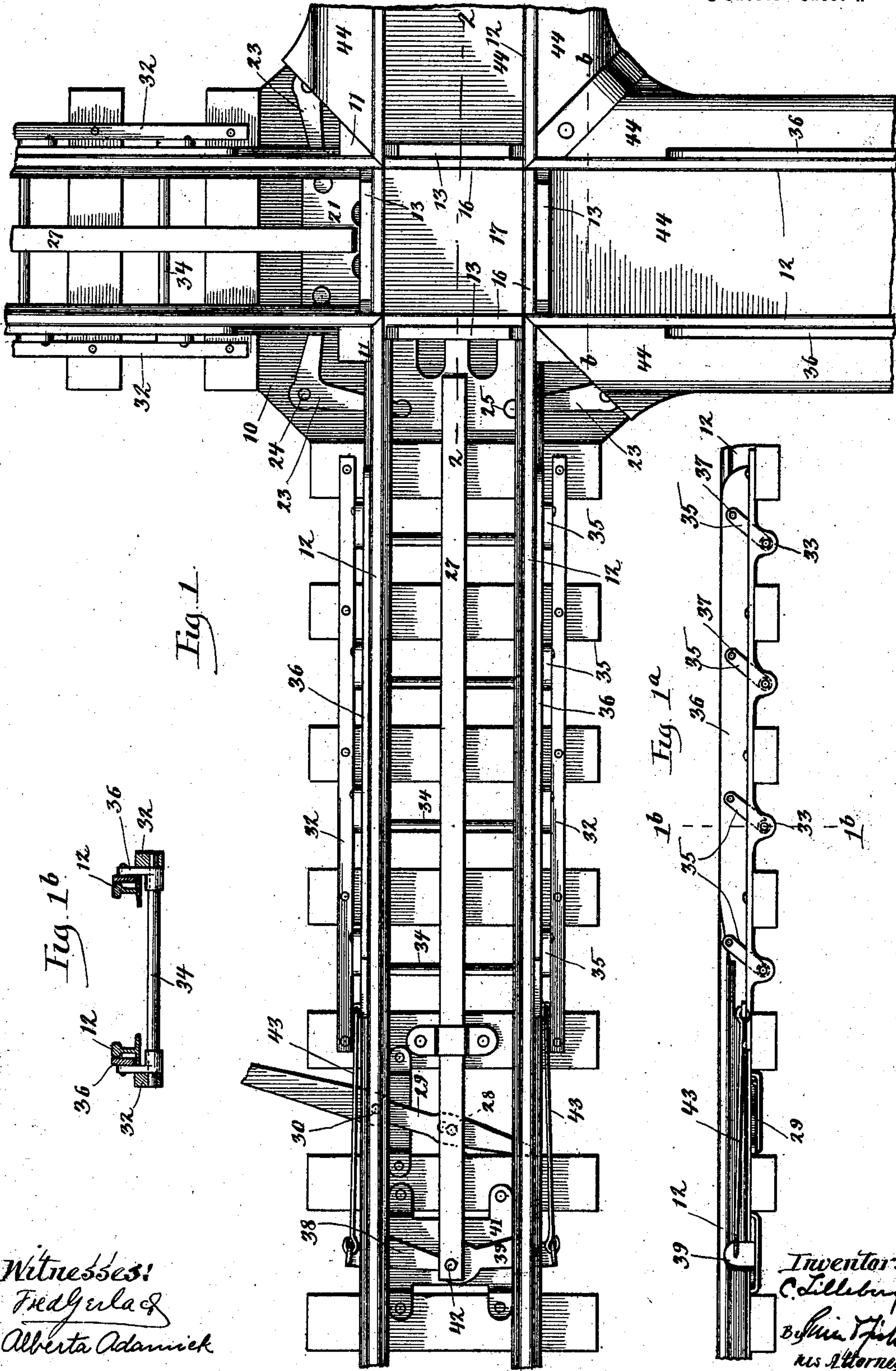
Patented Apr. 22, 1902.

