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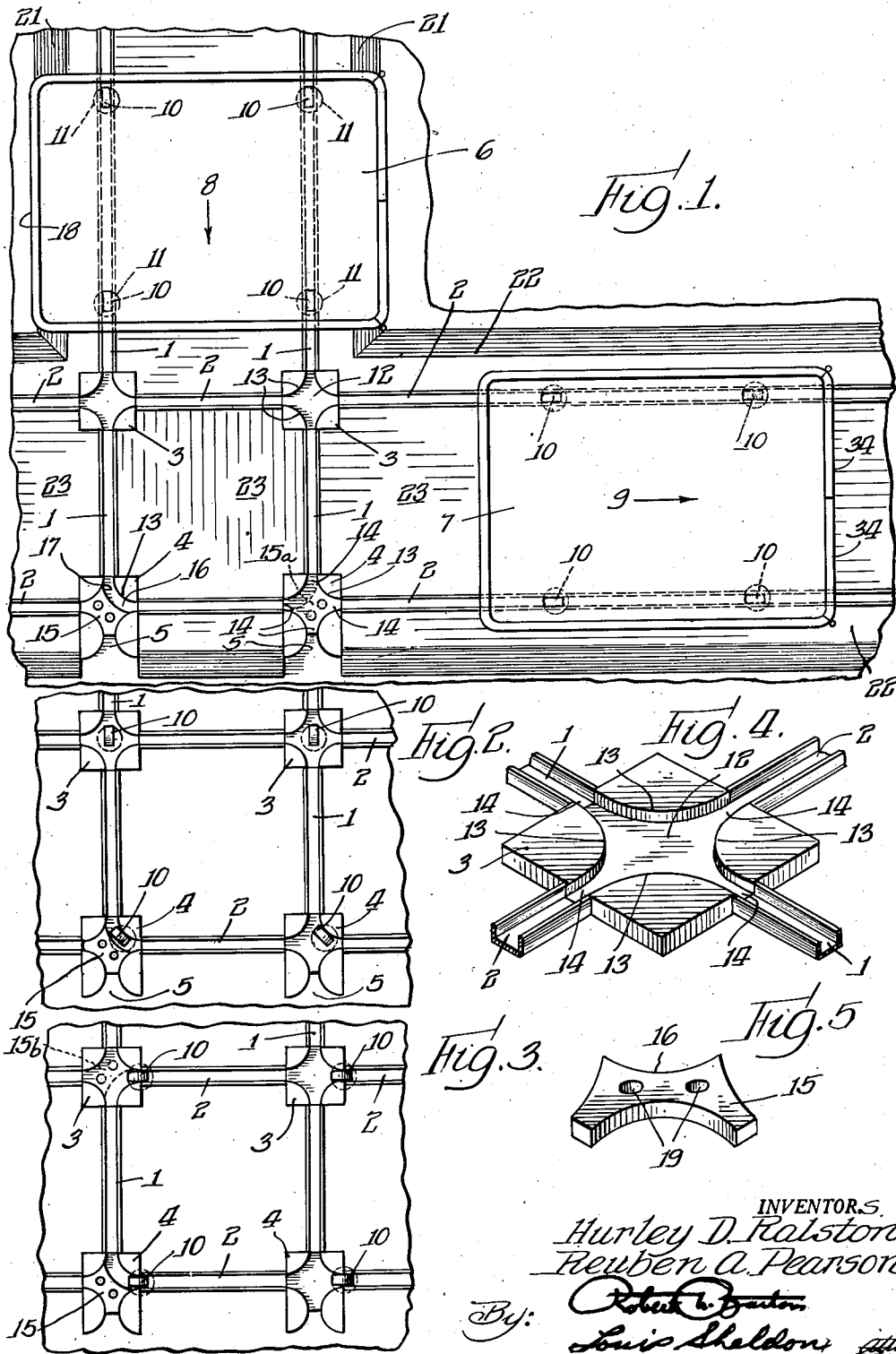
H. D. RALSTON ET AL

