

F. P. MURPHEY.
RAIL INTERSECTION.
APPLICATION FILED NOV. 7, 1911.

1,060,695.

Patented May 6, 1913.

3 SHEETS-SHEET 1.

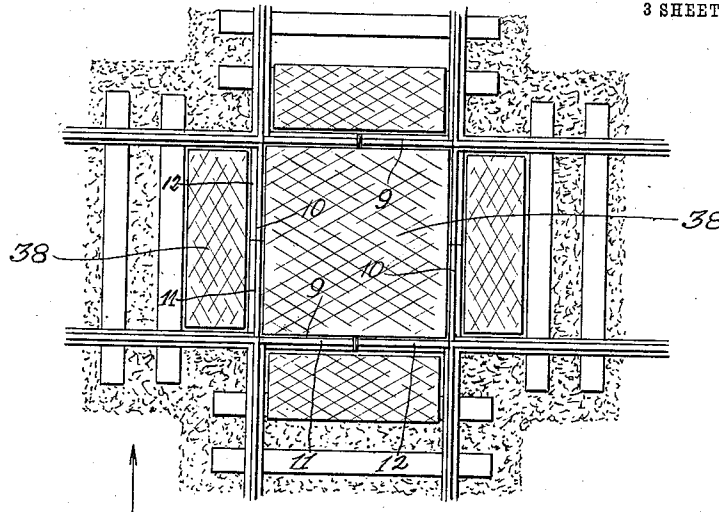


Fig. 1.

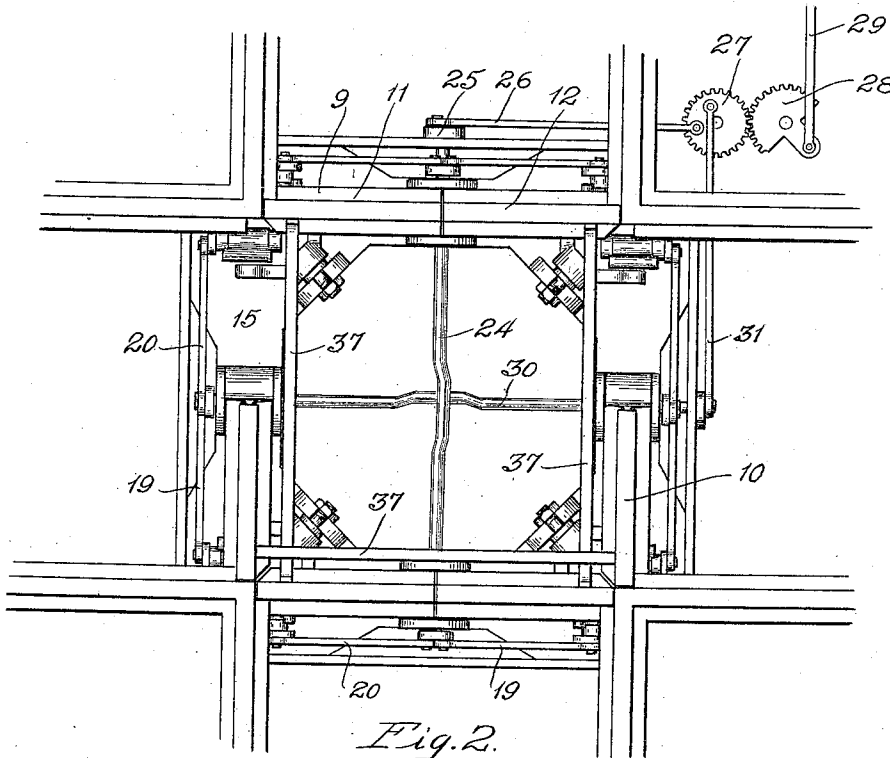


Fig. 2.

Witnesses:

Ephraim Banning.
J. M. Bond

Inventor:

Frank P. Murphey.
BY Banning & Banning
Attorneys

F. P. MURPHEY.
RAIL INTERSECTION.
APPLICATION FILED NOV. 7, 1911.

1,060,695.