C. LILLEBERG.  
RAILROAD CROSSING.

(Application filed June 28, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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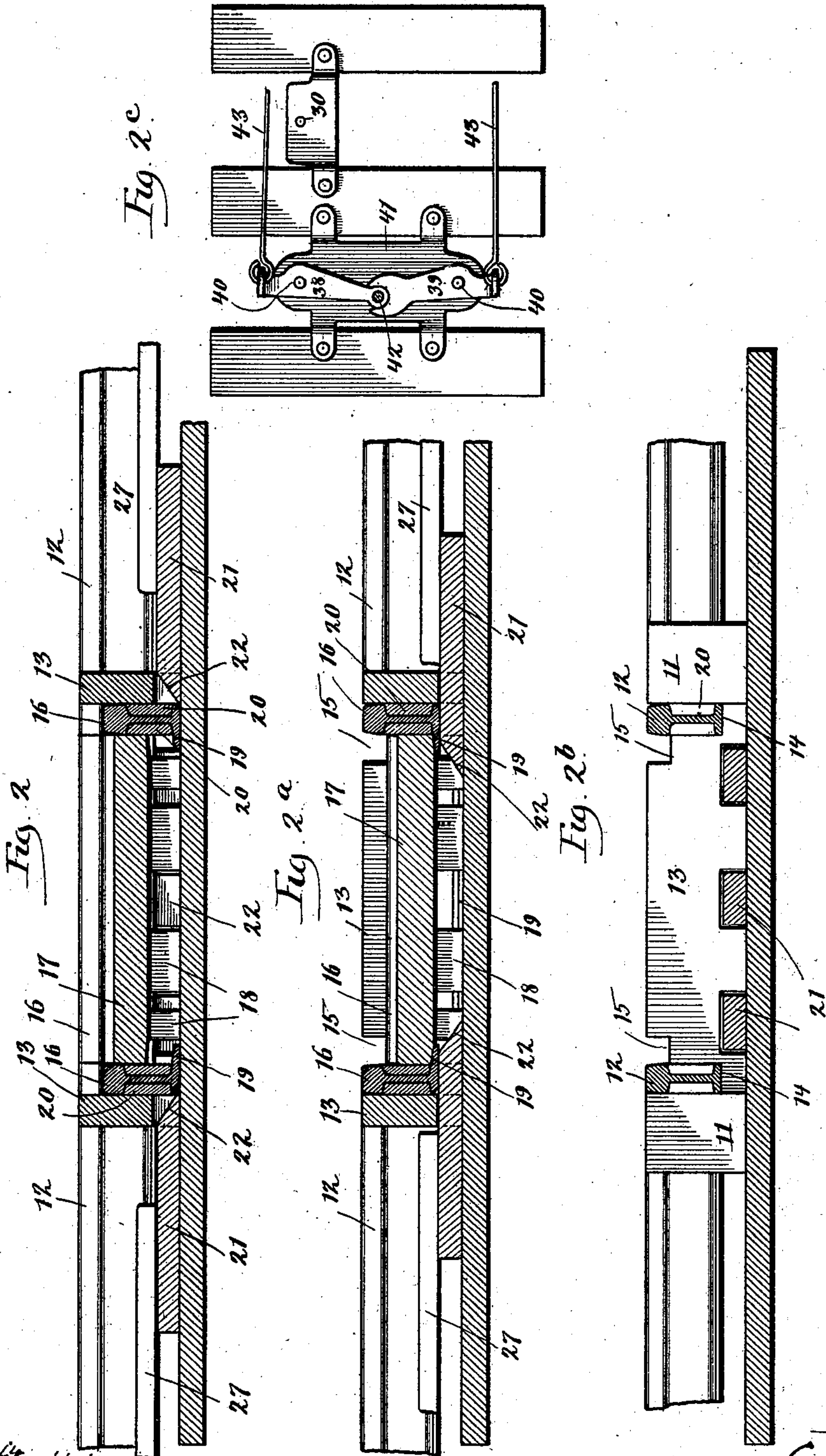
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

Fig. 3<sup>a</sup>.

