

(No Model.)

2 Sheets—Sheet 1.

T. M. KENNEY.  
CONVEYING APPARATUS.

No. 465,529.

Patented Dec. 22, 1891.

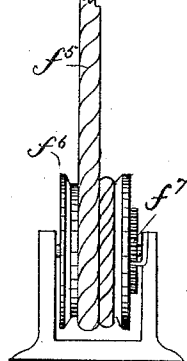
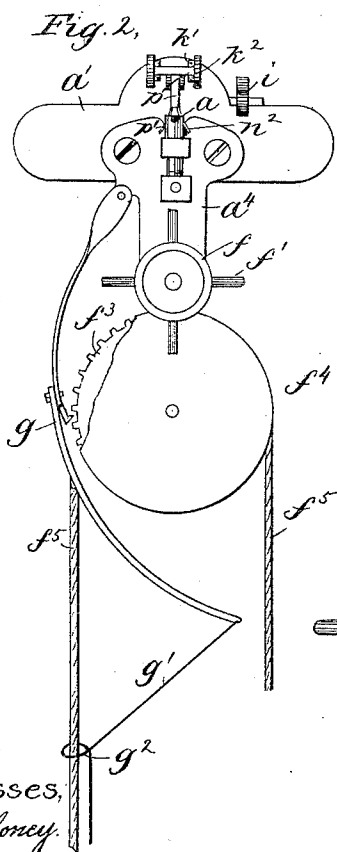
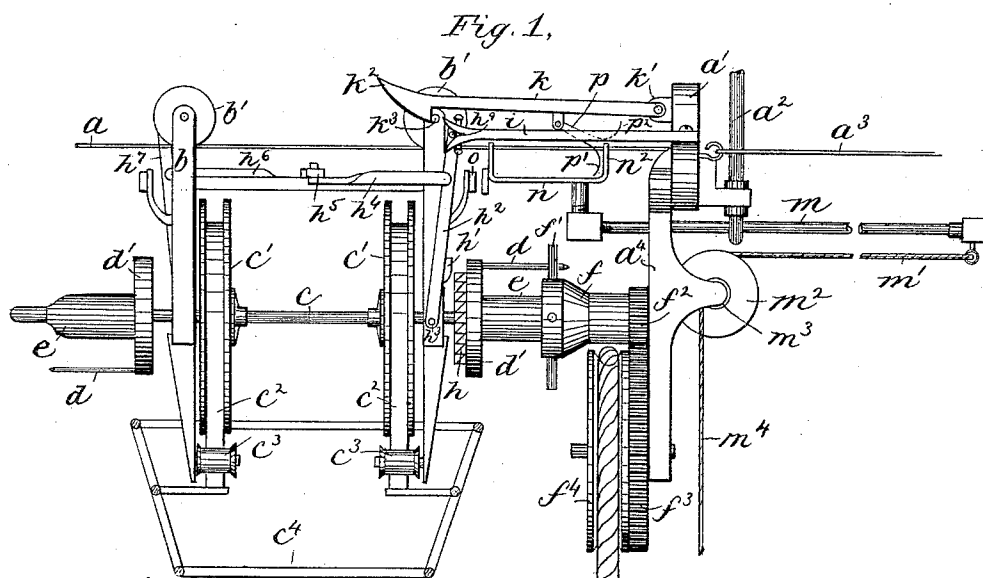
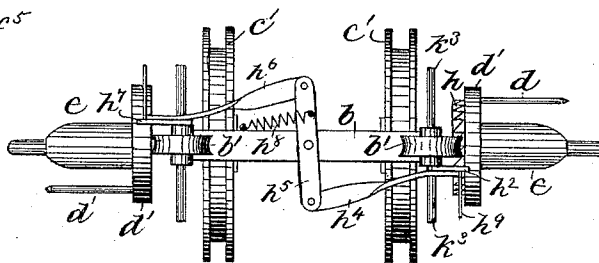


Fig. 3



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

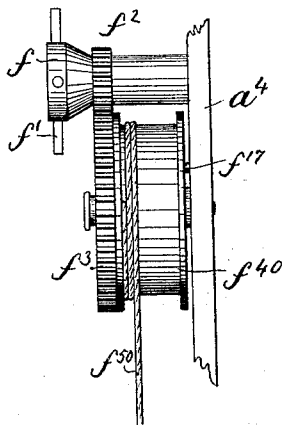


Fig. 5.

