M. U. BERNHEIM.

SYSTEM FOR TRANSFERRING FREIGHT AND BAGGAGE.

APPLICATION FILED JUNE 4, 1914.

1,124,268.

Patented Jan. 12, 1915.

6 SHEETS—SHEET 1.

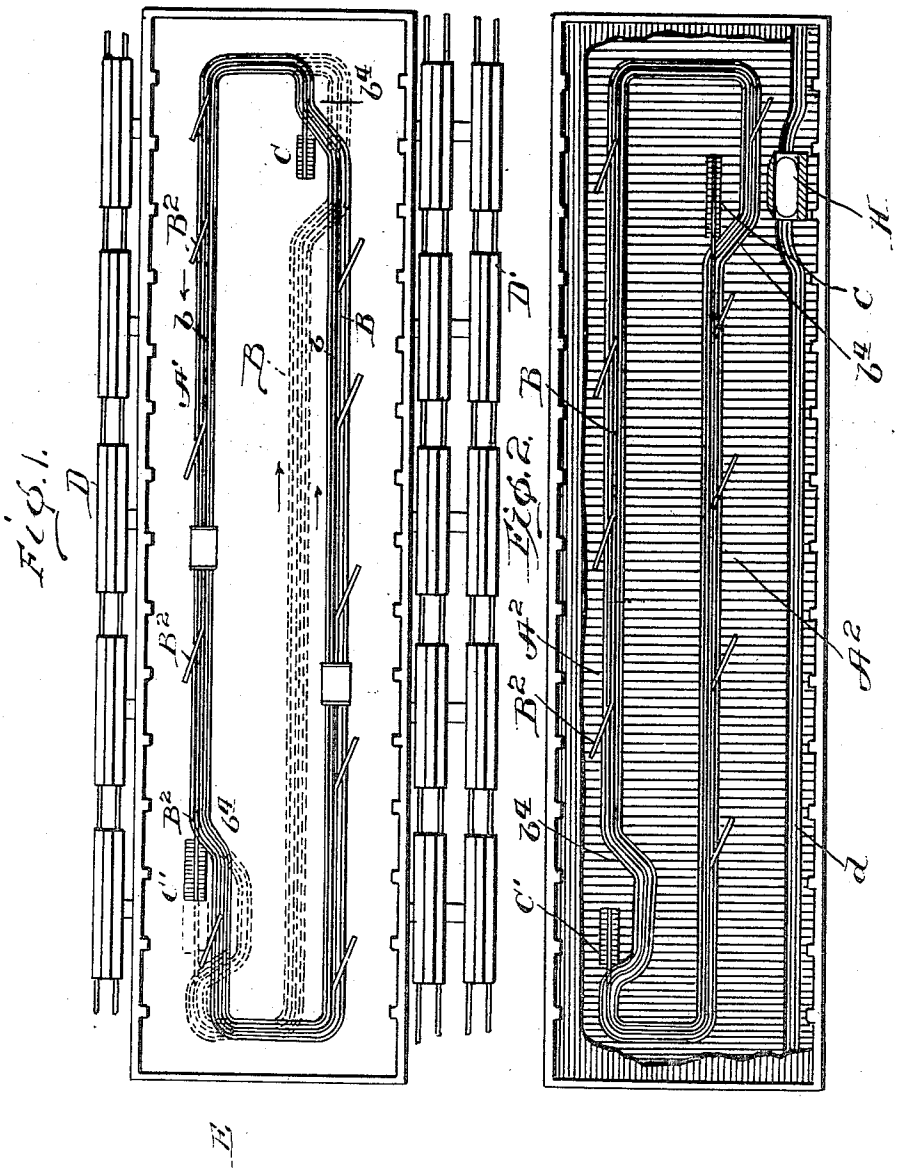


Fig. 1.

Fig. 2.

