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SYSTEM FOR TRANSFERRING FREIGHT AND BAGGAGE.

APPLICATION FILED JUNE 4, 1914.

1,124,269.

Patented Jan. 12, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

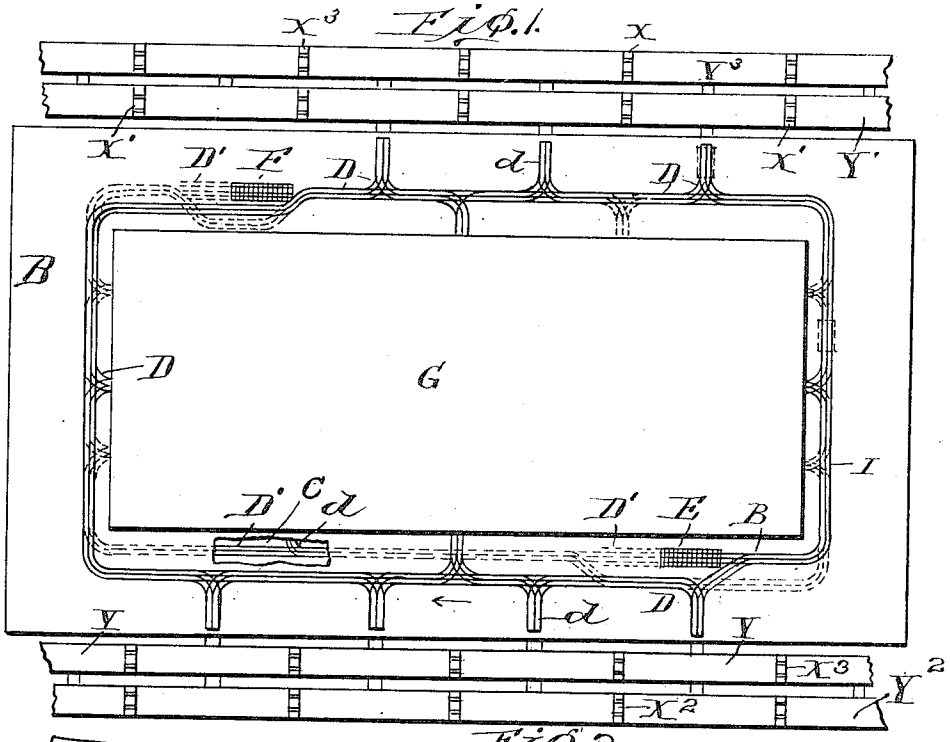
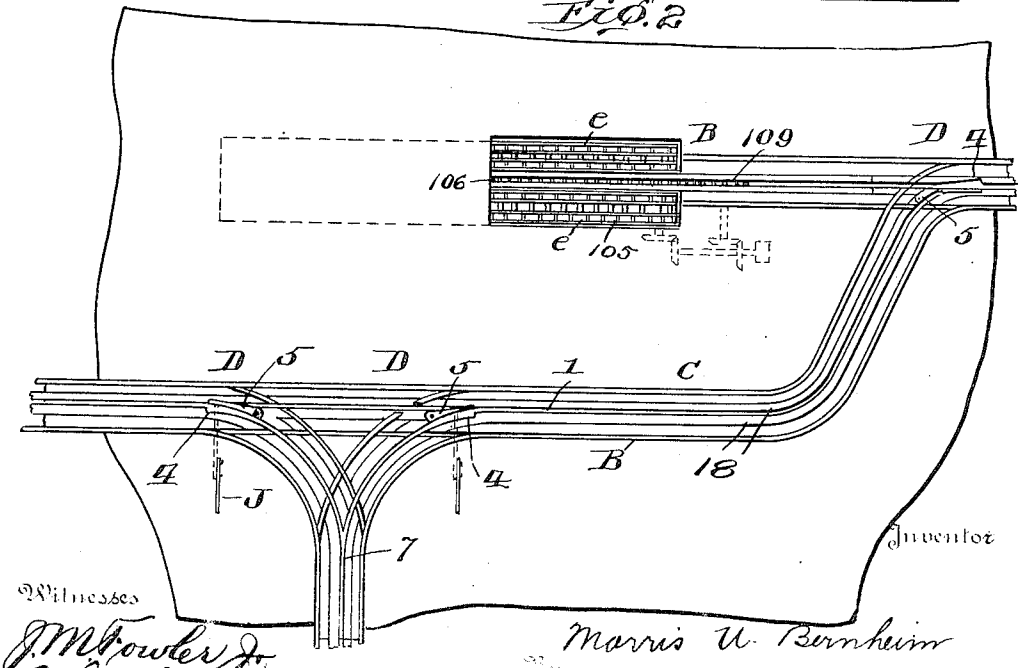


Fig. 2.



