

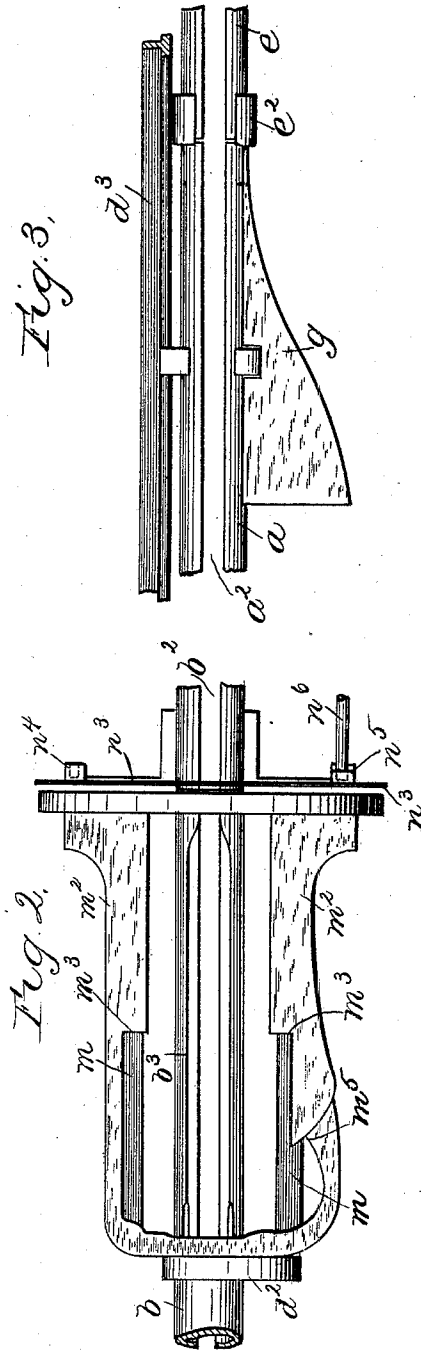
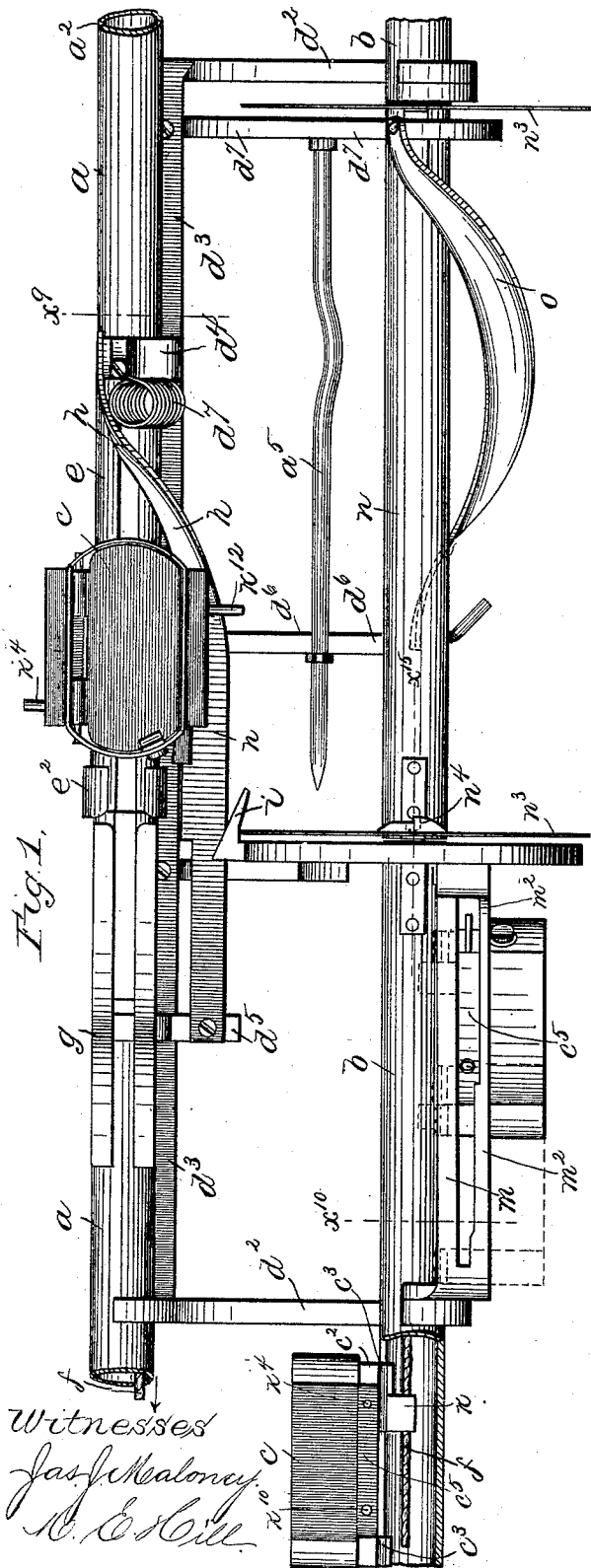
(No Model.)

4 Sheets—Sheet 1.

J. C. MARTIN.
CASH CARRIER APPARATUS.

No. 475,879.

Patented May 31, 1892.



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(No Model.)

4 Sheets—Sheet 2.

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No. 475,879.

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Fig. 4.