Witnesses

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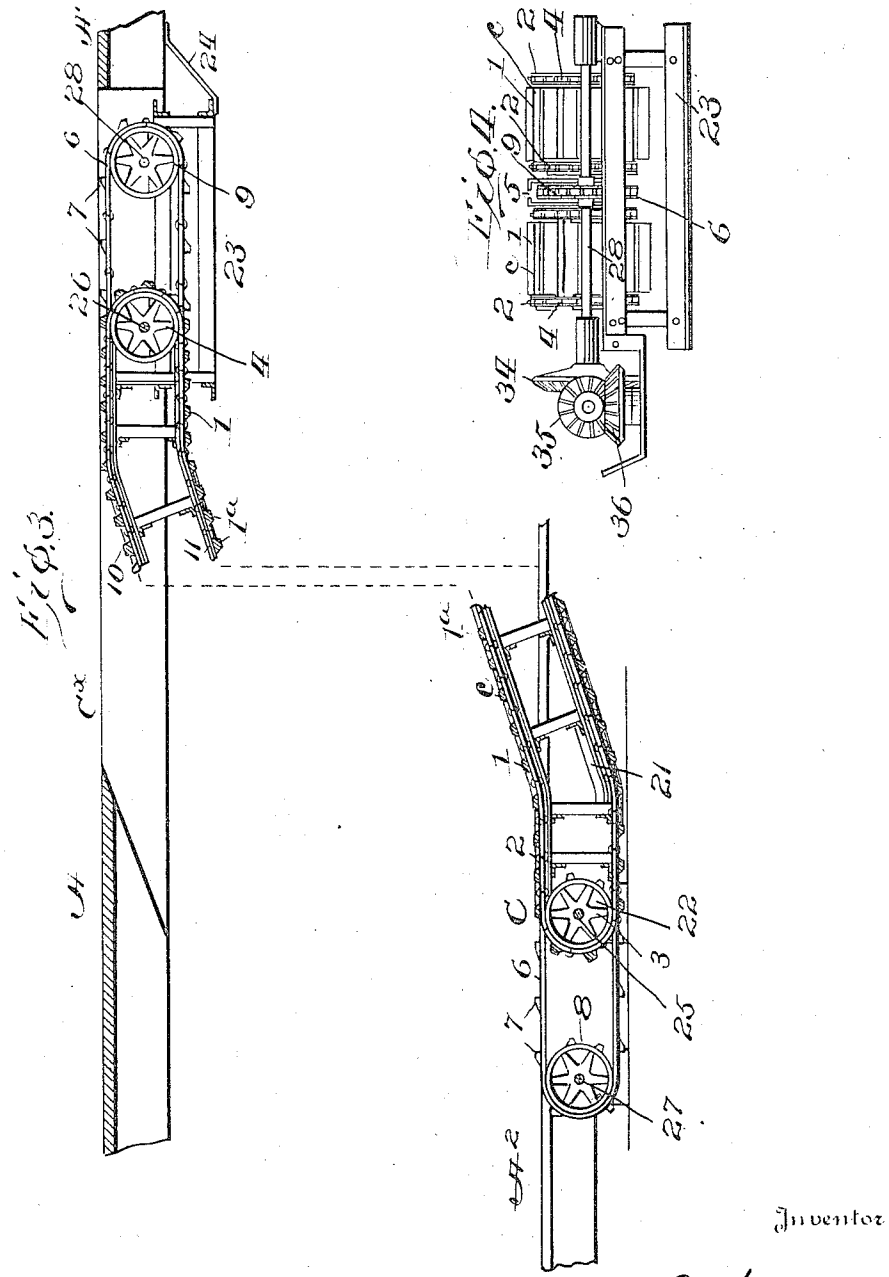
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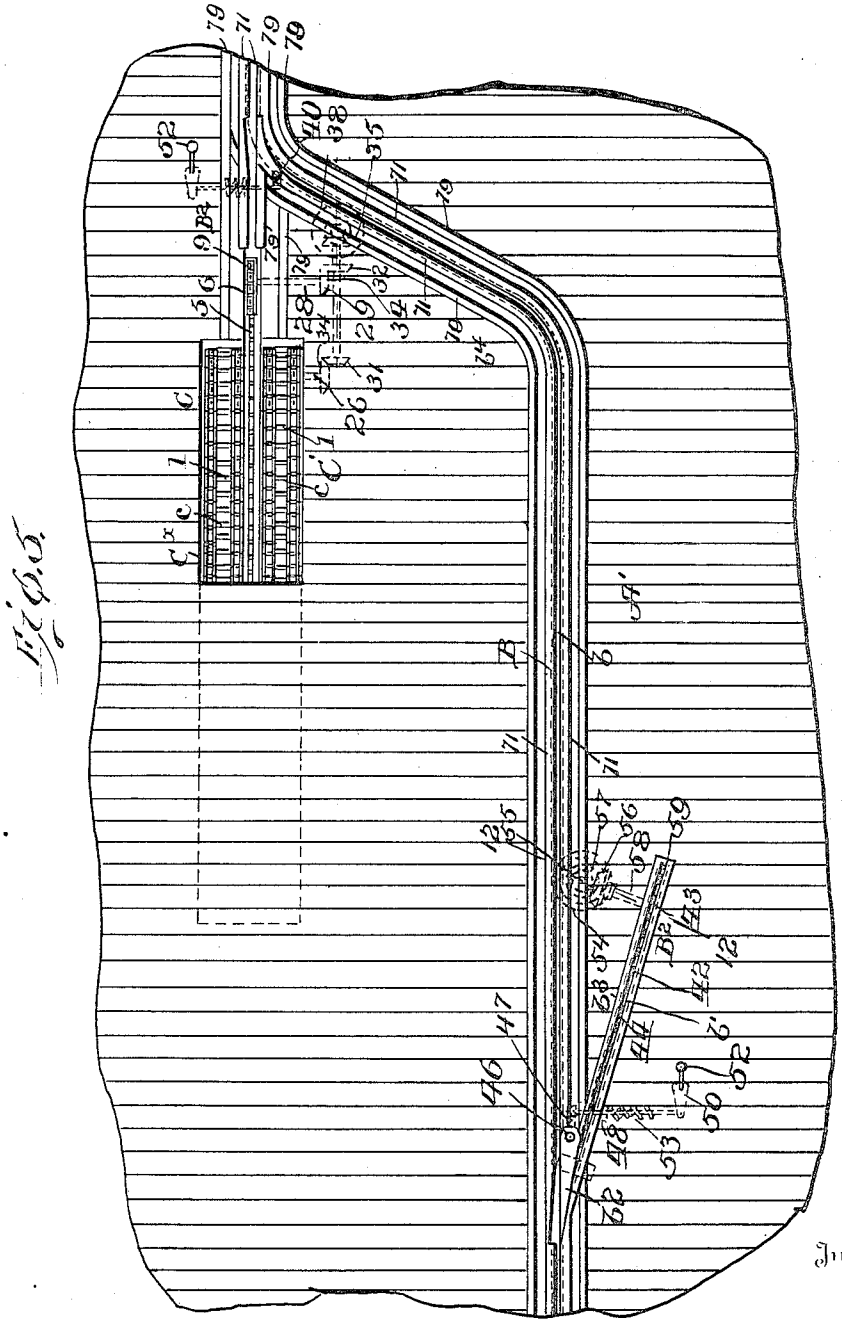
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6 SHEETS—SHEET 3.



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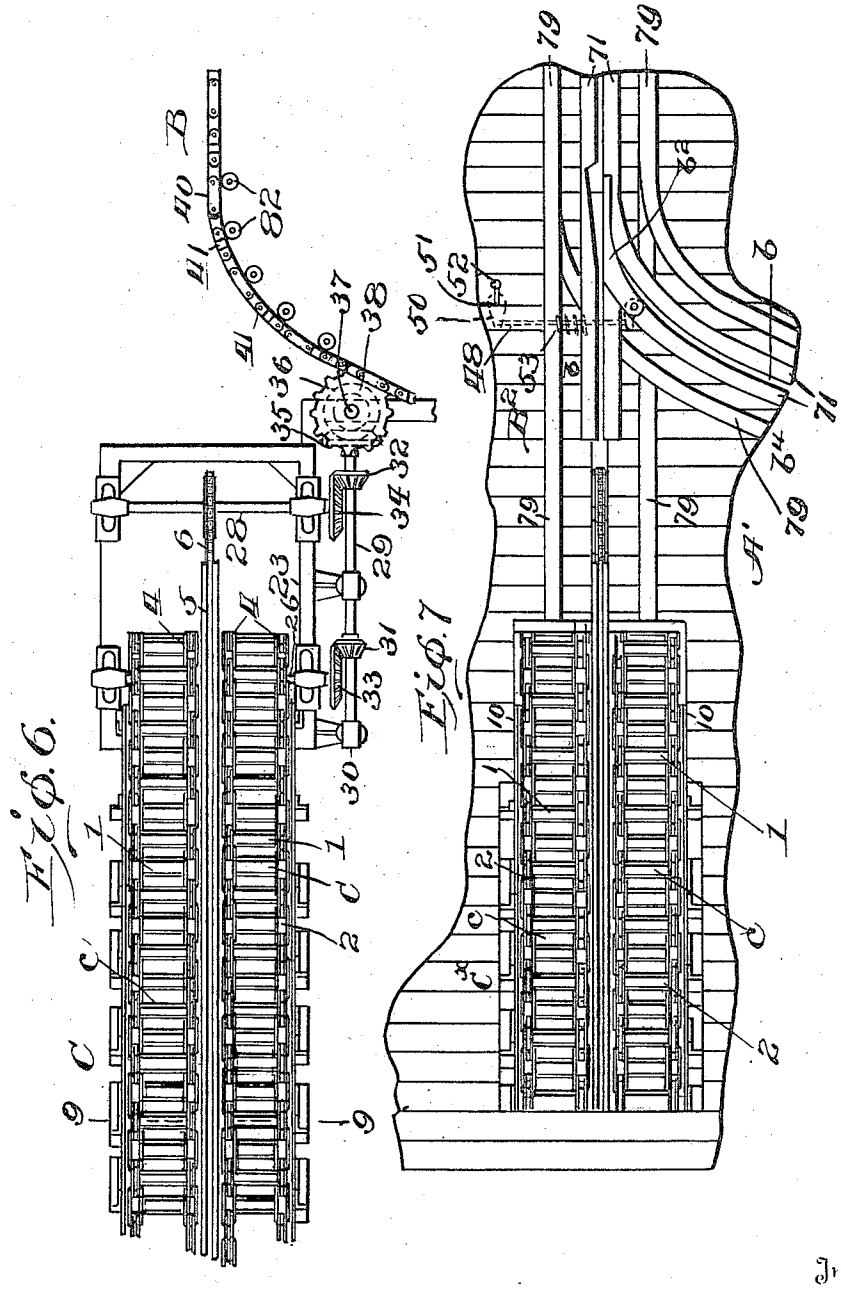