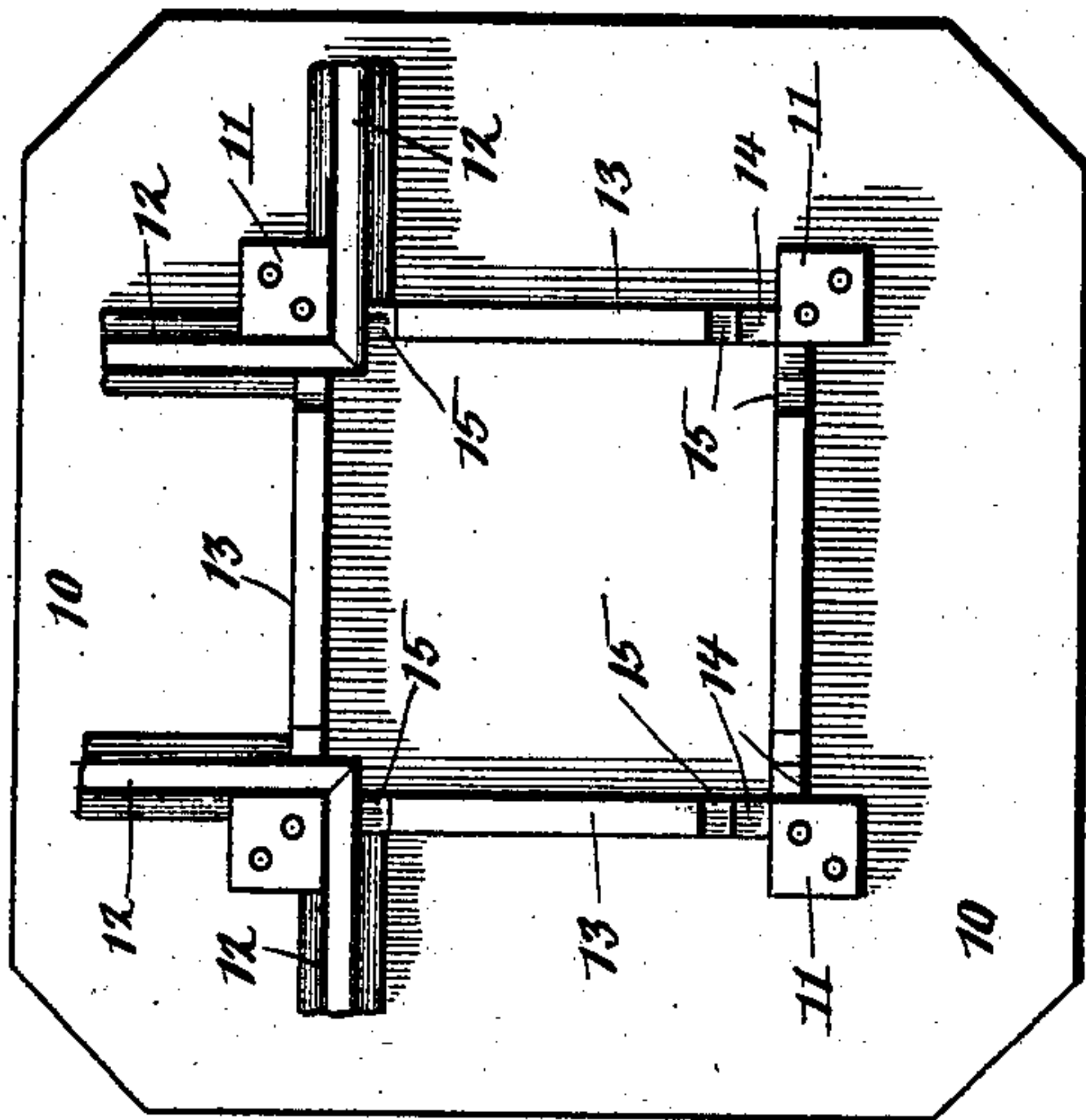
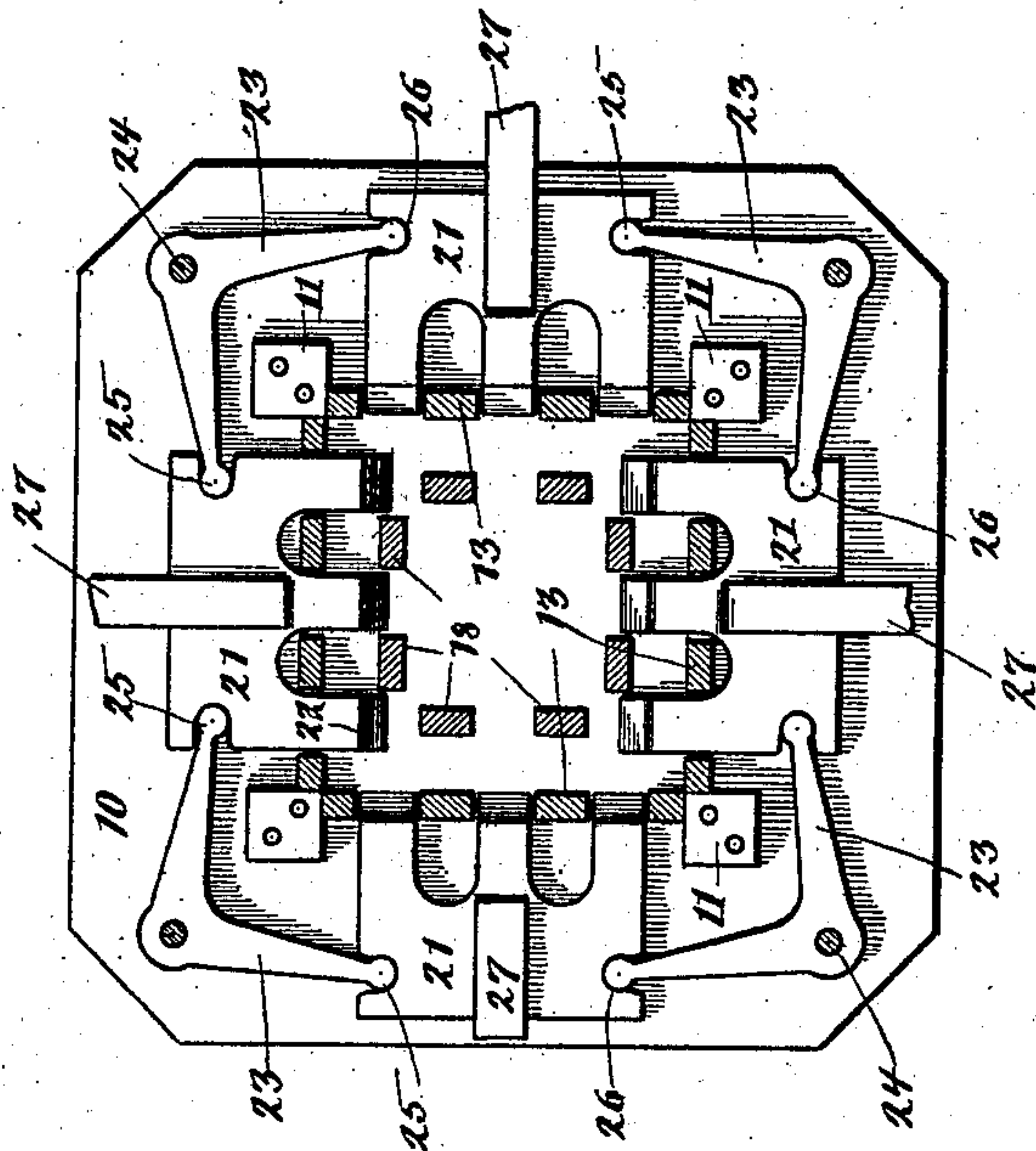


