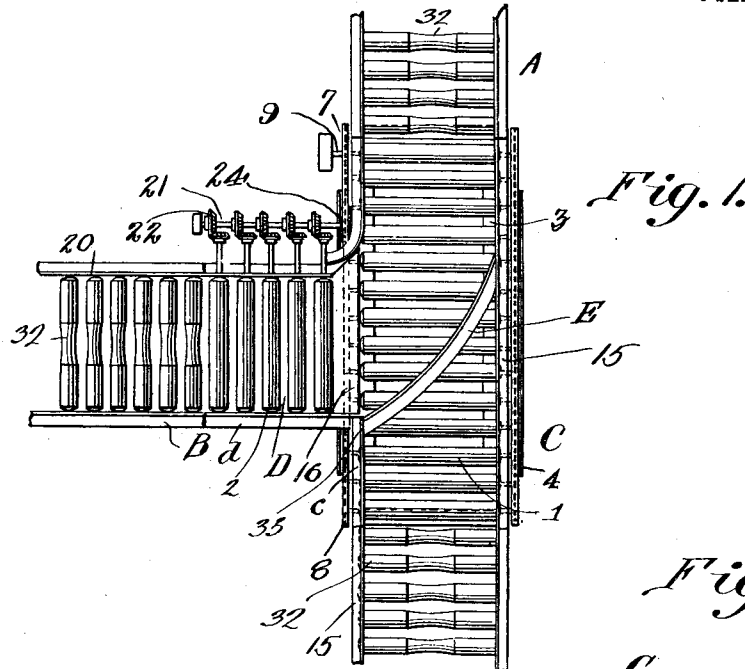
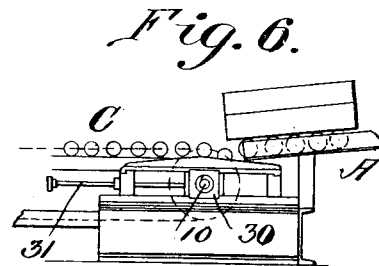
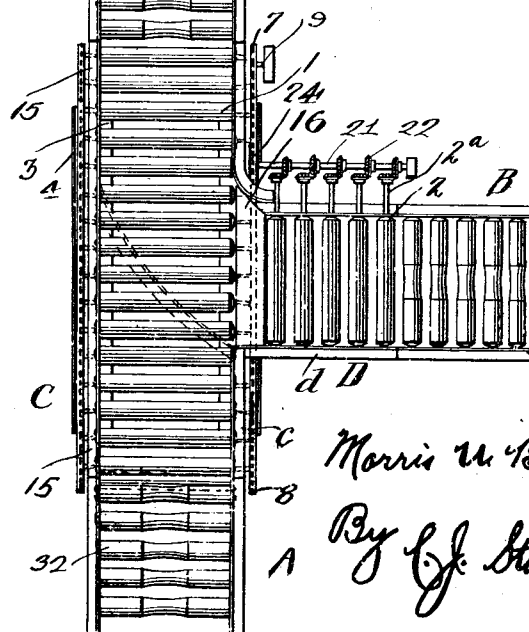


M. U. BERNHEIM.
CONVEYING SYSTEM.
APPLICATION FILED NOV. 3, 1909.

1,130,877.

Patented Mar. 9, 1915.