Fig. 6.

Fig. 7.

Witnesses

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6 SHEETS—SHEET 5

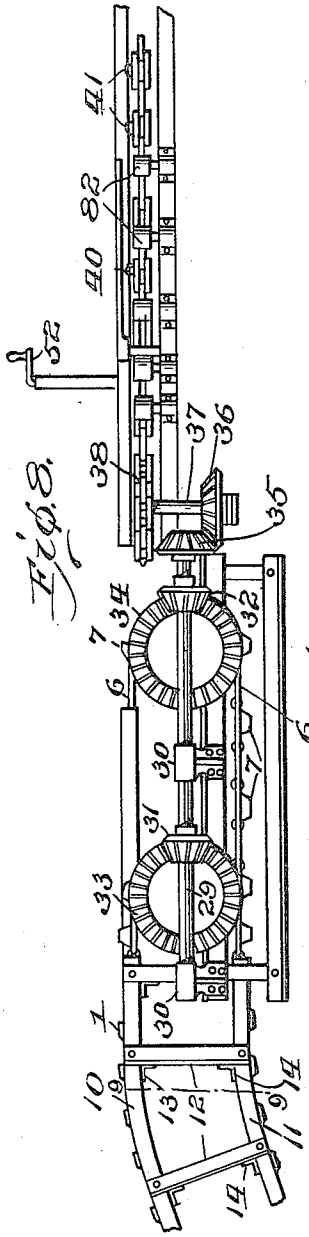


Fig. 8.

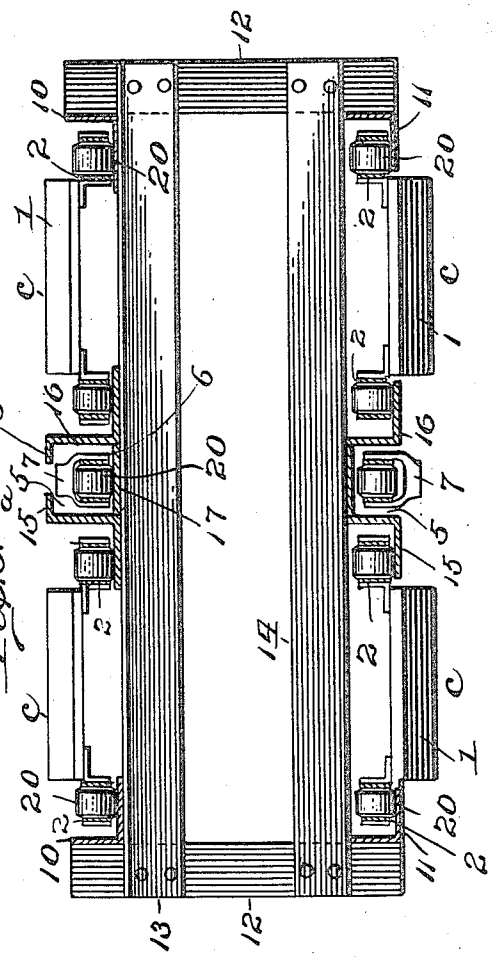


Fig. 9.

Witnesses

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Fig. 10.

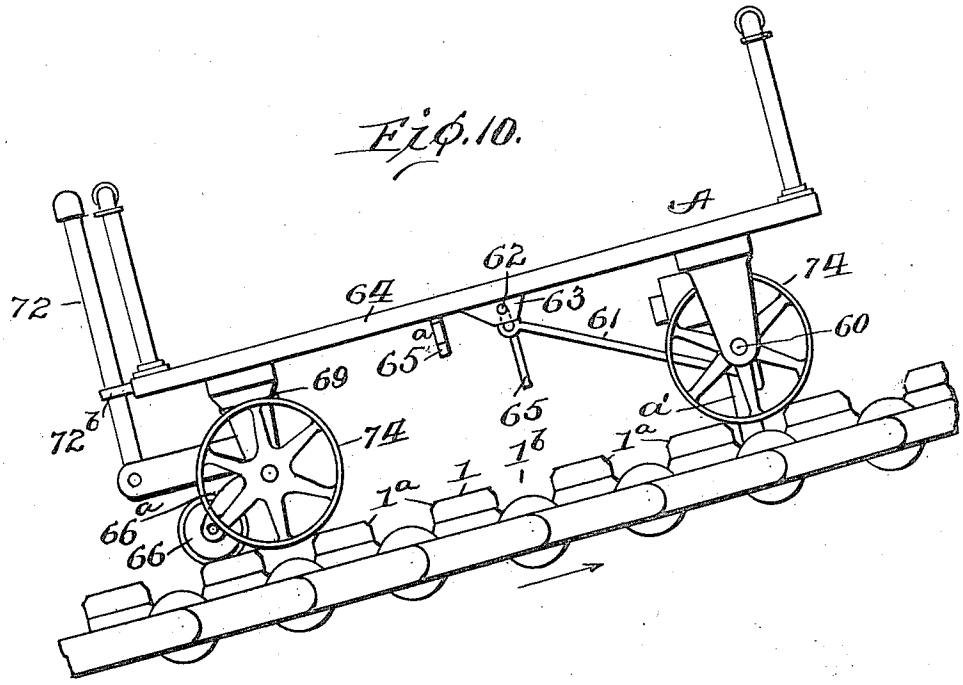


Fig. 11.