Fig. 3.



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# UNITED STATES PATENT OFFICE.

CHARLES LILLEBERG, OF CHICAGO, ILLINOIS.

## RAILROAD-CROSSING.

SPECIFICATION forming part of Letters Patent No. 698,206, dated April 22, 1902.

Application filed June 28, 1901. Serial No. 66,328. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES LILLEBERG, a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Railroad-Crossings, of which the following is a full, clear, and exact description.

The invention relates to improvements in railroad-crossings wherein two or more tracks cross one another at an angle. Such crossings are usually provided at the points of intersection of the rails with openings for the passage of the wheel-flanges. These openings are wide enough to cause a heavy jar upon the rolling-stock, rails, and foundation of the crossing, and the ends of the rails become granulated and brittle, thus necessitating frequent repairs and increasing the cost of maintenance. The present invention seeks to overcome these defects and for this purpose provides a simple and effective construction by which a continuous track may be formed in either direction and which may be operated directly or in connection with the usual interlocking switch mechanism, gate, or the like. Preferably, also, automatic means are provided whereby the crossing may be operated by an approaching train.

In the construction of the invention I have sought to do away with the use of bolts, nuts, pins, washers, and the like, which when used to connect moving parts soon wear and become loose, by which I am enabled to employ a simple and effective construction which will be durable in operation and in which the cost of maintenance is reduced to a minimum.