3 SHEETS—SHEET 1.



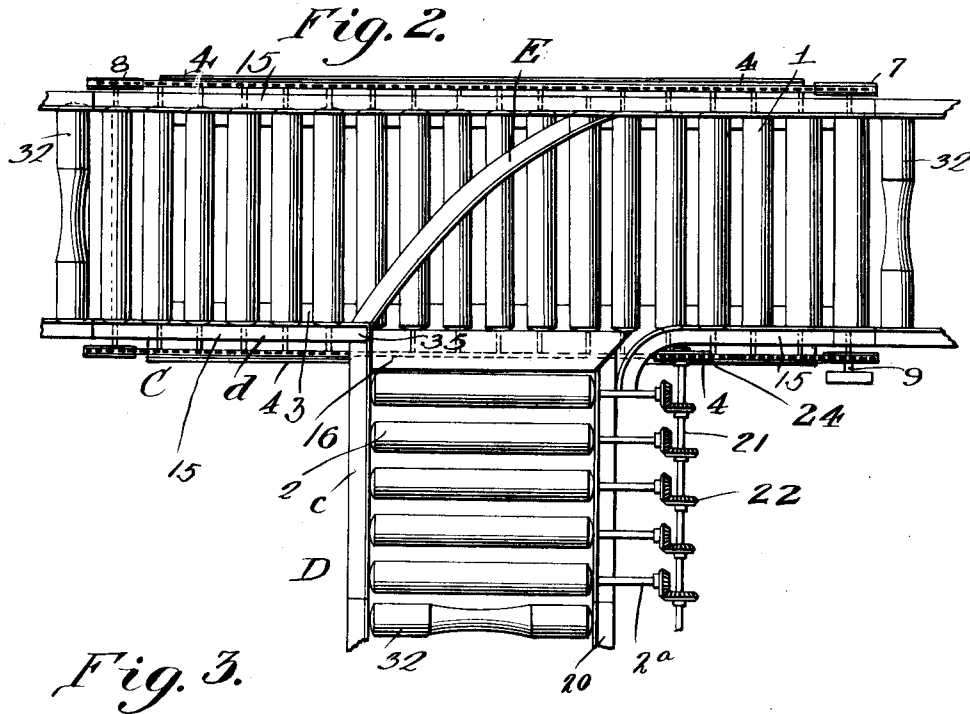
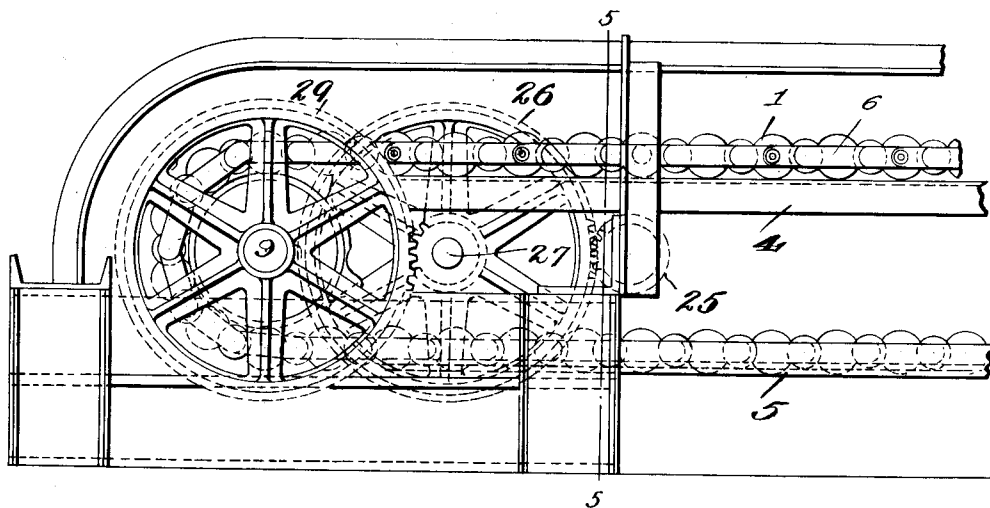
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3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