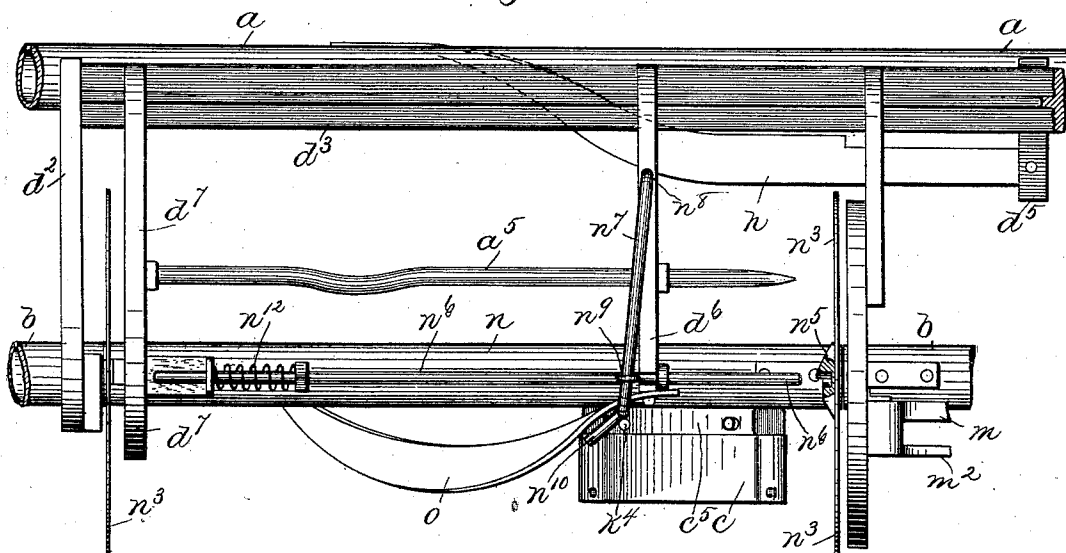


Fig. 5.

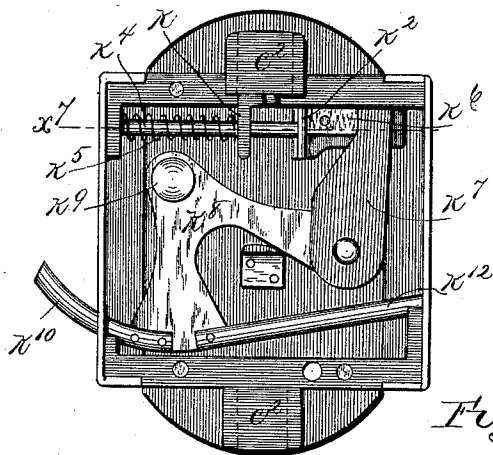


Fig. 6.

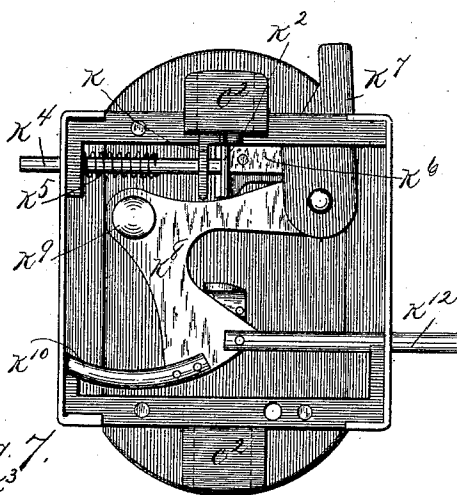
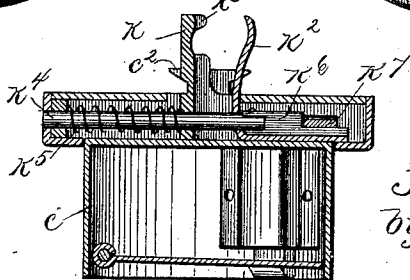


Fig. 7.



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Fig. 8.

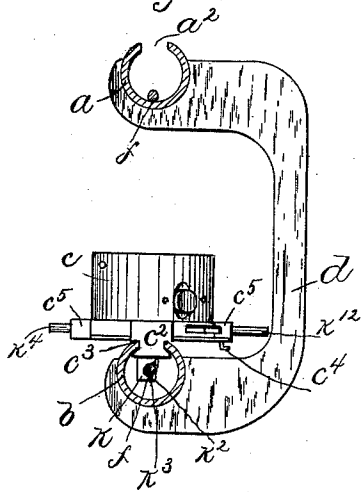


Fig. 9.

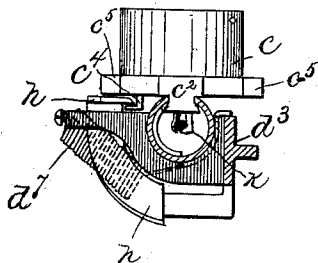


Fig. 10.

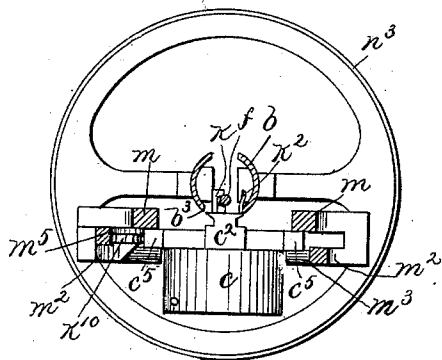


Fig. 11.

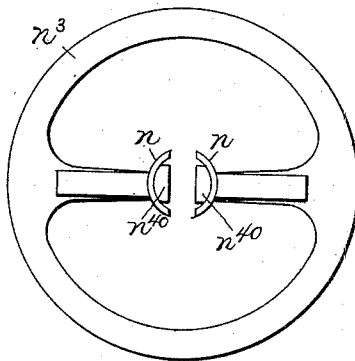


Fig. 13.

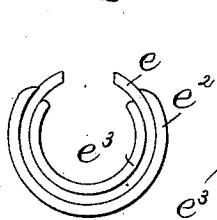


Fig. 12.