2,469,575

TRAMWAY

Filed April 19, 1944

2 Sheets-Sheet 1



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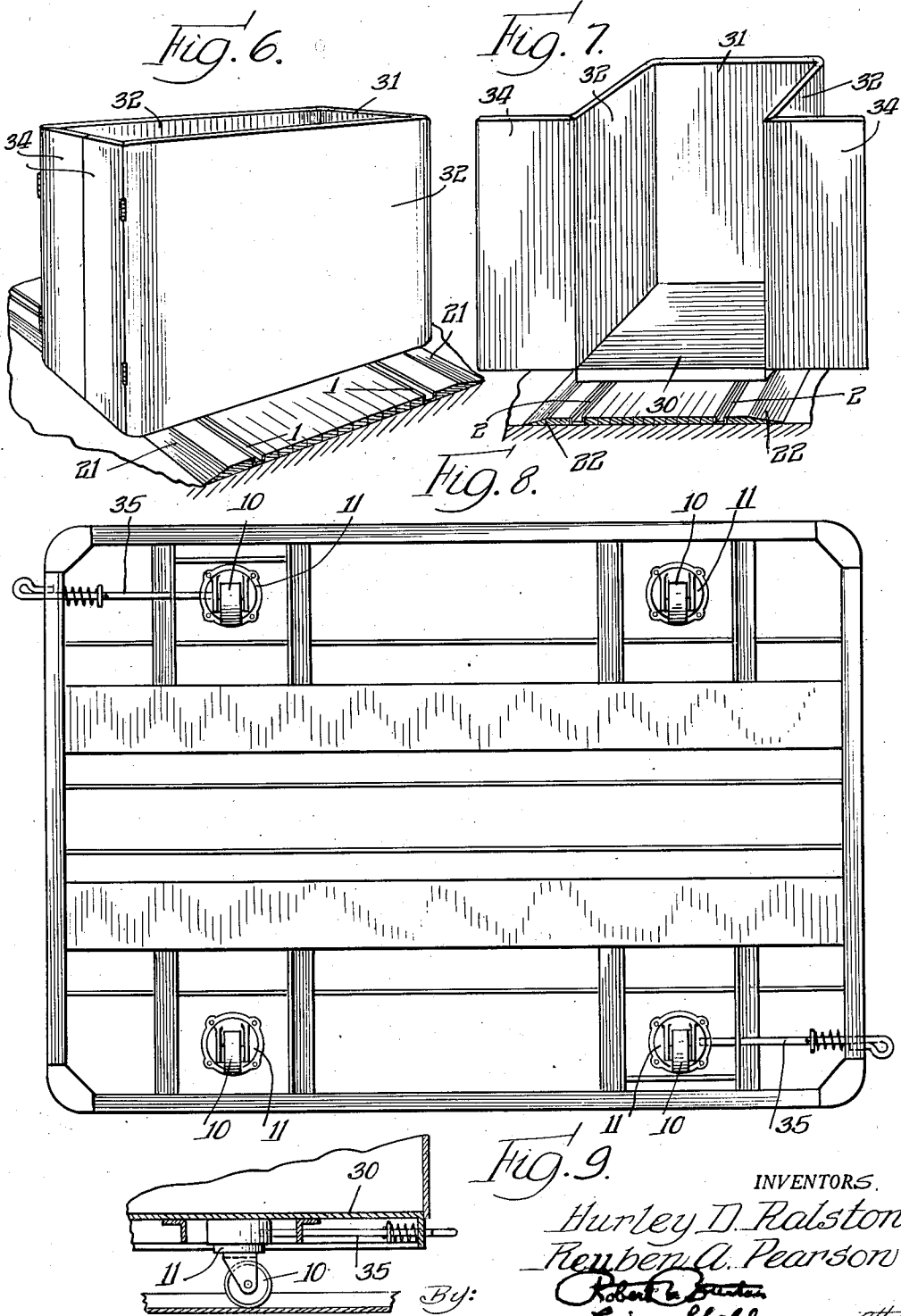
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

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TRAMWAY

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2 Claims. (Cl. 246—465)

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This invention relates to tramways of the type suitable for installation in factories or warehouses for guiding trucks from place to place therein in the transfer of materials and merchandise. One object of the invention is to provide a new and improved tramway structure including a novel form of crossing and novel switching means.