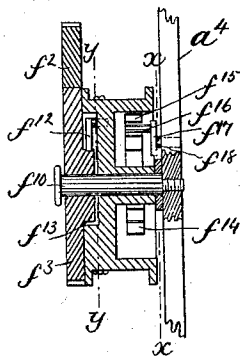


Fig. 6.

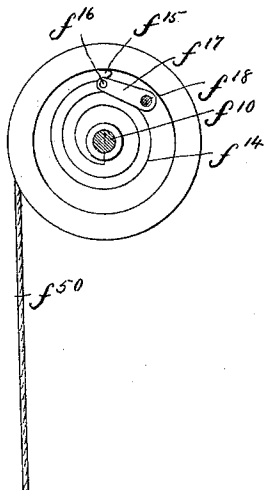
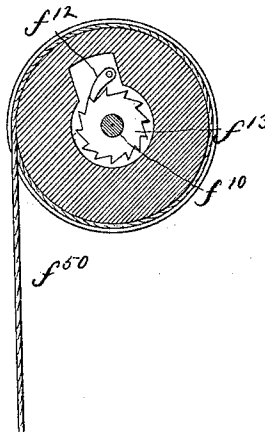


Fig. 7.



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# UNITED STATES PATENT OFFICE.

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## CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 465,529, dated December 22, 1891.

Application filed October 19, 1886. Serial No. 216,623. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS M. KENNEY, of Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Conveying Apparatus, 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 especially intended for use in stores or other buildings and adapted for conveying goods from a sales-counter to the packing-station and returning the same when properly packed or wrapped.

The invention is embodied in an apparatus comprising a track or supporting-guide connecting the stations between which articles are to be transferred and a carrier consisting of a truck or supporting portion adapted to travel on the said track, and a receptacle connected with the said truck in such manner that it can be raised and lowered with relation thereto. The track is intended to be high enough to guide the receptacle when raised up to the truck above all obstacles that may be on the floor of the building; and the invention consists in the means employed for raising and lowering the receptacle at the stations and for retaining it in its high position while traveling on the track and in the various combinations of devices hereinafter pointed out.

Figure 1 is a side elevation of a station at one end of the track and the carrier at the said station, it being understood that the station at the other end is or may be of similar construction. Fig. 2 is an end elevation of the apparatus at the station; Fig. 3, a plan view of the carrier; and Figs. 4 to 7, inclusive, details of a modification of the actuating device for the elevating mechanism.

The track *a* may be of any suitable or usual construction, being shown as consisting of a wire or cord connected at its end with a frame-piece *a'* (shown as supported on a rod *a''*) and steadied by guides *a'''*, connected with the ends of the frame-piece *a'*. The carrier is shown as comprising a truck or frame *b*, provided with grooved rollers *b'*, resting on the track *a*, the said frame *b* extending below the track and supporting the receptacle-elevating mechanism, shown in this instance as composed of a

shaft *c*, provided with reels *c'*, upon which are wound cords or straps *c''*, passing over guide-pulleys *c'''*, supported on the lower part of the frame *b* and connected with a receptacle *c''''*, which is shown in this instance as a wire basket, but which may be of any desired shape, size, and construction, according to the nature of the materials to be carried. The straps *c''* are intended to be long enough to permit the receptacle *c''''* to be lowered into convenient reach of a person standing on the floor when the track *a* is at any desired height sufficient to carry the receptacle *c''''* when elevated, as shown at Fig. 1, above the heads of persons on the floor or over any other obstacles that may exist in the building where the apparatus is used.

Other devices might be used as elevating mechanism to raise and lower the receptacle *c''''* with relation to the part *b* of the carrier that remains on the track without departing from the invention.

