W. C. CARR.

TRANSPORTATION SYSTEM.

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943,810.

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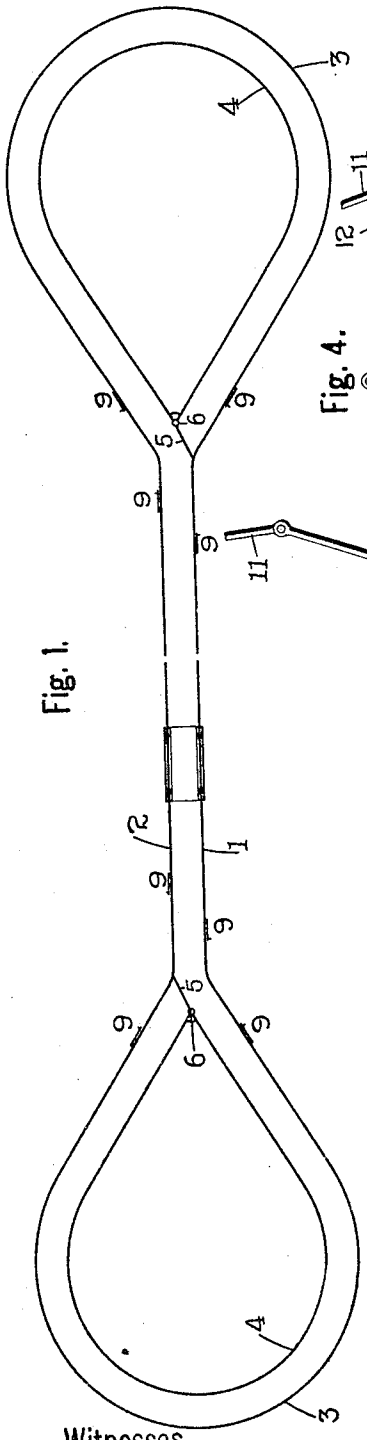

Fig. 1.

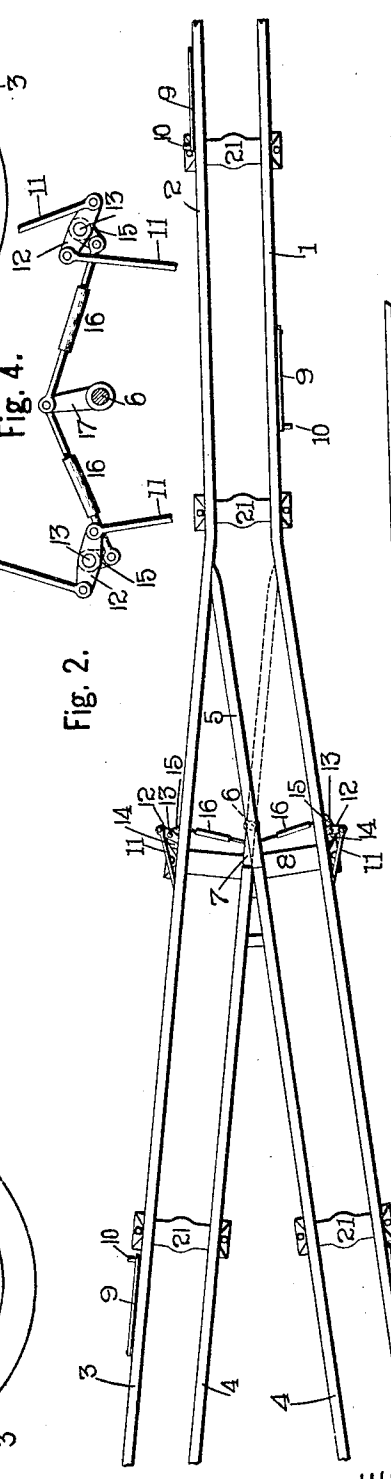

Fig. 2.

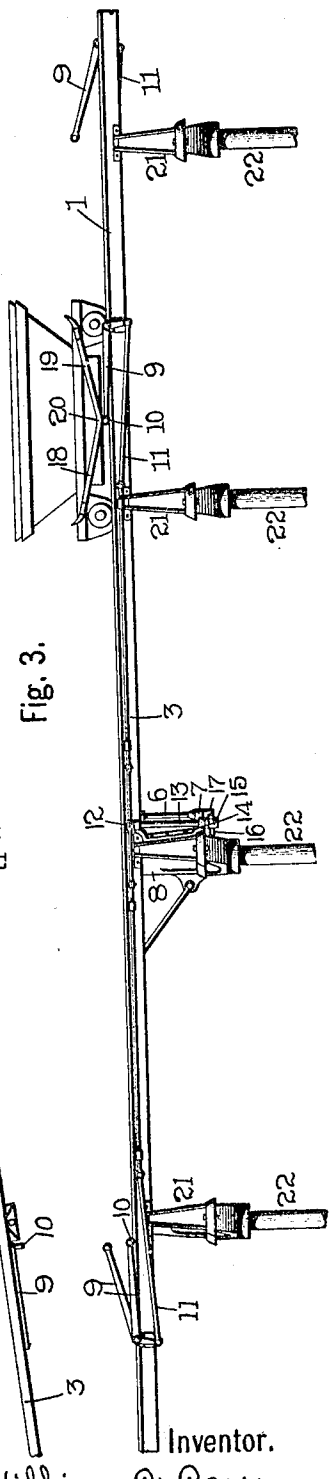

Fig. 3.