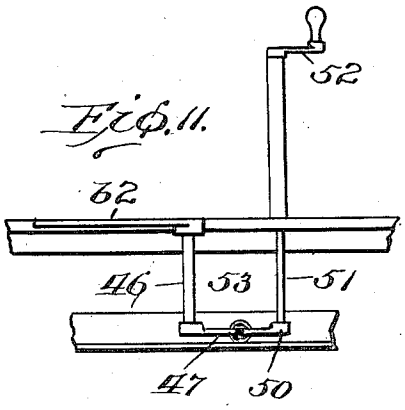
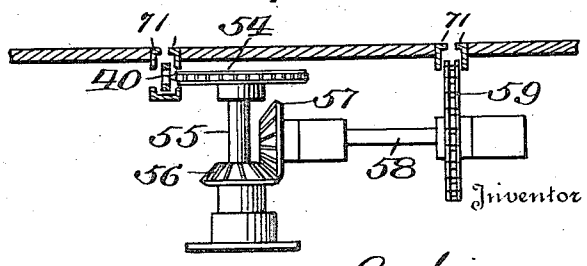


Fig. 12.



Witnesses

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UNITED STATES PATENT OFFICE.

MORRIS U. BERNHEIM, OF CINCINNATI, OHIO, ASSIGNOR TO THE ALVEY-FERGUSON COMPANY, OF OAKLEY, CINCINNATI, OHIO, A CORPORATION OF OHIO.

SYSTEM FOR TRANSFERRING FREIGHT AND BAGGAGE.

1,124,268. 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. 842,950.

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.

This invention has general reference to systems for mechanically handling freight and baggage at railway stations and other places, embodying wheeled carriers and means for moving the same between various loading and unloading places within or outside of a freight house, transfer house or warehouse, for example. It has more especial reference to a system of the class described, embodying means for transferring the carriers upon and between a plurality of different levels, with provision for diverting the carriers from the transferring means at any one of a number of different places on either of the before-mentioned levels, and moving the same adjacent to cars which are to be unloaded or loaded, or to storage places. A system of the kind last referred to is shown, described and generically claimed in my application No. 575,511 filed Aug. 4, 1910 (renewed June 4, 1914, as Serial Number 843,092), the present application setting forth a species of the invention generically claimed in my said renewal application No. 843,092 and being a division of the same, and the latter being a continuation as to all the features shown, described and claimed herein, of an application for Letters Patent filed by me Sept. 13, 1909, and numbered 517,450, abandoned October 11, 1913.

The present invention has for its object the provision of a system, of a mechanical—as contradistinguished from an electrical—nature which will be thoroughly practicable for the purposes for which it is intended and which, among its important advantages (1) is capable of handling freight or baggage with maximum rapidity and safety and with a minimum amount of manual labor; and (2) will enable railroad companies to employ freight houses, transfer houses or warehouses having a plurality of floors, without requiring the use of straight-lift platform freight elevators, many of whose disadvantages are overcome by the present system.

There are other purposes and advantages which need not be explicitly referred to herein but which will be understood by those familiar with the present systems of handling freight etc., in railway yards and terminals.

The several objects of the invention are secured in the system illustrated in the accompanying drawings, the said illustrated system exemplifying the preferred form of the invention, but it will be understood that changes in the herein illustrated embodiment of the invention may be made without departing from the spirit of the invention or the scope of the subjoined claims.

In the drawings: Figure 1 is a plan view, somewhat diagrammatic, illustrating my present system arranged upon two floors of a freight shed or transfer house which is between tracks for trains running to different destinations and frequently containing freight or baggage to be transferred from one to the other. Fig. 2 is a similar view of said house, with the upper floor broken away to disclose the portion of the system upon the lower floor. Fig. 3 is a sectional view of one of the inclined sections of the systems. Fig. 4 is an end view thereof. Fig. 5 is a plan view of a portion of the way or floor, showing the delivering end of an elevator and the portions of the main and switch lines contiguous thereto, and also showing in dotted lines the means for operating the switches and elevator. Fig. 6 is a detail view of the upper end of one of the inclined sections or conductors for raising or lowering the carriers, showing a portion contiguous thereto broken away to disclose the means which communicate motion thereto. Fig. 7 is a plan view showing the junction of said conductor with the main and switch lines of the system. Fig. 8 is a side elevation of the portion of the system at the junction of a conductor and the main and switch lines, particularly intended to show the driving connections between said parts. Fig. 9 is a transverse section through the inclined section of the system, taken on the line 9—9 of Fig. 8, for example. Fig. 10 is a side elevation of a truck upon an inclined section of the system, employed to

elevate the same from the lower way to the upper way. Fig. 11 is a detail side elevation of a suitable means for operating a switch-point. Fig. 12 is a section on the line 12—12 of Fig. 5.

The same characters of reference designate the same parts in the several views.

In the present system it is purposed to transfer the freight or baggage upon wheeled carriers, those exemplified being four-wheel trucks A which, except as to features hereinafter set forth necessary to adapt them to the present system, are of usual or any suitable construction. These carriers are propelled upon ways A′ and A² which are located upon different levels, and are transferred from one way to the other by traveling conductors C, C′ which move in an inclined plane from one way to the other. The ways A′ and A² are provided by floors of a railway transfer house, freight shed or warehouse.

As shown diagrammatically in Figs. 1 and 2, the system includes what may be arbitrarily termed a main line B on each of said ways. Each main line is preferably a continuous one, that is to say, each preferably extends continuously around the way or floor. Each main line comprises traveling propelling means, indicated by broken lines in Fig. 5 and each traveling propelling means preferably comprises an endless sprocket chain 40. The said propelling means are arranged below the upper surfaces of the respective ways or floors in operative relation to grooves b in the latter. Each carrier has a projecting element, as a' for example, which travels in the grooves b and is engaged by the propelling means and communicates movement of the latter to the truck.

The groove of each main line is provided at intervals with lateral openings b' (see Fig. 5) which, in connection with a suitable means, as switch points b^2, for diverting the trucks thereat from the main line, constitute switches B^2. These switches may be prolonged and provided with truck-propellers designated generally by the character b^3, so as to form branch lines leading to predetermined places, as, for example, from the main line to places contiguous to cars D and D′ arranged on opposite sides of the transfer or other shed E or to storage places, or wagons, either or all, as desired. Each main line has communication with both conductors C and C′ before mentioned, certain of the switches B^2 being interposed between the same and the main line.

In order that there may be no interference between trucks destined for an inclined section and those whose destination is a place on the same floor and beyond said section, a bend is arranged at the junctions of the main line and inclined sections as shown at the various places designated b^4. It is preferred that these bends be in the main line, as illustrated, and this arrangement is, therefore, shown.

While the invention in its broadest aspects is not to be construed as being restricted to details of parts, yet in order that the ends of the invention may be most fully subserved I have found it to be desirable to provide parts of peculiar construction and coöperative relation, and these parts will now be set forth in detail.