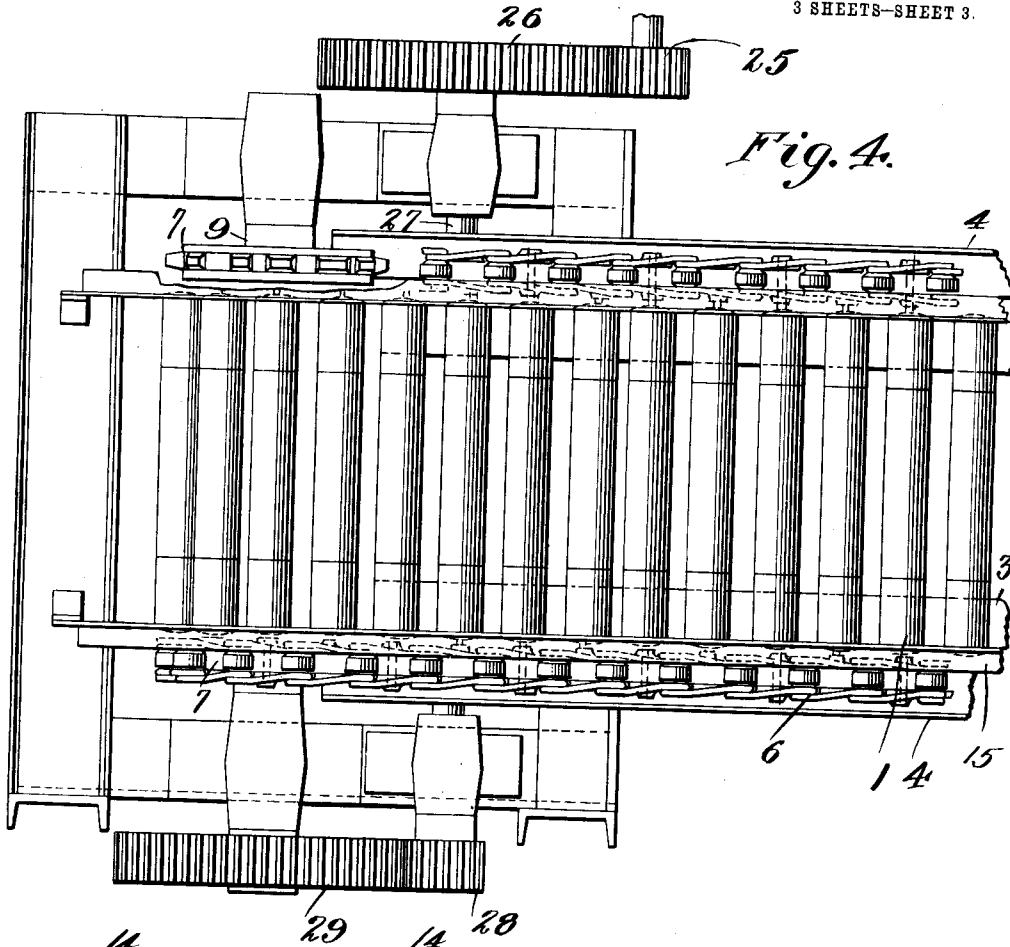


Fig. 4.

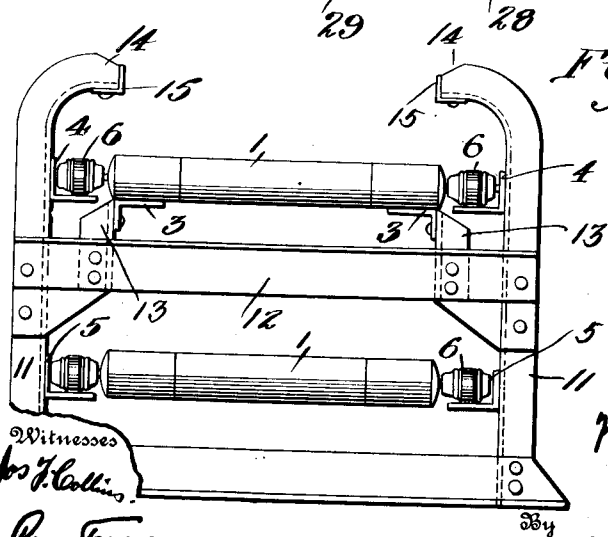


Fig. 5.

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UNITED STATES PATENT OFFICE.

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CONVEYING SYSTEM.

1,130,877.

Specification of Letters Patent.

