March 24, 1936. K. R. WEISE 2,035,355

AUTOMATIC LIFT

Filed Dec. 5, 1931 4 Sheets-Sheet 1

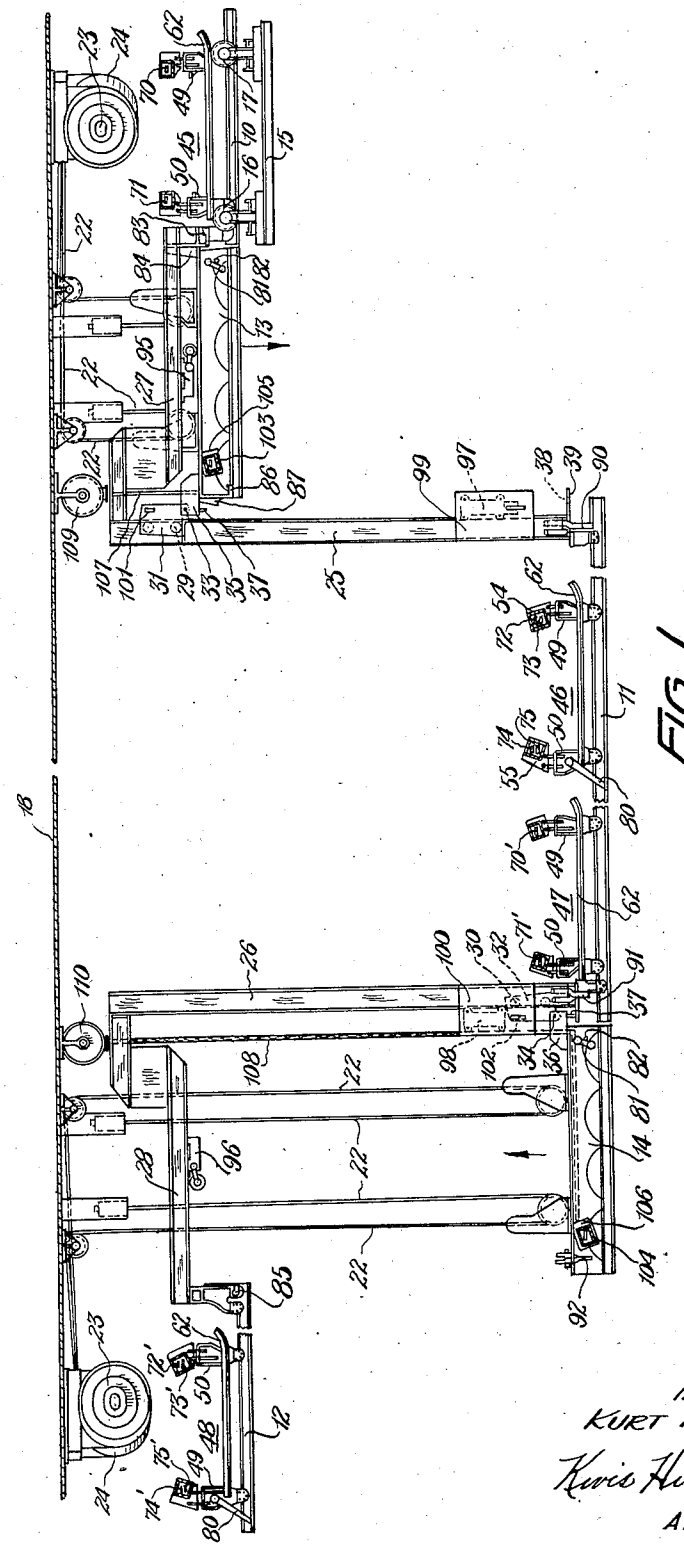

FIG. 1

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March 24, 1936. K. R. WEISE 2,035,355