The invention consists in the features set forth in the following description, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of my improved crossing with the mechanism on one side of the same shown in detail. Fig. 1<sup>a</sup> is a detail view in elevation of a part of the automatic operating mechanism. Fig. 1<sup>b</sup> is a detail sectional view on line 1<sup>b</sup> 1<sup>b</sup> of Fig. 1<sup>a</sup>. Fig. 2 is a view in vertical section of the improved crossing, taken on the line 2 2 of Fig. 1. Fig. 2<sup>a</sup> is a view similar to Fig. 2 with the movable cross-rails shown in their lower position. Fig. 2<sup>b</sup> is a view in vertical section

taken on the line *b b* of Fig. 1. Fig. 2<sup>c</sup> is a detail plan view of a part of the operating mechanism. Figs. 3 and 3<sup>a</sup> are detail plan views of parts of the crossing.

The crossing may be mounted upon a suitable framework of wood or steel, but is preferably mounted upon a base-plate 10, of steel, which is preferably anchored to a cement foundation, with a thin interposed sheet of rubber backing it. The base-plate is provided with the upwardly-projecting abutments 11, secured to or formed in piece with the base-plate and to which are fastened the abutting ends of the main rails 12, which form the intersecting tracks. Between the ends of the main rails 12 and between the abutments 11 extend the oppositely-disposed pairs of tie-rails 13, which are secured to the base-plate 10 and which are provided with the shouldered portions 14, whereon the inner ends of the main rails 12 are mounted, as most clearly shown in Fig. 2<sup>b</sup>. The tie-rails are arranged with their upper edges level with the tops of the main rails and slightly out of line therewith, as shown in Fig. 1, but in position to partially support a train as it passes over the crossing, and are provided with the openings or passages 15 at their ends for the wheel-flanges. By this construction the parts of the crossing are all rigidly connected together, will not be displaced by contraction and expansion under varying temperatures, and will readily withstand the shock and jar of the passing trains.

Intermediate the ends of the main rails 12 and adjacent the tie-rails 13 are positioned the oppositely-disposed pairs of vertically-movable cross-rails 16, which are of such length that when either pair is in its raised position it will completely fill the gap between the ends of the main rails, so as to form a continuous track in one or the other direction. The tie-rails 13 serve as a guide on the outer side for the movable cross-rails, and means are provided for guiding the cross-rails at their inner side. Such means preferably consist of the center plate or block 17, of steel, mounted upon the horizontal supports 18, which are interposed between the edges of the center plate and the base-plate 10. The plates 10 and 17 and the supports 18 are preferably rigidly secured together by suitable bolts. The



cross-rails 16 are provided at their lower edges with the inwardly-projecting flanges 19, which by engaging with the edges of the center plate 17 serve to limit the upward movement of the cross-rails and retain the same in place. The outer lower edges of the cross-rails are slightly beveled, as shown in Figs. 2 and 2<sup>a</sup>. These cross-rails are preferably formed of an ordinary rail-section, in which the depressed sides are filled up with the longitudinal strips 20, firmly bolted to the body of the section and with the portion of the lower outer flange cut off, as shown in Figs. 2 and 2<sup>a</sup>. The tie-rails 13 may be similarly constructed, if desired.

Oppositely-disposed pairs of reciprocating shifters or wedges 21 are mounted to slide upon the base-plate and beneath the cross-rails 16 for raising the latter. These wedges are provided with the forwardly-projecting prongs, preferably three in number and preferably of considerable width. These prongs are provided at their forward ends with the inclined portions 22 for engaging the lower beveled edge of the cross-rails and have horizontal upper bearing-surfaces, whereon the cross-rails rest when in raised position and so that the cross-rails are rigidly supported in such position. The prongs of the wedges pass through suitably-arranged openings in the tie-rails 13 and in the supports 18, as most clearly shown in Fig. 2<sup>b</sup>. Each wedge or shifter 21 of one pair is connected to the adjacent wedges of the other pair by means of the bell-crank levers 23, which are mounted to swing in a horizontal plane upon the upwardly-projecting studs 24, secured to the base-plate 10, and which are provided with the circular-headed ends 25, engaging the circular notches 26 in the sides of the wedges or shifters 21. The bell-cranks are preferably slipped over the upwardly-projecting studs 24, so as to swing over the upper face of the base-plate 10. The ends of the bell-crank levers pass beneath the ends of the main rails 12 into engagement with the notches 26 of the shifters. By this means the wedges or shifters are so connected that when one oppositely-disposed pair of cross-rails is moved inwardly the other pair is moved outwardly and so that when one oppositely-disposed pair of cross-rails is raised to form a continuous track in one direction, as shown in Fig. 2, the other pair of cross-rails will drop into their lower position, as shown in Fig. 2<sup>a</sup>, and will not interfere with the wheel-flanges of the train passing over the continuous track.