Witnesses

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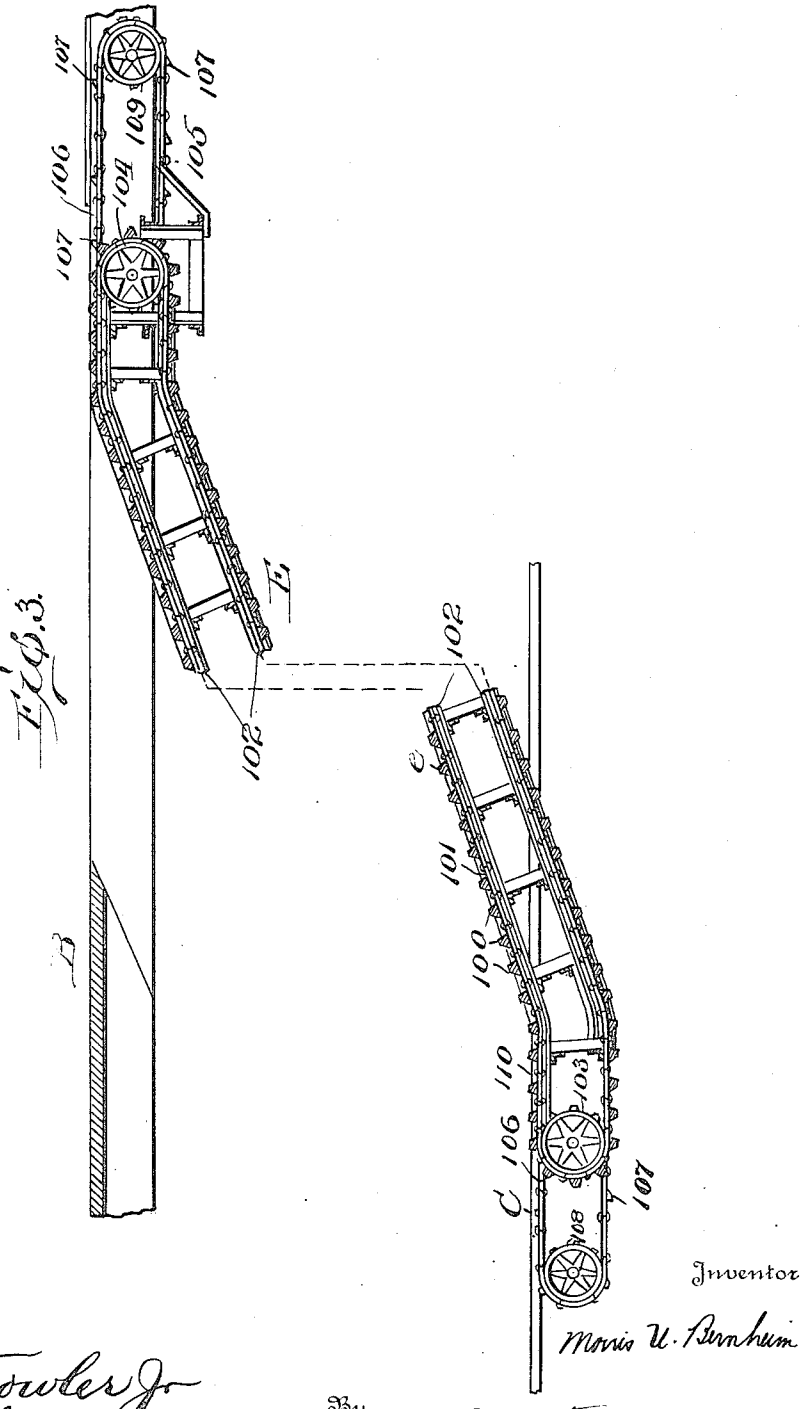

Fig. 3.

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3 SHEETS—SHEET 3.