Patented May 6, 1913.

3 SHEETS—SHEET 2.

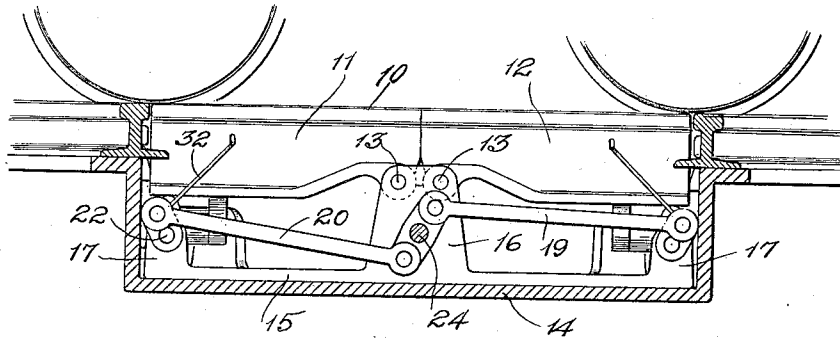


Fig. 3.

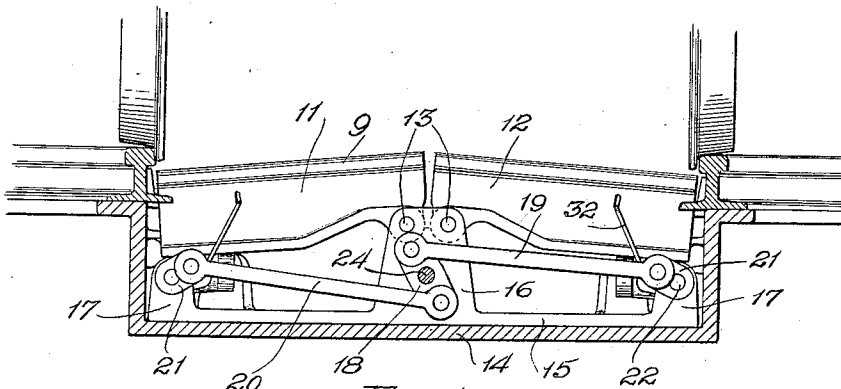


Fig. 4.

Witnesses:
Ephraim Banning.
Wm. P. Bond

Inventor:
Frank P. Murphey.
By *Banning & Banning*
Attorneys.

F. P. MURPHEY.
RAIL INTERSECTION.
APPLICATION FILED NOV. 7, 1911.

1,060,695.

Patented May 6, 1913.

3 SHEETS—SHEET 3.

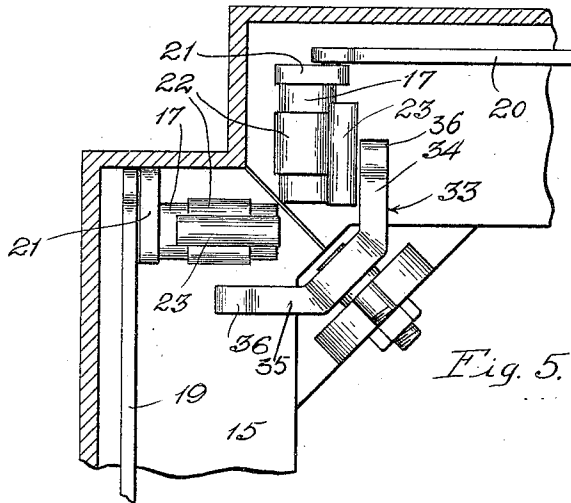


Fig. 5.

Fig. 6.