Another object of the invention is to provide a tramway having rails in the form of upwardly open channels with special intersection blocks interposed to form crossings and constructed to permit switching a car from one to the other of two intersecting tracks at such a crossing.

It is also an object of the invention to provide a tramway structure in which the rails are in the form of upwardly open channels adapted to be installed upon a floor without cutting into the floor itself and provided with special intersection blocks at crossings also adapted to be installed upon the top surface of the floor, some of such blocks being formed with entrance openings to receive the wheels of a car from the floor into the track channels.

Other objects and advantages of the invention will appear from the following description taken in connection with the drawings in which:

Fig. 1 is a plan view of a tramway embodying this invention showing portions of a pair of tracks crossing at right angles and also showing the outlines of a car on each of said tracks, together with a removable switch block disposed in the crossing at a position for causing a car to be transferred from one track to the other.

Fig. 2 is a plan view of the crossing portion of said tracks showing diagrammatically the positions assumed by the wheels of a car in the process of switching from one track to the other.

Fig. 3 is a plan view similar to Fig. 2 showing the positions of the wheels of the car upon completion of the switching operation.

Fig. 4 is a perspective view of an intersection block with fragments of the connecting rails extending therefrom.

Fig. 5 is a perspective view of an insertable switch block for use with the intersection block of Fig. 4.

Fig. 6 is a perspective view showing a car in operative position on the tramway embodying this invention.

Fig. 7 is a perspective view of the car with its end doors open for loading or unloading.

Fig. 8 is a bottom plan view of the car on a larger scale than the other figures showing the castor type wheels and their location thereon.

Fig. 9 is a detail fragmentary sectional view

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showing a portion of the car body and one of the castor wheels by which it is supported.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and re-arrangements of the parts may be made without departing from the spirit and scope of the invention, and that the same is not limited to the particular form herein disclosed, except insofar as indicated by the appended claims.

In transporting packages in merchandise warehouses or stock rooms of large stores and for transporting small parts of materials from one department to another of a factory, it is quite common to employ wheeled trucks which may be pushed about by hand or which may be coupled in trains in some cases and drawn by tractors or small electric locomotives. The present invention relates to tracks and cars for such a system and is particularly concerned with a type of track comprising upwardly open channel rails in which the wheels of the car run; this permits the wheels to have ordinary plain treads which are equally suitable for operation over a floor at areas where there are no tracks. Such a track of channel rails may be laid on top of the floor if desired without cutting into the floor surface, the tracks being flanged by sloping approaches and the space between the rails being filled with special flooring flush with the tops of the channels so that the presence of the rails offers no obstruction to the passage of trucks transversely over them and they are not likely to trip persons walking across the floor. Such an arrangement permits the movement of material handling trucks over the entire floor area with guide rails disposed along definite traffic lanes over which the trucks will move to and from their receiving and delivery stations.

Fig. 1 illustrates the essential parts of such a tramway system showing a track comprising channel rails 1, 1 and a second track comprising channel rails 2, 2, these tracks intersecting at right angles. At their intersections the rails 1 and 2 are interrupted and are replaced by special intersection blocks such as those shown at 3, 3. For an ordinary crossing at which both tracks extend in both directions from the intersection, four of these intersection blocks 3 may be employed; but as illustrated, two special blocks 4, 4 are shown because the track composed of rails 1, 1 terminates at the crossing and these blocks 4, 4 provide flared entrance openings 5, 5 to receive the wheels of a truck or car from the floor sur-

face and to facilitate the movement of the car onto the track 1, 1.