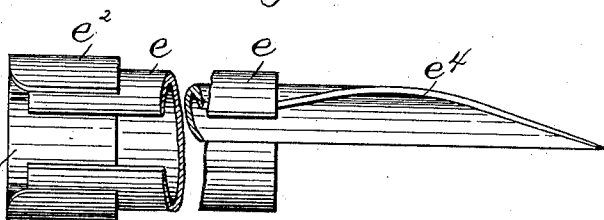


Fig. 14.

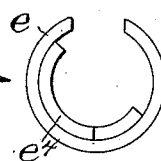
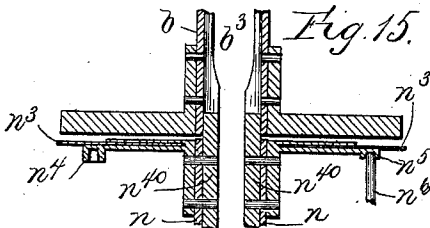


Fig. 15.



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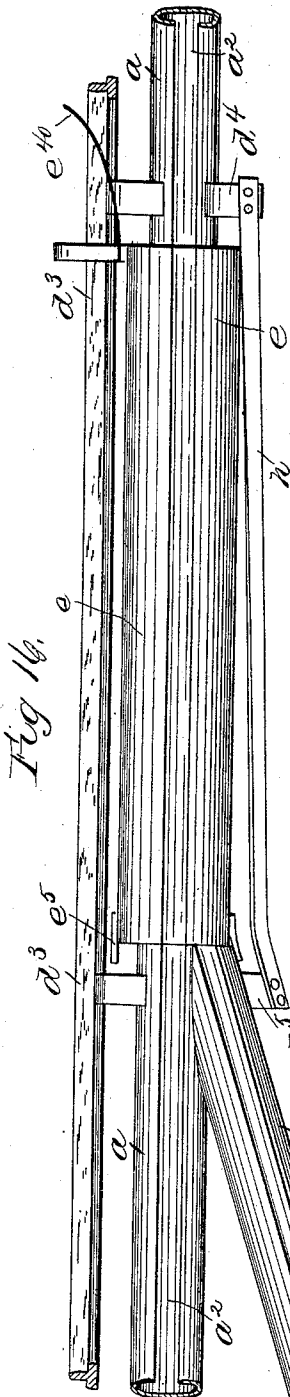
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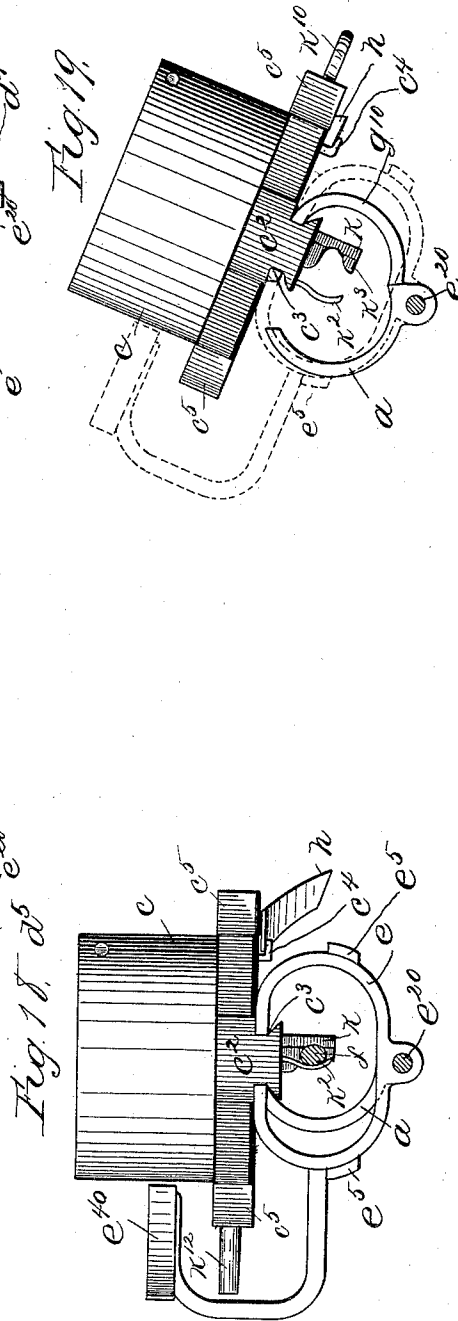
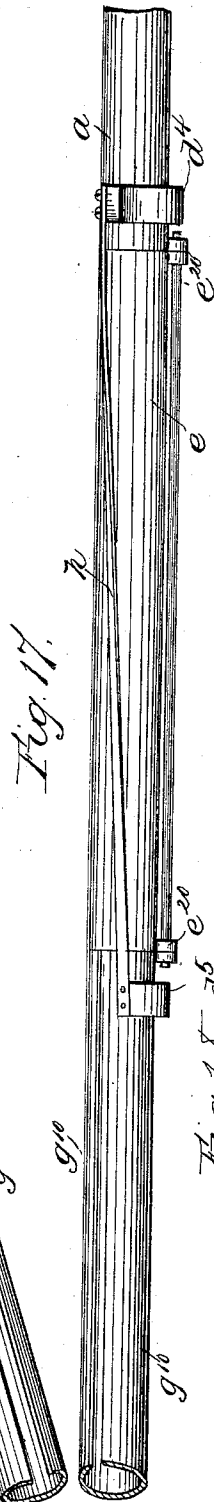
J. C. MARTIN.
CASH CARRIER APPARATUS.

No. 475,879.

Patented May 31, 1892.



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Jas. J. Maloney.
W. C. Hall.



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UNITED STATES PATENT OFFICE.