The shaft *c* is extended outside the frame *b*, as shown, and is provided at each end with a crank-pin *d*, (shown as connected with a plate *d'*), and the projecting portion of the shaft is provided with a tapering cushion *e*, preferably of rubber. When the carrier comes to a station the said elevating mechanism is brought into co-operation with actuating mechanism, shown in this instance as comprising a tapering or funnel-shaped socket *f* on a shaft having a bearing in a bracket *a''''*, fixed upon the frame-piece *a'*, the said socket or hollow shaft *f* being properly located to receive the projecting portion of the shaft *c*, and provided with arms *f'*, that engage the crank-pin *d*, and also being provided with a pinion *f''*, meshing with a gear *f'''*, also having a bearing on the bracket *a''''*. When the shaft *c* of the elevating mechanism and the shaft *f* of the actuating mechanism therefor are thus engaged or clutched together by the engagement of the pin *f'* and crank *d*, it will be seen that rotation of the said hollow shaft *f* in either direction will be accompanied by corresponding rotation of the shaft *c* and spools *c'*, and consequent winding and unwinding of the straps *c''* and raising or lowering of the receptacle *c''''*. The gear *f'''* is provided with a pulley *f''''*, engaged by a cord or

belt  $f^5$ , that may extend to the floor or to any other point below the level of the hand of the operator, where it is shown as passing over another pulley  $f^6$ , preferably provided with a ratchet and pawl  $f^7$ , that prevents its rotation in the direction tending to lower the basket  $c^4$ , but permits its free rotation in the other direction. The pulley  $f^4$  is roughened or provided with projections to engage the cord  $f^5$ , so that it will not slip thereon; but the said cord, in moving in the direction to lower the basket, slips on the pulley  $f^6$ , which thus affords a frictional resistance which may be made to about balance the weight of the basket. In order to prevent the basket from running down rapidly by its own weight, a dog  $g$  is provided, that engages the teeth of the gear  $f^4$ , as best seen in Fig. 2, the said dog falling into the teeth by gravity or by a spring, and being provided with a cord  $g'$ , preferably passing to a ring or loop  $g^2$ , that embraces one member of the cord  $f^5$ , and being provided with a tassel or handle in reach of the operator, who may thus release the gear by pulling on said cord and disengaging the dog  $g$ , thus permitting the basket to run down by gravity, while its movement may be regulated by the hand encircling the cord  $f^5$ .

The gears  $f^2$   $f^3$  are merely for increasing the movement of the basket with relation to that of the cord  $f^5$ , so that a comparatively short movement of the cord is sufficient to raise the basket up to the truck or frame-work of the carrier, and the said gears might, if desired, be dispensed with and the cord engaged directly with a pulley on the hollow shaft  $f$ .

When the receptacle is raised, by actuating the elevating mechanism by the cord  $f^5$ , as described, it will be retained in its elevated position by the dog  $g$  engaging the gear  $f^3$  until the carrier is sent away from the station.

In order to prevent the spools  $c'$  from turning and lowering the receptacle when the crank  $d$  is disengaged from the pins  $f'$  when sent away from the station, a locking device is provided. The shaft  $c$  is provided with a ratchet  $h$ , that is then engaged by a dog  $h'$  on a lever  $h^2$ , pivoted at  $h^3$  on the side of the frame of the car. The said lever is connected by a link  $h^4$  (best shown in Fig. 3) with a lever  $h^5$ , having its opposite end connected by another link  $h^6$  with a similar lever  $h^7$  at the other end of the carrier. A spring  $h^8$  (see Fig. 3) acts on the lever  $h^3$  in a direction to turn the lever  $h^2$ , so as to throw the dog  $h'$  into engagement with the ratchet  $h$ , and thus prevent the shaft  $c$  and spools thereon from turning. The dog  $h'$  is disengaged when the carrier comes into a station by the action of a pin  $h^9$  projecting from the free end of the lever  $h^2$ , as shown in Figs. 1 and 3, which pin comes into the forked end of a stationary arm  $i$ , fixed on the main frame  $a'$  of the track, as shown in Figs. 1 and 2, thus turning the lever  $h^2$  back on its pivot  $h^3$ , as shown in Fig. 1. Thus when the carrier arrives at the station the