Fig. 4.

Witnesses.

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TRANSPORTATION SYSTEM.

943,810. Specification of Letters Patent. Patented Dec. 21, 1909.

Application filed December 10, 1908. Serial No. 466,761.

To all whom it may concern:

Be it known that I, WILLIAM C. CARR, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Improvement in Transportation Systems, of which the following is a specification.

This invention relates to improvements in transportation systems and the object of the invention is to provide means by which a car may traverse a single track and upon reaching the end thereof may be turned to return over the single track without reversing its motor or the direction of rotation of its driving wheels.

The invention also relates to details of construction which will be hereinafter described, reference being had to the accompanying drawings in which a preferred adaptation of the invention is illustrated.

Figure 1 is a fragmentary top plan view of the single track provided at each end with a return loop. Fig. 2 is an enlarged fragmentary top plan view of the single track with a portion of one of its loop ends to illustrate the single switch rail and the mechanism employed for shifting the same. Fig. 3 is a side elevation of the fragment of the track shown in Fig. 2, with a side elevation of a car thereon to illustrate the manner of automatically operating the switch shifting mechanism from the car. Fig. 4 is a plan view of the rock shafts, cranks and connecting rods for shifting the switch rail.

In referring to the accompanying drawings in detail, like numerals designate like parts in the adaptation of the invention illustrated thereby.

The system consists of a single track having its end curved upon itself to form a return loop and a car on the track which travels to the loop, passes around the loop and returns over the single track to its starting point.

The return loop simply turns the car around so that it will travel in the opposite direction to enable it to return over the single track without reversing its motor or the direction of rotation of its driving wheels.

Referring to Fig. 1, the single track consists of two parallel rails 1 and 2, both of which, at their ends, merge in a curved rail which forms the outer loop rail 3 of the return loop, said loop being of pyriform outline. An inner loop rail 4 is located within the outer loop rail 3, and curves correspondingly to said outer loop rail 3, so as to extend in parallelism with said rail 3 and is supported from said outer loop rail precisely the same distance as the rails 1 and 2 are separated from each other. The loop formed by the inner rail is of similar pyriform outline but smaller than the aforesaid outer loop.

Both the single track and the outer and inner loops are of immovable and permanently rigid construction, not being provided in any portion with a movable switch, and a separate control switch is located between the two loops and is adapted to be swung in either direction to open the loop track on either side. This switch construction is preferably as follows: A centrally located single switch rail 5 is supported upon a vertical shaft 6 journaled in bearings in a bracket 7 fastened to the middle arm of the rail support 8 and located slightly in front of the apex or junction of the ends of the inner loop rail, or at the point 6 shown in dotted lines in Fig. 2. The switch rail 5 has a short rearwardly projecting portion which is adapted to register with one end of the inner loop rail 4 when it is in one switching position and to register with the opposite end of said loop rail when it is in the opposite switching position; and a long forwardly extending portion having a centrally tapered front end which is adapted to operatively engage either of the ends of the outer loop rail at or near their junction with the rails 1 and 2.

The mechanism for shifting the single switch rail is specifically illustrated and described in my companion application Serial Number 460,515, filed October 31st, 1908, to which reference is to be had for an extended description of its detail construction.

Referring to Fig. 3, a vertically operated bell crank 9, is pivoted to one of the rails and has its longer member provided at its outer end with a roller 10, and its shorter member pivoted at its outer end to a long connecting rod 11, composed of a series of members and extending longitudinally along the rail from which it is supported at intervals. The opposite end of the connecting

rod 11, is pivoted to one end of a double crank 12, located at the upper end of a vertical rock shaft 13, carried in a bracket 14 secured to the outer arm of the rail support 8. A crank 15 is secured to the lower end of the rock shaft 13 and an extensible connecting rod 16 is secured at its respective ends to the crank 15 and to a crank 17 on the lower end of the vertical shaft 6 which carries the switch rail 5.

The car supported on the track has a depressing bar fastened to its side which is in the form of a V having its members 18 and 19 bent downward or separated so widely that they nearly assume a horizontal position, see Fig. 3. In other words, the middle point 20 of the bar is in the lowest horizontal plane and the two members 18 and 19 extend oppositely from said middle point and diagonally upward on a slight incline, see Fig. 3.

In the adaptation illustrated, four switch shifting mechanisms are employed which are connected in pairs and operate in unison. Each pair consists of two bell cranks 9, pivoted to the rail, two connecting rods 11, slidably supported in brackets attached to the rail, a vertical rock shaft 13 having a double crank 12 at its upper end and a crank 15 at its lower end, and an extensible connecting rod 16 pivoted at its outer end to the crank 15 and a crank 17 on the vertical shaft 6.