AUTOMATIC LIFT

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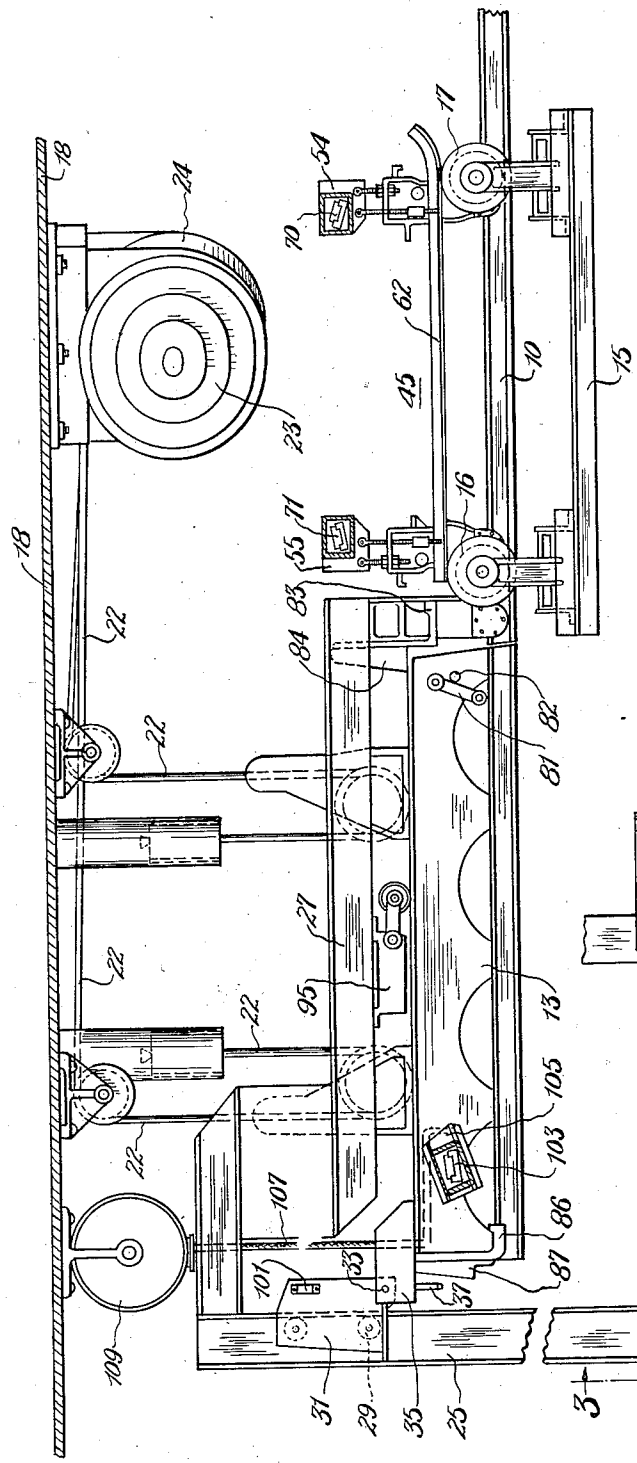

FIG. 2

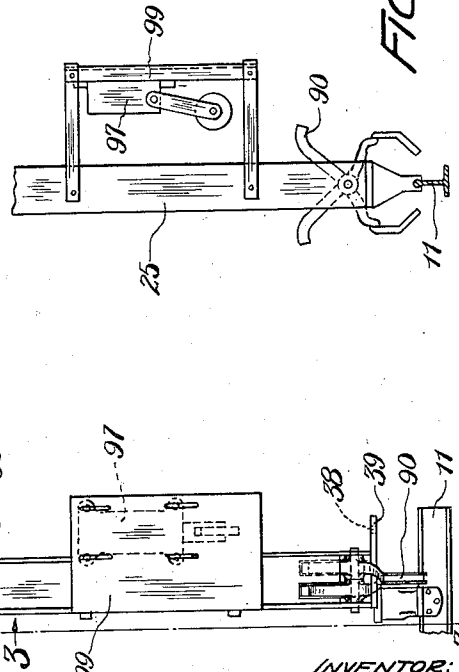

FIG. 3

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AUTOMATIC LIFT

Filed Dec. 5, 1931 4 Sheets-Sheet 3

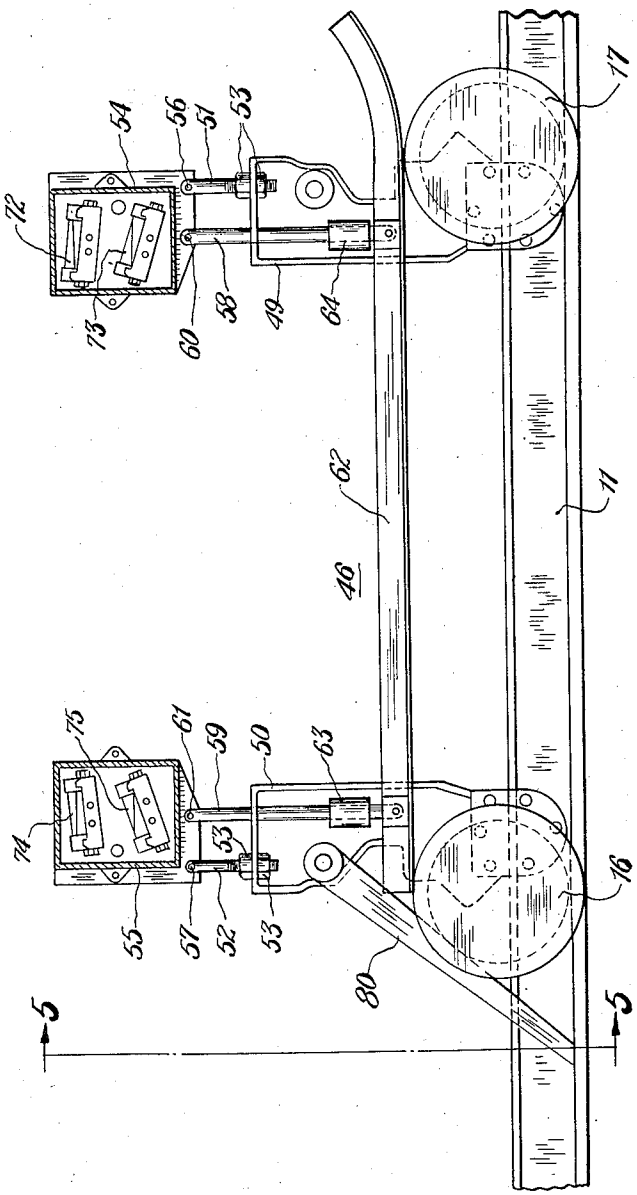

FIG. 4

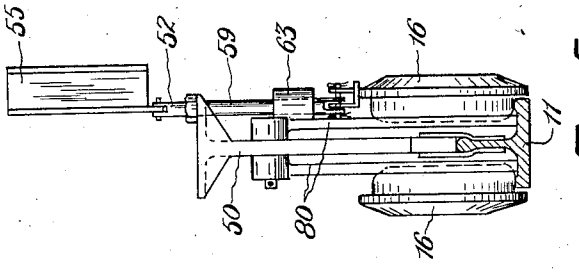

FIG. 5

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March 24, 1936. K. R. WEISE 2,035,355