The inclined conductors C and C′ may be of identical construction, and a description of one therefore will answer for the other. Each conductor is composed of a pair of platforms each formed of a series of slats 1 the ends of which are connected to links of endless chains 2 of suitable construction. These chains pass over sprockets 3 and 4 at the base and top of the elevator respectively. The platforms thus formed are arranged at opposite sides of a central longitudinal channel 5 in which travels an endless chain 6 having upwardly projecting lugs 7 at proper intervals. The chain 6 engages sprockets 8 and 9, the former of which is located at the base of the elevator in advance of the sprockets 3, while the sprocket 9 is arranged at the top of the elevator rearward of the sprocket 4. The sprockets 3 and 8 are arranged in approximately the same horizontal plane and the sprockets 4 and 9 similarly are horizontally alined, in order that the receiving and delivering portions of the elevator will be approximately horizontal, the inclination commencing at a point near the base of the elevator rearward of the sprocket 3 and terminating at a place near the top of the elevator in advance of the sprocket 4. These horizontal portions of the elevator also are level with the floors or ways A′ and A² respectively, whereby the carriers may be run onto and off from the conductor with ease and without shock. Openings c are provided in the upper floor through which the upper portions of the conductors extend. The inclined portions of the conductors are preferably at an angle of about twenty degrees.

The slats 1 are spaced apart and have their confronting faces 1^a beveled so as to provide between them transversely extending pockets 1^b which conform in a measure to the curvature of the wheels of the carrier A and receive the lower portions of said wheels and restrain movement of the truck upon the plaform while the truck is being moved in an inclined plane. It is preferred also to cause the projecting elements a' of the carrier and the lugs 7 of the chain 6 to be engaged with each other while the carrier is being elevated or lowered, which will further restrain relative movement between the carrier and movable platforms. The

frame of the elevator is preferably composed of angle irons suitably connected with each other and relatively so disposed as to provide a strongly braced and yet light frame of inexpensive construction. A most desirable construction of frame (see Figs. 8 and 9) is composed of a pair of longitudinal angle irons 10 and 11 arranged in different vertical planes at each side of the frame; straps 12 suitably arranged along the length of the frame at each side thereof, and to which the ends of the angles 10 and 11 are secured; and horizontally disposed transverse angle irons 13 and 14 arranged along the length of the frame and secured to the straps 12, the angle irons 13 supporting the irons 10.

The angle irons 10 form tracks or ways for the operating runs of the outer sprocket chains 2 and the angle irons 11 similarly form tracks or ways for the returning runs of the outer chains. Angle irons 15 and 16 provide similar tracks or ways for the two chains 2 which are located near the longitudinal center of the elevator. These angle irons are so disposed that they also form the channels 5 hereinbefore referred to, and the upper ones have inwardly extending edges 15^a which close the mouth of the channel to an extent which admits the elements a' of the carrier thereto and at the same time restrains lateral movement of said element. The channels 5 are provided with plates 17 which extend longitudinally of the frame and form tracks for the chain 6. The chains 2 and 6 are preferably provided with rollers 20 in order to lessen the friction of their movement, and these rollers travel upon the tracks already referred to. Suitable means should be provided at the junction of the horizontal and inclined sections of the elevator for guiding the chains at these places. This means may desirably be composed of irons or straps such as is indicated at 21 in Fig. 3. Suitable supports for the base and top of the elevator will also be provided. The support for the top will preferably be composed of a frame 23 having connected elements which depend from the frame proper and are engaged by one or more hangers 24 secured to a beam or beams of the upper floor.

The sprockets 3, 4, 8 and 9 are mounted on shafts 25, 26, 27 and 28, respectively. In the present exemplified form of the invention the sprockets 4 and 9 are the driving sprockets of their respective chains 2 and 6.

Referring now to Fig. 6: For communicating motion to the shafts 26 and 28 of the sprockets 4 and 9 respectively, it is preferred to utilize the chain 40 of the main line B hereinbefore referred to. A convenient mechanism for this consists of a shaft 29 suitably supported in bearings 30 at the driving end of the elevator and provided with beveled gears 31 and 32. These gears respectively mesh with bevel gears 33 and 34 mounted on the shafts 26 and 28 respectively. The shaft 29 is also provided with a bevel gear 35 meshing into a bevel gear 36 mounted on a vertical shaft 37, which has a sprocket wheel 38 engaged by the chain 40 of the main line. The endless traveling propelling chain 40 of each main line is provided at suitable intervals along its length with projections 41 (Fig. 6) to engage the projections a' from the trucks and to communicate traveling movement to the latter. The projections 41 travel in the grooves b but terminate at or below the surfaces of the ways so as to not interfere with the full use of the latter by pedestrians or in the manual propulsion of trucks thereover. The endless traveling means of each branch line (see Fig. 5) also is preferably composed of an endless chain 42, extending over sprockets, 43, and provided at intervals with projections, 44, to engage the elements a' of the truck.

Each switch point b^2 at the junction of each main line and branch line or switch, is adjustable by suitable means in order to break the continuity of the main line and open communication between the same and a branch line or switch controlled thereby. A suitable means for adjusting each switch point is shown, and this means comprises a vertical shaft 46 having its upper end connected to the switch point b^2 and its lower end provided with an arm 47 connected by a link 48 with an arm or crank 50 projecting from the lower end of a shaft 51 which rises through the way or floor and has its upper end provided with a handle 52 for operating it to turn the switch point. The switch point is normally held in one position by a spring 53 (see Fig. 7) herein shown as mounted on the link 48. The normal position is preferably that in which the switch point extends across and closes the mouth of the groove of the branch line.

The propellers of the branch lines are preferably driven from the propeller of the main line. A suitable means for this purpose (shown in Figs. 5 and 12) comprises a horizontally disposed gear 54 which meshes with the chain 40 of the main propeller and is mounted upon a shaft 55 having a beveled gear 56 which engages a similar gear 57 mounted on a shaft 58 to which is fixed a sprocket 59 arranged to be engaged by the chain 42 of the branch propeller.

There is a switch B^2 between the main line and each inclined section, as already stated. Each switch includes a way for supporting the truck in its passage between the main line and the elevator, having a groove b into which extends the propeller engaging element a' of the truck. A switch

point b^2 is also arranged in this junction and this point is adjustable, by means which may be identical with those already described, to break the continuity of the main line to thereby cause approaching trucks to travel to the elevator, or to close the entrance between the switch and the main line, to thereby cause trucks on the main line to continue thereon past the switch, or to exclude from the main line any truck on a switch which it is not desired immediately to engage with the main line.

