

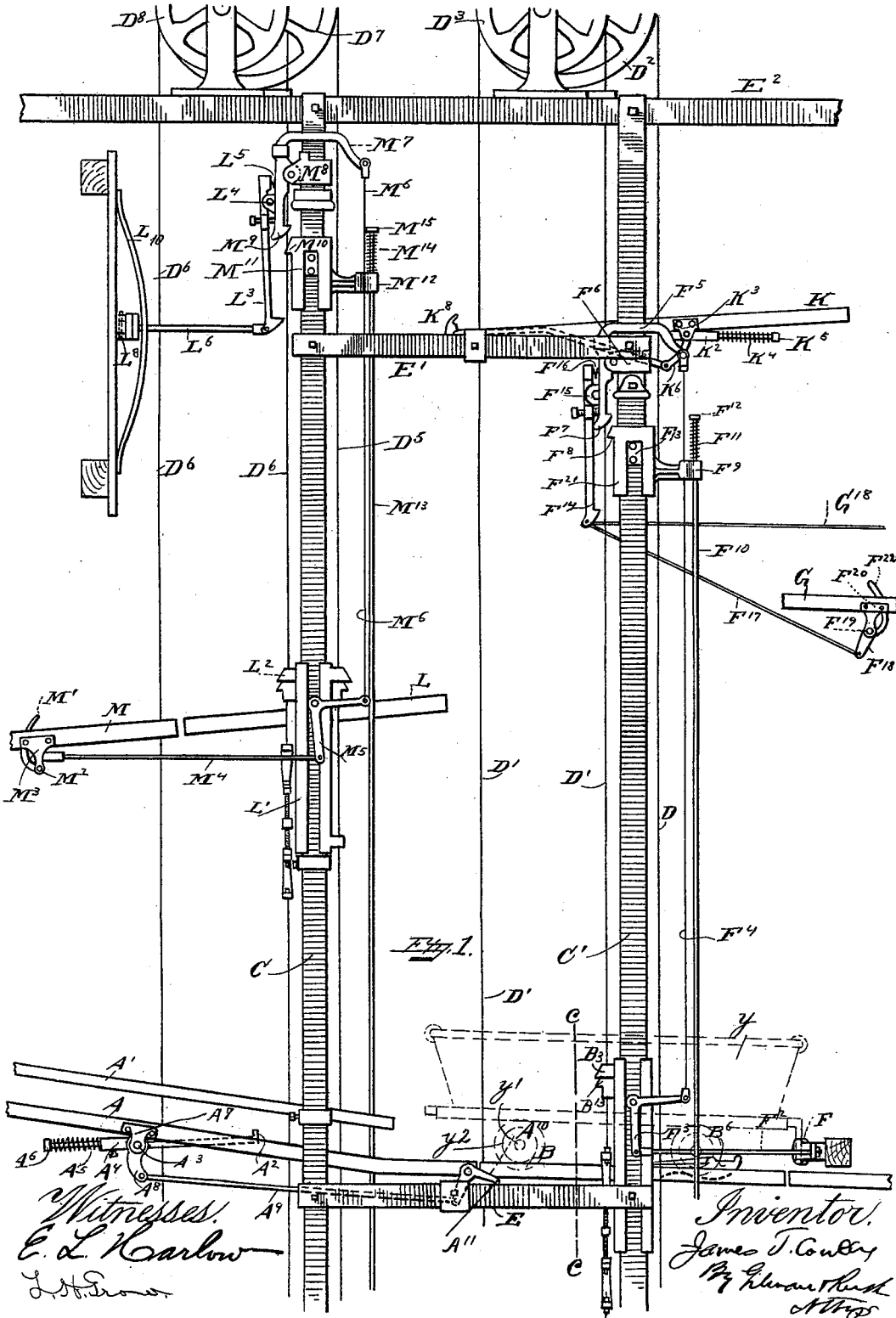
(No Model.)

7 Sheets—Sheet 1.

J. T. COWLEY.
CONVEYING APPARATUS.

No. 582,809.

Patented May 18, 1897.



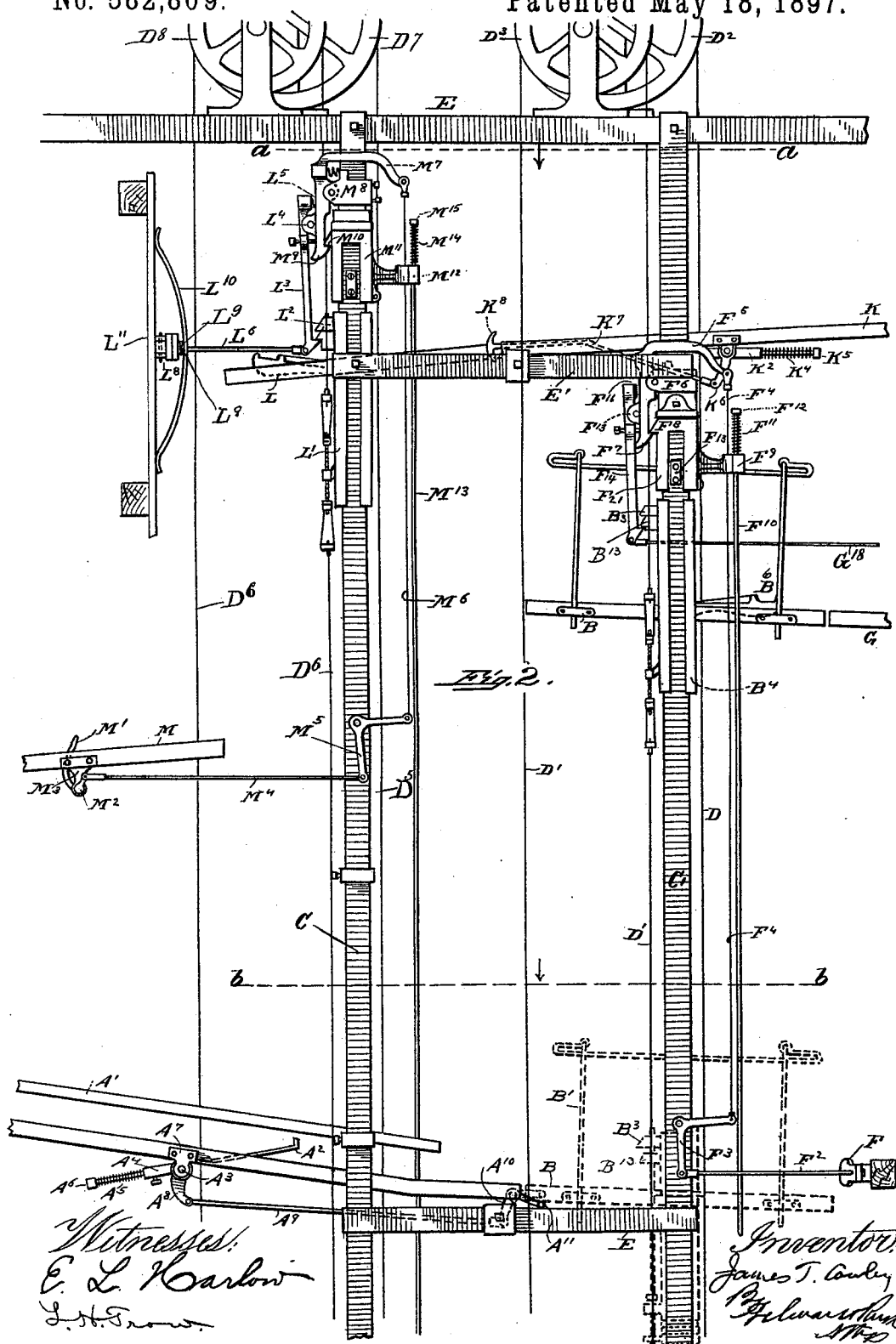
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7 Sheets—Sheet 3.