AUTOMATIC LIFT

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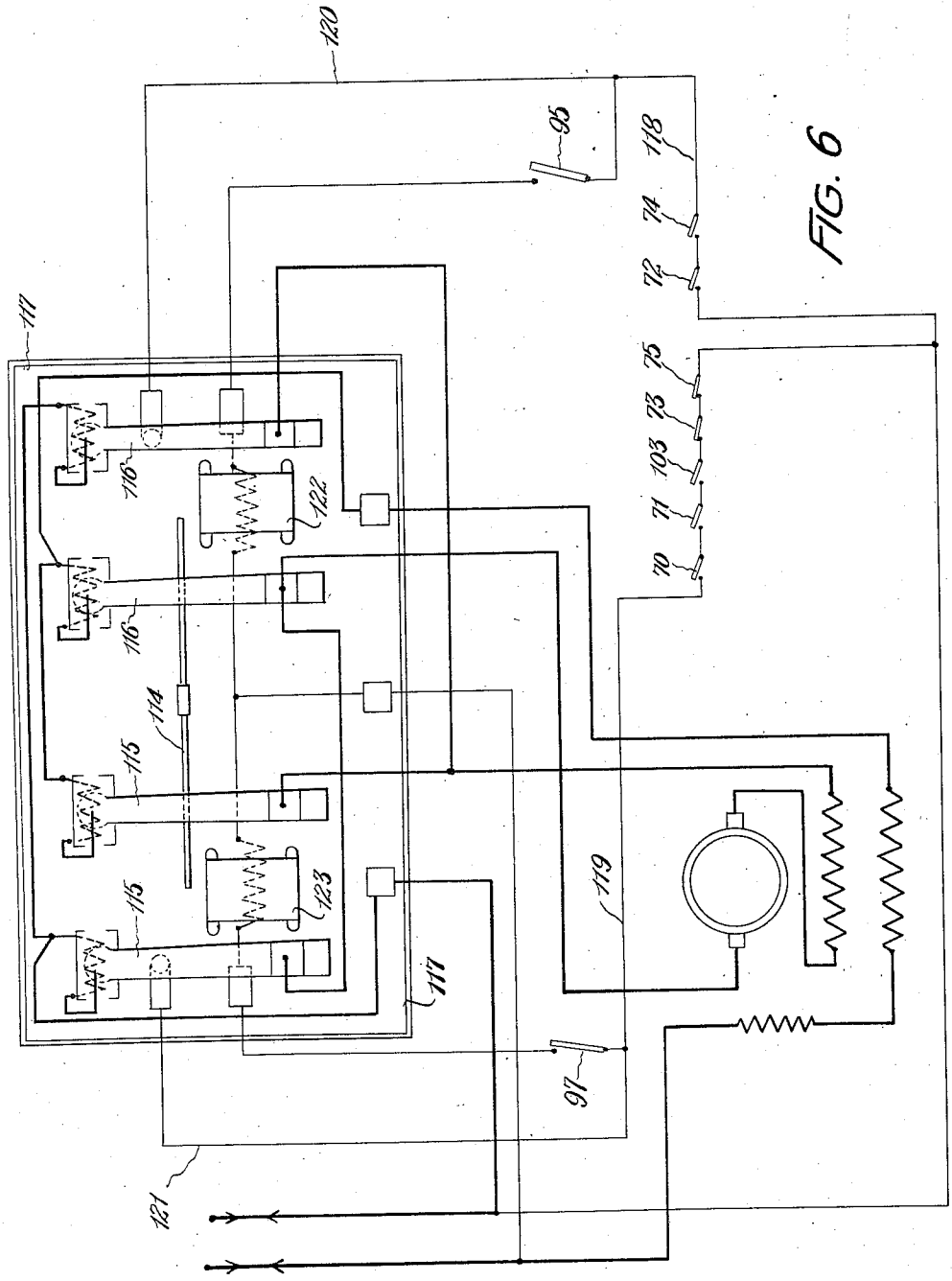

FIG. 6

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Patented Mar. 24, 1936

2,035,355

UNITED STATES PATENT OFFICE

2,035,355

AUTOMATIC LIFT

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Application December 5, 1931, Serial No. 579,255

32 Claims. (Cl. 104—89)

The present invention relates to a transfer system and more particularly to a monorail system in which a carrier is moved from one track to another either on the same or different levels by automatic means. In systems of the type referred to, the carrier is usually run onto a movable section of track which is subsequently aligned with the track to which it is desired to transfer the carrier and the carrier run off. In operation, the movable section of track which is under the control of an operator is often moved while the carrier is only partly positioned thereon, resulting in damage to the equipment and load and in unnecessary delay. The movable section of track may consist of a transfer bridge, drop section, raised section, two elevation transfer sections, tongue or slide switch, or any device used to move a carrier from one position to another.