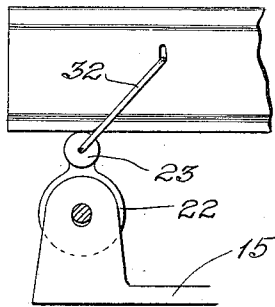
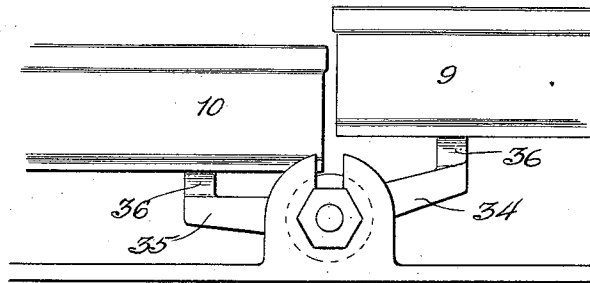


Fig. 7.

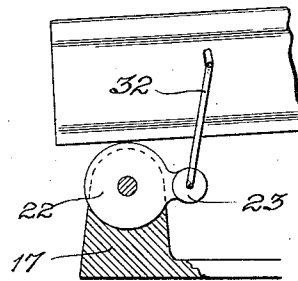


Fig. 8.

Witnesses:
Ephraim Bauning
J. P. Ford

Inventor:
Frank P. Murphey.
BY Bauning & Bauning
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK P. MURPHEY, OF DECATUR, ILLINOIS.

RAIL INTERSECTION.

1,060,695.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed November 7, 1911. Serial No. 658,971.

To all whom it may concern:

Be it known that I, FRANK P. MURPHEY, a citizen of the United States, residing at Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Rail Intersections, of which the following is a specification.

The present invention relates to a plurality of rail sections intended to be positioned at the intersection of railroad tracks, so that said intersection consists of a series of shiftable rail sections, which are adapted to be positioned to form a continuous track over the intersection in the direction desired, which trackway will be smooth and regular, and permit of a passage of the wheels of the cars over the intersection without the jolting or jarring which is incident to the use of the ordinary type of intersection.

The objects of the present invention are: to provide means for raising and lowering said rail sections, and to provide for the raising of selected rails to form a continuous track in one direction over the intersection and simultaneously lower the other rails to permit of the passage of the wheel flanges over the lowered or depressed rails; to provide means for utilizing the force incident to the descent of the rail sections to assist in the elevating of the sections being raised, thus making the device practically counterbalanced, and relieving the actuating mechanism from the load which would otherwise be thrown upon it if it were necessary to effect the raising of the rail sections solely by the operation of the actuating mechanism; to so arrange the mechanism which permits of the raising and lowering of the rail sections that when the rail sections are raised, a firm and rigid support will be given to these sections; and to arrange the operating mechanism so that when the rails are shifted they will be locked in shifted position, to prevent an accidental jar or jolt moving them out of such position.

Further objects of the invention are: to provide a covering for the mechanism so as to insure against its being rendered ineffective by reason of an accumulation of snow or ice; and to provide a positive connection between the means for raising and lowering the rails and the rails themselves, so that if a film or web of ice or other matter should gather, such a web or film would be broken

by the movement of the rail sections, thus insuring a proper positioning of the rail sections at each actuation of the raising and lowering means.

The invention further consists in the features of construction and in the combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view showing a track intersection arranged in accordance with the present invention, and showing the coverings for the operating mechanism in position; Fig. 2, a plan view with the covering removed, as well as a portion of the rail sections; Fig. 3, a side elevation showing the mechanism for shifting the rails in position to maintain them in elevated position; Fig. 4, a view similar to Fig. 3, showing the rails lowered and the mechanism in position to permit of such lowering; Fig. 5, a detail plan view of the members which control the movements of the rail, and also showing the members which transmit the power incident to the descent of one section to another section, thereby causing such power to assist in the elevating of the last named section; Fig. 6, a detail of said transmitting mechanism, showing a rail extending in one direction raised and a rail extending at an angle thereto lowered; Fig. 7, a detail showing the swinging head which controls the movements of the rail section in the position it assumes when a rail is held up, and showing the connection between said rail and controlling member; and Fig. 8, a view similar to Fig. 7, showing the mechanism in the position it assumes when the rail is lowered.