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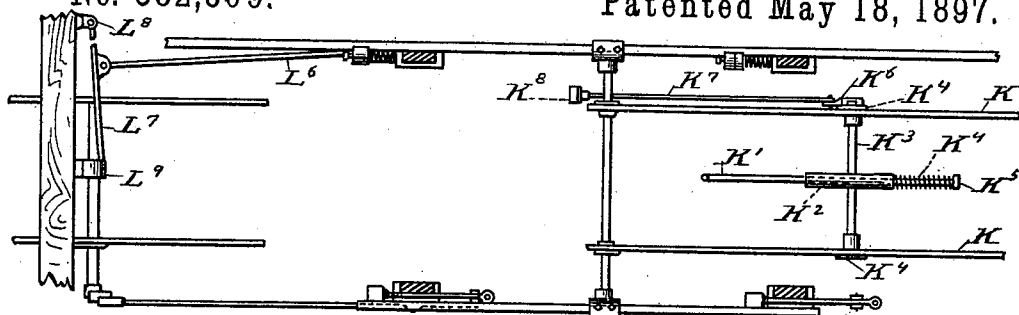


Fig. 4.

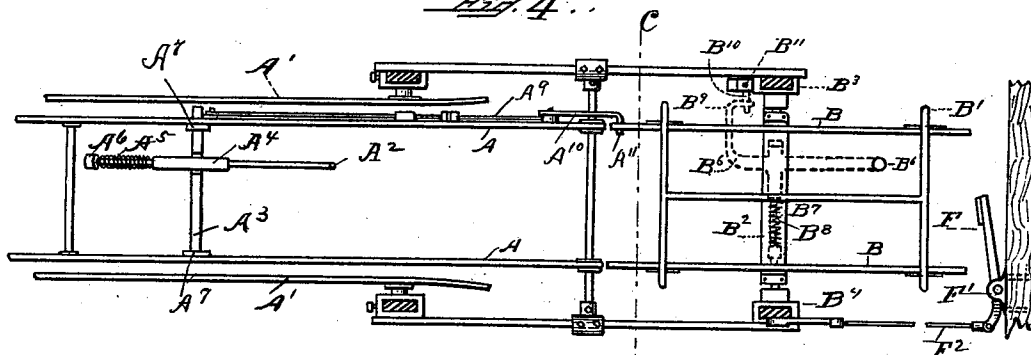


Fig. 3.

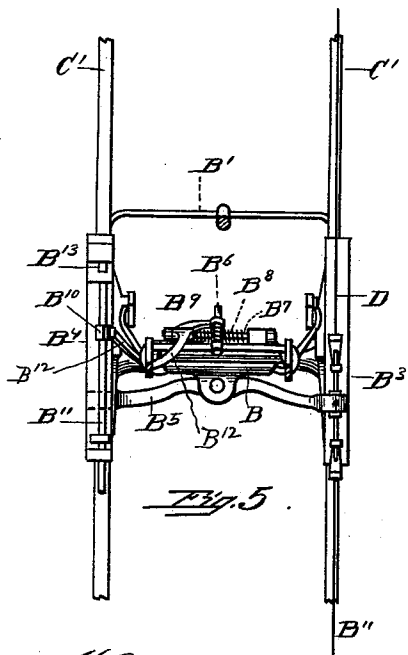


Fig. 5.

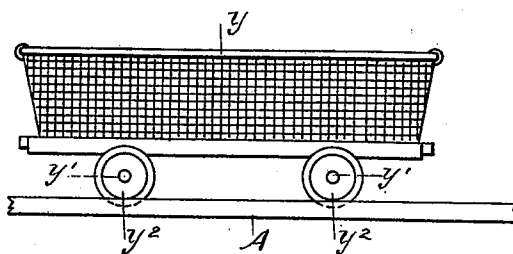


Fig. 6.