An object of the invention is the provision of a transfer system in which a carrier is automatically moved from one track to another by means of a transfer section.

Another object of the invention is the provision of a transfer system in which a carrier is automatically moved from one track to another by means of a transfer section, which will be simple and economical in construction and positive and reliable in operation, and which will function without any attention whatsoever.

Another object of the invention is the provision of a control means for a transfer section in which a carrier is automatically moved from one track to another by means of a transfer section which will prevent any operation or movement of the transfer section when a carrier is improperly positioned on the transfer section or adjacent tracks.

Other objects and advantages of the invention will be apparent to those skilled in the art from the following disclosure of the preferred embodiment of the invention described with reference to the accompanying drawings, in which:

Figure 1 is a side elevational view of a section of a transfer system embodying the present invention;

Fig. 2 is an enlarged view of the drop section shown at the right-hand end of Fig. 1;

Fig. 3 is a view taken on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged elevational view of the right-hand control unit mounted on the lower section of track shown in Fig. 1;

Fig. 5 is a view taken on the line 5—5 of Fig. 4; and

Fig. 6 is a wiring diagram of the drop section, hoist motor, and control circuits.

The preferred embodiment of the invention illustrated in the drawings shows a section of a monorail transfer system which includes an upper level track 10, a lower level track 11, and a second upper level track 12, a drop section of track 13 for lowering carriers from track 10 to track 11, and a raised section of track 14 for moving the carriers from track 11 to track 12. A carrier designated in general by the reference character 15 is provided with front wheels 16 and rear wheels 17 and is adapted to travel along the transfer system from right to left, as viewed in Fig. 1 under the action of gravity, all of the tracks sloping slightly toward the left.

The stationary tracks 10, 11 and 12 are supported in any suitable manner, as is well known in the art, such as by hangers, not shown, attached to the ceiling 18. The movable sections of track are supported by hoist cables 22 and raised and lowered by reversible hoist motors 23 provided with an electric brake and connected to drums 24 about which the cables 22 are wound and unwound in a manner well known in the art.

The movable sections of track 13 and 14, as they travel between the upper level tracks 10 and 12 and the lower level track 11, are guided by vertical H-beams 25 and 26 which form part of structures 27 and 28 connecting adjacent ends of the tracks 10 and 11 and tracks 11 and 12 respectively. The H-beams 25 and 26 are engaged by a plurality of rollers 29 and 30 carried by members 31 and 32 pivotally connected as at 33 and 34 to brackets 35 and 36 fixed to the movable sections 13 and 14 respectively. Pins 37 carried by the brackets 35 and 36 are positioned to engage in openings 38 in plates 39 attached to the structure 27 and 28 at the lower ends of the H-beams 25 and 26 and aid in aligning the movable sections of track with the lower level track 11.

A plurality of control units 45, 46, 47 and 48 are positioned on the track, as shown in Fig. 1, and are adapted to be operated by the wheels of the carriers as they move along the transfer system. Each of the control units 45, 46, 47 and 48 consists of two brackets 49 and 50 suitably secured to the top of the rails and spaced from each other approximately the distance between the front and rear wheels of the carrier 15. Short rods 51 and 52 are adjustably secured, as by means of nuts 53, to the brackets 49 and 50 respectively. Switch boxes 54 and 55 are pivotally supported as at 56 and 57 on the rods 51 and 52 respectively and are adapted to be moved about the pivots 56 and 57 by rods 58 and 59 pivotally connected at one end to the boxes 54 and 55, as at

60 and 61, and at the other end pivotally connected to a trip bar 62. The rods 58 and 59 slidably supported in suitable bosses 63 and 64 on the brackets 49 and 50 and support the trip bar 62 in such a position relative to the track that it is engaged and lifted to pivot the switch boxes about the pivots 56 and 57 by the carrier wheels 16 and 17 as the carrier moves underneath along the track. The construction is such that the switch boxes 54 and 55 are not pivoted to close or open the switches therein unless a carrier wheel is underneath the trip bar 62 adjacent the box; that is in order to pivot both boxes 54 and 55 enough to operate all the switches in any one unit, both the front and rear wheels of the carrier must be underneath the trip bar 62.

The switch boxes 54 and 55 of control unit 45 have mounted therein normally closed mercury switches 70 and 71 respectively which are opened as the boxes are pivoted by the wheels of the carrier engaging the trip bar 62. Control units 45 and 47 are identical in construction, each having a single mercury switch mounted in each switch box, and are positioned adjacent the movable sections of track 13 and 14 respectively. Reference characters 70' and 71' designate the corresponding switches in control unit 47. Control units 46 and 48, which are identical in construction, are spaced from the end of the tracks on which they are supported a distance approximately equal to the length of the movable sections and differ from units 45 and 47 in that each switch box carries two mercury switches instead of one. Mercury switch 72 normally open and mercury switch 73 normally closed are mounted in switch box 54, and mercury switch 74 normally open and mercury switch 75 normally closed are mounted in switch box 55 of control unit 46. The corresponding switches in control unit 48 are designated by the reference characters 72', 73', 74' and 75'.