Fig. 1 shows a car 6 on the track 1, 1 and a similar car 7 on the track 2, 2, and it may be understood that if the car 6 travels in the direction of the arrow 8 the crossing may be utilized for switching it onto the track 2, 2 for movement to the position at which the car 7 is shown and in the direction indicated by the arrow 9. To accomplish this the four wheels 10 of each car are castor wheels, that is, they are mounted to swivel about vertical axes which are somewhat offset from the vertical planes of their axles in a well understood manner, and the four wheels 10 of each car are thus swivelly mounted at four points on the bottom of the car constituting the four corners of a square. A side of the square is equal to the "gauge" of the track, that is, the distance between the center lines of the rails 1, 1 or 2, 2.

Each of the intersection blocks 3 and 4 includes a central recessed portion 12 with up-standing lateral walls 13 and these wall sections 13 are separated from each other by openings 14. In the case of the blocks 3 and 4, openings 14 connect with the channels of the rail sections 1 or the rail sections 2, and in the case of the blocks 4 one of the openings 14 connects with the rail section 1, two of said openings connect with rail sections 2, and the remaining opening leads to the flared entry 5 through which a car wheel may be directed from the floor surface onto the track as already noted. The wall sections 13 are preferably curved convexly toward the center of the recess 12 and may be quadrant curves each connecting a rail section 1 with a rail section 2, since these rails are at right angles to each other.

The car bodies may be square in plan if desired, but as shown, they are somewhat oblong although castor wheels 10 define a square supporting base. Normally as the car moves forward, whether on the floor or on the rails, the castor wheels trail with respect to their vertical pivotal mountings; in the drawings it is assumed that each of said pivotal mountings includes a circular turntable which is indicated by the circle 11 in Fig. 1 and the trailing relation of the castor wheel 10 is thus clearly shown. If the car were to travel continuously in the same direction over a crossing the wheels 10 would simply ride across the recesses 12 of the intersection blocks and if the wheels swerved at all from the general direction of travel, they would be righted and guided into the connecting rail channel by means of the convexly curved side walls 13, 13 at the far side of each recess 12.

However, if it is desired to switch the car from the track 1, 1 to the track 2, 2 a switch block 15 is dropped into the recess 12 of one of the intersection blocks 4, 4 as seen in Fig. 1 so that as the four wheels 10 of the car 6 arrive in the respective recesses 12 of the four intersection blocks at the crossing, one of the leading wheels 10 will be deflected by the concavely curved guide surface 16 of the switch block 15, this surface as shown being substantially concentric with the wall section 13 of the recess with which it cooperates to form a curved channel 17 connecting the outer rail section 1 with the outer rail section 2. Thus one of the leading wheels 10 is caused to travel from the rail 1 into the rail 2 and the lateral displacement of the leading portion of the car body which results as this wheel follows the curved channel 17 causes the pivotal turntable 11 of the other leading wheel 10 to be shifted laterally in the same direction so that said other wheel is

forced around a convexly curved wall 13 of the other block 4 as shown in Fig. 2, and enters the rail section 2 leading away from said block. With the leading wheels of the car thus engaged in one of the rails 2 of the transverse track 2, 2 it is impossible for the rear wheels to travel any further in the track 1, 1 and they are easily deflected into the other rail of the track 2, 2 by a slight push against the surface 18 which is a lateral surface of the car as it approaches the crossing, this surface becoming the rear end as the car begins to travel along the track 2, 2, as shown in Fig. 3, and toward a position similar to that of the car 7 and in the direction of the arrow 9. When the cars are operated singly and are manually propelled, it is a simple matter to apply pressure in the proper direction to cause them to be switched from one direction to the other as just described and the only modification in the regular crossing which is needed to insure such switching action is the insertion of a single switch block 15 at one corner of the crossing. The block is shaped to close two adjacent openings 14, 14, leaving the other two adjacent openings connected by the curved channel 17 between the surface 13 and the surface 16 as already described. Preferably the block is provided with finger holes 19 by which it may be readily gripped for removal from the recess 12 of the intersection block. It will be evident from an inspection of Fig. 1 that if the switch block were inserted in the other one of the two intersection blocks 4, 4 as indicated in dotted lines at 15a, so as to provide a curved channel connecting the rail section 1 with the left-hand rail section 2, the car would be directed to the left instead of to the right.