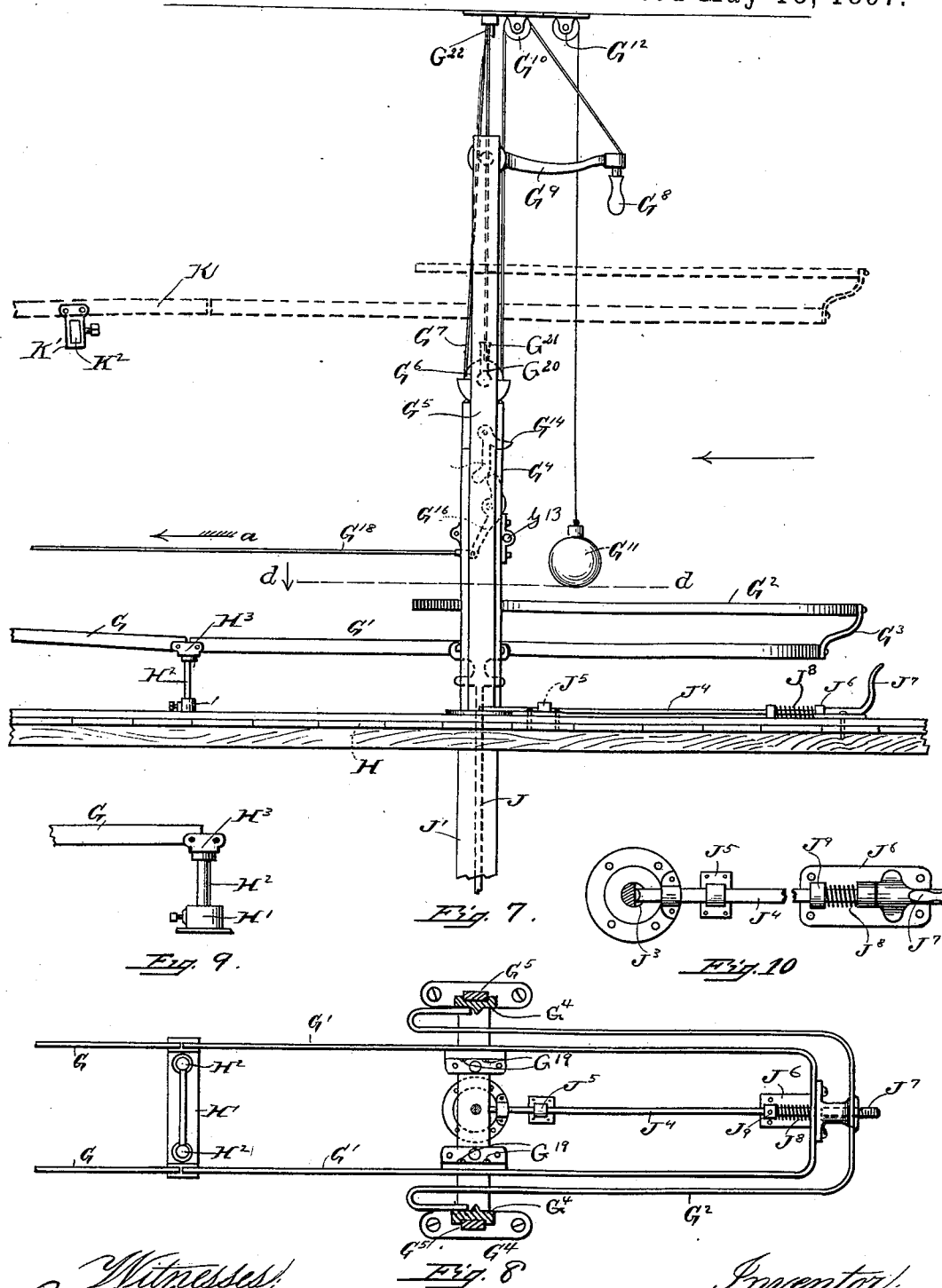
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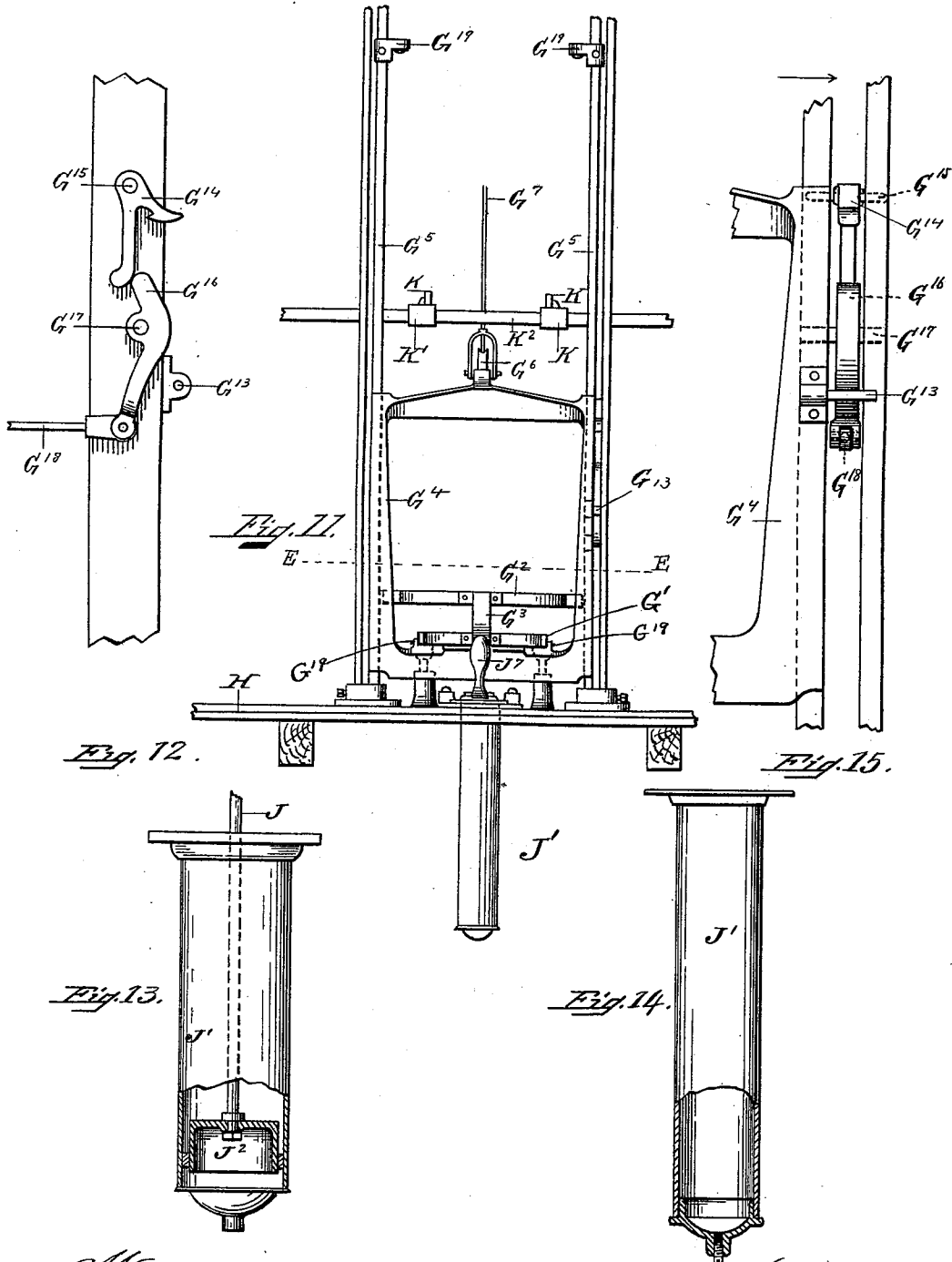
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7 Sheets—Sheet 5.