Each of the shifting-wedges is provided with a horizontally-disposed operating-rod 27, rigidly secured at one end to the wedges and extending along between the rails of each track on each side of the crossing. In Fig. 1 the operating mechanism is shown only on one side of the crossing; but it will be understood that the construction of such operating mechanism is the same on each of the four sides. The operating-rod 27 is provided

near its end with a downwardly-projecting stud 28, which engages a slot in the end of a lever 29. The lever 29 is preferably mounted to swing about a stud 30, secured upon a bent plate 31, which is mounted between two of the ties, as shown in Fig. 1 and in the detail view Fig. 2<sup>c</sup>. The lever 29 may be connected in the well-known manner to the switch-tower usually located at such crossings and, if desired, may be connected with the safety interlocking switch mechanism, so as to be operated simultaneously therewith, or the lever could be connected to the gates or other devices employed at such a crossing. Preferably, also, at least one of the other operating-rods 27 is also provided with a similar lever, so that in setting the crossing to form a continuous track in either direction the crossing will be operated by direct pulls on all parts of the operating mechanism, thus avoiding all danger of buckling of the parts.

Means are also provided so that the crossing will be operated by a train approaching in any direction. For this purpose a pair of longitudinal bars 32 are secured to the ties outside of the main rails 12 of the track on each track of the crossing. These bars are preferably provided with downwardly-projecting ears 33 between the ties. Cross-shafts 34 are provided, having shouldered ends journaled within the ears 33 of the bars 32. Upwardly-extending rock-arms 35 are mounted upon either end of the shafts 34 and extend upwardly between the bars 32 and the main rails 12. Rocking bars 36 are arranged against the outer sides of the main rails 12 and are provided with laterally-projecting studs 37, which are engaged by the upper ends of the rocking arms 35. A pair of levers 38 and 39 are mounted to swing upon studs 40, mounted upon a horizontal bent plate 41, secured in position between the ties adjacent the end of the operating-rod 27. The lever 38 is provided on its inner end with a circular head, which interlocks with a circular notch in the lever 39. The lever 38 is also provided on its inner end with an upwardly-projecting stud 42, engaging a hole in the end of the operating-rod 27, and the outer ends of the levers 38 and 39 have upturned ears, as shown, which are connected to the rocking bars 36 by the links 43. By this means if the crossing is not properly set for an approaching train the wheels thereof will engage the rocking bars 36, rock the latter downwardly and horizontally, and thereby operate the crossing through the medium of the levers 38 and 39 and operating-rod 27 to properly set the crossing to form a continuous track in the direction in which the train is approaching. It will be understood that all four sides of the crossing are provided with automatic operating mechanism, so that the crossing will be properly actuated by a train approaching in any direction. Preferably the operating mechanism is inclosed so



as to be protected from the weather by a sheet-iron casing 44, secured to the ties in any suitable manner. (See Figs. 1 and 2<sup>b</sup>.)

It will be observed that none of the operating parts are secured together by bolts and nuts and that the use of connecting-pins, washers, and the like, which are apt to quickly wear loose, is avoided. The operating-shifters for the cross-rails of each track are positively connected, so that the crossing is certain and safe in operation, and a continuous track will be formed in one direction only. The parts are so mounted upon the base-plate 10 that by removing the ends of the main rails 12 and the center plate 17, the parts may be removed and repaired by an entirely new set in a very short space of time without delaying the traffic, and means are provided for positively operating the crossing by direct pulls in connection with the interlocking switches, together with automatically-operating means, so that safety and certainty of operation are assured. The mechanism could be applied to a number of tracks crossing one another and could be easily modified to suit any angle of intersection.

It is obvious that the details of construction could be varied by the skill of the mechanic without departure from the essentials of the invention.