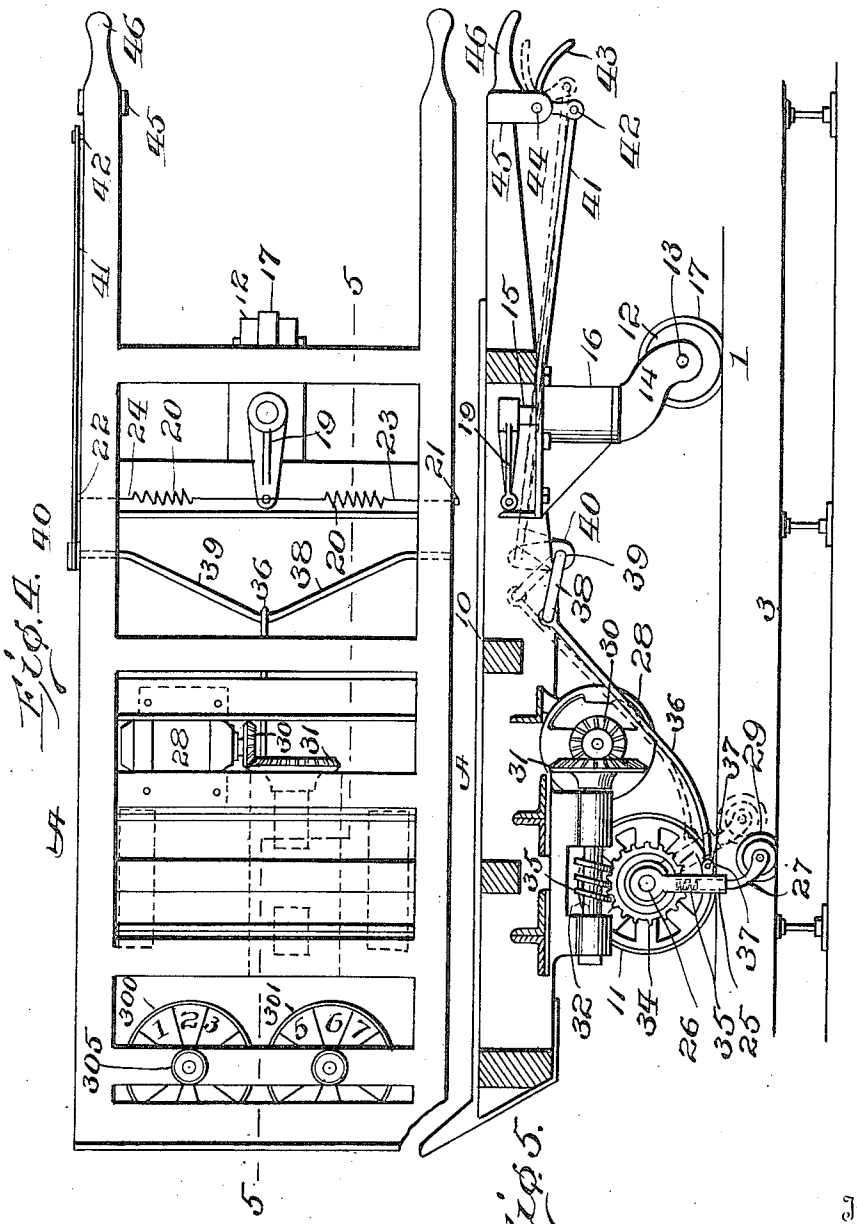

Fig. 4.

Fig. 5.

Witnesses

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SYSTEM FOR TRANSFERRING FREIGHT AND BAGGAGE.

1,124,269. Specification of Letters Patent. Patented Jan. 12, 1915.

Original application filed August 4, 1910, Serial No. 575,511. Renewed June 4, 1914, Serial No. 843,092. Divided and this application filed June 4, 1914. Serial No. 842,951.

To all whom it may concern:

Be it known that I, MORRIS U. BERNHEIM, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Systems for Transferring Freight and Baggage, of which the following is a specification.

The present invention relates to a system of handling freight or baggage at railway stations or other places of the kind shown for example in my application for Letters Patent of the United States filed Aug. 4, 1910, Serial No. 575,511, (renewed June 4, 1914, as Serial Number 843,092) of which the present case is a division: the present invention mainly relating to a system of the kind set forth wherein the carriers are electrically propelled over the different levels and, as in the parent case, mechanically transferred by one or more inclined endless traveling platforms from one level to the other.

In the accompanying drawings, illustrating the invention and wherein like characters of reference denote like parts in the several views: Figure 1 is a plan view diagrammatically illustrating a railway station provided with one form of the present system: a part of the upper floor being broken away to disclose the portion of the system on the lower floor or level, the latter part of the system being shown in dotted outline. Fig. 2 is a detail view on a larger scale than Fig. 1, illustrating the parts at a place where the trucks are transferred from one level to another. Fig. 3 is a vertical section, representing two floors of a railway transfer or freight house, and showing the means employed for transferring the trucks from one of these floors to the other. Fig. 4 is a plan view of one form of truck which may be employed in the system. Fig. 5 is a longitudinal vertical section on the line 5—5 of Fig. 4.

A designates a carrier forming one element of the present system. A series of carriers are employed in practice. The carrier herein selected to exemplify this element of the system is a type of baggage truck which, except as to the features hereinafter referred to, necessary to adapt it for use as a part of a system of the kind to which the present invention relates, may be of the usual construction of freight or baggage trucks intended to be manually propelled. I would have it understood that while I have shown and will hereinafter describe in detail a particular construction of carrier, yet this is for exemplary purposes only and various different constructions and kinds of carriers may be employed without departing from the spirit of the invention as defined by the subjoined claims.

The system in its preferred form includes an upper floor or way B and a lower floor or way C, connected with each other by inclined endless traveling platforms E and F, one of which platforms, as E, is intended to lower the carriers from the upper floor or way to the lower floor or way while the other platform, F, is intended to raise the carrier from the lower floor or way to the upper floor or way. These platforms are preferably of the construction and arrangement with respect to the levels of the floors or ways as those shown and described in my parent application, Serial Number 575,511, (renewed Serial Number 842,092) hereinbefore referred to.

In the system herein exemplified, a freight or baggage house G is encircled by a platform which forms the upper floor or way B, the said house G being disposed between railway tracks, as X, X′, X^2 and X^3, any number of which are arranged on opposite sides thereof. The platform is preferably arranged on a level with the floors of cars forming trains Y, Y′, Y^2 and Y^3 on said tracks, respectively. The lower floor or platform C is preferably employed for the storage of the freight or baggage, and its delivery to or receipt from wagons. It will be understood that this arrangement and use of the two floors B and C is merely exemplary, and that it is fully within the spirit of the invention to arrange them differently with respect to the train level and to use them for different purposes. For example, the parts may be so correlated that

the freight may be received from or delivered to wagons at the floor B, and for a further example, the floor C may be above instead of below the floor B. These and other various arrangements and uses of the floors B and C, not necessary herein particularly to set forth are contemplated to be within the spirit of the present invention. Each floor or platform provides a way for the carrier A and is provided with means for propelling the latter thereover, the said means comprising a main line or lines in each way, having switches or branch lines leading therefrom to predetermined places. These lines define the movements of the carriers.