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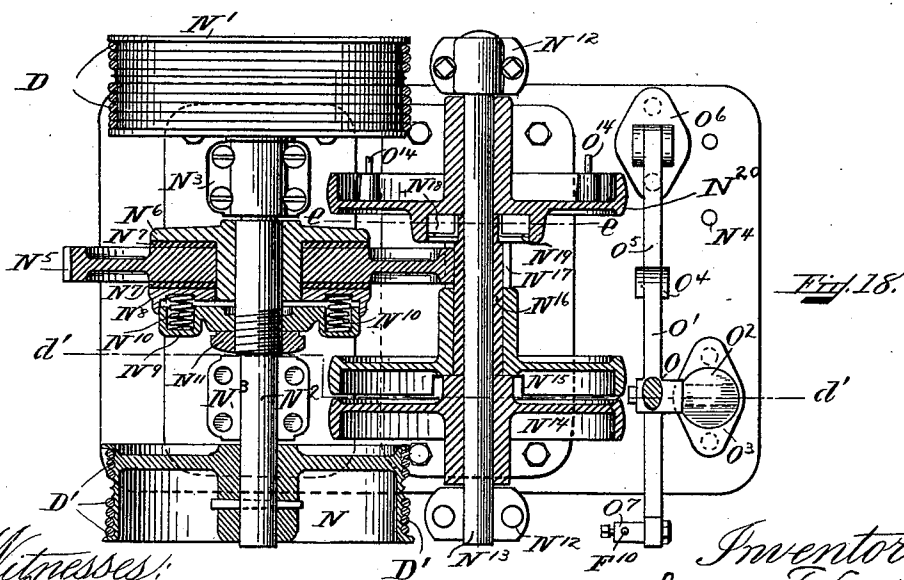
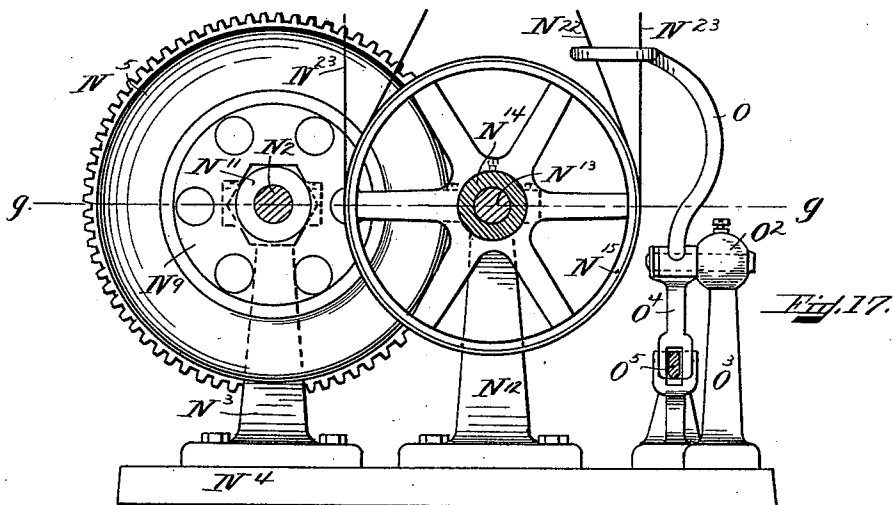
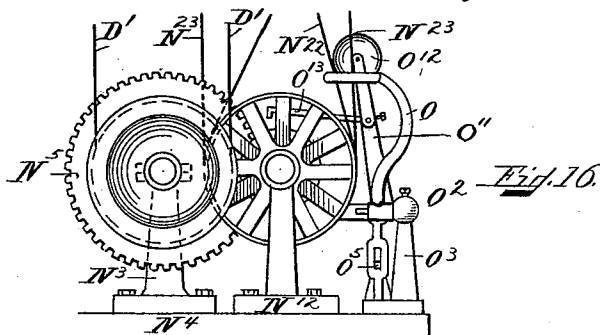
(No Model.)

7 Sheets—Sheet 6.

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No. 582,809.

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7 Sheets—Sheet 7.

No. 582,809.

Patented May 18, 1897.

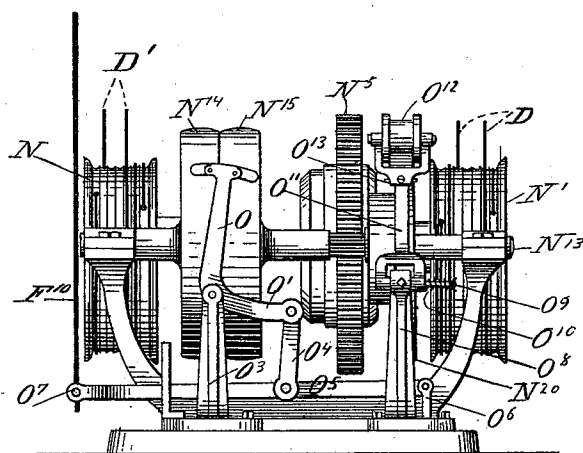


Fig. 19.