It is a well known fact in railroad circles that, at the intersection of tracks, considerable wear and tear on the tracks and rolling stock are caused on account of the jars and jolts which are incident to the passage of the wheels across such intersection. This is due to the fact that the rails forming the intersection must be spaced away from the main rails a distance to permit the flange of the wheel to pass across the intersecting tracks. This space is a distance of about two inches, and hence the wheels in going across these jumps or gaps strike the ends of the main rail sections with considerable force, causing a jolting or jarring to the rolling stock and a mutilation of the tracks, which is objectionable for various reasons.

The present invention is in the nature of

a mechanical device for placing a series of rails in proper position to effect a continuous track in the direction desired across an intersection, and to arrange the rails forming the intersection so that proper space will be left for the passage of the flanges of the wheels. By the arrangement employed in the present invention, the rails constituting the inner section can be brought into close relation with the rails of the main track, thus forming a smooth continuous trackway across the intersection and eliminating wear on the rails and wheels, which is occasioned by the wheels passing over the form of intersection now commonly in use. In the form of device illustrated in the drawings, the mechanism is employed at an intersection of tracks which extend at right angles to one another, but, obviously, the angled relation of the main track can be varied and the present invention still utilized.

The form of invention illustrated in the drawings comprises a series of rail sections, two of said sections 9 being oppositely disposed to one another, and two of said sections 10 being oppositely disposed to one another. The sections 10 are raised when it is desired to form a continuous trackway in the direction of the arrow shown in Fig. 1; and the sections 9 are raised when it is desired to form a continuous trackway the other way of the intersection. It is understood that when the sections 9 are raised, the sections 10 are depressed and vice versa. In the form of construction illustrated, each of these sections consists of two rail members 11 and 12, which, as shown more clearly in Figs. 3 and 4, are pivoted at their adjoining ends 13. The free ends of each rail member lie in position so that when raised, as shown in Fig. 3, they will lie substantially close to the ends of the main tracks, thus forming a comparatively unbroken continuity of trackway across the intersection. The mechanisms for effecting the raising and lowering of these sections are all alike, that is, the mechanism for effecting the movement of any particular section is similar to the mechanism for effecting the movement of the remainder; and, therefore, it will only be necessary to describe one set of mechanisms.

The mechanisms and the rail members are mounted upon a support 14, which in the form illustrated in the drawings consists of a plate 15 having bearing lugs 17 at each end thereof, and a bearing lug 16 at the center. It is understood that there are four of these supporting plates, one for each rail section, and, in the construction shown, the plates are arranged so as to form a rectangle in conformity to the rectangular shape of the intersection. The support 14 may be attached in any suitable manner to

a foundation for the intersection. Such foundation could either be of reinforced or I-beam construction; or a foundation may be provided which is constructed in any other manner desired.

Pivoted to the lug 16 is a crank lever 18, to one end of which is attached a link or bar 19, and to the other end of which is attached a similar link or bar 20. The link or bar 19 is attached to a crank arm 21, which in turn is secured to a shaft or trunnion 22, which trunnion has formed integrally therewith, or fixedly secured thereto, a head 23. The lever 20 is connected to a similar crank arm and head. These heads underlie the free ends of the rail sections and are what may be termed controlling members, since the position in which they lie determines the position of the rail sections.

The lever 18 is keyed or otherwise secured to a shaft 24, and, as best shown in Fig. 2, this shaft has secured thereto a crank arm 25, which in turn is connected to a link or bar 26; and this link or bar is attached to a toothed member 27, the teeth of which are in mesh with the teeth of a toothed member 28; and to the latter member is attached a member 29, which forms the actuating member of the device. This actuating member may be positioned at a point adjacent to the intersection; and it may be operated from the tower from which the block signals, etc., are operated, or it may be operated by automatic means by the approaching trains, or in any other suitable manner. The link 26, as shown in Fig. 2, is connected to the shaft 24, and this shaft, as shown, is the one which effects the operation of the sections 9. The sections 10 are operated in a manner similar to the sections 9, by means of a shaft 30 connected to a link or bar 31, which in turn is connected to the toothed member 27.