One of the rock shafts 13 and two of the transverse connecting rods 11 are located on one side of the switch rail and the other rock shaft 13 and two connecting rods 11 are located on the opposite side of the switch rail and each one of the connecting rods 11 is pivoted at its inner end to an end of the double cranks 12 and extends in opposite directions being pivoted at each of its opposite ends to one of the bell cranks 9.

Four of the vertical bell cranks 9 are employed and are arranged in connected pairs so that the cranks 9 of each pair will shift the switch rail in the same direction.

The preferred form of the loop end is substantially of a pear shape as shown in Fig. 1 having two straight portions which gradually diverge from each other at the point at which their ends merge with the single track proper and an outer end portion of even curvature which connects to the outer ends of the straight portions. In other words the loop end consists of a pyriform outer rail and a corresponding pyriform inner rail within and surrounded by the outer rail, so that the loop is of a pyriform outline.

The outer pyriform rail is immovable and permanently connected to the two rails of the straight track and the loop track and the straight track are of a continuous immovable and rigid structure throughout, the switching being accomplished by a single switch located between the inner and outer rails of the loop. The single switch rail is separate and distinct from the rails of the track and loop.

With this construction the car can be run around the loop end in either direction and the switch rail will be automatically shifted to permit the car to enter one end of the loop and then automatically shifted to its opposite position to permit the car to leave the other end of the loop on its return journey.

The direction in which the car travels over the loop is determined by the position of the depressing bar which may be attached to either side of the car so as to operate either pair of bell cranks 9.

The operation of the improved system is as follows,—A car being run over the single track to the point where its depressing bar will travel upon the roller 10 of one of the bell cranks 9 located at the side of one of the rails of the single track the upper member of the bell crank will be depressed from an inclined position to the horizontal position shown in Fig. 3 and the switch rail will be shifted from the position shown in dotted lines to the position shown in full lines in Fig. 2. The rail supporting brackets 21 are mounted on vertical standards 22 as shown in Fig. 3. The car now enters the loop passing around it to the left and upon reaching the bell crank attached to the outer loop rail on which its depressing bar may contact, depresses said bell crank, again shifts the switch rail and leaves the loop to return over the single track to its starting point.

In Fig. 1 a single track is shown with a return loop at each end, one of which would constitute a starting station and the other the destination. For instance in employing the car for transporting ore, one loop end would be located at the mine and the other at a point in proximity to a surface railway or other suitable medium for long distance transportation.

I claim—

1. A transportation system consisting of a single track having a return loop at at least one end thereof; said track and return loop being of immovable and rigid construction throughout and a single switch rail located between the rails of the return loop.

2. A transportation system consisting of a single track having a return loop at each of its opposite ends; said track and return loop being of immovable and rigid construction throughout and a single switch rail located between the rails of the return loop.

3. A transportation system consisting of a single track having a return loop at at least one end thereof of pyriform outline; said track and return loop being of immov-

able and rigid construction throughout and a single switch rail located between the rails of the return loop.

4. A transportation system consisting of a single track having a return loop at each of its opposite ends of pyriform outline; said track and return loop being of immovable and rigid construction throughout, a single switch rail located between the rails of the return loop and a single switch rail pivoted at the apex of the inner rail of the return loop and adapted to be swung in either direction into contact with the outer rail.

5. A transportation system consisting of a single track having a return loop at at least one end thereof of pyriform outline with the ends of the outer rail of the loop merging in the rails of the single track; said track and return loop being of immovable and rigid construction throughout and a single switch rail located between the rails of the return loop.

6. In a transportation system, a single track composed of two rails and a return loop at one end of the single track having an outer loop rail which merges at its ends with the rails of the single track and an inner loop rail within the outer loop rail, all of said rails being of permanently immovable and rigid construction throughout.

7. In a transportation system, a single track composed of two rails and a return loop at one end of the single track having an outer pyriform loop rail which merges at its ends with the rails of the single track and an inner pyriform loop rail within the outer loop rail; all of said rails being of permanently immovable and rigid construction throughout.

8. In a transportation system, a single track composed of two rails and a return loop at one end of the single track having an outer loop rail which merges at its ends with the rails of the single track, an inner loop rail within the outer loop rail; all of said rails being of permanently immovable and rigid construction, and a single switch rail pivoted near the apex of the inner loop rail and adapted to swing to either side.

9. In a transportation system, a single track composed of two rails and a return loop at one end of the single track having an outer loop rail which merges at its ends with the rails of the single track, an inner loop rail within the outer loop rail; all of said rails being of permanently immovable and rigid construction, and a single switch rail pivoted near the apex of the inner loop rail and means for shifting said switch rail in either direction.

10. In a transportation system, a single track having a return loop; said track and return loop being of permanently immovable and rigid construction throughout, a switch located in the return loop mechanism for shifting the switch and separate and distinct from the track or return loop and a car on the track having means for operating the switch shifting mechanism.

11. In a transportation system, a track having a return loop, said track and return loop being of permanently immovable and rigid construction throughout, a switch located between the rails of the loop at the apex thereof, switch shifting mechanism, a car on the track and a depressing bar on the car adapted to operate the switch shifting mechanism.

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