Patented Mar. 9, 1915.

Application filed November 3, 1909. Serial No. 526,140.

To all whom it may concern:

Be it known that I, MORRIS U. BERNHEIM, citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Conveying Systems, of which the following is a specification.

This invention has reference to conveying systems of the kind wherein what may be arbitrarily termed a main line or run is tapped at intervals by what may be termed branch lines leading off therefrom to various places. Such a system is useful, for example, in a case wherein packages are to be taken from a receiving station, which may be contiguous to cars or wagons to be unloaded and delivered thence to various places inside of the warehouse, or taken from various places in such warehouse and delivered to a receiving place which may be adjacent to wagons or cars to be loaded.

The principal object of the invention is to provide a most effective means for transferring the packages from the main to a selected branch run, or from the latter to the main run, as the case may be, which means will be positive in its action and will accomplish its function with the utmost reliability and without danger of breakage of the packages, or of the contents thereof, even though the latter be of fragile nature, as glass.

Another of the important objects of the present invention is to provide a gravity conveyer, adapted to be arranged at a relatively slight grade as compared with gravity chutes, and having sections disposed at an angle with each other and with their ends connected together by a means which will obviate the necessity of providing a widely curved section at the junction of the two angularly arranged sections and will overcome all danger of the packages stopping on the curve when moving slowly or of striking the guards customarily provided at said curves with sufficient force to be liable to disarrange or injure the contents of the packages even when said contents are of a fragile nature.

Another of the important objects of the invention is to provide a gravity conveyer of the kind referred to, having a main line tapped between its ends by one or more branch lines arranged approximately at

right angles therewith, with a means connecting the main line and each of the branch lines together, said means being capable of positively and safely transferring the packages from the main line to the branch line or from the branch line to the main line, and also adapted to permit the packages to pass from one section of the main line to another section thereof, at will.

These objects of the invention are well accomplished by the construction illustrated in the accompanying drawings, selected to exemplify what I at present regard as the best form of the invention, but in the details of which changes 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 of part of a gravity conveyer embodying my present improvements. Fig. 2 is a plan view of the transferring section of the conveyer arranged at the junction of the main and branch lines or runs. Fig. 3 is a side elevation of one end portion of said transferring section. Fig. 4 is a plan view of said end portion. Fig. 5 is a cross section on the line 5—5 of Fig. 3. Fig. 6 is a view on a smaller scale of the transferring section, showing also the end of a gravity conveyer in operative relation therewith.

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

The herein-exemplified system of conveyers embodying the present improvements has a plurality of conveyer-sections A whose confronting ends are separated from each other so as to form what may be arbitrarily designated a main line interrupted at one or more places in its length: one or more conveyers or sections B, which may be arbitrarily designated "branch lines" extending in appropriate directions with respect to the main line and having their ends which are adjacent to the latter respectively so disposed as to be opposite to the spaces interrupting the continuity of the latter and in a spaced relation therewith: and one or more transferring conveyers each composed of two elements C and D, the former of which occupies the space between two adjacent conveyers or sections A and the element D of which taps the side of the element C and occupies the space between the latter and the adjacent conveyer B; together with a suitable switch E which is arranged con-

tiguous to the elements C and D and acts to guide the package from one element to the other, when it is in place. In the exemplified arrangement this switch intersects the path of the packages delivered to the element C by the contiguous section A of the main line and diverts the same from said path to that formed by the element D, which delivers the package to the adjacent section B of the branch line.

In respect of the transferring conveyer, the invention comprehends the use of one having two separate series of power-driven rollers 1 and 2, which form the beds or ways of the elements C and D, respectively, the rollers of one series having their axes arranged at right or other suitable angles with those of the other series, and the said series being in such coöperative relation with each other and with the switch E, that the rollers of one will exert a force on the package sufficient to cause it to turn, and continue its progress in its changed direction, when it reaches the switch, and will deliver its forward edge to the rollers of the other element before releasing their action upon the package, the two series of rollers now, for a length of time dependent upon the length of the package, acting upon the latter, one to push and the other to pull the same, until it has been fully withdrawn from one element, whereupon the rollers of the other element propel the package to the section or line of conveyer to which it leads. By this coöperative action of the means set forth, packages such as beer-cases, for example, either filled or empty, can be safely and positively delivered from one conveyer or line of conveyers, to another arranged at right angles therewith, all tendency of stoppage of the progress of the packages at the junction place being overcome.