It will be observed that the chains 6 at the receiving and delivering ends of the elevator and lowerer are horizontally prolonged beyond the moving platform in line with the respective chains 40 of the main lines, whereby a carrier which has been switched from the main line toward the receiving portions of the elevator or lowerer may be automatically picked up by the chain 6 of the latter and moved thereby to the moving platforms, and similarly, a carrier leaving the delivering ends of the elevator or lowerer which has been switched onto the main line will be automatically picked up by the chain 40 of the latter and conveyed to its destination. In order to reduce the shock due to the impact of the lugs of the chain with the elements a' of the carrier it is preferred that the portions of the way between the chains 6 and 40 be free from propelling means and that this portion be of such length that carriers traveling thereon will lose their momentum when they have reached the place at which they are to be picked up by the lugs of said chains. If desired, the engagement of the carrier with the propelling means of the main lines and elevator and lowerer may be effected manually.

It will be understood that the upper ends of the elevator and lowerer are connected with different portions of the main line on the floor by switches and that the lower ends of said elevator and lowerer similarly are connected by switches with different parts of the main line on the lower floor.

The carrier A herein exemplified is provided at that end thereof which is at the front in the automatic transfer of the trucks, with the element a' hereinbefore referred to as being the one which engages the projections 7 from the traveling propellers. This element is shown here as an arm or bar pivotally mounted between its ends on the axle 60 of the truck and provided with an adjusting arm 61 which is pivoted thereto at a point below the axle and extends thence to the cranked portion of a crank shaft 62. This shaft is mounted in bearings 63 depending from the platform 64 of the truck and is provided with an operating lever or handle 65 which may be operated to raise and lower the lower end of said arm into and out of the position in which it engages the propeller. The other end of the truck is provided with a guide wheel 66 which is yieldably pressed downward and held in operative position. This guide wheel has a circumferential flange 66^a which runs in the several channels of the main and branch lines and elevator and lowerer, hereinbefore referred to. Its portions on opposite sides of the channels run on tracks 71 (Figs. 5, 7 and 12) preferably formed by angle irons set flush with the floor or way adjacent to said channels.

The carrier A herein shown is a four wheel type of truck and it is adapted in use to be automatically propelled by the means herein described or to be manually operated in the transfer of goods between the propelling system and storage places or between the propelling system and cars, for example. When manually operated the end thereof which in Fig. 10 is shown at the left hand is the forward end. Thus, in the automatic propulsion of the device the power is applied to the front end of the truck, where it is most effectively utilized.

It will be understood that when the truck is to be manually propelled the lug or projecting element a' will be elevated in order to clear the floor and will be held in such position by a catch 65^a arranged to engage the lever 65. When the truck is being mechanically propelled its handle 72 will be held in upright position by a suitable catch 72^b. The carrying wheels 74 of the truck preferably run on tracks 79 formed by plates set flush with the floor or way (see Figs. 5 and 7.)

In practice the propeller chains of the main and branch lines are preferably of the roller type and a channel iron or other suitable means forming a track therefor will preferably be mounted in each groove or channel in which the propeller chains travel. A series of small guide rollers 82 (Figs. 6 and 8) for the main line propellers are preferably arranged at the places where the main line bends to extend around the elevator or lowerer.

From the foregoing the operation of my system will be clearly understood and it will be seen that I have provided a system wherein trucks, adapted to be manually propelled in an ordinary way are also adapted to be automatically propelled in a system which enables them to be carried between cars of the same or different trains, or between cars on one side of a transfer shed and others on the other side thereof, or between cars and places of storage on either of a plurality of different levels. The several main lines being flush with the floor or way offer no obstruction to the free passage of trucks across

the latter and the entire system leaves available for storage and operating purposes a maximum amount of floor space.

From the foregoing general description of the system it will be seen that carriers to be loaded or unloaded may be placed upon the main line on the upper floor and will be diverted therefrom at any place or places on said floor on the branch lines, by a proper setting of the switches at the junctions of the main line and branch lines, which switches act upon the elements a' of the carriers which latter thus serve to direct the motion of the carriers as well as to communicate movement thereto. It will also be seen that any of these carriers destined for the lower floor will by the proper setting of the switch between the main line and lowerer be diverted from the main line and conveyed thence by the lowerer and finally delivered to the main line on the lower floor from which it may be diverted at a predetermined place by a proper setting of a switch at the junction of the main line and the branch line on the lower floor. Similarly, it will be apparent that any loaded or unloaded carrier on the lower floor may be propelled around the same and diverted therefrom at any one of the number of predetermined places and that if the carrier is to be conveyed to the upper floor it is switched from the main line at a place contiguous to the receiving end of the elevator C' and is delivered to the upper floor where it is switched upon the main line and propelled to a predetermined branch line at a place contiguous to that at which it is to be loaded or unloaded.

The present system is shown in connection with a subway beneath the lower floor, for cars which transfer the freight underground between the railway freight house and various warehouses, stores and other places having communication with the subway. In this case, as at present preferred by me, the packages are unloaded from the trucks upon the lower floor A^2, and loaded upon subway cars which are arranged upon tracks d extending longitudinally of the basement or lower floor. These cars are then moved to an ordinary platform freight elevator which is arranged in the tunnel shaft H, and are thence lowered to the subway and propelled therethrough in the usual manner. Similarly, the various establishments having communication with such a subway, load their freight or express matter upon the cars which are then transferred to the tunnel shaft and thence lifted to the lower floor or basement of the freight shed or transfer house, where it is handled by the present system in its distribution to the place intended therefor.

From the foregoing description of the herein exemplified form of my system it will be apparent that provision is made for the safe and rapid distribution of trucks upon either of a plurality of floors of a railway transfer house or freight house, and for the conveyance of the trucks between cars of trains located upon opposite sides of such houses, or between the house and any car of either of said trains.

While I have described the invention with reference to the loading and unloading of railway cars, it is to be understood that it may be used for double decker docks or piers, and in other than these mentioned places, all of which are intended to be covered by the subjoined claims.

In practice some conspicuously exposed means will be provided for indicating the destination of the several trucks. This means may desirably be composed of an indicator of suitable character on each truck which is set by an attendant to indicate the particular destination thereof, as by means of numbers corresponding to numbers of similar indications applied to each switch or car. As this forms no part of my present invention, I do not consider it to be necessary to illustrate any particular means for the purpose herein, and regard it as sufficient to call attention to the fact that a complete system should comprise some indications by which attendants may know the destination of each truck and may set the proper switch or switches for directing the truck thereto. Any suitable indicating means may be employed and many such will probably suggest themselves to those skilled in the art.

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 class described, a plurality of ways, a wheeled carrier adapted to travel on said ways, means for transferring the carrier from one way to the other, endless traveling propellers arranged below the surface of the ways, for conducting the carrier thereover, to and from the transferring means, said ways having grooves for giving access to the propellers, and means adapted to extend from the carrier into the groove and engage the propeller, for communicating motion of the latter to the carrier.