Stops 80 which normally engage the tread of the rail are pivotally carried by brackets 50 of control units 46 and 48 and prevent reverse movement of the carrier once the wheels have passed the stops. Stops 81 are pivotally mounted on the movable sections of track adjacent one end thereof. The stops 81 freely swing in one direction about their pivot, as they are engaged by the wheels of the carrier and permit the wheels to pass thereby, but movement of the stops 81 in the reverse direction is prevented by a projection 82 in the path of said stops. A stop 83 is slidably supported by the structure 27 adjacent the end of track 10 and projects in the path of the carrier wheels when the drop section 13 is not in alignment with track 10. As the drop section of track 13 moves into its up position, an abutment 84 of stop 83 engages the top of the section and raises stop 83 clear of the carrier wheels. A similar stop 85 is provided at the open end of track 12.

A stop 86 similar to stop 83 is slidably mounted in the drop section 13 at the end remote from stop 81 and prevents a carrier positioned on the drop section from running off the lefthand end, as viewed in Figs. 1 and 2. A projection 87 on stop 86 engages the plate 39 as the drop section 13 approaches its lower position and raises the stop clear of the wheels so that a carrier positioned thereon may run off the section onto track 11.

A stop 90, comprising a pair of arms pivoted in the H-beam 25 near the track 11, prevents a carrier from backing off the track 11 when the drop section 13 is not in alignment therewith. The arms which comprise stop 90 are swung about their pivots to clear the wheels of a carrier by the engagement of the lower part of the member 31 with the top part thereof as the drop section 13 moves into its lower position. Similar stops 91 and 92 are positioned at the lefthand end of track 11 and raise section 14, as viewed in Fig. 1.

Normally closed limit switches 95 and 96 are attached to the structure 27 and 26 in such a position that they are engaged and opened by the drop and raised sections 13 and 14 respectively as they reach their up positions. Normally closed limit switches 97 and 98 are adjustably attached to plates 99 and 100 carried by the H-beams 25 and 26 and are engaged and opened by cam members 101 and 102 on the members 31 and 32 respectively as the drop and raised sections 13 and 14 reach their down position. Normally open mercury switches 103 and 104 are mounted in switch boxes 105 and 106 pivotally carried by the drop and raise sections 13 and 14 in the path of the wheels of a carrier. As the wheels of a carrier engage the switch boxes 105 and 106, they are rotated about their pivots and the switches 103 and 104 are closed. Switches 103 and 104 are connected to the control circuit by cables 107 and 108 respectively. Take-up reels 109 and 110 supported on the ceiling are used to keep the cables taut at all times so that they will not obstruct the passage of the carriers along the transfer system.

Fig. 6 shows a schematic wiring diagram of the hoist motor and control circuit for the drop section 13. The motor is a conventional reversible type direct current motor, the supply of current to which is controlled by solenoid operated contactors 115 and 116. When the contactors 115 are closed, the motor is rotated to lower the drop section 13, and when the contactors 116 are closed, the motor is rotated to return the drop section to its up position. The contactors are mounted on a control panel 117 and have an interlock 114 to prevent both circuits being closed at the same time. The location of the various limit switches and mercury switches previously referred to in the up and down control circuits 118 and 119 respectively is shown in Fig. 6. Circuits 120 and 121 connected to auxiliary contacts on the contactors 115 and 116 are holding in circuits for the up and down solenoids 122 and 123 respectively. The holding in circuits 120 and 121 are employed to continue the movement of the drop section in either direction once it has started until stopped by the limit switches 95 or 97, independent of the other switches.

The operating circuits of both hoist motors are identical with the exception that the raise circuit of one will be the lower circuit of the other, and vice versa.

The operation of the system is as follows: Assuming that the parts are in the relative positions shown in Fig. 1, with the carrier 15 moving from right to left, the hoist motor 23 is inoperative and the brake is applied to hold the drop section 13 in its up position. Mercury switches 70 and 71 are open due to the engagement of the trip bar 62 of the control unit 45 with the wheels of the carrier 15. The movement of the carrier continues until the front wheels 16 strike the stop 86. Before the front wheels 16 reach stop 86 the rear wheels 17 clear the trip bar 62 on control unit 45 allowing it to drop and close mercury switches 70 and 71 which are in series with

mercury switch **103**. As the rear wheels **17** pass the stop **81**, it drops behind them and the carrier is securely locked on the drop section. As the front wheels **16** engage the stop **86**, the switch box **105** is pivoted by the front wheels **16** and the mercury switch **103** closes, energizing the motor **23** to lower the drop section. As the drop section **13** approaches its down position, cam **101** opens the limit switch **97** to stop the motor and apply the brake.

The stops **86** and **90** are now clear of the carriage wheels and the carriage runs off the drop section onto the track **11**. As the carriage passes under the control unit **46**, and while both the front and rear wheels are underneath the trip bar **62**, mercury switches **72** and **74** are closed by the engagement of the front and rear wheels with the trip rod **62**. Switches **72** and **74** which are in series in the raise circuit to the motor close the same and the drop section returns to its up position where it is stopped by the limit switch **95** which is opened by the engagement of the drop section **13** therewith. As the drop section moves away from the down position the stop **90** again projects in the path of the carrier wheels and prevents the carrier from backing off the rail.