The preferred embodiment of my invention will now be described in detail. The elements C and D comprise frames *c* and *d* which are arranged at right angles to each other, the ends of one, as *d*, abutting the side of the other at a place intermediate of the length of the latter. Each side of the frame *c* is composed of connected and supported angle irons 3, 4 and 5 (Fig. 5), arranged at different vertical planes and extending longitudinally thereof. The angle irons 4 and 5 form tracks or ways for the sprocket chains 6, or other endless traveling means, by which the rollers 1 are caused to travel longitudinally of the element C, while the angle irons 3 form tracks for the rollers, causing the same to rotate while they are being moved bodily forward, in their working run; whereby the package is propelled on the roller bed in addition to being advanced by the traveling movement of the latter. The endless traveling means referred to, run over sprockets, or other suit-

able driving and guiding elements 7 and 8 mounted on shafts at the ends of said elements C, the shafts of the driving sprockets 7 being marked 9.

The connecting and supporting members for the angle irons 3, 4 and 5 (see Fig. 5) comprise vertical members 11 at each side of the frame and transverse members 12 connecting each with its companion at the other side of the frame. These vertical members are preferably formed of angle irons and to each of the same the members 4 and 5 are secured, by rivets, or otherwise. The transverse members 12 are provided with plates or brackets 13 to which the angle irons 3 are secured. The vertical members extend to a plane above that of the rollers 1 and have inwardly bent ends, as shown at 14 and these ends of each series of members 11 are connected with each other by a longitudinal member 15. The members 15 form guide rails which prevent packages from moving laterally off the element C. The guide rail at the side of the elements C remote from the element D may be continuous throughout the length of its element, but that at the other side of the element C is interrupted at the junction with the element D so as to permit the package to enter the latter. At this junction, a plate 16 (Figs. 1 and 2) is arranged over the sprocket chain, said plate having its upper surface approximately in the plane of the upper surfaces of the rollers 1 and 2, so as to form a part of the bed or way, this plate serving to support the lower side of the package in its movement from one series of rollers (1), to the other series (2) and preventing its forward edge from falling below the longitudinal axes of the rollers, where it would not be properly engaged by the latter, and from engaging with or being engaged by the traveling chain. A frame formed of the elements set forth, properly spaced apart and secured together, is light and strong and for these reasons is preferred.

Inasmuch as it is not considered to be advisable to impart traveling movement to the rollers 2, the frame of the element D may be of much simpler construction. The one employed by me is composed of longitudinal angle-irons 20, suitably supported and forming bearings for the shafts 2^a of the rollers 2. These shafts 2^a are driven by the shaft 21 which extends longitudinally of the element D at the side thereof, and is provided with bevel gears 22 which intermesh with similar gears on the shafts 2^a.

One of the features of my invention is that there shall be a driving connection between the rollers 2 and at rollers 1, whereby one series of rollers receive motion from the other. Preferably, the rollers 2 derive motion from the means which cause the rollers 1 to travel; hence, as here shown, the end

of the shaft 21 contiguous to the element C is provided with a sprocket wheel 24 which engages the contiguous chain 6 and is driven thereby.