The mechanisms for operating the sections 9 and 10 are so arranged that they act in opposition to one another; that is, when a movement is imparted to the shaft 24 for the purpose of raising the rails of the sections 9, a movement is imparted to the shaft 30, which lowers the rails of the sections 10. Thus, the two sections are working in opposition. It will be noted that when the links 26 and 31 are thrown to acting position, the point of connection of said links to the members 27 is located past dead center, so that when the rail sections are thrown, they will be locked in this thrown position by the arrangement of the link members, so that a jarring or jolting will not produce an accidental displacement of the rails to throw them into improper position.

Referring again to the mechanism for controlling the movements of the rail section, it will be noted that the heads 23 have a bear-

ing in the lugs 17; and it will be further noted, by referring to Fig. 7, that when these heads are thrown into position to effect a raising of the ends of the rails, they assume a position which is at dead center with their pivotal centers and at right angles to the line of strain which is communicated to the rail sections by the passing of the wheels over such sections. In this manner, a firm and rigid foundation is effected for the ends of the rails, whereby a sagging of such ends when the cars are crossing the intersection will be prevented. Such sagging would obviously be highly objectionable, in that it would not make a smooth, continuous track across the intersection.

Attached to the heads 23 is a link or strap 32, suitably secured to the rail sections. This strap is not so much for the purpose of exerting a pull or push on the rail sections to effect the raising and lowering thereof, as it is for the purpose of insuring the raising and lowering of the rail in case there should a film of ice or other substance occur, which would interfere with the movements of the rail. If such a film should occur, it is obvious that in the absence of any direct connection between the head and rail, such film would prevent the proper actuation of the rail sections; but with the connection described, such a film would be broken by the pull of the actuating members, and hence the rail continue to perform its proper function.

The statement noted above that the strap 32 is not a medium for effecting the raising and lowering of the rail sections is borne out by the following facts: The rail sections are raised almost entirely by the action of gravity incident to the falling of the rail sections. This feature will be more fully hereinafter explained. The sections are lowered entirely by the action of gravity; that is, after the heads 23 have been withdrawn from their position underneath the rail sections, said rail sections will drop by reason of their own weight. Hence, in normal operation, the heads 23 do little of the actual work of raising or lowering the rail sections, and, obviously, the straps 32 would do little, if any, of such work, said straps being in the nature of a safety appliance to insure the lowering of the rails. The heads 23 would raise the rails even if the arms 33 hereinafter described did not properly perform this work. But if the rails were held up by a film of ice or other substance after the heads 23 were withdrawn from underneath them, the straps 32 would be necessary to effect the lowering of the rail, as, obviously, the heads 23 in and of themselves could never effect a lowering of the rails. This must be done either by the action of gravity or by means of a separate connection, such as the straps 32. So far as the raising of the rails is concerned, this would

be almost wholly accomplished by the action of gravity, irrespective of the action of the heads 23, and the straps 32 are not a necessary adjunct in connection with this operation.

It is the intention of the present invention to, as far as possible, produce an operation of the rail sections by means of counterbalancing; that is, to utilize the force of gravity produced by the descending rail sections to assist in the raising movement of the other rail sections. This is an important feature, since it relieves the operating mechanism of the load it would otherwise be subjected to in effecting an operation of the device. The structure I have shown for accomplishing this counterbalancing consists of a centrally hung arm or lever 33, best shown, perhaps, in Figs. 5 and 6. This arm or lever consists of two branches 34 and 35, each of which terminates in an upturned end 36; and these upturned ends underlie the rail sections at a point adjacent to the point of engagement of the under surface of the rail sections and the heads 23.

