H. H. TUNIS.

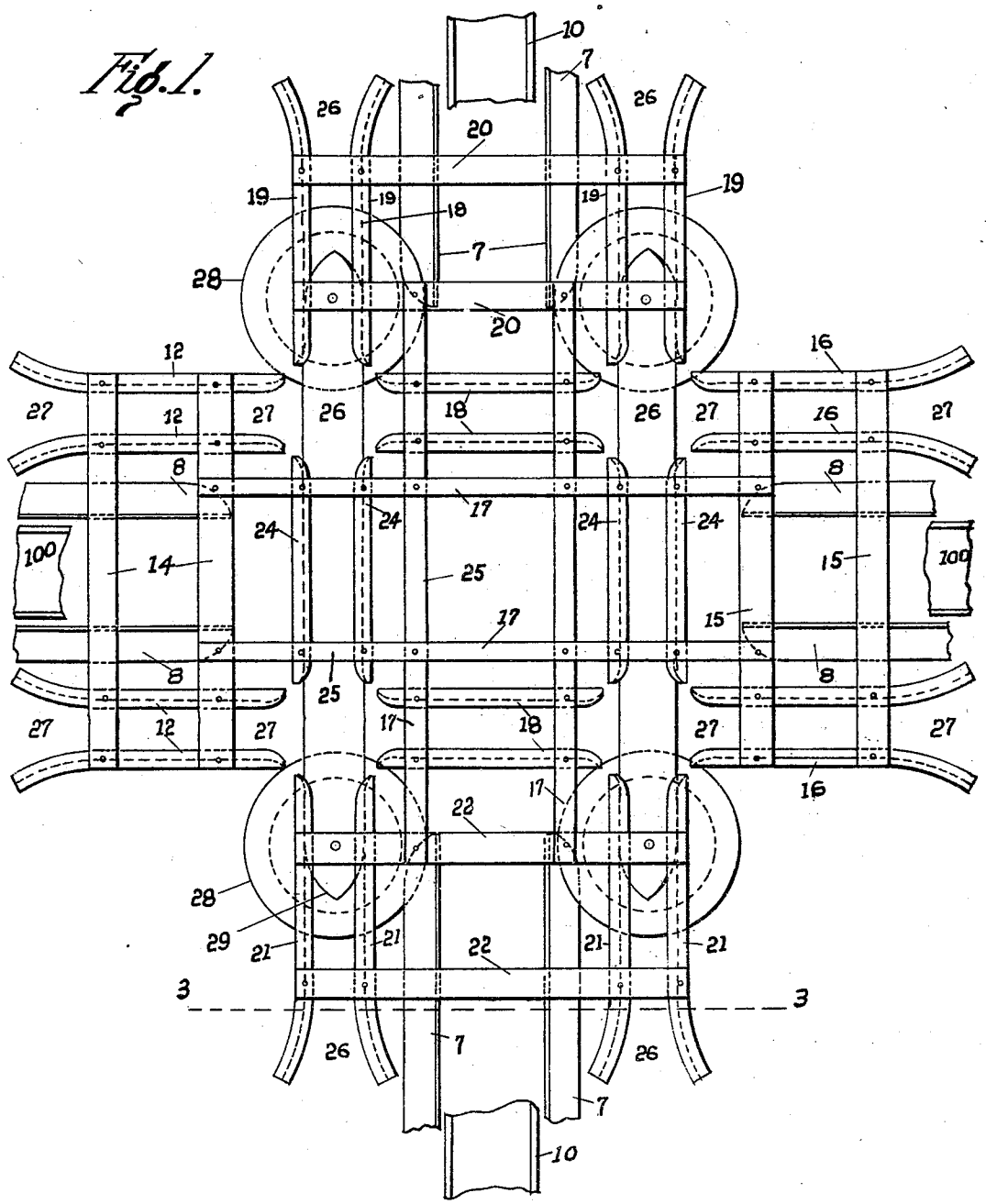
OVERHEAD RAILWAY SWITCH AND CROSSING.

APPLICATION FILED JAN. 11, 1909.

955,228. **Patented Apr. 19, 1910.**

3 SHEETS—SHEET 1.

Fig. 1.



