J. P. NIKONOW.

TELPHERAGE SYSTEM.

APPLICATION FILED APR. 23, 1915.

1,201,080.

Patented Oct. 10, 1916.

2 SHEETS—SHEET 1.

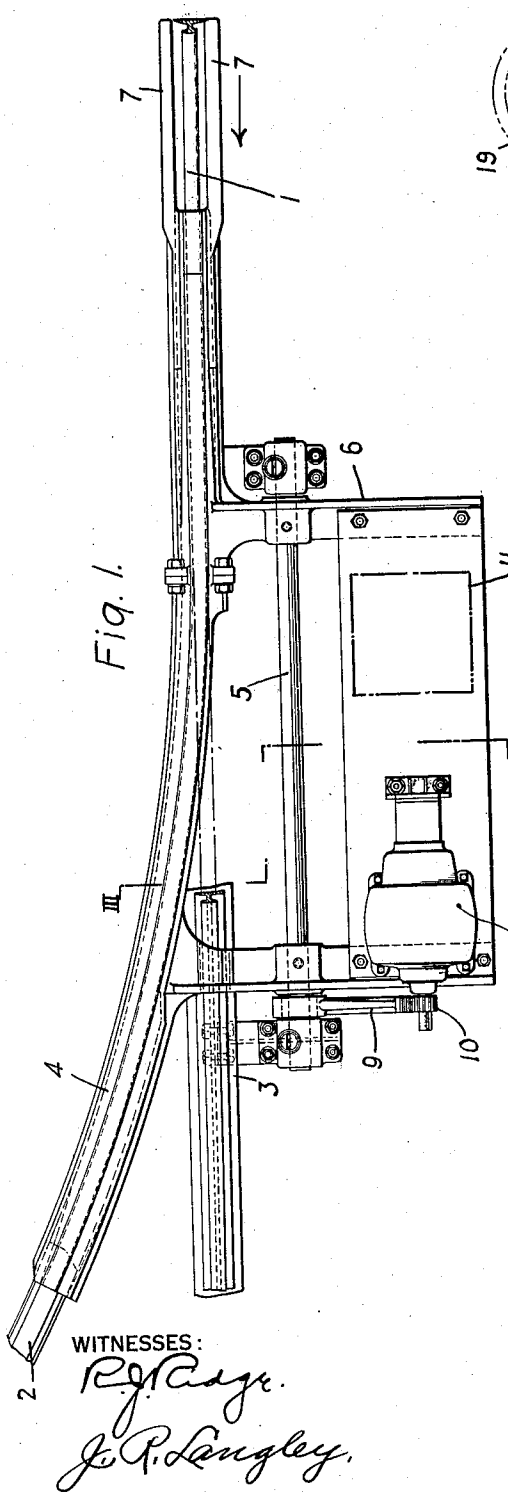

Fig. 1.