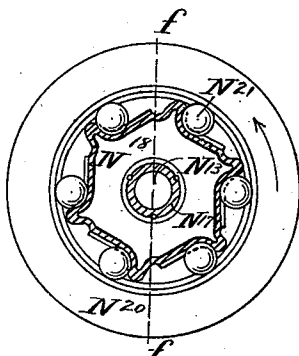


Fig. 20.

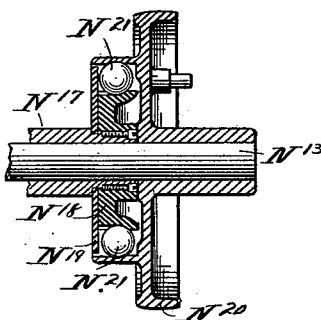


Fig. 21.

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UNITED STATES PATENT OFFICE.

JAMES T. COWLEY, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE
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CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 582,809, dated May 18, 1897.

Application filed May 18, 1895. Serial No. 549,816. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. COWLEY, of Lowell, county of Middlesex, and State of Massachusetts, have invented new and useful Improvements in Conveying Apparatus; and I hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to conveying apparatus for transporting parcels from one point to another, and it is especially adapted for conveying cash and parcels from one floor or one track-level to another above or below.

My invention consists of certain novel features, arrangements, and combinations hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate my invention, Figure 1 is a side elevation of the elevator with portions of the tracks above and below, and also showing one elevator in position to receive the carrier from the lower forwarding-track and another elevator in position to return the carrier onto the main return-track. Fig. 2 is a similar view to that shown in Fig. 1, but showing one elevator raised from alinement with the lower forwarding-track up to alinement with the forwarding-track located above and showing another elevator in alinement with the main return-track above. Fig. 3 is a sectional plan view taken on the line *b b*, Fig. 2. Fig. 4 is a sectional plan view taken on the line *a a*, Fig. 2. Fig. 5 is an end view of one of the elevators, partly in section, taken on the line *c c*, Figs. 1 and 3. Fig. 6 is a side view of the carrier of usual construction. Fig. 7 is a side view of the terminal placed at the end of the line on the upper floor, showing an elevator for transferring the carrier from the lower forwarding-line on the upper floor to the upper return-line on the same floor. Fig. 8 is a plan view of the same on line *d d*, Fig. 7, or line *e e*, Fig. 11. Fig. 9 is a detail view of the support for the ends of the forwarding-track. Fig. 10 is a detail view of the elevator-supporting catch. Fig. 11 is a front end view of Fig. 7 in the direction indicated by the arrow. Figs. 12, 13, 14, and 15 are detail views

of the parts of the terminal station hereinafter referred to. Figs. 16, 17, 18, 19, 20, and 21 represent certain views of the elevator-carriage-operating mechanism, in which Fig. 16 represents an end view; Fig. 17, a longitudinal sectional view on the line *d' d'* of Fig. 18. Fig. 18 shows a plan view in section on the line *g g* of Fig. 17. Fig. 19 is a front view of the elevator-operating mechanism, showing the belt-shifting mechanism. Fig. 20 is a sectional view of the clutch mechanism on the line *e e* of Fig. 18, and Fig. 21 is a cross-section of the clutch mechanism on the line *f f* of Fig. 20.

Like letters of reference refer to like parts throughout the several views.

Supported by the main forwarding-track A near the elevator is a catch A², which passes through a sleeve A⁴, provided with a spring A⁵ and collar A⁶. This sleeve A⁴ is supported on the shaft A³, mounted in the lugs A⁷, which are fastened to the track A. Mounted on the end of the shaft A³ is a lever A⁸, to the end of which is pivotally secured the rod A⁹, the opposite end of which is pivotally secured to the bell-crank lever A¹⁰, having a pin A¹¹ in position to be engaged by the elevator-track B when the elevator reaches its lowest position.

When the elevator is in its lowest position, the pin A¹¹ of the bell-crank lever A¹⁰ is pressed downward, which moves with it the rod A⁹ and lever A⁸, which is fastened to the shaft A³. This movement carries down the catch A² out of engaging position with the axle *y'* of the carrier *y*, which is guided in its travel by the guides A¹ as it moves down the track A toward the elevator B. This catch A², being pressed downward out of engaging position with the axle *y'* of the carrier, allows the carrier *y* to pass onto the elevator-track B. As the carrier passes onto the elevator-track B the forward end of the carrier strikes a lever F, mounted in the lug F', secured upon a suitable support. As the carrier strikes this lever F the lever is pushed backward, which moves with it the rod F², one end of which is fastened to the bell-crank lever F³. To the opposite end of this bell-crank lever F³ is secured the rod F⁴, which extends upwardly and is fastened to the catch

F⁵, supported on the lug F⁶ and provided with the lower catch F⁷. When this lever F is moved by the carrier through the connections just described, the catch F⁷ is moved out of engagement with the catch F⁸ on the slide F²¹, which allows the slide F²¹ to drop until arrested by the stop F¹³. This slide F²¹ carries with it an arm F⁹, through which passes the rod F¹⁰, which extends downwardly and operates to start and stop the elevator-operating mechanism hereinafter described. When this slide F²¹ is dropped from engagement with the catch F⁷ to the position shown in Fig. 1 and the elevator-operating mechanism is thrown into operation, the elevator, with the track B guided upon the elevator guide-rods C', supported by suitable braces E E' E², is raised to alinement with the forwarding-track G above. (Shown in full lines, Fig. 2.) As the elevator approaches this position it carries with it the slide F²¹, carrying the rod F¹⁰ up so as to again engage with the catch F⁷, and this movement of the slide F²¹ will throw off the power from the elevator-operating mechanism and the elevator will be allowed to settle down to alinement with the track G and will be supported in this position by the catch F¹⁴ catching under the lug B³ on the elevator, as shown in full lines, Fig. 2. This upward movement of the elevator is given by the operating-cables D D', which are secured to the yoke B⁵ on the elevator (see Fig. 5) and pass upward over suitable pulleys D² and D³, supported on the cross-brace E², and extend downwardly to suitable drums on the elevator-operating mechanism. This elevator-operating mechanism, which is shown in Figs. 16 to 21, inclusive, is constructed as follows:

Upon the base N⁴ are fastened two stands N³, and in the upper end of these stands is journaled the shaft N², upon each end of which are mounted drums N N'. These drums are provided with suitable spiral grooves upon which the lifting-cables D D' wind. Upon the center of this shaft N² is mounted a hub N⁶, and upon this hub is mounted a gear-wheel N⁵ and also a friction-plate N⁸. Between the flange of the hub N⁶ and the gear N⁵ and also between the friction-plate N⁸ and gear N⁵ are placed two leather disks N⁷. Fitting in a recess in the friction-plate N⁸ is a spring-plate N⁹, provided with springs N¹⁰, which engage with the friction-plate N⁸. One end of the enlarged portion of the shaft N² is threaded to receive the nut N¹¹, which bears upon the hub of the spring-plate N⁹ and is adapted to give the proper tension to the springs N¹⁰. Upon the base N⁴ are also mounted two stands N¹², to the upper ends of which are fastened a stationary shaft N¹³, and upon this shaft are loosely mounted pulleys N¹⁴ and N¹⁵. The pulley N¹⁵ is mounted on a hub N¹⁶, provided with a gear N¹⁷, which engages with the large gear N⁵. Upon one end of this hub N¹⁶ is mounted a clutch N¹⁸, formed to receive the balls N²¹, and a plate N¹⁹ holds the

balls N²¹ in place. The clutch N¹⁸ enters into a recess in the pulley N²⁰, which is also loosely mounted on the shaft N¹³.

From the base N⁴ extends a stand O³, provided with a stud O², upon which is journaled a belt-shifter O, formed at its top with a suitable yoke through which the belt N²³ passes. From the lower end of this lever O extends an arm O', to which is attached the link O⁴, Fig. 19, and the opposite end of this link is fastened to the lever O⁵. One end of this lever O⁵ is journaled upon the stand O⁶, and the opposite end extends upward to receive a loose stud O⁷, to which is attached one end of the rod F¹⁰. The pulleys N¹⁴ and N¹⁵ are provided with the straight belt N²³, and the pulley N²⁰ is provided with a cross-belt N²², so that the pulley N²⁰ will revolve in an opposite direction from the pulleys N¹⁴ and N¹⁵, and the arrangement of the clutch N¹⁸ is such that the pulley N²⁰ is free to revolve in a direction indicated by the arrow in Fig. 20 when the hoisting mechanism is not in operation.

To the base N⁴ is fastened the stand O⁸, Fig. 19, to the upper end of which is journaled an arm O¹¹ upon the stud O⁹ and provided at its upper end with a pulley O¹², which is held in contact with the belt N²² by the spring O¹⁰, Fig. 19. Fastened to the arm O¹¹ is a hook O¹³, projecting outward and in position to engage the pins O¹⁴ on the pulley N²⁰, Figs. 16 and 18, should the belt N²² become displaced. The object of this is to provide a safety-stop to catch and hold the pulley N²⁰ in case the belt N²² should break or run off or become displaced.

In operation the lever O⁵ is normally held in a raised position by the rod F¹⁰, and in this position the belt N²³ runs upon the pulley N¹⁴ and the elevator-lifting mechanism remains idle.

When the carrier runs on the elevator-carriage B and strikes the lever F, through the connections F², F³, F⁴, F⁵, and F²¹, the rod F¹⁰ is dropped and the lever O⁵ is lowered, and the yoke of the belt-shifting lever O moves the belt from the pulley N¹⁴ to the pulley N¹⁵. The lever F and the connections F², F³, F⁴, F⁵, and F²¹ thus constitute means whereby the mechanism for moving the elevator is actuated by the carrier passing onto said elevator. This pulley N¹⁵ being attached to the hub N¹⁶ and gear N¹⁷ this gear is revolved and moves with it the gear N⁵, and the gear N⁵ carries with it the hub N⁶ by the contact of the leather friction-disks N⁷. This hub N⁶ is secured to the shaft N², upon which is mounted the drums N and N'. Around these drums N and N' the lifting-cables D D' are wound, which pass upwardly over pulleys D² and D³. The opposite ends of these lifting-cables are attached to the yoke B⁵ of the elevator-carriage, Fig. 5, and by the operation of these drums N and N' by the pulley N¹⁵ and the gears N¹⁷ and N⁵ and lifting-cables D D' mechanism is provided for operating

the elevator and moving the elevator-carriage. The cross-belt N²², working on the pulley N²⁰, revolves the pulley N²⁰ in an opposite direction to the pulleys N¹⁴ and N¹⁵. The object of this pulley N²⁰ and clutch N¹⁸ working within the pulley is to govern the downward movement of the elevator-carriage and prevent the same from moving beyond a certain speed.

When the elevator-carriage B is released from the catch L (see Fig. 2) by the carrier striking the lever L⁷, (see Fig. 4,) the weight of the elevator-carriage and the carrier combined is sufficient to turn the drums N and N' to unwind the cable therefrom and revolve the drums in an opposite direction to that required to raise the elevator-carriage. As these drums revolve backward they carry with them the shaft N² and gear N⁵, engaging with the gear N¹⁷, upon the hub of which is mounted the clutch N¹⁸. This movement of the clutch N¹⁸ is in the same direction as the pulley N²⁰ is traveling, and the clutch N¹⁸ is so arranged that should the downward movement of the elevator cause the clutch N¹⁸ to revolve faster than the pulley N²⁰ the clutch-balls N²¹ will wedge upon the inclined portion of the clutch N¹⁸ and check the downward movement of the elevator. By this it will be seen that the downward movement of the elevator is controlled by the speed of the pulley N²⁰, operated by the cross-belt N²², while the drums N and N' are free to be revolved to raise the elevator-carriage.