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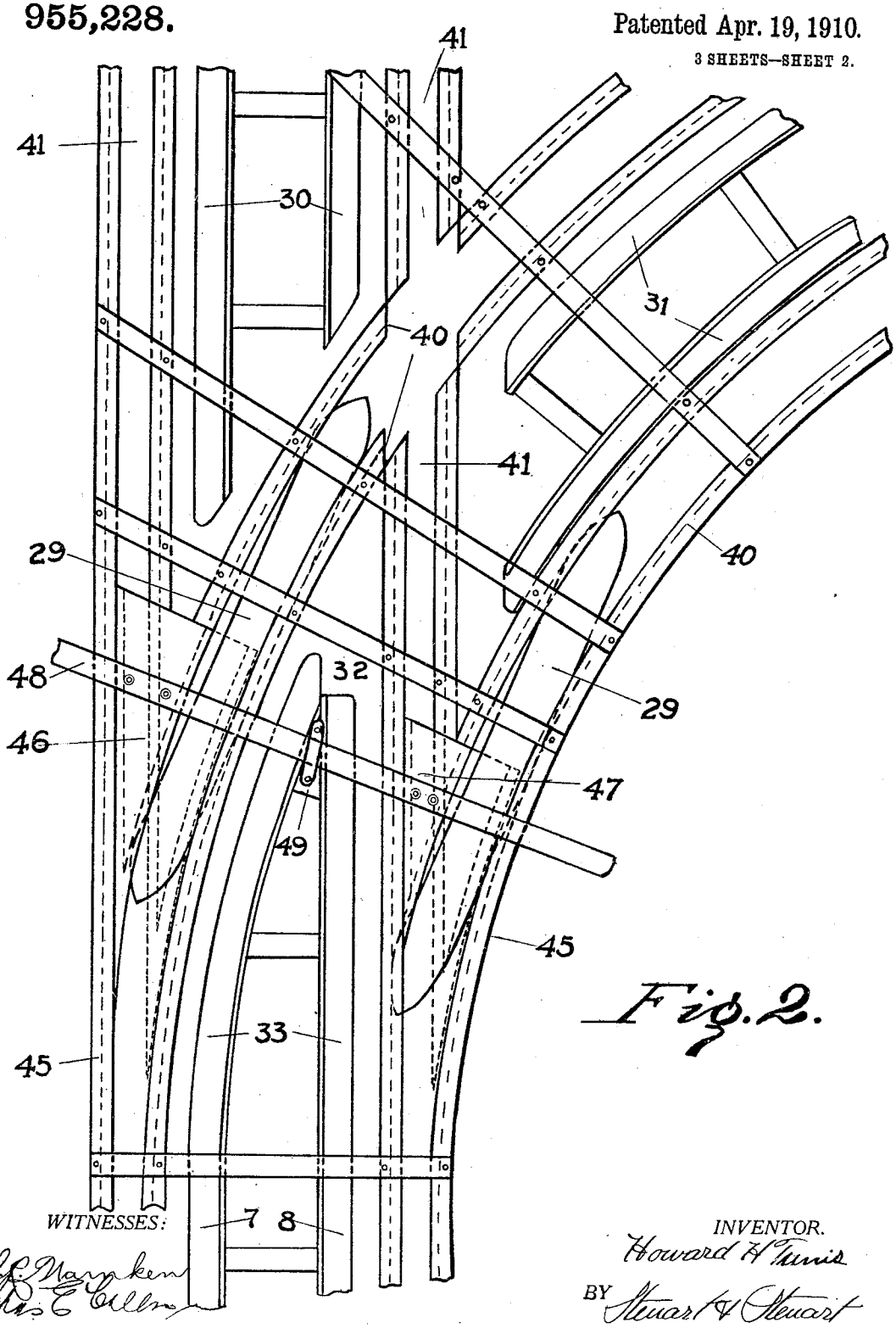

Fig. 2.

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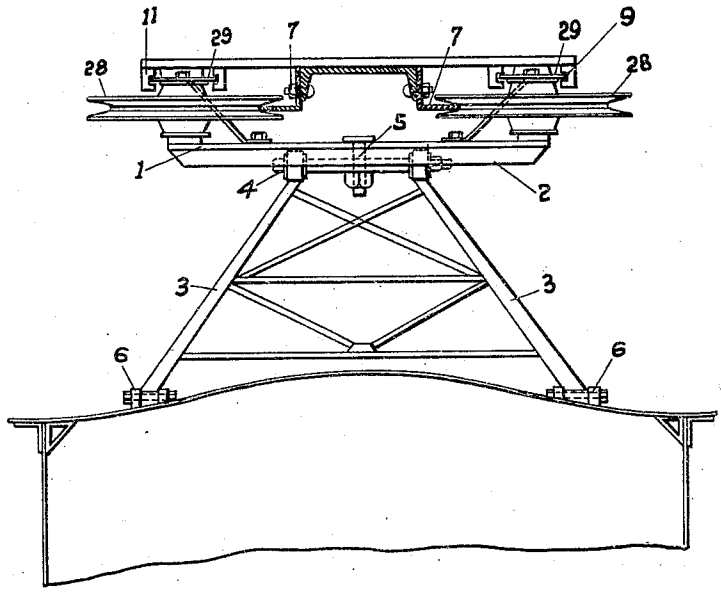
3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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OVERHEAD RAILWAY SWITCH AND CROSSING.