Mercury switches **73** and **75** are in series, and if either of these switches is open due to engagement of the trip bar **62** of the control unit **46** with either a front or rear carrier wheel the drop section is prevented from lowering even though the mercury switch **103** is closed by a carrier positioned on the drop section **13** until the carrier on the lower level has passed completely underneath the control unit **46**. Once the carrier passes the control unit **46**, it is prevented from backing up under the trip bar by the stop **80**.

The operation of the raise section **14** is substantially the same as that of the drop section **13**, and it is considered unnecessary to describe it in detail.

The embodiment of the invention illustrated and described is merely the preferred form, and I do not wish to be limited to the particular construction shown. The word reciprocable or its derivatives, as used throughout the claims, is intended to cover an oscillatory as well as a lineal movement, and I particularly point out and claim as my invention:

1. In a transfer system, the combination of a track, a second track, a reciprocable section of track adapted to be aligned with either of said tracks, means adapted to move said section from alignment with one track into alignment with the other to transfer a carrier from one track to the other, and means adapted to prevent movement of said section when a carrier is positioned on either of said tracks adjacent said movable section.

2. In a transfer system, the combination of a track, a second track, a reciprocable section of track adapted to be aligned with either of said tracks, means for moving said section from alignment with one track into alignment with the other to transfer a carrier from one track to the other, and control means on one of said tracks for the first mentioned means to prevent operation of said section when a carrier is positioned on one of said tracks adjacent the movable section.

3. In a transfer system, the combination of a track, a second track, a movable section of track adapted to be aligned with either of said tracks, means adapted to move said section from alignment with one track into alignment with the other to transfer a carrier from one track to the other, control means on said section for said first mentioned means, said control means being adapted to be operated by a carrier positioned on said section for moving said section, means supported by said tracks adapted to prevent a carrier from backing up on said system, and means supported by said tracks adapted to prevent operation of said section when a carrier is positioned on one of said tracks adjacent said movable section.

4. In a transfer system, the combination of a track, a second track, a reciprocable section of track, means for moving said section from alignment with one of said tracks into alignment with the other, and means on said second track to prevent movement of said section when a carrier is positioned on the second track adjacent the movable section.

5. In a transfer system, the combination of a track, a second track, a movable section of track, means adapted to move said section from alignment with one of said tracks into alignment with the other, automatic means positioned on said section adapted to automatically operate said first mentioned means when a carrier has been positioned on said section, and means supported by said tracks adapted to be controlled by a carrier and adapted to prevent operation of said movable section when a carrier is positioned on one of said tracks adjacent said movable section.

6. In a transfer system, the combination of a track, a second track, a reciprocable section of track adapted to be aligned with either of said tracks, a motor adapted to move said section from alignment with one track into alignment with the other, a control circuit for said motor, and switches in said control circuit actuated by a carrier on said system adapted to automatically operate said motor to move said section from one track to the other whereby a carrier is moved from one track to another as it travels along the transfer system and to prevent movement of said movable section when a carrier is positioned on one of said tracks adjacent said movable section.

7. In a transfer system, the combination of a track, a second track, a reciprocable section of track, means adapted to move said section from alignment with one of said tracks into alignment with the other, and means on one of said tracks adapted to prevent operation of said first mentioned means while a carrier is positioned on one of said tracks adjacent said movable section.

8. In a transfer system, the combination of a track, a second track, a movable section of track, means for moving said section from alignment with one of said tracks into alignment with the other, means on said section for operating said first mentioned means, and means on said tracks for preventing operation of said means when a carrier is positioned on one of said tracks adjacent said section.

9. In a transfer system, a track, a second track spaced laterally from said first mentioned track, a movable section of track, means including a motor for moving said section into alignment with either of said tracks, a control circuit for said motor, means on said section for closing said circuit adapted to be operated by a carrier on said section, and automatic means on said tracks adapted to open said circuit when a carrier engages the first mentioned track adjacent said movable section.

10. In a transfer system, a track, a second

track spaced laterally from said first mentioned track, a movable section of track, means including a motor for moving said section into alignment with either of said tracks, a control circuit for said motor, means on said section for closing said circuit adapted to be operated by a carrier on said section, and means on one of said tracks adapted to open said circuit when a carrier is positioned on said track adjacent said section.

11. In a transfer system, a track, a second track vertically positioned with reference to said first mentioned track, a movable section of track adapted to be aligned with either of said tracks, a motor for moving said section, a control circuit for operating said motor, means on said section for closing said circuit adapted to be operated by a carrier, and means for opening said circuit when a carrier is positioned on said tracks adjacent said section.

12. In a transfer system, a track, a second track vertically positioned with reference to said first mentioned track, a movable section of track adapted to be aligned with either of said tracks, a reversible motor for moving said section, a control circuit for operating said motor in one direction, a second control circuit for operating said motor in the other direction, means on said section adapted to be operated by a carrier for closing said first mentioned circuit, means for opening said circuit when a carrier is positioned on said tracks adjacent said section, and means on said second track adapted to be operated by a carrier for closing said second circuit.