As will be seen upon reference to Fig. 1, the main line D on the upper floor extends continuously around the house G, and is tapped at intervals by switches or branch lines, marked *d*, some of which extend toward the tracks and are at distances apart approximately the same as that between the doorways of cars, others of which extend toward the building and still others of which connect the main line D with the lowerer E and elevator F respectively. The main line D′ on the lower floor, in the arrangement herein exemplified, similarly extends continuously around the floor and has branch lines or switches *d′* leading therefrom in any required direction, including some which connect the main line with the lower ends of the elevator and lowerer, respectively. Each main line preferably comprises a groove 1 formed in its way and an electrical conductor 3 for delivering power to propel the trucks upon said way, the said conductor being arranged in such relation to the groove that a suitable conducting element carried by each truck may project through the groove into electrical contact with the conductor 3. It is apparent however that features of the invention lend themselves to the utilization of overhead trolleys, without departing from the spirit of the invention or the scope of subjoined claims. It is preferred, however, that the conductor be arranged below the plane of the way and be associated with a groove which will exercise a guiding function upon the trucks as well as afford a convenient means for access to the power transmitting element referred to. The groove of each main line is provided at intervals with lateral openings 4 at which the trucks are diverted therefrom, suitable means, as switch points 5, being employed adjacent to said openings to guide the trucks from the main line onto the branch lines. As already stated, these branch lines lead to predetermined places, as, for example, to places contiguous to cars which are to be loaded or unloaded, to storage places, to places convenient to wagons, and to elevators or lowerers, according to the particular requirements of the installation. Each branch line preferably includes a groove in the way and an electrical conductor in operative relation to the same for delivering power to the trucks. Preferably, however, the diverting means adjacent to the receiving ends of the lowerers and elevators are not provided with conductors, in order that full control of the trucks by attendants will not in anywise be interfered with. This, however, is not essential, nor is it essential that any of the branch lines include conductors: though it is highly desirable in any case to provide grooves in all the branch lines. The several switch points 5 are provided with suitable means, indicated generally at J in Fig. 2, for throwing them so as either to break the continuity of the main line and establish communication therewith of one or more of the switches or branch lines, or to close communication of the main line with the switches or branch lines. These points, of course, will be severally controlled, either from a common station or from separate stations, as desired. As a particular means for throwing the points is not essential to the invention and different means adapted to serve the purpose will suggest themselves to those skilled in such matters, it is considered to be unnecessary to describe any special one herein. Different forms of trucks are suitable for use in the present system.

Referring to the forms herein exemplified in Figs. 4 and 5, the platform 10 of the truck A is mounted upon two wheels 11 at the front and upon a wheel 12 at the rear. This rear wheel is mounted upon a horizontal axis 13 which is borne by a yoke 14 provided with a vertical spindle 15, extending through a sleeve 16, which sleeve forms a bearing for the spindle and projects from the platform 10. The wheel 12 is thus free to swing upon a vertical axis as well as to rotate upon its horizontal axis. Its tread is provided with a flange 17 to travel in the grooves of the ways, and the remaining portion of the tread is arranged to run upon the way, the latter being preferably provided with wear plates 18 which are flush with the surface of the way and are arranged at opposite sides of the groove, to form tracks for said wheel. From the upper end of the spindle an arm 19 extends into engagement with cross-springs 20, which preferably have means for adjusting their tension. The tension-adjusting means here shown comprises nuts 21 and 22 which are threaded on the ends of rods 23 and 24, which project from the springs 20 and are suitably supported by the frame of the truck. A depending guiding means 25 is arranged at the front of the truck and is adapted to travel in the grooves in the ways.

In the exemplified form of the invention, this guiding means is a sleeve which is preferably suitably connected to the axle 26 upon which the wheels 11 are mounted, and into it extends an arm 27 the upper end of which is properly electrically connected with an electric motor 28, while the lower end carries the contact element 29 which engages the conductor 3. This contact element is preferably a rotative one, as shown, and the conductor may be either a wire or a rail as desired. The sleeve 25 obviously should be insulated from the arm 27 and it is apparent that any suitable electrical motor may be employed and that suitable electrical connections, whereby the current from the conductor 3 may be availed of to drive the motor, will readily suggest themselves to those persons familiar with such matters. For this reason I do not consider it necessary particularly to illustrate the construction of the electric motor or the circuit-forming means herein. Power derived from this motor is transmitted to the driving wheels of the truck in the exemplified form of the invention, through the intermeshing gears 30 and 31, shaft 32, worm 33, gear 34 and axle 26. The contact element 29 is yieldably held to the conductor 3 by a spring 35 which presses thereagainst and is mounted in the sleeve 25 as shown in dotted lines in Fig. 8. For reasons which will hereinafter fully appear it is desirable at times to disconnect the truck from the main and branch lines and to adapt it to be manually propelled to and from said lines. The guide sleeve 25 is, therefore, pivotally mounted so that it, and the arm 27 and contact element 29, may be turned into or above the plane of the upper surface of the way. A very desirable means for accomplishing this adjustment, consists of a link or lever 36 which is pivoted at 37 to the sleeve 25 below the fulcrum of the latter and extends thence rearward to the cranked portion 38 of a shaft 39 which extends transversely of the truck. This transverse shaft is journaled in the side members of the truck frame, and its ends are provided with short arms or cranks 40 to which the forward ends of the links 41 are pivoted. The rear ends of these links 41 are pivoted at 42 to bent handles or grip pieces 43 which in turn are pivoted, between their ends, at 44, to brackets 45 which extend from the side members of the truck frame adjacent to the handles or grip portions 46 of the latter. The actuating elements 43 of the adjusting means are thus located in the most convenient position, as the attendant when grasping the truck handles 46 to move the truck may at the same time grasp the grip levers 43 and by moving the same toward said handles raise the sleeve 25 and contact element 29 out of the groove in the way, into the position shown in dotted outline in Fig. 8. If desired suitable means for holding the parts in adjusted position may be employed.