955,228. Specification of Letters Patent. **Patented Apr. 19, 1910.**

Application filed January 11, 1909. Serial No. 471,581.

To all whom it may concern:

Be it known that I, HOWARD H. TUNIS, a citizen of the United States of America, residing in the county of Baltimore, State of Maryland, have invented certain new and useful Improvements in Overhead Railway Switches and Crossings, of which the following is a specification.

This invention relates to monorail roads of the general type in which the balance of the cars is maintained by means of an overhead balance rail and a truck, or follower, engaging the rail and mounted on the car.

To provide a switch and crossing guide to be used at junctions and intersections of the tracks is the object of the invention.

The device to be described and shown herewith as an embodiment of the invention, consists of a fixed crossing or switch guide having guiding surfaces, preferably forming channels parallel to the balance rails at the junctions and crossings, and a follower on the truck. The followers engage the channels to support and guide the trucks. They will hereinafter be known as switch or crossing followers, selecting members, or shoes.

When it is desired to have the direction of the car at a switch varied on different trips, a movable member carrying guiding surfaces may be provided in connection with the switch guide, and this member is moved to change the direction of the switch channel, or other guide, whereby the direction taken by the truck is determined.

The accompanying drawings illustrate my invention.

Figure 1 is a plan view showing balance rails meeting at a crossing, a crossing guide or selecting member, and selecting followers engaging the crossing guide. Fig. 2 is a similar plan of a junction or switch in which two tracks meet at an angle. Fig. 3 is a transverse section on line 3—3 of Fig. 1.

Referring to Figs. 1 and 3, the truck 1 is shown as having a frame 2 mounted on the arm 3 by means of the horizontal pivot 4 and the vertical pivot 5, whereby the truck is allowed to swing relatively to the arm in a vertical and in a horizontal plane. The arm is secured to the car by means of hinge joints 6 so that it is rigid in a direction transverse of the car and adapted to swing in a vertical, longitudinal plane. The balance rail 7 is rigidly supported in horizontal position over the track 10 parallel thereto by a suitable means not shown, and a second balance rail 8 is placed at right angles to the first similarly supported and overlying a track 100 which intersects the first track 10. These balance rails are discontinued adjacent the crossing of their center lines to permit the passage of the balance trucks in both directions.

The crossing guides 11 which are an important feature of this invention are formed of a series of horizontally grooved plates, or guide members, placed parallel to each other and to the respective balance rails. The crossing guides are so placed that they form two channels parallel to each balance rail, and one on each side of the rail. The plates forming each channel are broken at the crossing and spaced longitudinally the width of the channels so that the channels are unobstructed. The first group of plates, beginning at the left in Fig. 1, consists of four plates, each numbered 12, supported by means of cross bars 14 secured to the upper surface of the balance rail 8, extending transversely thereto. These plates form a section of two channels 27. Each guide plate is attached at its upper edge to the two cross bars, and placed parallel to the balance rail 8, with its groove 9 horizontally and inwardly disposed. At the outer extremity; *i. e.*, the left hand end, the plates are bent out so that the mouth of each channel is distended. The extremity of the balance rail 8 at the opposite side of the crossing is provided with cross bars 15, similar to the cross bars 14, and a group of guide plates 16, four in number and alined respectively with the plates 12, is secured to these cross bars. Two cross bars 17 are secured at their extremities to the nearer bars 14 and 15. A group of four guide plate 18, parallel to each other and alined each with a plate 12 and a plate 16 of the other series, is secured to the cross bars 17. Four guide plates 19 are secured to the extremity of the guide rail 7 parallel thereto in a manner similar to those numbered 12 and 16, forming two channels parallel to the balance rail 7; and four other guide plates 21, in alinement with those numbered 19 and similarly placed, are secured to the other extremity of the same balance rail 7; and guide plates 24, parallel to each other and in alinement with the plates 19 and 21, are supported by means of the cross bars 25, secured to the cross

bars 20 and 22. We have thus, as described, four channels, two of them designated by reference character 26 parallel to each other and to the balance rail 7, one being on each side of the latter, and two of them also parallel to each other and numbered 27, parallel to the balance rail 8 and on each side of the same. The side walls of all the channels are discontinued at the crossings so that all the channels are unobstructed.

The truck 1 is provided with follower rollers 28, four in number, adapted to engage the balance rails 7 and 8 and with selecting members, or switch and crossing shoes 29, in the form of horizontal plates tapered at their extremities, of elongated form and of longitudinal extent greater than the distance between the inner extremities of the plates. The selecting or switch guide to be used where the tracks, instead of crossing, branch or meet at an angle is illustrated in Fig. 2. The balance rails 30 and 31 meet at 32 the single balance rail 33. These rails are, as previously described, discontinued adjacent the junction to allow passage of the truck in either direction, and we have three pairs of channels, the channels of each pair parallel to each other, one pair 40 being parallel to the rail 31, another pair of channels 41 is parallel to the rail 30, and still another pair of channels 45 is parallel to the balance rail 33. The plates forming the channels are joined by suitable curves so that a truck of the kind described, having guide shoes 29 passing along either rail 30 or 31 will be supported over the junction by the selecting channels 40 or 41 of the rail from which it comes and the selecting channels 45 of the rail 33 until the rollers 28 of such truck come into engagement with the balance rail 33.