13. In a transfer system, a track, a second track laterally spaced from said track, a movable section of track adapted to be aligned with either of said tracks, a carrier adapted to be moved along said tracks and section, a motor for moving said section, a control circuit for operating said motor, means for opening said circuit as said carrier is moved onto said section, and means on said section for closing said circuit when said carrier is positioned on said section.

14. In a transfer system, a track, a second track laterally spaced from said track, a movable section of track adapted to be aligned with either of said tracks, a carrier adapted to be moved along said tracks and section, a reversible motor for moving said section, a control circuit for operating said motor in one direction, a second control circuit for operating said motor in the other direction, means for opening said first mentioned circuit as said carrier is moved onto said section, means on said section for closing said first mentioned circuit when said carrier is positioned on said section, and means on said second track for closing said second circuit after the carrier has moved off of said section onto said second track.

15. An overhead transfer system comprising an overhead track, a second overhead track, a movable section of overhead track adapted to be aligned with either of said overhead tracks, means for moving said section from alignment with one of said overhead tracks into alignment with the other thereof, whereby a carrier is transferred from one of said overhead tracks to the other, and means adapted to prevent movement of said section when a carrier is positioned on either of said tracks adjacent said movable section.

16. An overhead transfer system comprising an overhead track, a second overhead track, a movable section of overhead track adapted to be aligned with either of said overhead tracks, means for moving said section from alignment with one of said overhead tracks into alignment with the other thereof, whereby a carrier is transferred from one of said overhead tracks to the other, and control means on one of said overhead tracks for the first mentioned means to prevent operation of said means when a carrier is positioned on one of said overhead tracks adjacent said movable section.

17. An overhead transfer system comprising an overhead track, a second overhead track, a movable section of overhead track adapted to be aligned with either of said overhead tracks, means for moving said section from alignment with one of said overhead tracks into alignment with the other including a motor, a control circuit for said motor, and switches in said control circuit adapted to be actuated by the movement of a carrier along said overhead tracks adapted to control the operation of said motor and to prevent operation of said motor when a carrier engages one of said tracks adjacent said movable section.

18. An overhead transfer system comprising an overhead track, a second overhead track, a movable section of overhead track, means for moving said section from alignment with one of said overhead tracks into alignment with the other, means on said section for operating said first mentioned means, and means on said overhead tracks for preventing operation of said means when a carrier is positioned on one of said overhead tracks adjacent said section.

19. An overhead transfer system comprising an overhead track, a second overhead track vertically positioned with reference to said first mentioned overhead track, a movable section of overhead track adapted to be aligned with either of said overhead tracks, a reversible motor for moving said section, a control circuit for operating said motor in one direction, a second control circuit for operating said motor in the opposite direction, means on said section adapted to be operated by a carrier positioned thereon for closing said first mentioned circuit, means for opening said first mentioned circuit when a carrier is positioned on said overhead tracks adjacent said section, and means on said second overhead track adapted to be operated by a carrier positioned thereon for closing said second circuit.

20. An overhead transfer system comprising an overhead track, a second overhead track vertically positioned with reference to said first mentioned overhead track, a movable section of overhead track adapted to be aligned with either of said overhead tracks, a carrier adapted to be moved along said overhead tracks and section, means including a motor for moving said section, a control circuit for said motor, means for opening said circuit as said carrier is moved onto said section, and means on said section for closing said circuit when said carrier is positioned on said section.

21. An overhead transfer system comprising an overhead track, a second overhead track vertically spaced from said first overhead track, a movable section of overhead track adapted to be aligned with either of said overhead tracks, a carrier adapted to be moved along said overhead tracks and section, means for moving said section including a reversible motor, a control circuit for operating said motor in one direction, a second control circuit for operating said motor

in the reverse direction, means for opening said first mentioned circuit as said carrier is moved onto said section, means on said section for closing said first mentioned circuit when said carrier is positioned on said section, and means on said second overhead track for closing said second circuit after the carrier has moved off of said section onto said section track.

22. In a transfer system, the combination of a track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a carrier adapted to travel along said track, a member pivotally supported adjacent one of said tracks adapted to simultaneously engage spaced points on said carrier, and means adapted to energize said motor actuated by the engagement of said member by a plurality of points on said carrier.

23. In a transfer system, the combination of a track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a carrier adapted to travel along said track, a member pivotally supported adjacent one of said tracks adapted to simultaneously engage spaced points on said carrier, a carrier provided with front and rear wheels adapted to travel along said tracks, a member pivotally supported adjacent one of said tracks adapted to simultaneously engage the front and rear wheels of said carrier, and means adapted to energize said motor when said member is simultaneously engaged by both front and rear wheels of said carrier.

24. In a transfer system, the combination of a track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a carrier adapted to travel along said track, a member pivotally supported adjacent one of said tracks adapted to simultaneously engage spaced points on said carrier, and means adapted to open the circuit to said motor actuated by the engagement of said member by any part of said carrier.