JOSEPH C. MARTIN, OF FLORENCE, MASSACHUSETTS.

CASH-CARRIER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 475,879, dated May 31, 1892.

Application filed February 16, 1892. Serial No. 421,731. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. MARTIN, of Florence, county of Hampshire, State of Massachusetts, have invented an Improvement in Cash-Carriers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a conveying apparatus for use in stores, and is embodied in an apparatus of that kind in which a propelling-cable is used, and the carriers are provided with clutches or cable-grips by which they are connected with the cable when they are to be propelled along the track, although portions of the invention are applicable to an apparatus in which other means than a traveling cable are employed to propel the carriers.

The invention relates especially to details of construction of the apparatus at the stations where the carriers are to be applied to the track and connected with the cable, and removed from the track and disconnected from the cable, and also to details of construction of the gripping devices or clutch and means for operating the same.

The apparatus comprises two tracks, on which the carriers move in opposite directions, one of which tracks will for convenience be called the "forwarding-track," being the one on which the carriers are sent from the stations at which the sales are made to the cashier's desk, and the other of which will be called the "return-track," and the cable travels in one direction along one of said tracks and in the opposite direction along the other track, which tracks are for the main parallel with one another and are usually arranged one above the other, although such arrangement is not essential. The tracks are composed for the most part of tubes having a slit along their upper side, the edges of which slit constitute the rails or guides of the track upon which the carriers run and by which they are positively supported and guided in their movement. The cable is contained within the said tube, which constitutes a support and guide for the cable, except at angles or bends in the track at which the usual guide-pulleys are used, the construction at angles, &c., constituting no part of the

present invention. The position of the track, whether horizontal or vertical or inclined, and the position of the guide-slit are immaterial, except at the points where the carriers are to be applied to the track, at which points the effect of gravity on the cable is relied upon to insure the proper engagement with the clutch; but for convenience the terms "upper" and "under" and "top" and "bottom," &c., will be used in describing the apparatus, although it is to be understood that the actual position of the parts with relation to the horizontal or vertical is immaterial, except at the points where the cable is gripped.

A common characteristic of the appliances at the stations is that short portions of the track or switch sections are movable, having a rotary or oscillating movement about an axis parallel or coincident with the axis of the main track, by which movement the carriers are applied to or removed from the main track, the said movable or switch sections having guide-slots which in one position of the sections are in line with the guide-slots of the main track, so that the switch-section then constitutes substantially a part of the main track, upon which such carriers as belong to other stations may run past the stations having the switch-section in question and which guide-slot of the switch-section is carried by the oscillatory movement of the said section out of line with the main track and preferably into line with a branch section or guide other than the main track for the purpose of enabling the carriers to be delivered from the main track and onto the branch track as they arrive at the stations on the return-track to which they belong or for enabling them to be applied to the forwarding main track at the stations.

Suitable guides are provided for causing the proper movement of the carriers and switch-tracks at the delivery and receiving points, and also for causing the clutches to be engaged and disengaged at the proper times.

Figure 1 is a front elevation of the appliances employed at the station of a conveying apparatus embodying this invention, the parts being shown with a carrier in the operation of being delivered from the return-track and one in two positions in the operation of being applied to the forwarding-track, and a third

being represented as traveling on the forwarding-track from a station other than the one shown. Fig. 2 is an underneath plan of the branch portion of the forwarding-track to which the carriers are applied by the attendant preparatory to being sent along the said forwarding-track; Fig. 3, a top plan of a portion of the return-track and branch on which the carriers are received therefrom; Fig. 4, a rear elevation of a portion of the appliances shown in front elevation in Fig. 1; Figs. 5 and 6, underneath plans of the bottom of the box with the clutch-inclosing plate removed, showing the clutch and its operating devices in open and closed position, respectively; Fig. 7, a section of the clutch mechanism on line x^7 , Fig. 5; Fig. 8, a transverse section of the main portion of the two tracks between the stations, showing one of the carriers in front end elevation; Fig. 9, a transverse section on line x^9 , Fig. 1, showing the station appliances of the return-track in end elevation; Fig. 10, a transverse vertical section on line x^{10} , Fig. 1, of the appliances of the forwarding-track; Fig. 11, an end elevation of the movable switch-section of the forwarding-track; Fig. 12, a partial plan showing the end portions of the movable switch-section of the return-track; Figs. 13 and 14, end elevations thereof, respectively; Fig. 15, a sectional plan on line x^{15} , Fig. 1; Fig. 16, a plan view showing a modified construction of the station appliances on the return-track; Fig. 17, a side elevation thereof; Fig. 18, an end elevation of the switch-track shown in Fig. 16 on a larger scale, and Fig. 19 a detail showing in end elevation the junction of the main and branch tracks of the construction shown in Fig. 16.

The construction of the main tracks is best shown in Figs. 1 and 8, said tracks consisting of tubes a b , each having a longitudinal slit a^2 b^2 , the edges of which constitute the rails or guides that sustain and guide the carriers c . The said tracks a b may be supported from point to point on suitable brackets d , (see Fig. 8,) which may themselves be supported or connected with the building or structure in which the apparatus is to be used in any convenient manner.

The carriers c may be receptacles of any suitable size or shape, being shown in this instance as oblong boxes having latched covers, and there being nothing novel in this part of the apparatus except the guiding portion of the carrier and the cable-clutch, which will be hereinafter described. The said boxes have projecting from their under surfaces, near each end, lugs c^2 , provided with lateral grooves c^3 , as best shown in Fig. 8, to receive the edges of the slit tube, as shown in Fig. 8, which thus interlock with the said lugs c^2 and retain the carriers positively in line with the track, it being impossible to disengage the carriers except by moving them endwise out from the slitted tube or by cutting away the sides of the slit in the tube for a width suffi-

cient to permit the ungrooved portion of the projections c^2 to pass laterally out from the tube.