The preferred construction of the elevators and the lowerers is shown best in Fig. 3. Each comprises as a principal part thereof, a pair of endless moving sections *e* (Fig. 2) arranged at opposite sides of its longitudinal center and each having its surface interrupted to form pockets for the wheels of the trucks. As here shown, each section is composed of a series of spaced slats 100, each end of which is connected to a link 101 of an endless chain 102 of suitable construction. These chains pass over sprockets 103 and 104 mounted at the base and top of the elevator or lowerer. At the longitudinal center, there is a channel 105 in which travels an endless chain 106 having upwardly projecting lugs 107 at proper intervals. This chain engages sprockets 108 and 109, the former of which is located at the base of the traveling platform in advance of the sprocket 103, while the sprocket 109 is arranged at the top thereof, rearward of the sprocket 104. The sprockets 103 and 108 are arranged in approximately the same horizontal plane and the sprockets 104 and 109 similarly are horizontally alined, in order that the receiving and delivering portions of the elevator or lowerer will be approximately horizontal, the inclination commencing at a point near the base thereof rearward of the sprocket 103 and terminating at a place near the top of the same in advance of the sprocket 104. These horizontal portions also are level with the floor or ways whereby the trucks may be run onto and off of the traveling platforms with ease and without shock. It will be observed that the slats 100 are shown as sufficiently spaced apart and as having their confronting faces so beveled as to provide between them seats designated 110 conforming in a measure to the curvature of the wheels of the truck and serving to restrain movement of the truck upon the platform. The engagement of the lugs 107 with the sleeve 25 also helps to restrain movement of the truck upon the platform while it is passing from one level to the other, the truck being so arranged that the sleeve will be in front of the lug with which it is in contact while being elevated and will be back of said lug while being lowered.

The elevator and lowerer hereinbefore described are identical in construction with the conductor shown in my application (No. 1) executed of even date herewith, to which reference may be had for a better understanding thereof, if necessary.

As already stated, switches or branch lines are interposed between the main line or lines and the traveling platforms and it is apparent that a truck intended to be con-

veyed from one level to the other will thereby be diverted from the main line at a place adjacent to the elevator or lowerer and can readily be engaged with the latter, preferably by an attendant stationed at this point.

It is preferred to form the longitudinal members of the elevator or lowerer of suitably disposed angle irons or channel irons adapted to provide channels or rails for supporting and guiding of the chains. The elevator and lowerer are driven by a motor of any suitable description suitably connected therewith.

It is preferred in practice to bevel the end wall of the groove of each branch line in order that it may act automatically to raise the contact element out of the groove at the discharging end of said branch line, and to so arrange this groove in the platform that the truck may lose its impetus after it has left the branch and before it reaches its destination. This will prevent accident in the event that an attendant is not ready to handle a truck at the moment it is delivered. If desired, however, the groove may be prolonged beyond the conductor sufficiently to enable the truck to lose its impetus before it reaches the end of the groove. It is also desirable to provide each truck with means for indicating its destination. This part of the invention is not herein claimed but for the sake of completeness of disclosure, I have considered it to be expedient to show one suitable form of indicating means in Fig. 4. This comprises a plurality of drums 300 and 301 having suitable indicating characters thereon, such as numerals for example; one drum relating to the tracks or floors, while the other relates to the switches.

It is believed that the construction, operation and advantages of my present invention will be clearly understood from the foregoing description and it will be noted that I have provided one which reduces the employment of manual attendance to a minimum, will save time in the transfer of freight or baggage to and from railway cars and other places, reduces to a minimum any interference with floor space and embodies trucks which can be operated manually as well as electrically and also enables the handling of freight and baggage on a plurality of floors all in a most economical and expeditious manner.

While I have shown two floors provided with the present system it will be understood that more than two floors may be so provided, if desired and that whether it have two or more floors, one such floor may, if desired, have the series of ways particularly set forth in my application Serial Number 575,511, renewed Serial Number 843,092—hereinbefore referred to.

Having now described the invention what I believe to be new and desire to secure by Letters Patent, is:—

1. In a system of the kind described, a way having a groove with a lateral opening therefrom, an element arranged at the junction of the groove and opening and adjustable to interrupt the continuity of the latter, a truck having an electric motor, a conductor and means whereby the motor receives current from the conductor, said truck also having supporting wheels and a guiding wheel, the latter wheel engaging the groove in the way.

2. In a system of the kind described, a way having a groove with a lateral opening therefrom, an element arranged at the junction of the groove and opening and adjustable to interrupt the continuity of the latter, a truck having an electric motor, a conductor and means whereby the motor receives current from the conductor, said truck also having supporting wheels, and guiding means at opposite ends of the truck to engage the groove in the way.

3. In a system of the kind described, a way having a groove, a conductor below said way and in operative relation with the groove, a truck having supporting wheels, and provided at one end with a means which extends into the groove and has a conducting element for contacting the conductor, a motor on the truck, electrically connected with said element, and a guiding means projecting from the other end of the truck.