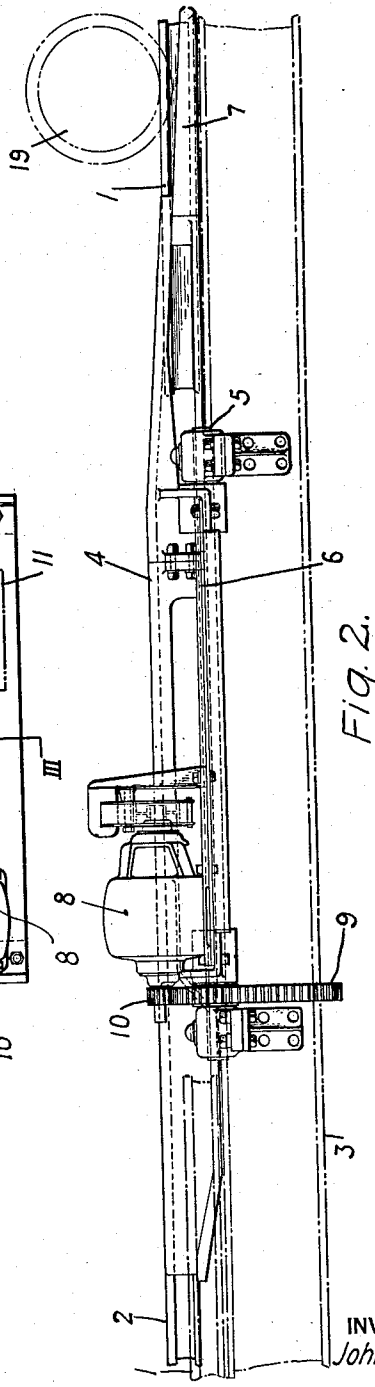

Fig. 2.

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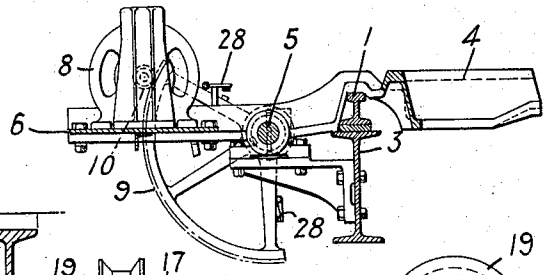

Fig. 3.

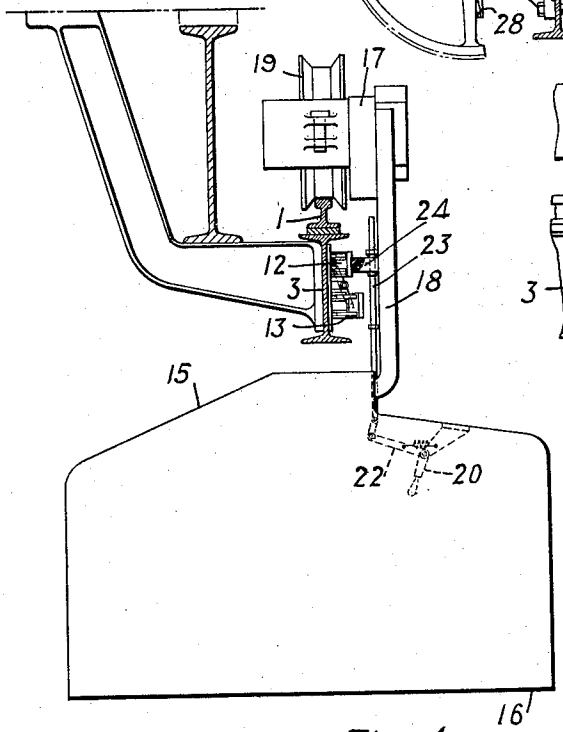

Fig. 4.

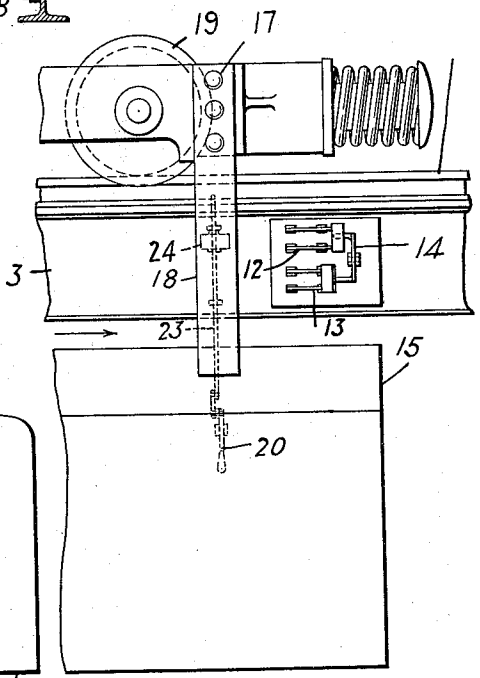

Fig. 5.