Assuming the parts to be in the position shown in Fig. 6, in which the rails of the section 10 are raised, and those of the section 9 lowered, it is obvious that when the heads 23 are shifted so as to allow the rails of the section 10 to descend, through the action of gravity, such descending will tilt or rock the arm 33 about its pivotal center, raising the portion 35, which is underlying the section 9; and such raising movement will assist in the elevation of the section 9, so that the actual work of elevating said section will be practically entirely accomplished by the action of gravity due to the lowering of the section 10. As heretofore stated, the mechanism for raising each of the rail members of the sections is similar, and it is understood that a mechanism similar to the one shown in Fig. 5 is positioned at each corner of the intersection.

A series of tie bars 37 are provided, which are more clearly shown in Fig. 2, and, as shown, join the opposing rails of the sections 9 and 10 to one another, whereby a simultaneous and even movement of said sections is insured. In order to prevent transverse movement of the rails forming the intersection, the flanges of certain of the main rails may be so positioned that they will bear against the web portion of the rails forming the intersection. This will be seen more clearly from a study of Fig. 2, where the construction is illustrated in connection with one of the rails of the intersection by means of dotted lines.

As shown more clearly in Fig. 1, a series of plates 38 are provided, which are formed to lie between the rails forming the intersection and also to the outside of said rails. These plates form a covering to prevent

snow or ice, or other foreign matter, from entering the interior mechanism and stopping the operation of the device.

The operation is as follows: Supposing it is desired to raise the section 10 and lower the section 9, so as to form a continuous trackway across the intersection, in the direction indicated by the arrow in Fig. 1, the operating member 29 is actuated by the tower-man, or otherwise, and the toothed member 28 thrown to turn the toothed member 27 in position to move the link member 26 and rock the shaft 30 to throw the pivoted arm 18 into the position shown in Fig. 3. In this position, the links 19 and 20 will be thrown outwardly, rocking the trunnions 22 through the medium of the crank arms 21, and lifting the heads of controlling members 23 to the position shown in Fig. 7. In such position they will form the support for the ends of the rails of which the sections 10 are composed. Simultaneously with the rocking of the shaft 30 in the manner above described, the shaft 24 will be rocked to throw the arm 18 into the position shown in Fig. 4, moving the ends of the links 19 and 20 inwardly, as shown in this figure, swinging the crank arms downwardly, and lowering the heads 23 to permit the rails of the sections 9 to fall. Such a falling movement will, through the action of the pivoted arm or lever 33, tend to raise the rails comprising the sections 10, and, as heretofore described, said rails when raised will be held in position by the position assumed by the heads 23. A movement of the rail sections to form a continuous trackway the other way of the intersection from that heretofore described would simply involve a reversal of the operation which I have set forth, and need not be described in detail, since it is perfectly obvious.

I do not desire to be understood as limiting myself to the exact form of mechanism shown and described, since the same may be changed as desired, provided that the invention is maintained within the boundaries defined by the annexed claims.

I claim:

1. In a device of the class described, the combination of a series of rails extending between the main tracks, and means for raising and lowering selected of said rails to form a continuous trackway in the direction desired, substantially as described.

2. In a device of the class described, the combination of a series of rails, and means embodying a rocking member located adjacent the juncture of each of said series of rails and the main tracks for raising a portion of said rails to form a continuous trackway in the direction desired and lowering the remaining rails to break the continuity of track in another direction, substantially as described.

3. In a device of the class described, the combination of a series of rails extending between the main tracks, and means for simultaneously raising a portion of said rails to form a continuous trackway in one direction across the intersection and to lower the remaining rails to break the continuity of trackway the other way of the intersection, substantially as described.

4. In a device of the class described, the combination of a series of rails extending between the main tracks, and a single actuating member operatively connected to throw a portion of said rails into raised position to form a continuous trackway one way of the intersection and to lower the remaining rails to break the continuity of trackway the other way of the intersection, substantially as described.

5. In a device of the class described, the combination of a series of rail sections, each section being formed of two rails pivoted at their adjoining ends, and means for swinging selected of said rails to form a continuous trackway over the intersection in the direction desired, substantially as described.