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

1. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track and mechanism for simultaneously operating said cross-rails to form a continuous track in either direction, substantially as described.

2. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track, an oppositely-disposed pair of horizontally-movable shifting-wedges for raising each pair of cross-rails and mechanism for simultaneously actuating said wedges to form a continuous track in either direction, substantially as described.

3. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track, an oppositely-disposed pair of horizontally-movable shifting-wedges for raising each pair of cross-rails, connections between each wedge of one pair and the adjacent wedges of the other pair and means for simultaneously operating said wedges to form a continuous track in either direction, substantially as described.

4. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting

the main rails of each track, an oppositely-disposed pair of shifting-wedges for raising each pair of cross-rails, bell-crank levers connecting each wedge of one pair with the adjacent wedges of the other pair and operating-rods connected to said wedges, whereby as one pair of wedges is advanced, the other pair is withdrawn and a continuous track formed in one or the other direction, substantially as described.

5. In a railroad-crossing, the combination with a base-plate therefor and with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track, a pair of oppositely-disposed shifting-wedges for raising each pair of cross-rails mounted to slide horizontally upon said base-plate and having flat upper bearing-surfaces for supporting said cross-rails in the raised position, connections between each wedge of one pair and the adjacent wedges of the other pair and means for simultaneously operating said wedges to form a continuous track in either direction, substantially as described.

6. In a railroad-crossing, the combination with a base-plate therefor and with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track, an oppositely-disposed pair of shifting-wedges for raising each pair of cross-rails, connections between each wedge of one pair and the adjacent wedges of the other pair, means for simultaneously operating said wedges to form a continuous track in either direction, laterally-projecting flanges on said cross-rails and means for engaging said flanges to limit their movement in an upward direction, substantially as described.

7. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track, an actuating-shifter for raising each one of said cross-rails, connections between each pair of adjacent shifters and means for operating said shifters to form a continuous track in either direction, substantially as described.

8. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-movable cross-rails for connecting the main rails of each track, an actuating-shifter for each one of said cross-rails, connections between each pair of adjacent shifters and operating-rods connected to each of said shifters, whereby any one of the same may be operated to form a continuous track in one or the other direction, substantially as described.

9. In a railroad-crossing, the combination with a base-plate therefor and with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-mov-



able cross-rails for connecting the main rails of each track, an oppositely-disposed pair of reciprocating shifters for raising each pair of cross-rails, bell-crank levers connecting  
 5 each shifter of one pair with the adjacent shifters of the other pair and mechanism for simultaneously moving one pair of shifters inwardly and the opposite pair outwardly to form a continuous track in one or the other  
 10 direction, substantially as described.

10. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of movable cross-rails for connecting the main  
 15 rails of each track, an oppositely-disposed pair of horizontally-movable shifters for raising each pair of cross-rails, notches in the sides of said shifters, bell-crank levers for connecting each adjacent pair of shifters  
 20 mounted to swing in a horizontal plane and arranged to operatively engage said notches and operating means connected to one of said shifters, whereby a continuous track may be formed in either direction, substantially as  
 25 described.

11. In a railroad-crossing, the combination with a base-plate therefor and with the abutting main rails of the intersecting tracks, of an oppositely-disposed pair of vertically-mov-  
 30 able cross-rails for connecting the main rails of each track, an oppositely-disposed pair of wedges mounted to slide upon said base-plate for raising each pair of cross-rails and having flat upper bearing-surfaces for support-  
 35 ing said cross-rails in the raised position, circular notches in the sides of said wedges, studs on said base-plate, bell-crank levers for connecting each pair of adjacent wedges mounted to swing on said studs and having  
 40 circular-headed ends for engaging said notches, operating-rods connected to each one of said wedges by any one of which said wedges may be shifted to form a continuous track in either direction, substantially as de-  
 45 scribed.

12. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of tie-rails for connecting said  
 50 main rails arranged slightly out of line therewith, oppositely-disposed pairs of vertically-movable cross-rails adjacent said tie-rails and in line with said main rails, oppositely-disposed pairs of reciprocating shifters for raising said cross-rails, connections between each  
 55 pair of adjacent shifters and means for operating said shifters, whereby as one pair is advanced, the other is withdrawn to form a continuous track in one or the other direction, substantially as described.