4. In a system of the kind described, a way having a groove with a lateral opening therefrom, a switch at said opening, a conductor below said way and in operative relation with the groove, a truck having supporting wheels to engage the way, and provided at one end with a means which extends into the groove and has a conducting element for contacting the conductor, a motor on the truck, electrically connected with said element, and a guiding means projecting from the other end of the truck into said groove.

5. In a system of the kind described, a way having a groove with a lateral opening therefrom, a switch at said opening, a conductor below said way and in operative relation with the groove, a truck having supporting wheels to engage the way, and provided at one end with a means which extends into the groove and has a conducting element for contacting the conductor, a motor for the truck, electrically connected with said element, and a flanged wheel at the other end of the truck, the flange of said wheel running in the groove of the way.

6. In a system of the kind described, a way having a groove, a conductor in operative relation with the groove, a wheeled carrier, having a device adapted to extend into the groove and provided with a conducting

element to engage said conductor, said carrier having an electric motor connected with said conducting element, and a transporting means for conveying the carrier from the level of said way to a different level.

7. In a system of the kind described, a way having a groove, a conductor in operative relation with the groove, a wheeled carrier, having a device adapted to extend into the groove and provided with a conducting element to engage said conductor, said carrier having an electric motor connected with said conducting element, and a transporting means for conveying the carrier from the level of said way to a different level comprising an endless traveling platform disposed in an inclined plane.

8. In a system of the kind described, a way having a groove, a conductor in operative relation with the groove, a wheeled carrier, having a device adapted to extend into the groove and provided with a conducting element to engage said conductor, said carrier having an electric motor connected with said conducting element, a transporting means for conveying the carrier from the level of said way to a different level, and a switch arranged in said way between the groove and the transporting means.

9. In a system of the kind described, a way having a groove, a conductor in operative relation with the groove, a wheeled carrier, having a device adapted to extend into the groove and provided with a conducting element to engage said conductor, said carrier having an electric motor connected with said conducting element, a transporting means for conveying the carrier from the level of the way to a different level, comprising a platform which travels in an inclined plane, and a switch arranged in said way between the groove and transporting means.

10. In a system of the kind described, an upper way having a groove and an opening, a lower way, an inclined endless traveling platform extending from the lower way through said opening, a carrier having a guiding element extending into the groove, and means for electrically propelling the carrier.

11. In a system of the kind described, a plurality of ways, having grooves, conductors arranged below the ways in operative relation with the grooves, electrical carriers adapted to travel on the ways and provided with a device having a conducting element to engage said conductors, an inclined endless traveling transporting means for the carrier, arranged between said ways, and switches interposed between the ends of the transporting means and the grooves in the ways.

12. In a system of the kind described, a plurality of ways, having grooves, conductors below the ways in operative relation with the grooves, electrical carriers adapted to travel on the ways and provided with a device having a conducting element to engage said conductors, a transporting means for the carrier, arranged between said ways, and switches interposed between the ends of the transporting means and the grooves in the ways, said transporting means comprising an endless traveling platform movable in an inclined plane.

13. In a system of the kind described, a plurality of ways, having grooves, conductors arranged below the ways in operative relation with the grooves, an electrical carrier adapted to travel on the ways and provided with a device having a conducting element to engage said conductors, a transporting means for the carrier, arranged between said ways, and switches interposed between the ends of the transporting means and the grooves in the ways, said transporting means comprising an endless traveling platform movable in an inclined plane, and having its receiving and discharging ends approximately in the planes of the ways, respectively.

14. In a system of the kind described, a way having a groove, a conductor in operative relation with said groove, switches tapping the groove at intervals and leading off therefrom toward receiving or storage places, and a baggage or freight truck having an electrical motor and a terminal, the latter engaging the conductor and provided with a supporting element which travels in the groove.

15. In a system of the kind described, a way having a groove and provided with switches tapping the groove at intervals, said switches leading from the groove to places which are spaced apart distances approximately corresponding to the distances between the doors of cars of a railway train, a baggage or freight truck having a guiding means which extends into the groove, an electric motor mounted on the truck, and conducting means having connection with said motor.

16. In a system of the kind described, a way having a groove and provided with switches tapping the groove at intervals, said switches leading from the groove to places which are spaced apart distances approximately corresponding to the distance between the doors of cars of a railway train, a baggage or freight truck having at its opposite ends guiding means which extend into said groove, one of said guiding means provided with a terminal, a conductor arranged below said way in operative relation with the terminal, and an electric motor carried by the truck and having connection with said terminal.

17. In a system of the kind described, a

plurality of ways arranged upon different planes, and each provided with an endless main line and with a plurality of switches tapping the same and leading thence toward receiving or storage places, an electric carrier which travels on said ways in operative relation with the main line and is adapted to be diverted therefrom by the switches and means for connecting said ways with each other and for conducting the carrier from one to the other.

18. In a system of the kind described, a plurality of ways arranged upon different planes and each provided with an endless main line and with a plurality of switches tapping the same and leading thence toward receiving or storage places, an electric carrier which travels on said way in operative relation with the main line and is adapted to be diverted therefrom by the switches and a plurality of inclined endless platforms which connect the ways with each other, and conduct the carrier from one to the other.