2. In a system of the class described a plurality of ways, a wheeled carrier adapted to travel on said ways, means for transferring the carrier from one way to the other, endless traveling propellers arranged below the surface of the ways, said ways having grooves for giving access to the propellers, means adapted to extend from the carrier into the groove and engage the propeller, for communicating motion of the latter to the carrier, and a switch leading from one propeller toward the transferring

means, having a device adapted automatically to disengage the carrier from the propeller.

3. In a system of the class described, a plurality of ways, a wheeled carrier adapted to travel on said ways, means for transferring the carrier from one way to the other, endless traveling propellers extending around their respective ways, below the surface thereof, said ways having grooves for giving access to the propellers, means adapted to extend into the grooves from the carrier, for communicating movement of the propellers to the latter, and switches between the propellers and transferring means, one of said switches having an element adapted to disengage the last mentioned means from the propeller.

4. In a system of the class described, a wheeled carrier, a plurality of ways arranged in different planes, each having a main line including a traveling element below the surface of the way, each way having a groove giving access to said element, the carrier having means extending into said groove and coöperating with the traveling elements in propelling the carrier over the ways, means for disconnecting the carrier-propelling means at predetermined places in the travel of the carrier, and an inclined conductor for moving the carrier from one way to the other, including means for controlling relative movement between the conductor and a carrier engaged therewith.

5. In a system of the class described, a wheeled-carrier, a plurality of ways arranged in different planes, each having a main line including a traveling element below the surface of the way, each way having a groove giving access to said element, the carrier having means extending into said groove and coöperating with the traveling elements in propelling the carrier over the way, means for disconnecting the carrier-propelling means at predetermined places in the travel of the carrier, and an inclined conductor for moving the carrier from one way to the other, including traveling elements adapted to engage the carrier and control relative movement between the conductor and carrier.

6. In a system of the class described, a wheeled-carrier, a plurality of ways arranged in different planes, each having a main line including a traveling element below the surface of the way, each way having a groove giving access to said element, the carrier having means extending into said groove and coöperating with the traveling elements in propelling the carrier over the ways, means for disconnecting the carrier-propelling means at predetermined places in the travel of the carrier, an inclined conductor for moving the carrier from one way to the other including a traveling means adapted to engage the carrier and control relative movement between the conductor and carrier, and means whereby the traveling means of the conductor derive motion from said traveling element.

7. In a system of the class described, a wheeled carrier, a plurality of ways arranged in different planes, each having a main line including a traveling element below the surface of the way, the way having a groove giving access to said element, said carrier having means extending into the groove, whereby it is propelled by said traveling element, switches at various places in the lengths of the main lines, and conductors which travel between the switches of said lines for transferring the carrier from one way to the other.

8. In a system of the class described, a wheeled carrier, a plurality of ways arranged in different planes, each having a main line including a traveling element below the surface of the way, the way having a groove giving access to said element, said carrier having means extending into the groove, whereby it is propelled by said traveling element, switches at various places in the lengths of the main lines, and conductors which travel between switches of said lines for transferring the carrier from one way to the other, each of said conductors including an endless traveling platform which supports the carrier.

9. In a system of the class described, a wheeled carrier, a plurality of ways arranged in different planes, each having a main line including a traveling element below the surface of the way, the way having a groove giving access to said element, said carrier having means extending into the groove, whereby it is propelled by said traveling element, switches at various places in the lengths of the main lines, and conductors which travel between the switches of said lines for transferring the carrier from one way to the other, each of said conductors including an endless traveling platform which supports the carrier, and means whereby said platform derives motion from a traveling element of a main line.

10. In a system of the class described, a plurality of ways arranged in different planes, each having a main line, a wheeled carrier adapted to travel on each way, means for conducting the carrier from one way to the other, said carrier and main lines having interengaging carrier-propelling devices, and means for disconnecting said devices at predetermined places in the lengths of the main line.

11. In a system of the class described, a plurality of ways arranged in different planes, each provided with a traveling pro-

pelling means, an inclined conductor which travels from one way to the other, and a wheeled carrier adapted to be propelled on said ways by the propelling means of the latter and transferred from one way to the other by the conductor.

12. In a system of the class described, a plurality of ways arranged in different planes, each provided with a traveling propelling means, an inclined conductor which travels from one way to the other, a driving connection between the propelling means of the way and the conductor, and a wheeled carrier adapted to be propelled on said ways by said propelling means and transferred from one way to the other by the conductor.

13. In a system of the class described, a plurality of ways arranged in different planes, each provided with a traveling propelling means, a conductor having a part which travels in an inclined plane from one way to the other, a wheeled carrier, adapted to be propelled by the propelling means and transferred by the conductor, and means between the receiving end of the conductor and the propelling means, for disengaging the carrier from the latter

14. In a system of the class described, a plurality of ways arranged in different planes, an endless traveling propelling means in operative relation with each of said ways, a wheeled carrier having means engaged by the propelling means for propelling the carrier over said ways, and an endless platform which travels in an inclined plane from one way to the other.

15. In a system of the class described, a plurality of ways arranged in different planes, an endless traveling propelling means in operative relation with each of said ways, a wheeled carrier having means engaged by the propelling means for propelling the carrier over said ways, and an endless platform which travels in an inclined plane from one way to the other and means for disengaging the carrier from the propelling means at a place adjacent to the receiving end of the platform.

16. In a system of the class described, a pluralitv of ways arranged in different planes, each having a main line with switch-lines, leading therefrom, said main and switch lines each including traveling propelling means, inclined conductors, connecting the ways with each other and arranged between the switch-lines, a wheeled carrier adapted to travel on each way and to be conducted from one to the other by the inclined conductors, the carrier having a device to engage the propelling means of the main and switch lines, and means at the junctions of the main lines and switch lines for controlling the movement of the carrier between the same.

17. In a system of the class described, a plurality of ways arranged in different planes, each provided with an endless traveling propelling means and switches at different places along the length thereof, a plurality of conductors each having a part which travels in an inclined plane from one way to the other, and a wheeled carrier movable on said ways and adapted to be transferred by the conductors, said carrier having means by which it is propelled by the propeller and directed by the switches.

18. In a system of the class described, a plurality of ways arranged in different planes each having a groove, an inclined movable platform traveling between said ways, means inclined along said platform, having a channel which communicates with the grooves in the ways, and an endless traveling propelling means which traverses said grooves and channel.

19. In a system of the class described, a plurality of ways arranged in different planes, each having a groove, a frame inclined between said ways and having a channel which communicates with said grooves, an endless traveling propelling means which traverses said grooves and channel, endless platforms supported by the frame and arranged on opposite sides of said channel, and means for communicating simultaneous movement to said platform and endless traveling means.