The carrier is held on the elevator-track B in its upward movement by the catch B⁶, engaging with the forward axle y' of the carrier. This catch B⁶ is mounted on the shaft B⁷ on the elevator, (see Fig. 5,) and is provided with a spring B⁸ on the shaft B⁷. This catch has an arm B¹², which extends downwardly and engages with the lugs B¹⁰ on the rod B¹¹, which is supported on the side of the elevator-frame B⁴. This rod B¹¹ is provided with a catch B¹³ at its upper end, which catch engages with and is lifted by the catch F¹⁴, which supports the elevator in its raised position. As this catch B¹³ is lifted, carrying with it the rod B¹¹ and the arm B¹² of the catch B⁶, the catch B⁶ is lowered out of engagement with the forward axle y' of the carrier, and the carrier is allowed to pass onto the upper forwarding-track G.

As the carrier passes along the track G the axle y' of the carrier engages with the finger F²², supported on the shaft F¹⁹, mounted in the lug F²⁰ and secured to the track G. (See Fig. 1.) Secured upon the end of this shaft F¹⁹ is a lever F¹⁸, and to the end of this lever is secured a rod F¹⁷. This rod F¹⁷ extends outwardly and is fastened at its opposite end to the catch F¹⁴.

As the axle y' of the carrier engages with the finger F²² and pushes it forward as it travels over the track G through the connections on the shaft F¹⁹ and lever F¹⁸ and rod F¹⁷ the catch F¹⁴ is pushed out of engagement

with the lug B³ on the elevator-frame B⁴ and the elevator is allowed to descend to its normal position, as shown in full lines, Fig. 1. The carrier will then pass along over the track G until it approaches a station or terminal when it will then leave the track G and pass onto the track G' and will be arrested by the guide-rails G², supported at the rear end by the brace G³.

The track G' is supported, Figs. 7 and 11, by a suitable frame G⁴ and secured thereto by bolts G¹⁹, and said frame is adapted to slide upon the guides G⁵. This frame is provided at its top with a pulley G⁶, around which a suitable cord G⁷ passes, and one end of said cord is fastened at G²¹ to the yoke G²⁰ on the frame G⁴. This cord passes upwardly over a suitable pulley G²² and downwardly under pulley G⁶ on the top of the frame G⁴, and then said cord passes upwardly around pulley G¹⁰ and downwardly through an eye on the end of the arm G⁹ and is provided with a handle G⁸, by which the elevator may be raised to the position shown in dotted lines, Fig. 7, in alinement with the upper return-track K. From the bottom of this elevator-frame G⁴ there extends a rod J, upon the end of which is mounted a plunger J², which is adapted to work in an air-chamber J' to regulate the rising and lowering of the elevator-frame G⁴. This rod J is provided with a notch J³, Fig. 10, to be engaged by the end of the rod J⁴ when the elevator is raised to alinement with the track K. This rod J⁴, mounted in the supports J⁵ and J⁶, by engaging with the notch J³ on the rod J, will support the elevator-frame G⁴ in its raised position.

After the carrier y has been forwarded over the return-track K the elevator is released from its raised position by the attendant pulling on the handle J⁷, mounted on the end of the rod J⁴, and the rod J⁴ is pulled out of engagement with the notch J³ and the elevator is allowed to descend. When the attendant releases the handle J⁷, the action of the spring J⁸, engaging with the collar J⁹ on the rod J⁴, will return the rod J⁴ to its original position, ready to again engage with the notch J³ when the elevator is again raised. When the elevator is in its lowest position, the ends of the track G' will rest upon the support H³, mounted on the rods H², which are supported by the base H'. This support also supports the ends of the track G, and the track G and elevator-track G' are therefore held in alinement with each other.

The elevator-carriage G⁴ is provided with a pin G¹³. (See Figs. 7 and 15.) This pin extends outwardly in position to engage with the end of the dog G¹⁴ in its upward movement and will raise the end of the dog G¹⁴, mounted on the stud G¹⁵, Fig. 12, as the elevator is raised to alinement with the upper return-track K. This movement of the dog G¹⁴ will, by engagement with the lever G¹⁶, mounted on the stud G¹⁷, move the rod G¹⁸ in

the direction indicated by the arrow *a*, Fig. 7. This rod G^{18} extends outwardly along the track *G*, and the opposite end is pivotally secured to the catch F^{14} , mounted on the lug F^{15} . The movement of this rod G^{18} , as before described, will therefore move the catch F^{14} out of engagement with the lug B^3 on the elevator-frame B^4 and will release the elevator from its raised position should the elevator fail to have been released by the carrier passing over the track *G* and engaging with the trip F^{21} , as before described.

As the carrier passes over the return-track *K* and passes onto the elevator-track *L*, as shown in full lines in Fig. 2, the forward end of the carrier will engage with the end L^9 of the lever L^7 , mounted in the lug L^8 , to which is secured the flat spring L^{10} , having its free ends bearing against the framework L^{11} , and said spring assists in returning the lever L^7 to its normal position, Figs. 2 and 4. This lever L^7 , by the action of the carrier, will be pushed backward and will carry with it the rod L^6 , which is fastened to the elevator-supporting catch L^3 , mounted in the lug L^4 , provided with the spring L^5 , and the elevator-carriage, with the carrier, will be allowed to descend to the position shown in full lines, Fig. 1. The movement of the said elevator-track *L* is controlled through the medium of the elevating cables D^5 and D^6 , passing over the pulleys D^7 and D^8 and then downwardly to independent mechanism similar to the mechanism previously described for the cables *D* and D' .