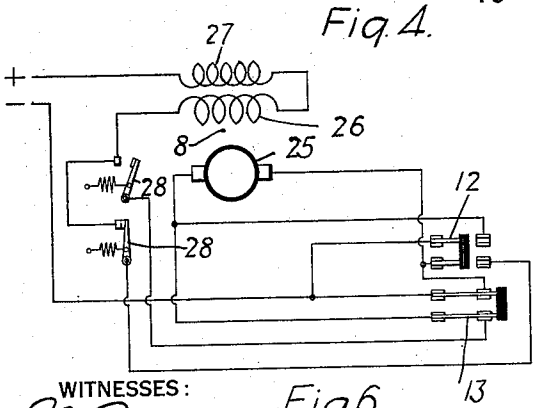

Fig. 6.

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UNITED STATES PATENT OFFICE.

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TELPHERAGE SYSTEM.

1,201,080. Specification of Letters Patent. Patented Oct. 10, 1916.

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To all whom it may concern:

Be it known that I, JOHN P. NIKONOW, a subject of the Czar of Russia, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Telpherage Systems, of which the following is a specification.

My invention relates to telpherage systems and particularly to switching mechanisms therefor.

My invention has for its object to provide a simple and efficient means for controlling the connections of tracks in a system of the above indicated character.

A system constructed in accordance with my invention is particularly adapted for use in connection with the loading of ships, the disposal of freight in terminal warehouses and for other similar purposes. The switching mechanism for controlling the connections of the several tracks is especially adapted for use in connection with a system in which the movement of the conveying cars is in a single direction.

In systems of this character, it is usual to provide a number of branch tracks which are connected to the main track in order to allow certain of the conveying cars either to shorten their route or to change their destination. It is highly desirable, in the interest of efficient operation, that the route to be taken may be determined before the car reaches the track switch which must be actuated to properly route the car. It is desirable, also, that the actuation of the switch may be accomplished without undue loss of time caused by stopping the car while the switching operations are effected.

According to the present invention, I provide a movable switching member which, when lowered, connects a main or continuous track to a branch track. When the switch member is raised to its upper position, the cars continue on the main track and a suitable gap is left between the main track and the branch track to provide for the passage of the car. The switch member, or bridging member, is controlled by an electric motor that is operatively connected to it. A reversing switch for the motor, which is located on the main track at a considerable distance from the switch, may be operated to either of its positions, as desired, by the setting of a controlling mechanism carried by the tractor which propels the car.

The details of my invention will be described in connection with the accompanying drawings in which—

Figure 1 is a plan view of a portion of track embodying a switching mechanism constructed in accordance with my invention, parts being broken away. Fig. 2 is a view, in elevation, of the mechanism of Fig. 1. Fig. 3 is a sectional view, on line III—III of Fig. 1. Fig. 4 is an end view of a car equipped with the motor controlling mechanism, and its associated parts, the track being shown in section. Fig. 5 is a view, in elevation, of the mechanism of Fig. 4. Fig. 6 is a diagrammatic view of circuits and apparatus embodying my invention.

Referring particularly to Figs. 1, 2, 3, 4 and 5, a portion of the main or continuous track of a telpherage system is indicated at 1. A branch track 2, which is adapted to be connected to the main track at desired times, ends at a considerable distance from the main track to form a gap through which suspended cars may pass. The tracks may be supported by any suitable means as, for example, upon I-beams 3 that may be secured to any suitable stationary members. The gap between the end of the branch track 2 and the main track 1, is adapted to be bridged by a curved switch member 4 which is pivotally mounted on a shaft 5 by means of a frame 6. The switch member 4 is bifurcated at one end to provide inclined projections 7 upon which the flanges of the car wheels roll to an elevation sufficient to insure that they may clear the main track 1 when the car changes its course. The main portion of the switch member 4 is materially higher than the top of the main track 1. The position of the bridging member 4, relatively to the tracks 1 and 2, is controlled by an electric motor 8 that is mounted on the frame 6 and is geared to a stationary rack 9 by means of a pinion 10. A suitable counterweight 11, indicated by dot and dash lines in Fig. 1, may be located on the outer side of the frame 6.