As shown in Fig. 1 the floor area laterally adjacent each of the tracks 1, 1 and 2, 2 is covered with inclined approaches 21 and 22 and the areas between the rails of the tracks are built up with special flooring boards to a level flush with the upper edges of the channel rails 1 and 2, such areas being indicated at 23. This facilitates running trucks or cars across the floor and across the tracks without entering them in the tracks, and it also reduces the hazard to persons walking across the floor which would otherwise be presented by the tracks if they merely stood up above the floor level without such inclined approaches. Of course, as an alternative and particularly in a concrete floor, the tracks might be embedded so that the upper edges of the channels would be flush with the floor surface. With either arrangement, a car may be entered in the track by merely running it onto the inclined approach and then steering it along a direction almost parallel with the channel rails until the wheels drop into the channels. Another method is provided by the flared entrances 5, 5 in the blocks 4, which lead directly into the track 1. When the car is thus entered in the short rail sections of the track 1, which extend transversely between the rails 2, 2, it may be switched onto the track 2 by using the switch block 15 in one of the intersection blocks 3, as shown in dotted lines at 15b in Fig. 3.

Figs. 6 and 9 illustrate a type of package car suitable for use in warehouse and mercantile establishments for conveying miscellaneous packages and bundles from a stock room to a delivery point for shipment. The car includes a floor 30 with an end wall 31 and side walls 32, 32. At the other end there are provided a pair of hinged doors 34, 34, and ordinarily the car will be operated in such a direction that the doors 34 are

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at the forward end as indicated in Fig. 1 so that at the terminal of the track the load will be removed to a point beyond the track, as to an elevator or transfer truck. If desired, of course, the package car itself may be shifted onto an elevator and even transferred to a motor vehicle by extending suitable tracks to the shipping platform.

Fig. 8 shows in bottom plan view the floor structure of the car and the wheels 10 with their swivelly mounted turntables 11 already described. Fig. 9 shows one of the wheels 10 in side elevation with its swivel mounting 11 secured to the floor 30 of the car. When a truck of this type is employed over a floor without guiding tracks, it is found preferable to lock at least one of the four castor wheels against turning, preferably one of the leading wheels, and for this purpose locking bolts 35 of standard construction are shown associated with two of the castor wheels in Fig. 8.

It may be understood that it will nearly always be preferable to have the four castor wheels of the car placed at the corners of a square, so that all tracks may be of the same gauge. However, if for any reason, it is found desirable to have the cars so long that a square wheel-base is impracticable, then the wheels may be placed at the four corners of an oblong; and for such a car, the tracks extending in one direction will correspond in gauge to the width of the oblong while the transverse tracks will be of a gauge equal to the length of the oblong, permitting the car to be transferred from a track of either gauge to a track of the other gauge by use of the switch block 15, in the manner already described.

We claim:

1. In a system of traffic channeling, the combination with a plurality of coordinately arranged trackway sections, each comprised of equally spaced channels, junction plates located at intersection points between sections, said plates having a central recess conforming in depth to that of said channels and filleted to provide arcuate juncture between the adjacent vertical wall surfaces of transversely related rail sections, and means for achieving variously predetermined traffic routes in said system comprising removable switching frog elements insertable into any one

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of said plates according to intended routing, said frog elements constituting a routing curvature located in an outermost junction plate when establishing a turn in a traffic routing system.

2. In a system of trackway channeling for truck traffic including a plurality of trackway sections arranged in parallel and transverse portions, each comprised of equally spaced channels, junction plates located at the intersection between transverse sections of channel rails, said plates having a central recess conforming in depth to the channel of said rails and filleted to provide parallel arcuate juncture curves between the adjacent vertical wall surfaces of related perpendicular rail sections, and means for establishing variously predetermined traffic routes in said system comprising removable switching frog elements having application in one of said plates in said arcuate juncture curves whereby to provide directing guidance to the foremost and outermost castor wheel of a four wheel supporting truck system in order to effect intersection routing.

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