When the carrier reaches the position shown in full lines, Fig. 1, in alinement with the track *M*, and the carrier has passed onto the track *M*, the axle of the carrier will engage with the finger M' , secured to the shaft M^2 , mounted upon the lugs M^3 , and will move the finger M' forward in the direction the carrier is traveling. This movement will carry with it the rod M^4 , one end of which is secured to the bell-crank lever M^5 . To the opposite end of the bell-crank lever M^5 is secured the rod M^6 , which extends upwardly and is secured to the arm M^7 of the catch M^9 , mounted in the lug M^8 . This forward movement of the finger M' , carrying with it the rods M^4 and M^6 and operating the catch M^9 , will release the catch M^9 from the catch M^{10} on the slide M^{11} and will allow the slide M^{11} to drop to the position shown in Fig. 1. Secured to the slide M^{11} is the arm M^{12} , through which passes the rod M^{13} , provided at its upper end with a spring M^{14} and collar M^{15} . This rod M^{13} passes downwardly to a suitable elevator-operating mechanism, the same as before described for the other elevator, and the downward movement of this rod M^{13} will act to start the elevator-operating mechanism and return the elevator *L* to its normal position in alinement with the track *K*, and the carrier will travel along the track *M* to its destination.

From the foregoing it will be understood that the elevators for the forwarding-track and for the return-track are entirely independent of one another, and the object of using independent elevators is to form a continuous line, both forward and return, over which the carriers may be moved from one end of the line to the other, and the elevator of the forwarding-track is for the purpose of transferring only the carriers going forward and the elevator of the return-track is for the purpose of transferring only the carriers returning to the home station along the return-track, so that where the elevator of the forwarding-track has received a carrier from one section of the forwarding-track and transferred it to another section of said forwarding-track the carrier, upon passing off of the elevator onto the forwarding-track, in its movement operates mechanism which causes the elevator to return to alinement with that section of the forwarding-track from which it moved and in position to receive another carrier going forward. Now referring to the return-track, the elevator of said return-track receives a carrier returning and transfers it to alinement with another section of the return-track, and upon said carrier passing off onto said section it operates mechanism which causes said elevator to return to alinement with said section of the return-track from which it moved. Thus the elevator or elevators in the forwarding-track transfer the carriers going forward without regard to how they return and the elevator or elevators in the return-track transfer the carriers returning without regard as to how said carriers were forwarded, and thus each line, with its elevators, is entirely independent of one another.

In United States Letters Patent dated January 5, 1897, and numbered 574,714, issued to the Lamson Consolidated Store Service Company as my assignee, only one elevator for forwarding and returning the carriers is shown and described, and in said apparatus the elevator receiving the carrier moving along the forwarding-track transfers it to a station above and at which there is shown a short track onto which the carrier runs; but said elevator remains in alinement with said short track until the carrier is pushed back onto said elevator, when the elevator moves to alinement with the return-track, and as the carrier passes onto the return-track it operates in its movement mechanism which causes said elevator to return to alinement with the forwarding-track from which it first moved. In said patent the elevator is shown at the terminal of the line, whereas in this application the elevators are shown intermediate of the line, and there may be several elevators from the beginning to the end of the line wherever it is necessary to transfer carriers from one level to another.

I do not limit myself to the arrangement

and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus ascertained the nature of my invention and set forth a construction embodying the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a conveying apparatus, an upper and a lower forwarding-track, an elevator for receiving the carrier from the lower track and for transferring it to the upper track, mechanism for moving said elevator, and mechanism actuated by the carrier for releasing said elevator from alinement with the upper track and thereby allowing it to return to alinement with the lower track.

2. In a conveying apparatus, an upper and a lower forwarding-track, an elevator for receiving the carrier from the lower track and transferring it to the upper track, mechanism for moving said elevator, means whereby said mechanism is actuated by the carrier passing onto said elevator, and mechanism actuated by the carrier for releasing said elevator from alinement with the upper track and thereby allowing it to return to alinement with the lower track.

3. In a conveying apparatus, a forwarding-track, an upper and a lower return-track, an elevator for receiving the carrier from the upper track and for conveying it to the lower track, and mechanism actuated by the carrier for returning the said elevator to alinement with the upper track.

4. In a conveying apparatus, a forwarding-track, an upper and a lower return-track, an elevator for receiving the carrier from the upper track and for conveying it to the lower track, mechanism for moving said elevator, and means whereby said mechanism is actuated by the carrier passing off from said elevator for returning said elevator to alinement with said upper track.

5. In a conveying apparatus, a forwarding-track, an upper and a lower return-track, an elevator for receiving the carrier from the upper track and for conveying it to the lower track, means for holding said elevator in alinement with said upper track and adapted to be actuated by the carrier passing onto said elevator to release said elevator from said alinement, and to allow it to move into alinement with the lower track, means for holding said elevator in alinement with said lower track and adapted to be actuated by the car-

rier to release said elevator from alinement with said lower track, mechanism for moving said elevator, and means whereby said mechanism is actuated by the carrier passing off from said elevator to return said elevator to alinement with said upper track.

6. In a conveying apparatus, a forwarding-track, an upper and a lower return-track, an elevator for receiving the carrier from the upper track and for conveying it to the lower track, and mechanism actuated by the same carrier for returning said elevator to alinement with said upper track.

7. In a conveying apparatus, a forwarding-track, an upper and a lower return-track, an elevator for receiving the carrier from the upper track and for conveying it to the lower track, mechanism actuated by the carrier for releasing said elevator, and mechanism actuated by the same carrier for returning said elevator to alinement with the upper track.

8. In a conveying apparatus, an upper and a lower forwarding-track, an elevator for receiving the carrier from one track and for transferring it to the other track, mechanism for moving said elevator, means operated by the movement of the elevator to stop the moving mechanism when the elevator has reached the other track, and mechanism actuated by the carrier for releasing said elevator from alinement with said other track and thereby allowing it to return to alinement with the track from which it received the carrier.

9. In a conveying apparatus, an upper and a lower forwarding-track, an elevator for receiving the carrier from one track and for transferring it to the other track, mechanism for moving said elevator, means whereby said mechanism is actuated by the carrier passing onto said elevator, means operated by the movement of the elevator to stop the moving mechanism when the elevator has reached the other track, and mechanism actuated by the carrier for releasing said elevator from alinement with said other track and thereby allowing it to return to alinement with the track from which it received the carrier.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 8th day of May, A. D. 1895.

JAMES T. COWLEY.

Witnesses:

DELIA S. PETERSON,
L. H. TROW.