19. In a system of the kind described, a plurality of ways arranged upon different planes and each provided with an endless groove, a plurality of switches tapping each groove and leading toward receiving or storage places, transporting means arranged between said ways, certain of said switches being between the ways and the transporting means, a baggage or freight truck adapted to run on said ways and to be transferred by the transporting means, said truck having a guiding means which extends into the groove, an electric motor carried by the truck and means for conducting current to the motor.

20. In a system of the kind described, an upper way and a lower way, each having an endless groove, a carrier having a guiding means which travels in said groove, means for diverting the carrier from the groove at a predetermined place, means for conducting the carrier from one way to the other, and means for electrically propelling the carrier.

21. In a system of the kind described, an upper way and a lower way, the upper way having a groove and an opening, a carrier having a guiding means which travels in said groove, means for diverting the carrier from said groove, means extending through the opening in the upper way for conducting the carrier from one way to the other, and means for electrically propelling the carrier.

22. In a system of the kind described, an upper way and a lower way, the upper way having an endless groove and an opening, a carrier having a guiding means which travels in said groove, means for diverting the carrier from said groove, means extending through the opening in the upper way for conducting the carrier from one way to the other, and means for electrically propelling the carrier.

23. In a system of the kind described, an upper way and a lower way, each having a groove, the groove of one of the ways being endless and the upper way provided with an opening, a carrier having a guiding means which travels in said grooves, means for diverting the carrier from the endless groove, means extending through the opening in the upper way for conducting the carrier from one way to the other, and means for electrically propelling the carrier.

24. In a system of the kind described, an upper way and a lower way, each having an endless groove, the upper way also provided with openings, a carrier having a guiding means which travels in said grooves, means settable to divert the carrier from said grooves, means extending from the lower way through the openings in the upper way for conducting the carrier from one way to the other, and means for electrically propelling the carrier over said ways.

25. In a system of the kind described, an upper way having a groove and an opening, a lower way, a traveling platform extending from the lower way, through said opening, a carrier having a guiding element extending into the groove, and means for electrically propelling the carrier.

26. In a system of the kind described, a plurality of ways, one above another, one of said ways having an endless groove, the upper way also having a plurality of openings, a plurality of inclined traveling platforms extending from the lower way through said openings respectively, a carrier having a guiding element extending into said groove, and means for electrically propelling the carrier.

27. In a system of the kind described, a plurality of ways one above the other, one of said ways having an endless groove, the upper way also having a plurality of openings, a plurality of inclined traveling platforms extending from the lower way through said openings respectively, a carrier having a guiding element extending into said groove, means settable to divert the carrier from said groove, and means for electrically propelling the carrier.

28. In a system of the kind described, a plurality of ways located one above another, each of said ways having an endless groove and the upper way having a plurality of openings, a plurality of inclined traveling platforms extending from the lower way through said openings, respectively, a carrier having a guiding element adapted to travel in said grooves, means settable to divert the carrier from the grooves, and means for electrically propelling the carrier over the ways.

29. In a system of the kind described, a plurality of ways arranged in different planes, an endless platform which travels in an inclined plane from one way to the other and has receiving and delivering portions in the planes of the ways, respectively, a wheeled carrier adapted to be transferred on said platform from one way to the other, and means for electrically propelling the carrier over said ways.

30. In a system of the kind described, a plurality of grooved ways arranged in different planes, a platform which travels in an inclined plane from one way to the other and has receiving and delivering portions in the planes of the ways, respectively, a wheeled carrier adapted to be transferred on said platform from one way to the other, and coöperating means on the carrier and in the ways for electrically propelling the carrier over the ways toward and from the platform.

31. In a system of the kind described, a plurality of ways arranged in different planes, a wheeled carrier, means for moving the carrier electrically over said ways, an endless platform which travels in an inclined plane from one way to the other and is adapted to support the carrier, and means movable with the platform and engaging the carrier and restraining movement of the carrier on the platform.

32. In a system of the kind described, a wheeled carrier, an endless platform arranged to move in an inclined plane and adapted to support the carrier, means which travels with the platform and engages the carrier and restrains relative movement of the carrier on the platform, and means for propelling the carrier electrically toward and from the platform.

33. In a system of the kind described, a grooved way, a wheeled carrier having an element which extends into the groove in the way, means for electrically propelling the carrier over the way, and means for conveying the carrier from the way to a different level, comprising an inclined traveling platform having means movable therewith and engaging said element to restrain movement of the carrier on the platform.

34. In a system of the kind described, a grooved way, a wheeled carrier having an element which extends into the groove in the way, means for electrically propelling the carrier over the way, and means for conveying the carrier from the way to a different level, comprising an inclined traveling platform having a longitudinal channel to receive said element of the carrier and a traveling means having a projection to engage said element for the purpose specified.

35. In a system of the kind described, a grooved way, a wheeled carrier having an element which extends into the groove in the way, means for electrically propelling the carrier over the way, and means for conveying the carrier from the way to a different level, comprising an inclined traveling platform having spaces for the wheels of the carrier and means movable with the platform and engaging said element and cooperating with said spaces to restrain movement of the carrier on the platform.

36. In a system of the kind described, a wheeled carrier, an endless platform for transferring the carrier from one level to another, said platform traveling in an inclined plane and having spaces which receive the wheels of the carrier and restrain movement of the latter thereon, and means for propelling the carrier electrically toward and from the platform.