60 13. In a railroad-crossing, the combination with a base-plate therefor and with the abutting main rails of the intersecting tracks, of abutments on said base-plate to which the ends of the main rails are attached, tie-rails  
 65 connecting said main rails and arranged slightly out of line therewith, oppositely-disposed pairs of vertically-movable cross-rails

arranged adjacent said tie-rails and in line with said main rails, oppositely-disposed pairs of shifting-wedges for raising said cross-rails  
 70 mounted to slide upon said base-plate, bell-crank levers connecting each pair of adjacent wedges and means for simultaneously operating said wedges to form a continuous track in one or the other direction, substantially as  
 75 described.

14. In a railroad-crossing, the combination with a base-plate therefor and with the abutting main rails of the intersecting tracks, of tie-rails connecting the ends of said main rails  
 80 arranged slightly out of line therewith and having flanged openings, a center guide-plate, oppositely-disposed pairs of vertically-movable cross-rails arranged intermediate said guide-plate and said tie-rails and in line with  
 85 said main rails, oppositely-disposed pairs of shifting-wedges for raising said cross-rails, connections between each pair of adjacent wedges and operating means for said wedges, whereby a continuous track may be formed  
 90 in either direction, substantially as described.

15. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of oppositely-disposed pairs of vertically-movable continuous cross-rails for con-  
 95 necting said main rails and mechanism arranged to be automatically operated by a train approaching in any direction to move said cross-rails to form a continuous track in that direction, substantially as described. 100

16. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of oppositely-disposed pairs of cross-rails for connecting said main rails, op-  
 105 positely-disposed pairs of reciprocating shifters for raising said cross-rails, connections between each pair of adjacent shifters, operating-rods connected to each shifter and devices connected to said operating-rods and arranged adjacent the main rails of the inter-  
 110 secting tracks on each side of the crossing in position to be engaged by the wheels of an approaching train, whereby said cross-rails will be automatically shifted to form a continuous track, substantially as described. 115

17. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of oppositely-disposed pairs of vertically-movable cross-rails for connecting the  
 120 main rails of each track, oppositely-disposed pairs of horizontally-reciprocating shifters for raising said cross-rails, bell-crank levers connecting each pair of adjacent shifters, horizontal operating-rods connected to each shifter, rocking bars arranged adjacent the main  
 125 rails on each side of the crossing in position to be engaged by the wheels of an approaching train and connections between said rocking bars and said operating-rods, substantially as described. 130

18. In a railroad-crossing, the combination with the abutting main rails of the intersecting tracks, of oppositely-disposed pairs of vertically-movable cross-rails for connecting the



main rails of each track, oppositely-disposed  
pairs of shifting-wedges for raising said cross-  
rails, bell-crank levers connecting each pair  
of adjacent wedges, operating-rods connected  
5 to each of said wedges, interlocking pivoted  
levers engaging the ends of said operating-  
rods, rocking bars arranged adjacent the main  
rails of each track on each side of the cross-  
ing in position to be engaged by the wheels of  
10 an approaching train, rock-arms whereon said  
bars are mounted and connecting-links be-  
tween said bars and said pivoted levers, sub-  
stantially as described.

19. In a railroad-crossing, the combination  
15 with the abutting main rails of the intersect-  
ing tracks, of oppositely-disposed pairs of ver-  
tically-movable cross-rails arranged to con-  
nect the main rails of each track, oppositely-  
disposed pairs of reciprocating shifting-  
20 wedges for raising said cross-rails, bell-crank  
levers connecting each pair of adjacent  
wedges, operating-rods connected to each of  
said wedges and a shifting-lever connected

to one or more of said operating-rods, where-  
by a continuous track may be formed in either 25  
direction, substantially as described.

20. In a railroad-crossing, the combination  
with the main rails, of the movable cross-rails,  
means for shifting said cross-rails to form a  
continuous track in either direction, a hori- 30  
zontal operating-rod for said means extend-  
ing between said main rails, supporting-bars  
fixed in place outside of said main rails car-  
rying shouldered cross-shafts between them,  
rock-arms carried by said shafts between said 35  
supporting-bars and said main rails, horizon-  
tal rocking bars positioned between said rock-  
arms and said rails and having laterally-pro-  
jecting studs engaging the free ends of said  
rock-arms and connections between said rock- 40  
ing bars and said operating-rod, substantially  
as described.

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