25. In a transfer system, the combination of a track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a carrier adapted to travel along said track, a member pivotally supported adjacent one of said tracks adapted to simultaneously engage spaced points on said carrier, a carrier provided with front and rear wheels adapted to travel along said tracks, a member pivotally supported adjacent one of said tracks adapted to simultaneously engage the front and rear wheels of said carrier, and means adapted to open the circuit to said motor when said member is engaged by either a front or rear wheel of said carrier.

26. A transfer system comprising, a first track, a second track, a movable section of track adapted to be aligned with either of said tracks, a reversible electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a first control circuit for said motor adapted to actuate said motor to move said movable section of track from alignment with said first track into alignment with said second track, a second control circuit for said motor adapted to actuate said motor in the reverse direction to return said movable section of track into alignment with said first track, a normally closed switch in said first control circuit, means adapted to open said normally closed switch adapted to be actuated by a carrier positioned on said first track, a normally open switch in said second control circuit supported by said second track, and means adapted to close said normally open switch adapted to be actuated by a carrier positioned on said second track.

27. A transfer system comprising a first track, a second track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a first control circuit for said motor adapted to actuate said motor to move said movable section of track from alignment with said first track into alignment with said second track, a second control circuit for said motor adapted to actuate said motor in a reverse direction to return said movable section of track into alignment with said first track, a normally closed switch in said first control circuit, means adapted to open said normally closed switch adapted to be actuated by a carrier positioned on said first track adjacent said movable section of track, a normally open switch in said second control circuit, means adapted to close said normally open switch adapted to be actuated by a carrier positioned on said second track adjacent said movable section of track, and means adapted to prevent a carrier from backing up and actuating said last mentioned means once it has passed thereby.

28. A transfer system comprising a first track, a second track, a movable section of track adapted to be aligned with either of said tracks, means adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, said means including a reversible electric motor, a first control circuit for said motor adapted to actuate said motor to move said movable section of track from alignment with said first track into alignment with said second track, a second control circuit for said motor adapted to actuate said motor in a reverse direction to return said movable section of track into alignment with said first track, a normally closed switch in said first control circuit, means adapted to open said normally closed switch adapted to be actuated by a carrier positioned on said first track adjacent said movable section of track, a normally open switch in said second control circuit, means adapted to close said normally open switch adapted to be actuated by a carrier positioned on said second track adjacent said movable section of track, and a stop adapted to prevent a carrier from backing up and actuating said last mentioned means once it has passed thereby.

29. A transfer system comprising, a first track, a second track, a movable section of track adapted to be aligned with either of said tracks, means adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, said means including a reversible electric motor, a first control circuit for said motor adapted to actuate said motor to move said movable section

of track from alignment with said first track into alignment with said second track, a second control circuit for said motor adapted to actuate said motor in the reverse direction to return said movable section of track into alignment with said first track, a normally closed switch in said first control circuit, means adapted to open said normally closed switch adapted to be actuated by a carrier positioned on said first track adjacent said movable section, a second normally closed switch in said first control circuit, means adapted to open said second normally closed switch adapted to be actuated by a carrier positioned on said second track, a normally open switch in said second control circuit, and means adapted to close said normally open switch adapted to be actuated by a carrier positioned on said second track.

30. A transfer system comprising, a first track, a second track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a first control circuit for said motor adapted to actuate said motor to move said movable section of track from alignment with said first track into alignment with said second track, a second control circuit for said motor adapted to actuate said motor in the reverse direction to return said movable section of track into alignment with said first track, a normally closed switch in said first control circuit, means adapted to open said normally closed switch adapted to be actuated by a carrier positioned on said first track, a second normally closed switch in said first control circuit, means adapted to open said second normally closed switch adapted to be actuated by a carrier positioned on said second track, a normally open switch in said second control circuit, means adapted to close said normally open switch adapted to be actuated by a carrier positioned on said second track, and means adapted to prevent a carrier from backing up and actuating said last mentioned means after it has passed thereby.

31. A transfer system comprising a first track, a second track, a movable section of track adapted to be aligned with either of said tracks, an electric motor adapted to move said movable section of track from alignment with either of said tracks into alignment with the other of said tracks, a first control circuit for said motor adapted to actuate said motor to move said movable section of track from alignment with said first track into alignment with said second track, a second control circuit for said motor adapted to actuate said motor in a reverse direction to return said movable section of track into alignment with said first track, a normally closed switch in said first control circuit supported by said first track adjacent said movable section of track, means adapted to open said normally closed switch when a carrier is positioned on said first track adjacent said movable section of track, a second normally closed switch in said first circuit supported by said second track, means adapted to open said second normally closed switch when a carrier is positioned on said second track adjacent said movable section of track, a normally open switch in said second control circuit supported by said second track, means actuated by a carrier adapted to close said normally open switch when a carrier is positioned on said second track, and a movable member supported by said second track adapted to prevent a carrier from backing up and actuating said last two mentioned means once it has passed thereby.

32. An overhead transfer system comprising an overhead track, a second overhead track spaced laterally from said first mentioned overhead track, a movable section of overhead track, means including an electric motor for moving said section into alignment with either of said overhead tracks, a control circuit for said motor, means for closing said circuit, and means on one of said overhead tracks operated by a carrier positioned thereon for opening said circuit while the carrier is moving onto said section.

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