37. In a system of the kind described, a way having a groove, a conductor in operative relation with said groove, a wheeled carrier having a pendant projection adapted to extend into the groove and provided with a terminal to engage said conductor, a motor on the carrier electrically connected with said terminal, a traveler movable in an inclined plane relatively to said way and adapted to support the carrier and means movable with the platform and adapted to engage said projection and restrain movement of the carrier on the platform.

38. In a system of the kind described, a way having a groove, a conductor in operative relation with said groove, a wheeled carrier having a pendant projection adapted to extend into the groove and provided with a terminal to engage said conductor, a motor on the carrier electrically connected with said terminal, a traveler movable in an inclined plane relatively to said way and adapted to support the carrier, said platform having a channel to receive the pendant projection from the carrier, and an endless means having a lug which travels with the platform and engages said projection.

39. In a system of the kind described, a wheeled carrier having a pendant projection, an inclined platform having a plurality of movable sections arranged side by side with a channel between them, an endless traveler in said channel adapted to engage the projection from the carrier, and means for electrically propelling the carrier toward and from the platform.

40. In a system of the kind described, a wheeled carrier, means for propelling the same electrically, and an inclined endless traveling means for conveying the carrier from one elevation to another, comprising elements which engage the wheels of the carrier and restrain movement of the carrier on the conveying means.

41. In a system of the kind described, a wheeled carrier, means for propelling the

carrier electrically, and means for conveying the carrier from one elevation to another, comprising a platform which travels in an inclined plane and is provided with flexibly connected slats having pockets between their confronting faces adapted to receive the lower portion of the carrier wheels.

42. In a system of the kind described, a wheeled carrier having a pendant projection, means for propelling the carrier electrically, and means for conveying the carrier from one elevation to another comprising a platform which travels in an inclined plane and embodies a channel to receive said projection, a traveler which engages the projection, and flexibly connected slats which engage the wheels of the carrier and have beveled confronting surfaces forming pockets for said wheels.

43. In a system of the kind described, a way having a groove, a conductor in operative relation with said groove, a wheeled carrier adapted to travel on the way and provided with a pendant projection which extends into the groove and has a terminal to engage the conductor, said carrier having a motor electrically connected with said terminal, means for conveying the carrier from said way to a different level comprising a platform which travels in an inclined plane relatively to the way and embodies a channel to receive said projection, a traveler which engages the projection, and flexibly connected slats which engage the wheels of the carrier and have beveled confronting surfaces forming pockets for said wheels.

44. In a system of the kind described, a wheeled carrier, means for conveying the same from one level to another comprising an endless traveling platform which moves in an inclined plane and has an interrupted surface whereby it is adapted to hold the wheels of said carrier, an endless traveling means between the sides of the platform, adapted to engage the carrier, means for moving the platform and the endless traveling means, and means for propelling the carrier electrically to and from the platform.

45. In a system of the kind described, an endless traveling platform comprising a pair of sections which simultaneously move in an inclined plane, side by side and a carrier-propelling means operating in an approximately horizontal direction to and from the receiving and delivering ends of the platform and traveling in an inclined plane from one end to the other of the platform, and a wheeled carrier having means engaging said propelling means and means for moving the carrier electrically to and from said propelling means.

46. In a system of the kind described, a plurality of ways arranged on a different level, a wheeled carrier, means for propelling the carrier electrically upon said ways, and means for conveying the carrier from one way to the other, comprising a carrier-propeller which extends in an inclined direction from one way to the other and has receiving and delivering ends in the planes of said ways respectively, inclined traveling sections adapted to engage the wheels of the carrier and extending from one way to the other, and means for moving the traveling sections and said propelling means simultaneously, said carrier having means to engage the propelling means.

47. In a system of the kind described, a plurality of ways arranged in different planes, each having a groove, an inclined movable platform traveling between said ways and having a channel, an endless traveling propelling means which traverses said channel, a conductor in operative relation with the grooves in the ways, and a wheeled carrier provided with an electric motor, and having a pendant element adapted to traverse the grooves and channel and to engage the propelling means in the channel, and a terminal to engage the conductor.

48. In a system of the character described, the combination of a way having a groove, an electrical conductor in operative relation to said groove, a truck having supporting devices which engage the way adjacent to said groove, said truck having a device which travels in said groove and operates to drive the truck and direct its motion, and means for disengaging said device from the groove and propelling means.

49. In a system of the kind described, the combination of a way having a groove, an electrical conductor in operative relation to said groove, a truck having supporting devices which engage the way adjacent to said groove, said truck having a device which travels in said groove and operates to drive the truck and direct its motion, and means acting upon said device for disengaging the same from the groove and propelling means.

50. In a system of the kind described, a way having a groove with a lateral opening, an electrical conductor in operative relation to said groove, an element arranged at the junction of the groove and opening and adjustable to interrupt the continuity of the former, and a truck having supporting devices which engage the way and also having means adapted to travel in said groove and engage said conductor and also to engage said element and guide the truck from the groove when said element is set to interrupt the continuity of the groove.

51. In a system of the kind described, a way having a groove with a closed end, the wall forming said end having an inclined surface presented to the groove, and an elec-

trically-propelled truck having an element which projects into the groove, and yieldably presses toward the way and engages said surface and is thereby automatically raised from the groove at the end of the latter.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

MORRIS U. BERNHEIM.

Witnesses:
RUSSELL L. COOK,
E. A. GARTTMAN.