5 A suitable motor, not shown, has a driving connection with the shaft 9 for driving the chains 6. This driving connection preferably includes reducing gears, and as here shown (see Fig. 4) comprises a pinion 25
10 connected to the motor and meshing with a gear 26 mounted on one end of a transverse shaft 27, the other end of which is provided with a pinion 28 intermeshing with a gear 29 mounted on the shaft 9. At the other end
15 of the element C there is a take-up mechanism of suitable character, for taking up slack in the chains. This mechanism (see Fig. 6) may desirably include boxes 30 which form bearings for the shaft 10 and are slid-
20 ably mounted in the frame, with contiguous elements of which they have a suitable guiding connection, together with adjusting rods 31 engaging the boxes and having threaded connection with the frame.

25 The conveyer sections A preferably employed in conjunction with the present transferring means, are of the gravity-roller type, that is to say, of that type whereof the bed
30 or way is arranged at a downward inclination and is composed of freely rotatable rollers 32 which advance the packages under the influence of gravity, and this is also true of the sections B; it being one of the important purposes of my present invention to
35 provide a system of this character wherein crates, cases and other packages, of the kind usually handled by such systems can be successfully transferred from one line to another at right angles therewith by two series
40 of rollers, which in the junction or transferring element range with their axes parallel with those of their respective lines and at right angles with each other thus avoiding the necessity of wide turns on steep grades at the junction. The switch E when in place
45 to divert a package from the element C to the element D extends from the junction 35 of one side of frame c and one side of an end of frame d, diagonally across the plane of
50 the rollers 1, to the other side of the frame c, joining the latter at a place approximately in line with the other side of said end of the frame d, and at the junction of the latter
55 side of the frame d and the first-mentioned side of frame c, there is an arm or bar 36 which may be a continuation of the guide-rail 15 and serves to prevent lateral displacement of the packages in their movement from one element to the other. Prefer-
60 ably, the switch is curved to present a concave wall to the approaching package, and the arm or bar 36 is preferably curved, but disposed to present a convex side to said package, whereby angles in the path of
15 movement of the package from one element

of the transferring means to the other, are eliminated. The switch also is adapted to be moved out of its operative position in order that packages which are not intended to be switched from the section C may continue uninterruptedly on the latter. In the present embodiment this is accomplished by lifting it out of place manually.

From the foregoing construction, the operation and advantages of my invention will be readily comprehended, and it will be apparent that while I have provided a system of very advantageous detail construction, yet changes may be made in the illustrated details without departing from the spirit of the invention. Among changes which may be made in the details mention may be made of the use of concave rollers in the transferring element, like those illustrated in the gravity elements, and the use, if desired, of tapered rollers, concave or otherwise, in the traveling series. Another change which may be mentioned is the driving of the sprocket chains from the shaft 21, instead of utilizing the chain as a driver for said shaft.

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

1. A transferring means for package-conveying systems, comprising two members arranged approximately at right angles with each other, each of said members having its bed or way provided with a series of power-driven package-feeding rollers, the rollers of one member having their axes disposed approximately at right angles with the rollers of the other member, and the rollers of the two members being relatively so arranged that the end roller of one will be adjacent to the ends of rollers of the other, whereby the rollers of the two members will act conjointly upon a package, and a switch arranged as a bar to the path of travel of the package on one series of rollers for guiding said package from one series toward the other series.

2. A transferring means for package-conveying systems, comprising two members arranged approximately at right angles with and adjacent to each other, each of said members having its bed or way provided with a series of power-driven package-feeding rollers, the rollers of one member having their axes disposed approximately at right angles with the rollers of the other member, and driving mechanism for said rollers, including endless traveling elements connected with one series thereof to cause the same to travel longitudinally of their members, a power-transmitting element connected with said traveling element, and connections between said power-transmitting element and the rollers of the other series, the end roller of the latter series being ad-

adjacent to the ends of the traveling series of rollers and a switch arranged as a bar in the path of the packages so as to divert packages from one series of rollers to the other.

3. A transferring means for package-conveying systems, comprising two members arranged approximately at right angles with and adjacent to each other, each of said members having its bed or way provided with a series of power-driven package-feeding rollers, the rollers of one member having their axes disposed approximately at right angles with the rollers of the other member, means whereby the rollers of one series are given traveling movement in a path adjacent to and longitudinal of the end roller of the other series and are caused to rotate, a switch disposed over the traveling series of rollers, for guiding the package toward the other series of rollers, and driving elements for said other series of rollers.