At terminal stations—such, for example, as the cashier's desk—the carriers may merely be drawn out from or pushed into the end of the tube, there being no appliances required except to disengage the clutch from the cable and to cause its engagement therewith, which may be done by similar devices to those employed at the way-stations, so that no detailed description of the terminal stations is necessary.

At way-stations on the return-track a , where some of the carriers are to be removed from the track, the construction shown in Figs. 1, 3, 9, 12, 13, and 14 may be adopted. At these points the main track a is broken or has a short section removed and the space occupied by a switch-track e , which, as shown in Figs. 12 and 13, has at one end a short external collar e^2 or internal collar e^3 , or both, which embrace the end of the main track a , as shown in Fig. 3, thus constituting a bearing on which the switch-track e may rotate about the axis of the main track. At the other end the switch-section (see Figs. 12 and 14) is provided with a cam-shaped projection e^4 , which passes inside the main track and constitutes a similar bearing for supporting the switch-track in its rotation.

The switch-track e may be of the same tubing as the main track and is similarly slitted, so that when in normal position its slit is in line with that of the main track, and the carriers may run over said switch-section the same as if it constituted a part of the main track.

As there are other appliances at the switches besides the tracks, the brackets or framing that supports the tracks is of somewhat different construction from that employed between stations. (Shown in Fig. 8.) The said frame-pieces comprise two end portions d^2 , Fig. 1, which may be substantially like the brackets d between stations; but said end portions are connected by a longitudinal rib d^3 , (see Figs. 1, 4, and 9,) provided with arms that support the parts co-operating with carriers at the station.

Just beyond the rear end of the switch-section e , looking in the direction in which the carriers move on the return-track, (indicated by the arrows adjacent to the cable f ,) there is provided a branch track g , (see Figs. 1 and 3,) consisting merely of two flanges, the edges of which are in the same position with relation to one another as the edges of the slit in the main track, the space between said flanges being about a quarter-turn around the axis of the main track from the slit in the main track, as clearly shown in Figs. 1 and 3, and the said flanges coming up to the side of the main track at the rear end of the switch-track, and thence inclining outward from the axis of the main track, as clearly shown in Fig. 3. Thus by turning the switch-

section *e* a quarter around its axis—that is, from the position shown in Fig. 3, where its slit is in line with that of the main track, to the position shown in Fig. 1—the slit of the switch-track will be brought into line with that formed by the flanges *g*, and consequently if said switch-track be thus turned a quarter around after the carrier has entered upon it from the main track (moving from right to left, as shown in Fig. 1) the said carrier will on continuing its movement pass off from the switch-track onto the branch track *g*, as will be readily understood from Fig. 1, in which the switch-track and carrier are shown as turned into position to cause the carrier *c* to run from the switch-track onto the branch track instead of continuing along on the main track, as it would if the switch-track remained in the position shown in Fig. 3 after the carrier entered upon it. It is necessary, therefore, to rotate the switch-track as just described when the carrier is to be delivered at the stations to which said switch-tracks belong, and at other times to have the switch-track remain in line with the main track, so that other carriers not belonging to said station may pass by to the station to which they do belong. To secure such rotation of the switch-track for the carriers that are to be delivered, said carriers are provided with a projection *c*⁴, shown as at their under surface and near the rear end, (see Fig. 9,) which engages with the edge of a guide *h*, which edge is in the shape of a helix, being concentric with the axis of rotation of the switch-track *e*, but curved around said axis, so that when the projection *c*⁴ of a carrier engages with said guide *h* it causes the carrier to turn about the axis of movement of the switch-track as the carrier advances along the switch-track, and the carrier being positively engaged with the slit in the switch-track therefore causes the said switch-track to turn with it, so that as the projection *c*⁴ travels along the curved guide *h* the carrier and switch-track are both turned a quarter round the axis of movement of the switch-track, bringing its slit into line with the branch track *g*, as shown in Fig. 1, so that any carrier the projection *c*⁴ of which engages with the curved guide *h* at a station is thereby guided off from the main track and onto the branch track.

Where there are several stations along the return-track, the guide projections *c*⁴ of the carriers and the guides *h* will be in a different location for the different stations, the guide *h* at each preceding station being in such position as not to engage with the projection *c*⁴ of carriers belonging to the stations beyond.

It is further necessary only that the grip shall be disengaged from the propelling-cord *f* before the carrier has entered far enough upon the branch track *g* to pull the cord against the side of the main-track tube, which is done by a grip-disengaging projection *i*, (see Fig. 1,) acting upon the grip-opening

projection *k*¹² of the carrier, which will be hereinafter described, it being understood that the described operation of delivering the carrier from the return-track at a station does not depend upon the specific construction of the clutch, nor indeed upon the employment of a cable as the propelling means.

The construction and mode of operation of the appliances shown in Figs. 16 to 19 are substantially the same as has just been described, the corresponding parts being indicated by the same letters. The main difference is that the switch-track *e*, instead of turning on an axis concentric with the main track, turns on pivots *e*²⁰, just below the main track, its axis of oscillation being parallel, though not coincident, with the axis of the main track. With this construction it is not necessary to have so great an angle of movement for delivering the carrier onto the branch track *g*¹⁰, which latter may be a piece of tubing like the main track and set so that its slit comes close to that of the main track *a* at the rear end of the switch-track, which thus needs to move only far enough to carry its slot from the position in line with that of the main track to a position in line with that of the branch track *g*¹⁰, the junction of which tracks is best shown in Fig. 19.