Referring particularly to Figs. 4 and 5, the motor is controlled by a pair of single-throw switches 12 and 13 that are located along the main track at any desired distance from the track switch in the direction from which the car approaches. The switches 12 and 13 are mechanically interlocked by a pivoted bar 14 so that it

is impossible to close one switch without opening the other. The switches 12 and 13 are controlled by a mechanism that is operable from the cab of the operator. A car 15, which may be either a tractor for drawing a number of trailers or a motor-driven car for conveying articles from one point to another, comprises a main body portion 16 that is suspended from the frames 17 of the trucks by means of bars 18. The car is supported by a pair of grooved wheels 19, only one of which is shown. A handle 20, which is located within convenient reach of the operator, is connected by a suitable link mechanism 22 to a longitudinally slidable rod 23. A projecting member 24 is in alinement with one of the switches 12 and 13, according to the position of the controlling handle 20.

The circuits and apparatus employed in connection with my invention are diagrammatically illustrated in Fig. 6. The motor 8, the armature of which is indicated at 25, is provided with a series field magnet winding 26 which is in circuit with a brake coil 27 for controlling the operation of the motor. The motor circuit is provided with suitable limit switches 28 that are carried by the frame 6 and one of which is opened at the respective ends of the path of movement of the frame 6 about the pivotal shaft 5. The switches 12 and 13 constitute a reversing mechanism for the armature circuit of the motor. The series field winding 26 is permanently connected in circuit with the source. It may be assumed that a car on the track 1 and moving in the direction of the arrows in Figs. 1 and 5, is approaching the track switch and that it is desired that the car travel over the branch track 2. It may be assumed, also, that the bridging member 4 is in its upper position in which there is sufficient clearance to allow the wheel 19 and the frame 18 to pass beneath it. Before the car reaches the switching mechanism for controlling the motor, the handle 20 is adjusted to the proper position for insuring the closing of the track switch. It may be assumed, for example, that the upper positions of the rod 23 and the projection 24, as illustrated in Figs. 4 and 5, correspond to the lower or operative position of the bridging member 4, as illustrated in Figs. 1, 2 and 3. When the car 15 passes the switches 12 and 13, the projection 24 will engage the switch 12 to effect its closure, and the switch 13 will be opened by the interlocking bar 14. The motor circuit, which is closed thereby, extends from the positive terminal through the brake coil 27, series field winding 26, limit switch 28, switch 12, armature winding 25 and switch 12 to the negative terminal. The motor then rotates in a clockwise direction, as viewed in Fig. 3, to lower the bridging member 4 into engagement with the main track 1 and the branch track 2 to close the gap between them. When the bridging member 4 is in its operative position, the corresponding limit switch 28 will be opened to break the motor circuit. When the car reaches the portion of the main track 1 illustrated in Figs. 1 and 2, the flanges of the wheel 19 roll up the inclined surfaces of the arms 7, and the wheel 19 and its connected parts are elevated in order that the wheel may clear the main track 1. The car then proceeds along the branch track 2. In case it is desired to proceed along the main track 1, the operating handle 20 of the car that may be approaching the switches 12 and 13 is adjusted to place the projecting member 24 in its lower position to coact with the switch 13. The closing of the switch 13 operates to complete a circuit for the motor which is the same as that above described, except that the connections of the armature winding are reversed. The motor then rotates in a counter clockwise direction, as viewed in Fig. 3, to rotate the frame 6 and the bridging member 4 about the pivotal shaft 5 to raise the bridging member 4 to its upper position and thereby open the gap between the main track 1 and the branch track 2. The car may then proceed along the track 1, the frame 18 and the wheel 19 passing under the bridging member 4. In case it is desired that a car pass over the same route as that taken by a preceding car, the operating handle 20 will be adjusted to the corresponding position in the usual way. For example, if the switch 12 is closed and the projection 24 is in its upper position, the controlling mechanism will have no effect upon the switching mechanism as it passes. It will be clear, therefore, that, as long as it is desired to traverse the main track and the switching member 4 is in its open position, the operating handle 20 may remain in the corresponding position without change. If it is desired that the cars pass successively over the branch track 2, an initial adjustment only of the operating handle 20 is required.