shaft  $c$  is unlocked, but at the same time engaged with the shaft  $f$ , which then controls the movement of the shaft  $c$  and the receptacle supported from it, and in the construction shown, when the said shaft  $f$  is released by the disengagement of the dog  $g$ , as before described, both shafts  $f$  and  $c$  will be free to turn, except as controlled by the cord  $f^5$ , and the receptacle will run down by the action of gravity controlled by the operator, as before described; or, if need be, the operator can, by means of the cord  $f^5$ , turn the shaft  $f$  so as to positively turn the shaft  $c$  in the direction to unwind the straps  $c^2$  and lower the receptacle. The lever  $h^7$  at the opposite end of the carrier from the lever  $h^2$  is shown as provided with a pin similar to the pin  $h^9$  of the lever  $h^2$ , so that the dog  $h'$  may be disengaged from the ratchet when the carrier arrives at the station, the other end of the track, by engagement of the pin on the lever  $h^7$  with a forked arm similar to the one  $i$ , causing a movement of the said lever  $h^7$ , which is transmitted by the link  $h^6$ , lever  $h^7$ , and link  $h^4$  to the lever  $h^2$ , moving the latter into the position to disengage the dog  $h'$  from the ratchet  $h$ , and the cushions  $e$  around the end of the shaft  $c$ , striking into the socket  $f$ , arrest the carrier without too great shock.

The carrier is prevented from rebounding and caused to remain in the position shown in Fig. 1, with the crank  $d$  in the path of the pins  $f'$  and the dog  $h'$  disconnected from the ratchet  $h$  by means of a locking device  $k$ , pivoted at  $k'$  on the frame  $a'$  and provided at its forward end with an inclined striking-face  $k^2$ , that engages a pin  $k^3$ , projecting from the axle of the wheel  $b'$ , the said pin passing under a shoulder that drops and engages it, as shown in Fig. 1, preventing rebound and holding the carrier at the station until it is desired to send it away.

The carrier is propelled away from the station by a propelling device (shown as a rod  $m$ ) having suitable guides in the frame-work at the end of the track and connected with a frame  $n$ , that runs on and is guided by the track  $a$ , and when moved forward by the rod  $m$  engages a piece  $o$ , fastened on the framework of the carrier, thus pushing the entire carrier away from the station. The rod  $m$  is actuated by a flexible cord or strap  $m'$ , passing over a pulley  $m^2$ , having connected with it a smaller pulley or drum  $m^3$ , over which is wound a cord  $m^4$ , provided with a suitable handle accessible to the operator, who, by pulling down the said cord, rotates the pulley  $m^2$ , and thus winds up the cord  $m'$  and thrusts forward the rod  $m$  at much greater speed than that of the operator's hand.

The carrier has to be released by the locking device  $k$  before it can be moved by the propelling device  $m$  and connected parts, and this release is effected by a rocker  $p$ , pivoted on the locking device  $k$ , as shown, having two forked fingers  $p'$   $p^2$ , that rest over the track in front of a projection  $n^2$  of the frame  $n$  of

the propelling device. As the said frame begins to move forward under the action of the propelling device, the finger  $n^2$  moves the rocker  $p$  toward the vertical position, thus raising the locking device and disengaging the pins  $k^3$  of the carrier just before the propelling device reaches and begins to move the carrier. As the propelling device moves forward, the rocker  $p$  is carried past the center and comes to rest in a position inclined opposite to that represented in Fig. 1, and when the propelling device is returned to its original position, (represented in Fig. 1,) which may be done by the carrier coming into the station, the projection  $n^2$  engages the finger  $p^3$  and carries the rocker back to the position shown in time to permit the latch end of the locking device to drop into engagement with the pins  $k^3$  of the carrier.

It will be seen that the propelling and elevating mechanism are all connected with the supplemental frame or bracket  $a^4$ , which is fastened to the main frame  $a'$  by bolts or screws, as clearly shown in Fig. 2, and can consequently be removed, if needed, to make repairs by disconnecting the said supplemental frame from the main frame  $a'$ , which may remain supported on the rod  $a^2$  and stay by the tension of the track  $a$  and guys  $a^3$ , which need not be disturbed. It is not necessary that the mechanism should be duplicated at the other end of the track as the packing-station may be itself elevated to the level of the track, so that the baskets  $c^4$  will not have to be raised and lowered at the other end of the track, which would in such case need only the locking device for the carrier and the propelling device; or in some cases the track may be inclined upward from the station shown, in which case a sufficient impulse would be imparted to throw the carrier up the incline, and it would merely have to be caught by a suitable latch or locking device at the other end, and when released would return by gravity.