The switch-track *e* is preferably made oval in section, so that when moved into a line with the branch track its side remote from the branch track substantially coincides with the side of the main-track tube, as shown in dotted lines in Fig. 19, thus preventing any binding on the cable, and said switch-track may be provided with stops *e*⁵ to limit its movement in either direction.

The guide *h* is supported on arms *d*⁴ *d*⁵ from the station frame-piece *d*³, and a spring *d*⁷ (see Fig. 9) is applied between the switch-track *e* and arm *d*⁴, tending to turn the said switch-track into line with the main track, so that the said switch-track normally stands in line with the main track, and is returned thereto immediately after a carrier leaves the switch-track and enters onto the branch track.

The cam-piece *e*⁴, Figs. 12 and 14, projects into the main track *a* approaching the switch-track, and said portion *e*⁴ has a spiral edge, which as the switch-track is rotated from line with the main track stands diagonally across the slot in the main track approaching the switch-track, and consequently if the spring *d*⁷ should for any reason fail to return the switch-track into line with the main track a succeeding carrier would engage by its projection *c*² with the spiral edge of the projection *e*⁴ of the switch-track, which would then act as a cam to cause the switch-track to be turned back into line with the main track as the carrier advanced from the main track onto the switch-track.

In the construction shown in Figs. 16, 17, and 18 the switch-track is provided at its end with a cam-piece *e*⁴⁰, which serves to return it

into line with the main track in case the spring should fail, the said projection e^{40} being engaged by the side of the box as it approaches on the main track. The carriers are connected with the propelling-cord f by the clutch consisting of two members $k k^2$, which project below the bottom of the box and pass into the track-tube through the guiding-slot thereof, and when engaged with the cable hold the same about at the middle of the tube, as shown in the lower track in Fig. 8, while normally the cable will run along the bottom of the tube, as shown on the upper track of Fig. 8, so that if the carrier were introduced on the main track from above the cord would be below the clutch-jaws and would not be engaged thereby when the said jaws were closed together.

The carriers are in accordance with this invention first applied at the under side of the main track at stations on the forwarding-track, as best shown in Figs. 1 and 10. At this point the main-track tube b is cut away at its under side, as shown at b^3 , Figs. 2 and 10, enough to receive the open jaws of the clutch and the ungrooved portions of the projections c^2 of the carrier within it. Such slot or opening in the under side of the main track of course produces no effect upon the carriers running past the stations from stations beyond, as shown at the extreme left hand in Fig. 1.

At the sides of the main track are supported stationary guides $m m^2$, which, as shown in this instance, receive flanges c^5 on the lower part of the carrier-boxes at m^3 , Fig. 2, to enable the flanges c^5 to pass up into engagement with the guide m at the position shown in dotted lines, Fig. 1, after which by a slight movement of said carrier toward the right in said figure its flanges c^5 pass between the guides $m m^2$, which are inclined upward slightly with relation to the axis of the track, so that as the carrier moves toward the right it also is slightly raised, and by the time that it arrives at the end of the guides $m m^2$ the grooves c^3 in its guide projection c^2 are in line with the under portion of the main-track tube. The carrier is thus first applied in inverted position, as shown in dotted lines, Fig. 1, and in full lines, Fig. 10, with its clutch $k k^2$ projecting up through the wide opening b^3 in the track-tube b and in position to engage the cord f , if that is then traveling along the bottom of the tube; but if it should already be engaged by another carrier just approaching the station, as shown in Fig. 1, the cord would be so high up as not to be engaged by the clutch of the inverted carrier, which therefore cannot be engaged and started by the operator until after the carrier already on the track has passed the station, this construction preventing collisions at the point where the carriers are applied.

When the carrier has been applied in inverted position, as shown in dotted lines, Fig. 1, and in full lines, Fig. 10, and is moved in the

direction in which the carriers travel on the forwarding-track—i. e., toward the right, Figs. 1 and 2—a cam projection m^3 , Fig. 2, engages with the clutch-closing projection k^{10} , to be hereinafter described, and thus closes the clutch-jaws $k k^2$ onto the cable, which immediately propels the carrier along, in which movement, owing to the slight upward inclination of the guides $m m^2$, the projections c^2 are carried up through the wide opening b^3 in the bottom of the tube and into position to engage a true guiding-slot in the underside of the tube in the same manner as they have been described as engaging the slot b^2 or a^2 in the upper side of the main tube. It is now necessary in some manner to bring the carrier into its normal position engaged with the slot in the upper side of the main tube, an operation which is performed as follows: The portion of the main track b , having its under side cut away, as just described, terminates about at the end of the guides $m m^2$, there being a short break at this point which is occupied by the switch-track n of the forwarding-track. The said switch-track n is provided with two pairs of guide-edges, or, in other words, with two track-slots, diametrically opposite one another, as shown in Fig. 11, it being practically two segments of a short piece of tubing, which are wholly separated from one another. The said pieces are supported in proper position, so as to constitute, practically, a double-slotted tube by being connected with annular frames n^3 , one at each end of the said track-section, which is, furthermore, provided at each end with dowels or projections n^{40} , (see Fig. 15,) which enter a short distance into the main track, and thus form a bearing on which a double-slotted switch-track may rotate about the axis of the main track. The carrier is guided by the guides $m m^2$, previously described, into the track-slot at the under side of the switch-track n , and if while the carrier is traversing the length of said switch-track it may be caused to make a half-turn about its axis the said slit in which the carrier is traveling will be brought into line with the guide-slit b^2 of the main track beyond the station, as is required, the same operation presenting what was before the upper slit in the switch-track at the bottom thereof ready to receive another carrier. The slit in the switch-track, which is at any time uppermost, forms a connection between the slots b^2 of the adjacent portions of the main track b , so that the carrier may run across the said switch-section the same as if it were a part of the main track b .