6. In a device of the class described, the combination of a series of rail sections, each section comprising two rails pivoted at their adjoining ends, and means for swinging selected of said rails about their pivotal centers to form a continuous trackway one way of the intersection and to depress the remaining rails to break the continuity of trackway the other way of the intersection, substantially as described.

7. In a device of the class described, the combination of a series of rails extending between the main tracks, means for raising and lowering selected of said rails to form a continuous trackway in the direction desired, and means for locking said thrown members in position, substantially as described.

8. In a device of the class described, the combination of a series of rails extending between the main tracks, a single actuating member operatively connected to throw a portion of said rails into raised position to form a continuous trackway one way of the intersection and to lower the remaining rails to break the continuity of trackway the other way of the intersection, and means for locking said thrown members in position, substantially as described.

9. In a device of the class described, the combination of a series of rails, means for moving said rails to form a continuous trackway one way of the intersection, said means comprising rocking members underlying and in engagement with said rails of the series, and mechanism operatively connected for actuating the said rocking members, substantially as described.

10. In a device of the class described, the combination of a series of rails, a series of rocking members underlying and in engagement with said rails and means operatively connected to actuate said members and raise selected of said rails and lower the remainder of said rails to form a continuous trackway across the intersection in the direction desired, substantially as described.

11. In a device of the class described, the combination of a series of rails, a series of rocking members underlying and in engagement with said rails, means operatively connected to actuate said members and raise selected of said rails and lower the remainder of said rails to form a continuous trackway across the intersection in the direction desired, and means for locking said members in position, substantially as described.

12. In a device of the class described, the combination of a series of rails, a series of rocking members underlying and in engagement with said rails and means operatively connected to said members to simultaneously raise a portion of said rails and lower the remainder of said rails, whereby a continuous trackway is formed across the intersection in the direction desired, substantially as described.

13. In a device of the class described, the combination of a series of rail sections, each section comprising two rail sections pivoted at their adjoining ends, shiftable members underlying the free ends of said sections, and means operatively connected for actuating said shiftable members, whereby a portion of said sections are positioned to form a continuous trackway in one direction across the intersection, and the remainder of the rail sections positioned to provide a clearance for the flanges of the wheels, substantially as described.

14. In a device of the class described, the combination of a series of rail sections arranged in the form of a parallelogram and interposed between the inner tracks, means for simultaneously elevating a portion of said sections and lowering the remainder, and means located at each corner of the parallelogram for transmitting the power incident to the descent of said sections to assist in the raising of the other of said sections, substantially as described.

15. In a device of the class described, the combination of a series of rail sections arranged in the form of a parallelogram, means for simultaneously elevating a portion of said sections and lowering the remainder, means located beneath a rail extending in one direction and a rail extending at an angle thereto for transmitting the power incident to the descent of one rail to assist in the raising of the other rail, and means for locking said thrown members in position, substantially as described.

16. In a device of the class described, the combination of a series of rail sections, shiftable supports for the outer ends of said sections, means operatively connected for shifting said supports, whereby a portion of said sections are raised and the remainder lowered, and means in the form of a pivoted L-shaped lever for transmitting the power incident to the descent of one of said sections to the other of said sections to assist in the raising of the latter section, substantially as described.

17. In a device of the class described, the combination of a series of rail sections, rocking members forming supports for the outer ends thereof, and means for rocking said supports, whereby a portion of said sections are raised and the remainder lowered, the supports for said raised sections extending at right angles to the line of pressure on the rails constituting said sections, substantially as described.

18. In a device of the class described, the combination of a series of rail sections, each section comprising two rails pivoted at their adjoining ends, shiftable members forming supports for the free ends of said sections, and means for shifting said supports, whereby a portion of said sections are raised and the remainder lowered, the supports for said raised sections extending at right angles to the line of pressure on the rails constituting said sections, substantially as described.

19. In a device of the class described, the combination of a series of rails extending between the main tracks, means for raising and lowering selected of said rails to form a continuous trackway in the direction desired, and a covering for said moving means, substantially as described.