Carriers have been previously made in which the receptacle may be raised and lowered from a truck or frame that remains at the level of the track by elevating devices of various kinds, but none of these to my knowledge have been engaged with actuating mechanism located at a station of the track capable of being operated from a lower level, which is the main feature of this part of my invention, and the invention is not limited to the specific form of elevating and actuating devices shown, as elevating devices of other kinds may be easily modified to co-operate with an actuating device at the station. The locking devices for the elevating-reel herein shown may be dispensed with by using a self-winding reel, many forms of which are well known, having sufficient power to retain the receptacle elevated, in which case the actuating device at the station would only be required to turn the reel in the proper direction to lower the receptacle, and such a self-

winding or spring-actuated reel would be a well-known mechanical substitute for the reel and fastening device shown in the present case and as such would be within the invention.

The actuating device for the elevating mechanism represented in Figs. 1 and 2 is simple and effective and is represented in those figures in order to avoid confusion; but the device that I prefer and on which the specific claims for this part of the apparatus are based is represented separately in Figs. 4 to 7 and is the same as represented in Figs. 1 and 2, so far as the socketed shaft  $f$  and gears  $f^2$   $f^3$  are concerned. Instead, however, of the pulley  $f^4$  and endless belt  $f^5$  for actuating the gear  $f^3$ , a drum  $f^{40}$  and cord  $f^{50}$  are employed, the said cord having its end attached to the drum and being wound upon the drum as the receptacle  $c^4$  descends by gravity, when the dog  $g$ , the same as represented in Fig. 2, is disengaged from the teeth of the gear  $f^4$ .

In order that there may always be a sufficient amount of cord  $f^{50}$  wound upon the drum in the descent of the carrier to raise the carrier again wholly up to the truck  $b$ , the said drum is not rigidly connected with the gear, as in the construction before described; but both the said drum and gear are loose on the shaft  $f^{10}$ , and the drum is provided with a pawl  $f^{12}$ , that engages a ratchet  $f^{13}$ , fixed to or integral with the gear  $f^3$ , as clearly shown in Figs. 5 and 7, the latter figure being a section on line  $yy$  of Fig. 5. The drum can therefore turn back in the direction to wind the cord  $f^{50}$  upon it, while the gear is held stationary by the dog  $g$ , and it is thus turned back, so that there is normally about half a turn to a turn of the cord wound upon it, by means of a spring  $f^{14}$ , connected at one end with the hub or central portion of the drum, as best shown in Fig. 6, which is a section on line  $xx$ , Fig. 5, looking toward the left in that figure. The other end of the spring  $f^{14}$  terminates in a hook  $f^{15}$ , that rests against the inner surface of the hollowed-out portion of the drum that contains the spring, as best shown in Fig. 5, and the outer end of the spring is held at the proper time, so as to strain the spring in the act of unwinding the cord therefrom by means of a projection  $f^{16}$  from an arm  $f^{17}$ , pivoted at  $f^{18}$  upon the bracket or frame-work  $a^4$ , as shown. The pin  $f^{16}$  remains in the space between the coils of the spring, as shown, during the greater part of the rotary movement of the drum, so that the spring merely turns with the drum without being strained, and as the drum is turned by the gear when the receptacle  $c^4$  descends by its weight the cord  $f^{50}$  is wound on the drum, and the pin  $f^{16}$  merely travels in toward the center of the drum without affecting the spring. When, however, the drum is turned in the opposite direction by the operator pulling on the cord  $f^{50}$ , the pin  $f^{16}$  gradually works its way out until finally it engages

in the hook  $f^{15}$  at the end of the spring, and then if, owing to lost motion between the crank  $d$  and pins  $f'$  or for any other reason, it is necessary to unwind more of the cord  $f^{50}$  5 in order to raise the receptacle its full height than was wound on the drum in the descent of the receptacle, the drum will be turned still further, and in this further movement will strain the spring  $f^{14}$ , so that just as soon 10 as the operator lets go the cord  $f^{50}$  after the receptacle is raised its full height and the gear  $f^3$  engaged by the dog  $g$  the spring  $f^{14}$  will turn the drum back in the direction to wind the cord thereon, the pawl  $f^{12}$  then passing 15 over the teeth of the ratchet  $f^{13}$  an amount equal to the amount of cord required to make up for lost motion in the connection between the actuating device and the elevating device, and if at any time the cord should be 20 wholly unwound from the drum before the receptacle was raised the desired height the operator could turn the gear  $f^3$  the additional amount required by ratcheting the drum back and forth with relation to the gear, the spring 25 moving the drum and winding the cord when the operator relaxes the pull on the cord enough to give additional movement of the gear when the cord is again pulled down.