The carrier and switch-section n are rotated to bring the carrier from a position below to a position above the same as the carrier traverses across the switch-section (after being gripped to the cord) by means of a spiral guide o , fastened to brackets $d^6 d^7$ from the longitudinal frame-piece d^3 , the said spiral guide o engaging with the corner of the box, as shown in Fig. 4, and thus causing it to re-

volve half around with the switch-track as it travels along the same.

In order to insure keeping the switch-track with its slit in line with those of the main track, one of the frame-pieces n^3 is provided with locking projections $n^4 n^5$, (see Figs. 1, 2, and 4,) which are engaged by a locking-bolt n^6 , Figs. 2 and 4, working in guides connected with the brackets $d^6 d^7$, as shown in Fig. 4. The said bolt is disengaged at the time when the carrier enters the switch-track and just before it begins to turn under the action of the guide o by means of a lever n^7 , pivoted at n^8 and engaged with the slide-bolt n^6 at n^9 , said lever being provided with an inclined projection n^{10} , which is engaged by a projection k^4 from the side of the box, or it may be by the corner of the box. The parts are shown in Fig. 4 with the box having just arrived at the position to unlock the track and begin to turn. A guide-rod a^5 is supported on the brackets $d^6 d^7$, as shown in Figs. 1 and 4, which serves as a bunter to engage the side of the box as it comes around in its rotary movement, so as to check the lateral momentum of the box as it passes from the switch-track to the main track. The releasing-lever n^7 for the lock is disengaged immediately after the track begins to turn, and the bolt is pressed by a spring n^{12} , Fig. 4, toward the frame-piece n^3 , that carries the locking-shoulders, which are beveled so as to automatically engage with the spring-bolt at the end of the half-rotation.

It is obvious that the appliances thus far described do not depend for their operation upon the specific construction of the clutch employed for engaging the cord, and so far as the invention has been thus far described it is not limited to an apparatus in which the clutch has the specific construction which will now be described and which is best shown in Figs. 5, 6, and 7.

The clutch comprises a fixed or stationary jaw k , having on the side opposite the movable jaw k^2 a finger k^3 , (see also Fig. 8,) which stands below the cord to prevent it from pulling out from between the jaws. The movable jaw k^2 is supported upon a slide rod or shank k^4 , acted upon by a spring k^5 , which tends to move the jaw k^2 away from the jaw k , or, in other words, to open the clutch, as will be understood from Figs. 5, 6, and 7. The shank k^4 is shown in this instance as projecting beyond the side of the box when the clutch is closed, as shown in Fig. 6, and is employed to operate the lock-opener $n^7 n^{10}$, as shown in Fig. 4. This construction is not, however, essential, it being necessary only that the jaw-shank should be properly guided in its longitudinal movement. The movable jaw k^2 is also provided with a cam-block k^6 , acted upon by a cam or wedge k^7 , which when moved from the position shown in Fig. 5 to that shown in Fig. 6 forces the jaw k^2 toward the jaw k with a wedging action and finally brings up with the block k^6 upon a part beyond the end of the incline k^7 , so as to positively lock the jaw k^2 in its

closed position. The said jaw k^2 is composed of a comparatively thin piece of spring metal, preferably steel, and is thus sufficiently yielding to afford a firm grip on the cord without compressing the same sufficiently to damage it. The clutch-actuating cam or wedge k^7 is operated by an elbow-lever k^8 , pivoted at k^9 and provided with a projecting handle k^{10} , which when the clutch is open projects beyond the edge of the box, as shown in Figs. 5 and 9, and is the part operated upon by the clutch-closing cam m^5 on the forwarding-track at the station, (see Figs. 2 and 10,) which forces the projection k^{10} inward to the position shown in Fig. 6 as the carrier is moved by the operator from the dotted to the full line position, Fig. 1, in the guides $m m^2$. The clutch-operating lever k^8 also has pivotally connected with it an actuating-rod k^{12} , which is in such relation to the projection k^{10} that when the latter projects from the side of the box, as shown in Fig. 5, the rod k^{12} is inclosed within the box; but when the projection k^{10} is carried into the box, as shown in Fig. 6, in the act of closing the clutch the rod k^{12} projects beyond the side of the box, so that it may be acted upon by a part external to the box to press it back into the box, as shown in Fig. 5, and thus to cause the clutch to be ungripped. The cam-incline i , Fig. 1, supported on the station frame-work, thus acts upon the projecting rod k^{12} , as before stated, just as the box passes from the switch-track onto the delivering branch track, and thus disengages the carrier from the propelling-cord just at the time when the carrier leaves the main line and enters upon the branch, along which it will run a short distance by its momentum, which is sufficient to carry it out of the way of carriers moving along the line of the main track.

The branch track g^{10} may be of such length and afford such friction as to check the movement of the carrier and bring it to rest upon the branch track, from which it may be withdrawn by the operator; or, if preferred, it may be permitted to travel by its momentum wholly out from the branch track and dropped onto a suitable support or receptacle located to receive it.

It is obvious that the construction herein described may be modified in various particulars.

The main track is composed, essentially, of a strip of continuous tubing having a continuous slot in one side; but it is obvious that it is merely the portion at the edges of this slot which constitute the operative part, while the remainder of the tube is merely a frame-work to support these edges, and also to inclose and support the cord where it runs in straight stretches, and consequently the sides of the tube may be cut away where required to afford clearance for other working parts—as, for example, where the cord runs over guide-pulleys at angles.