4. A transferring means for package-conveying systems, comprising a frame, one side of which is interrupted intermediate of its length, means for propelling a package along said frame comprising a series of rollers and endless traveling means for imparting movement thereto, a second frame extending laterally with relation to the first frame and joining the same at the interruption in the latter, a series of power-driven rollers carried by the second frame and having their axes approximately at right angles with the axes of the rollers of the first mentioned frame, a guard arranged between the two series of rollers over the traveling means of the first frame at the interruption in the latter, and disposed approximately in the horizontal plane of the surfaces of the rollers, and a switch intersecting the path of movement of a package on the first series of rollers, for guiding the package toward the other series of rollers.

5. In a conveying mechanism, a plurality of members arranged approximately at right angles with each other, and respectively comprising a series of package-propelling rollers forming its bed or way, one of said members having endless-traveling chains which carry its rollers longitudinally thereof, and means whereby said rollers are caused to rotate during said traveling movement, the other member having a shaft, provided with driving connections between it and the rollers of said member and with a sprocket which is engaged by a chain of the first-mentioned member, and a switch intersecting the path of a package on the traveling rollers, for guiding said package therefrom to the other rollers.

6. In a conveying mechanism, a plurality of frames, one of which taps the side of the other intermediate of the length of the latter and is arranged approximately at right angles therewith, a series of rollers extend-

ing transversely of each frame, means for imparting traveling movement to one series of rollers, including a pair of endless traveling sprocket chains connected thereto, a track for the latter series of rollers, a switch intersecting the path of movement of a package on said rollers for guiding the same to the other series of rollers, and driving elements for said other series of rollers, including a sprocket wheel engaged by one of said chains.

7. A conveying mechanism comprising a plurality of main line sections having separated confronting ends, a branch line having an end arranged opposite the space between the main line sections, and a transferring means which comprises two members disposed approximately at right angles with each other, one of said members occupying the space between the sections of the main line and the other occupying the space between the first mentioned member and the branch line, each of said members having its bed or way provided with a series of power-driven package-feeding rollers, the rollers of one member having their axes disposed approximately at right angles with the rollers of the other member, and a switch arranged in the path of travel of the package on one series of rollers for guiding said package from one series toward the other.

8. A conveying mechanism comprising a plurality of main line sections having separated confronting ends, a branch line having an end arranged opposite the space between the main line sections, and a transferring means which comprises two members disposed approximately at right angles with each other, one of said members occupying the space between the sections of the main line and the other occupying the space between the first mentioned member and the branch line, each of said members having its bed or way provided with a series of power-driven package-feeding rollers, the rollers of one member having their axes disposed approximately at right angles with the rollers of the other member, and a switch arranged in the path of travel of the package on one series of rollers for guiding said package from one series toward the other, said switch and the two series of rollers being so correlated that the end of the package presented to the switch will be turned from the line of one series of rollers to the line of the other series and both series of rollers will act simultaneously thereon, one exercising a pulling and the other a pushing force, for a time in the transfer of the package.

9. A conveying mechanism comprising a plurality of lines of conveyers arranged at an angle with each other, and a transferring conveyer arranged in the junction of said lines and comprising two members respec-

tively forming elements of said lines, each
of said members having a series of package-
propelling rollers forming its bed or way,
one of said series of rollers having non-
5 traveling movement and the other having
traveling movement, a switch for guiding
the package from one series of rollers to
the other, and driving connections between
the two series of rollers, said driving con-
10 nections including an endless traveling chain

connected to one series of rollers, a sprocket
wheel engaged by said chain, and connec-
tions between said wheel and the other series
of rollers.

In testimony whereof I affix my signature 15
in presence of two witnesses.

MORRIS U. BERNHEIM.

Witnesses:

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