In the operation of my invention, it is apparent that the truck is normally supported by the balance rail, but at the crossings or junctions such balance rail must be discontinued and another element is necessary to support, as well as guide, the truck. The selecting channels, having side plates grooved at 29, as shown in Fig. 3, are engaged by the shoes, the edges of the shoes running in the grooves and thus guided and supported over the junction. It should be noted that the shoes are necessarily of greater longitudinal extent than the openings in the channel spaces which occur at junctions to admit the passage of the truck in either direction, so that the support afforded therefor is continuous.

In the modification shown in Fig. 2, the channels 45 are enlarged at the extremities adjacent the junction to permit the truck to be directed on to either rail 30 or 31 by suitable means, consisting of frogs 46 and 47 carried by the rod 48 mounted to slide in a support 49 secured to the rail 33.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a monorail system, in combination, a balance rail, a balance truck coöperating therewith, selecting means on the truck, and coöperating stationary selecting means adjacent the path of the truck.

2. In a monorail system, in combination, a balance rail, a balance truck coöperating therewith, selecting means on the truck, and coöperating stationary selecting means on the balance rail.

3. In a monorail system, in combination, intersecting balance rails, a balance follower, a crossing guide and support, and a crossing follower.

4. In a monorail system, in combination, balance rails meeting at an angle, a balance follower, selecting and supporting means adjacent the junction, and coöperating selecting and supporting means attached to the follower.

5. In a monorail, in combination, tracks and balance rails meeting at an angle, a balance follower, selecting means adjacent the junction, and coöperating selecting means attached to the follower.

6. In a monorail system, in combination, intersecting tracks, balance rails parallel to the tracks and also intersecting a balance truck to run on the balance rails, a selecting guide adjacent the intersection, and coöperating selecting members on the truck.

7. In a monorail system, in combination, intersecting tracks, balance rails parallel to the tracks and also intersecting, a balance truck to run on the balance rails, crossing guides for the truck forming channels parallel to the balance rails adjacent the intersection, and a coöperating follower member on the truck.

8. In a monorail system, in combination, balance guides meeting at an angle, a balance follower on the car coöperating with the guides, selecting guiding means adjacent the junction, and selecting means controlling the course of the truck and coöperating with the selecting guiding means at the junction.

9. In a monorail system, in combination, balance guides meeting at an angle, a balance follower on the car coöperating with the guides, crossing guides and supports adjacent the junction, and selecting and supporting means controlling the course of the truck and coöperating with the crossing guides at the junction.

10. In a monorail system, for balancing a car, balance rails meeting at an angle, a balance truck on the car coöperating with the balance rails, selecting guides parallel to the rails adjacent the junction, and a selecting follower on the truck coöperating with the selecting guides to determine the course of the truck at the junction.

11. In a monorail system, for balancing a car, balance rails meeting at an angle, a balance truck on the car coöperating with the balance rails, crossing guides parallel to the rails adjacent the junction, and an elongated shoe on the truck coöperating with the crossing guides to determine the course of the truck at the junction.

12. In a system, in combination for balancing a car, balance guides meeting at an angle having external guide surfaces, a balance truck having follower surfaces coöperating with the guide surfaces of the balance guide, a selecting guide near the junction, and a coöperating guiding member on the truck.

13. In a system, in combination for balancing a car, intersecting balance guides, a balance follower having a rigid frame cooperating with the balance guides, selecting guides adjacent the intersection, and cooperating selecting means connected with the follower to control the course of the same.

14. In a system, in combination, balance guides meeting at an angle, a balance truck coöperating therewith, a selecting member having internally disposed guiding surfaces adjacent the junction, and a selecting follower on the truck having externally disposed surfaces to coöperate with the guiding surfaces, and selecting members to determine the course of the truck at the junction, the selecting follower and guiding surfaces being tongued and grooved.

15. In a system, in combination, balance guides meeting at an angle, a balance truck coöperating therewith, a crossing guide member having guide surfaces parallel to each balance rail adjacent the junction, a member on the truck for controlling its course, at the vertex of the angle, said member having follower surfaces coöperating with the guide surfaces.

Signed by me at Baltimore, Maryland, this 24th day of November, 1908.

HOWARD H. TUNIS.

Witnesses:
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S. R. WARNKEN.