The opening at b^2 where the carriers are applied to the forwarding-track is merely to af-

ford such clearance as to enable the entire projections c^2 of the carriers to be introduced into the tube and to render the cord accessible to the clutch at this point, and any desired amount of the under side of the tube may be cut away, it being necessary only to have the edges of the upper slit properly supported. It is also unnecessary to have the guiding-slit a^2 or b^2 always in the upper part of the tube, and it is obvious that the operation would be the same if the slit were in any other position except directly underneath in horizontal positions of the track.

I claim—

1. A conveying apparatus comprising a main track composed of a tube having a continuous longitudinal guide-slot, combined with a propelling-cord contained within the said tube and supported and guided by the unslotted portion thereof, and carriers having laterally-grooved projections entering the slot of the tube, the edges of which engage with the grooves of said projections, and a cord-gripping clutch projecting from the carrier through the slit into the tube and co-operating with the propelling-cord therein, substantially as described.

2. The combination of a main track composed of a tube having a continuous longitudinal guide-slot with a propelling-cord contained within the said tube and supported and guided by the unslotted portion thereof, and carriers having grooved projections entering the slot of the tube, the edges of which engage with the grooves of said projections, and a cord-gripping clutch projecting from the carrier through the slit into the tube, and movable track sections or switches and guides co-operating with the carriers moving thereon, whereby the said carriers after passing from the main track onto the switch-section may be moved with the latter out of line with the guide-slot of the main track beyond the switch-section, substantially as described.

3. The combination of a main track composed of a tube having a continuous longitudinal guide-slot with carriers having grooved projections entering the slot of the tube, the edges of which engage with the grooves of said projections, and movable track sections or switches and guides co-operating with the carriers moving thereon, whereby the said carriers after passing from the main track onto the switch-section may be moved with the latter out of line with the guide-slot of the main track beyond the switch-section, substantially as described.

4. The combination of a main track composed of a tube having a continuous longitudinal guide-slot, with a propelling-cord contained within the said tube and supported and guided by the unslotted portion thereof, and carriers having grooved projections entering the slot of the tube, the edges of which engage with the grooves of said projections, and

a cord-gripping clutch projecting from the carrier through the slit into the tube, and movable track sections or switches and guides co-operating with the carriers moving thereon, whereby the said carriers passing from the main track onto the switch-section may be moved with the latter out of line with the guide-slot of the main track beyond the switch-section, and a clutch-operating device for ungripping the cord when the carrier is removed from the main track, substantially as described.

5. The combination of a main track and carriers supported and guided thereon with a switch-track having a pivotal movement on an axis parallel with that of the main track and a guide co-operating with the carrier on the switch-track to produce pivotal movement thereof, substantially as and for the purpose described.

6. The combination of a main track and carriers supported and guided thereon with a switch-track having a pivotal movement on the axis parallel with that of the main track and a guide co-operating with the carrier on the switch-track to produce pivotal movement thereof, and a cam or guide connected with said switch-track and operated by carriers approaching the same to place the said switch-track in line with the main track, substantially as described.

7. The main track composed of a tube having a continuous guide-slit, combined with a pivoted switch-section provided with two guide-slits and a guide co-operating with carriers moving on said switch-section, whereby the carrier engaged with a guide-slit of the switch-track out of line with that of the main track is rotated into line with the guide-slit of the main track, substantially as described.

8. The main track composed of a tube having a continuous guide-slit, combined with a propelling-cord contained within the said tube and supported and guided by the unslotted portion thereof, and a pivoted switch-section provided with two guide-slits, a stationary guide whereby a carrier is introduced into engagement with one of said guide-slits, and a clutch-closing device in said guide, and a guide co-operating with carrier moving on said switch-section, whereby the carrier engaged with a guide-slit of the switch-track out of line with that of the main track is rotated into line with the guide-slit of the main track, substantially as described.

9. The main track composed of a tube having a continuous guide-slit, combined with a pivoted switch-section provided with two guide-slits and lock for fastening the said switch-section with one of its guide-slits in line with that of the main track, a stationary guide whereby a carrier is introduced into engagement with the other of said guide-slits, and a guide by which the carrier and track-section are moved to bring the guide-slit into which

the carrier is introduced into line with that of the main track, and means operated by the carrier for unlocking the track-section to permit the said movement to take place, substantially as described.

10. The main track composed of a tube having a continuous guide-slot, combined with a propelling-cord contained within the said tube and supported and guided by the unslotted portion thereof, and a pivoted switch-section provided with two guide-slits, and a lock for fastening the said switch-section with one of its guide-slits in line with that of the main track, a stationary guide whereby a carrier is introduced into engagement with the other of said guide-slits, and a clutch-closing device in said guide, and a guide by which the carrier and track-section are moved to bring the guide-slit into which the carrier is introduced into line with that of the main track, and means operated by the carrier for unlocking the track-section to permit the said movement to take place, substantially as described.

11. A carrier provided with a clutch composed of a stationary jaw and movable jaw and guide therefor, and a cam for moving said jaw toward the fixed jaw, and cam-actuators one of which projects from the carrier when the cam is in one position with the grip closed and the other of which projects when

the cam is in its other position with the grip open, substantially as described.

12. The combination of the fixed jaw with a movable jaw and its actuating-cam, and the lever having one arm connected with said cam and its other arm with operating rods or projections extending from opposite sides of the carrier alternately, substantially as and for the purpose described.

13. In a conveying apparatus, a main track provided with a continuous guide-slot and a carrier adapted to positively engage the same, in combination with a correspondingly-slotted oscillatory switch-section interposed between adjoining portions of said track, with its guide-slot normally in line with and forming a continuation of the main-track slot, and a stationary guide engaged by the carrier at the time it is on the switch-section for moving said section in a direction to throw its guide-slot out of line with that of the main track, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH C. MARTIN.

Witnesses:

JOS. P. LIVERMORE,
M. E. HILL.