20. In a system of the class described, a plurality of ways arranged in different planes, each having a groove, a frame inclined between said ways and having a channel which communicates with said grooves, an endless traveling propelling means which traverses said grooves and channels, endless platforms supported by the frame and arranged on opposite sides of said channel, and means for communicating simultaneous movement to said platform and endless traveling means, said platform having interrupted surfaces whereby they are adapted to restrain movement of wheels thereon.

21. A system of the class described, comprising a wheeled carrier and conducting means therefor, including an endless traveling propeller for moving the carrier on a level and means for moving the carrier to or from said level, and means between the same for disengaging the carrier from one and permitting it to be engaged with the other.

22. In a system of the class described, a wheeled carrier, an endless traveling propeller therefor, an inclined conducting means for the carrier, and means for directing the carrier from the propelling means, between the latter and the conducting means.

23. In a system of the class described, an endless traveling propeller, switches tap-

ping the same at different places in the length thereof, a second endless traveling propeller arranged in a plane different from that of the first one, an inclined conducting means between said propellers, in operative relation with one of said switches, and a wheeled carrier, adapted to be engaged by said propeller and conducting means.

24. In a system of the class described, a plurality of endless traveling propellers arranged in different planes, a wheeled carrier having means for engaging the propellers, means arranged at various places along the lengths of the propellers for disengaging the carrier therefrom, and means for conducting the carrier between said propellers.

25. In a system of the class described, a wheeled carrier, a plurality of endless traveling propellers therefor, arranged in different planes, a plurality of conductors, inclined with relation to the propellers, for conveying the carrier from one plane toward the other and a switch arranged at the junction of each propeller and the receiving portion of an inclined conductor, operable to divert the carrier from the former toward the latter or to permit its movement with the propeller to continue.

26. In a system of the class described, a wheeled carrier, a pair of endless propellers therefor arranged to travel in different approximately horizontal planes, and means for conducting the carrier between said propellers, including a pair of conductors which travel between said planes and switches between the conductors and propellers.

27. In a system of the class described, a wheeled carrier, a pair of endless propellers therefor arranged to travel in different approximately horizontal planes, and means for conducting the carrier between said propellers, including a pair of inclined endless conductors which travel between said planes and switches between the conductors and propellers.

28. In a system of the class described, a wheeled carrier, conducting elements therefor, comprising a way, an endless traveling propelling means, in operative relation therewith, adapted to engage the carrier, and an endless traveling platform inclined with relation to said way and adapted to support the carrier, and means for disengaging the carrier from one of said traveling elements at a place adjacent to the other.

29. In a system of the class described, a plurality of ways arranged in different planes, a traveling propeller in operative relation with one of said ways, the latter having a groove giving access to said propeller, a wheeled carrier adapted to be moved on the ways having a device which travels in said groove and communicates movement of the propeller to the carrier, an inclined frame between said ways having a channel and traveling means in operative relation with said channel adapted to engage said device and traveling platforms on opposite sides of the channel for supporting the carrier in its passage between the ways.

30. In a system of the class described, a plurality of ways arranged in different planes, a traveling propeller in operative relation with one of said ways, the latter having a groove giving access to said propeller, a wheeled carrier adapted to move on said ways having a device which travels in said groove and communicates movement of the propeller to the carrier, an inclined frame between said ways having a channel, a traveling means in operative relation with said channel, adapted to engage said device, traveling platforms on opposite sides of the channel and adapted to support the carrier in its passage between the ways, and a driving connection between the propeller and the platform and traveling means of the frame.

31. In a system of the class described, a way, an endless traveling propeller operatively related to the way, a conductor inclined with relation to said way, and provided with an endless traveling element, a wheeled carrier having a projection to engage said propeller and traveling element, and a driving connection between the propeller and traveling element.

32. In a system of the class described, a way, an endless traveling propeller for moving a carrier over said way, an inclined conductor adapted to move the carrier relatively to said way, said conductor having a traveling means, and a driving connection between the traveling means of the conductor and the traveling propeller.

33. In a system of the class described, a way, an endless traveling propeller operatively related to said way and adapted to propel a carrier thereover, the way having a groove, an inclined conductor adapted to support the carrier, and means for imparting traveling movement to the conductor for conveying the carrier relatively to the way, said means having a driving connection with said propeller.

34. In a system of the class described, a way, an endless traveling propeller operatively related to said way, the latter having a groove giving access to the propeller, an inclined conductor having a traveling platform, and a driving connection between the platform and propeller.

35. In a system of the class described, a way, an endless traveling propeller arranged in an approximately horizontal plane and operatively related to the way and adapted to move a wheeled carrier thereover, an inclined traveling platform for transferring the carrier toward or from said way, endless traveling means for moving said plat-

form and a driving connection between said traveling means and propeller.

36. In a system of the class described, a way, a main endless traveling propeller arranged in an approximately horizontal plane adjacent to the way, branch lines leading from said propeller and including traveling propellers, an inclined conductor having a means which travels an inclined path relatively to the propellers and means whereby the propellers of the branch line and the traveling means of the conductor derive motion from the main propeller.

37. In a system of the class described, a way, a main endless traveling propeller arranged in an approximately horizontal plane adjacent to the way, branch lines leading from said propeller and including traveling propellers, an inclined conductor having endless platforms which travel an inclined path relatively to the propellers, and means whereby the propellers of the branch line and the platform of the conductor derive motion from the main propeller.

38. In a system of the class described, a way, an endless traveling propeller operatively related to the way, a conductor inclined with relation to said way, and provided with an endless traveling element, a wheeled carrier having a projection to engage said propeller and traveling element, and a driving connection between the propeller and traveling element.

39. In a system of the class described, a way, an endless traveling propeller for moving a carrier over said way, an inclined conductor adapted to move the carrier relatively to said way, said conductor having a traveling means, and a driving connection between the traveling means of the conductor and the traveling propeller.

40. In a system of the class described, a way, an endless traveling propeller operatively related to said way and adapted to propel a carrier thereover, the way having a groove, an inclined conductor adapted to support the carrier, and means for imparting traveling movement to the conductor for conveying the carrier relatively to the way, said means having a driving connection with said propeller.

41. In a system of the class described, a way, an endless traveling propeller operatively related to said way, the latter having a groove giving access to the propeller, an inclined conductor having a traveling platform, and a driving connection between the platform and propeller.

42. In a system of the class described, a way, an endless traveling propeller arranged in an approximately horizontal plane and operatively related to the way and adapted to move a wheeled carrier thereover, an inclined traveling platform for transferring the carrier toward or from said way, endless traveling means for moving said platform and a driving connection between said traveling means and propeller.

43. In a system of the class described, a way, a conductor provided with a platform which travels an inclined path, relatively to the way, a traveling propeller which traverses an approximately horizontal path adjacent to the way and is adapted to propel a carrier over the latter, and gearing driven by one of said traveling parts and communicating motion therefrom to the other.

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.