It will be noted that I provide a simple and effective means for automatically controlling the switching mechanism of a telpherage system by means of which the route to be taken may be preselected without loss of time on the part of the operator or without delaying the transported material. The switching mechanism is such that it does not interfere with the movements of cars that are suspended from the track, as would occur if the switching mechanism were similar to that employed in railway construction.

Many modifications will occur to those skilled in the art to which my invention appertains, and it is understood that such changes may be made as fall within the

scope of the appended claims without departing from the spirit of my invention.

I claim as my invention:

1. In a telpherage system, the combination with a continuous track and a branch track, of a substantially vertically movable switch member for connecting said tracks, and electrical means on one of said tracks for selectively controlling said member.

2. In a telpherage system, the combination with a continuous track and a branch track. of a substantially vertically movable member for connecting said tracks, a motor for controlling said member, and means for selectively controlling said motor.

3. In a telpherage system, the combination with a track having a section movable substantially in a vertical direction, and a car supported by said track, of a motor for actuating said movable section, and means in said car for controlling said motor.

4. In a telpherage system, the combination with a continuous track and a branch track, of a member movable substantially in a vertical direction for connecting said tracks, a motor for controlling said member, and means operable from the continuous track for controlling said motor.

5. In a telpherage system, the combination with a main track, and a branch track, of a switching mechanism for connecting said tracks comprising a member movable substantially in a vertical direction, a motor operatively connected thereto, a switching mechanism for controlling said motor, a car to be supported by said tracks, and means in said car for controlling said switching mechanism.

6. In a telpherage system, the combination with a continuous track and a branch track, of a pivotally mounted member for connecting said tracks, a motor mechanically connected to said member, and a stationary member coacting with said motor for actuating said connecting member in a vertical direction.

7. In a telpherage system, the combination with a continuous track and a branch track, of a horizontally pivotally mounted member for connecting said tracks, a motor mechanically connected to said member, and a stationary gear operatively connected to said motor.

8. In a telpherage system, the combination with a continuous track and a branch track, of a substantially vertically movable member for connecting said tracks, an electric motor for controlling said member and means for selectively controlling said motor.

9. In a telpherage system, the combination with a track having a section movable substantially in a vertical direction and a car supported by said track, of a motor disposed adjacent to said movable section for actuating the same and means in said car for controlling the motor.

10. In a telpherage system, the combination with a continuous track and a branch track, of a substantially vertically movable member for connecting said tracks, a motor disposed adjacent to said movable member for controlling the same, and means for selectively controlling the motor.

11. In a telpherage system, the combination with a continuous track and a branch track, of a substantially vertically movable switch member for connecting said tracks, and electrical means for operating said switch member.

12. In a telpherage system, the combination with a continuous track and a branch track, of a substantially vertically movable switch member for connecting said tracks, electrical means for operating said switch member, and means for selectively controlling said electrical means.

13. In a telpherage system, the combination with a continuous track and a branch track, and a car adapted to operate on said tracks, of a substantially vertically movable switch member for connecting said tracks, electrical means for operating said switch member and means whereby said electrical means may be selectively controlled from the car.

14. In a telpherage system, the combination with a continuous track and a branch track, of a member movable substantially in a vertical direction for connecting said tracks, electrical means for controlling said member, and means operable from the continuous track for controlling said motor.

15. In a telpherage system, the combination with a track having a movable section and a car supported by said track, of a motor having an armature and a field-magnet winding, said motor being adapted to actuate said movable section, and means in said car for effecting a reversal of the armature and the field-winding terminals relative to each other.

In testimony whereof, I have hereunto subscribed my name this 9th day of April 1915.

JOHN P. NIKONOW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."