It is obvious that a device of this character 30 may be used to transmit motion from an actuating cord and drum or capstan to an actuated device of any kind, which would be a substitute for the gear  $f^3$  and parts actuated by it—as, for instance, the drum might have 35 a ratchet-and-pawl connection directly with the shaft  $f$  or with any other shaft or wheel to be actuated in a similar manner.

The carrier and its receptacle are shown 40 shorter than they would commonly be made in practice.

I claim—

1. In a conveying apparatus, a track and carrier movable thereon provided with a receptacle, and elevating mechanism on the carrier 45 for said receptacle, combined with the actuating mechanism for the said elevating mechanism, located at the station and engaged with the said elevating mechanism only when the carrier is at the station, substantially as 50 described.

2. In a conveying apparatus, a track and carrier movable thereon provided with a receptacle, and elevating mechanism therefor 55 on the carrier, combined with the actuating mechanism for the said elevating mechanism at the station, engaged with the said elevating mechanism only when the carrier is at the station, and a locking device for the said 60 elevating mechanism, by which it is held inoperative, except when at a station, substantially as described.

3. In a conveying apparatus, a track and carrier movable thereon provided with a receptacle, and elevating mechanism on the carrier 65 for said receptacle, combined with actuating mechanism for said elevating mechanism, located at the station and engaged with

the said elevating mechanism only when the carrier is at the station, and a locking device 70 for the said elevating mechanism, by which it is held inoperative, except when at a station, and means for disengaging the said locking device while the carrier is at the station, substantially as described.

4. In a conveying apparatus, the combination 75 of the way and carrier movable thereon, with a propelling device comprising a part moving along the said way, a pulley and flexible connector between it and the said moving part, and a drum of smaller diameter connected 80 with said pulley and provided with an actuating-cord and a locking device that engages the carrier, and means actuated by the said moving part of the propelling device for unlocking the carrier before the propelling 85 device acts upon it, substantially as described.

5. The combination of the track and carrier-frame running thereon, with a shaft and a reel and receptacle suspended therefrom, a locking device to prevent rotation of said 90 shaft between stations, and an actuating device at the station engaged with the said shaft, substantially as described.

6. A track and carrier having a frame running on said track and a shaft, reel, and receptacle supported therefrom, the said shaft 95 projecting at the ends of the carrier and being provided with cushions, combined with a socket at the station to receive and engage the said shaft, and means for actuating the 100 same, substantially as described.

7. In a store-service apparatus, the combination of a movable carrier mounted on a way, a revolving cylinder on said carrier, a parcel-receptacle connected by a flexible support 105 to the cylinder, a windlass at the end of the way, and a yielding connection between the cylinder and windlass to arrest the movement of the carrier.

8. The combination of a track composed of 110 strained wire with a main frame connected with and supporting the end of the said wire, a carrier having a receptacle and elevating device therefor running on the said wire, and a supplemental frame detachably connected 115 with the main frame, and actuating mechanism for the elevating device, supported on the said supplemental frame, substantially as and for the purpose described.

9. The combination of the track and carrier 120 with a propelling device comprising a part  $m$ , moving along the said track and engaging the carrier in said movement, a locking device  $k$  for said carrier, and rocker  $p$ , co-operating with said locking device and operated 125 by the said propelling device, substantially as described.

10. A track and carrier having a frame running on the said track, and a shaft and reel supported on the said frame, and receptacle 130 supported from the said reel, the said shaft projecting at the end of the carrier, combined with a shaft at a station on the track having a funnel-shaped mouth which receives the

shaft on the carrier, and engaging devices whereby the said shafts are rotated together, substantially as described.

11. The combination of a drum and actuating-cord and an actuated member engaged by said drum when turned by unwinding the cord, but not when turning in the opposite direction, a spring having one end connected with the said drum, and a device that engages and holds the other end of the said spring during a portion of its movement produced by unwinding the cord, which spring causes a portion of the cord to be again wound on the drum when the actuating force is removed from the cord, substantially as described.

12. The combination of the drum with a spiral spring having one end connected with said drum and its other end terminating in a hook, and a pin or projection and pivoted supporting-arm therefor that engages the said hook and strains the said spring during a portion of the movement of the drum, substantially as and for the purpose described.

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

THOMAS M. KENNEY.

Witnesses:

JOS. P. LIVERMORE,

H. P. BATES.