20. In a device of the class described, the combination of a series of rail sections, each section being formed of two rails pivoted at their adjoining ends, means for swinging selected of said rails to form a continuous trackway over the intersection in the direction desired, and a covering for the means for effecting the swinging movement, substantially as described.

21. In a device of the class described, the combination of a series of rails, means underlying and in engagement with said rails and operated with a rocking movement to raise selected of said rails and lower the remainder of said rails to form a continuous trackway across the intersection in the direction desired, and a covering for the means for effecting the rocking movement, substantially as described.

22. In a device of the class described, the combination of a series of rail sections, means for simultaneously elevating a portion of said sections and lowering the remainder, means in the form of a pivoted L-shaped lever for transmitting the power incident to

the descent of one of said sections to assist in the raising of the other of said sections, and a covering for the elevating and lowering means, substantially as described.

23. In a device of the class described, the combination of a series of rail sections adapted to be raised and lowered, a series of swinging heads underlying said sections, means in the form of a pivoted lever having divergent arms operatively connected for actuating said heads to raise a portion of one of said rails and permit the remainder to descend, and a series of pivoted levers for transmitting the power incident to the descent of said sections to assist in the raising of the other of said sections, substantially as described.

24. In a device of the class described, the combination of a series of rail sections, means pivotally connected for simultaneously raising a portion of said rails and lowering the remainder, and a series of balanced pivoted L-shaped levers for transmitting the power incident to the descent of a portion of the rails to assist in the raising of the remainder of said rails, substantially as described.

25. In a device of the class described, the combination of a series of rail sections, means pivotally connected for simultaneously raising a portion of said rails and lowering the remainder, a series of balanced pivoted L-shaped levers for transmitting the power incident to the lowering of the rails to assist in the raising of the remainder of said rails, substantially as described.

26. In a device of the class described, the combination of a series of rail sections arranged in the form of a parallelogram, means operatively connected for raising a portion of said sections and lowering the remainder thereof, and a structure underlying the rails and providing mounting for the actuating mechanisms, substantially as described.

27. In a device of the class described, the combination of a series of rail sections, each comprising two rails pivoted at their adjoining ends, rocking actuating members underlying and in engagement with the rail sections for effecting a raising of a portion of said rails and lowering the remainder of said rails, and supporting members underlying the rails and providing bearing surfaces for the rocking means, substantially as described.

28. In a device of the class described, the combination of a series of rail sections adapted to be interposed at the intersection of trackways, means for elevating a portion of

said rails to effect a continuous trackway in one direction across the intersection and for simultaneously depressing the other of said trackways, and means for joining the rail sections moved in the same direction together, substantially as described.

29. In a device of the class described, the combination of a series of rails, means for moving said rails to form a continuous trackway one way of the intersection, said means comprising shiftable members underlying said rails of the series, mechanism operatively connected for actuating said shiftable members, and means for effecting a positive joining of the shiftable means and rails, substantially as described.

30. In a device of the class described, the combination of a series of rails, means underlying said rails and operated with a rocking movement to raise selected of said rails and lower the remainder of said rails to form a continuous trackway across the intersection in the direction desired, and means for effecting a positive joining of the shiftable means and rails, substantially as described.

31. In a device of the class described, the combination of a series of rail sections, shiftable members forming supports for the outer ends thereof, means for shifting said supports, whereby a portion of said sections are raised and the remainder lowered, the supports for said raised sections extending at right angles to the line of pressure on the rails constituting said sections, and means for effecting a positive joining of the shiftable means and rails, substantially as described.

32. In a device of the class described, the combination of a series of rail sections arranged in the form of a parallelogram and interposed between the main tracks, shiftable members underlying said sections, actuating means for said members arranged along each side of said sections, a main controlling means, and an operative connection between said actuating means and said controlling means, whereby an operation of said controlling means moves said actuating means to raise a portion of said rail sections and lower the remainder to form a continuous trackway in one direction across the intersection, substantially as described.

F. P. MURPHEY.

Witnesses:

WM. P. BOND,
MARY R. FROST.