

May 30, 1961

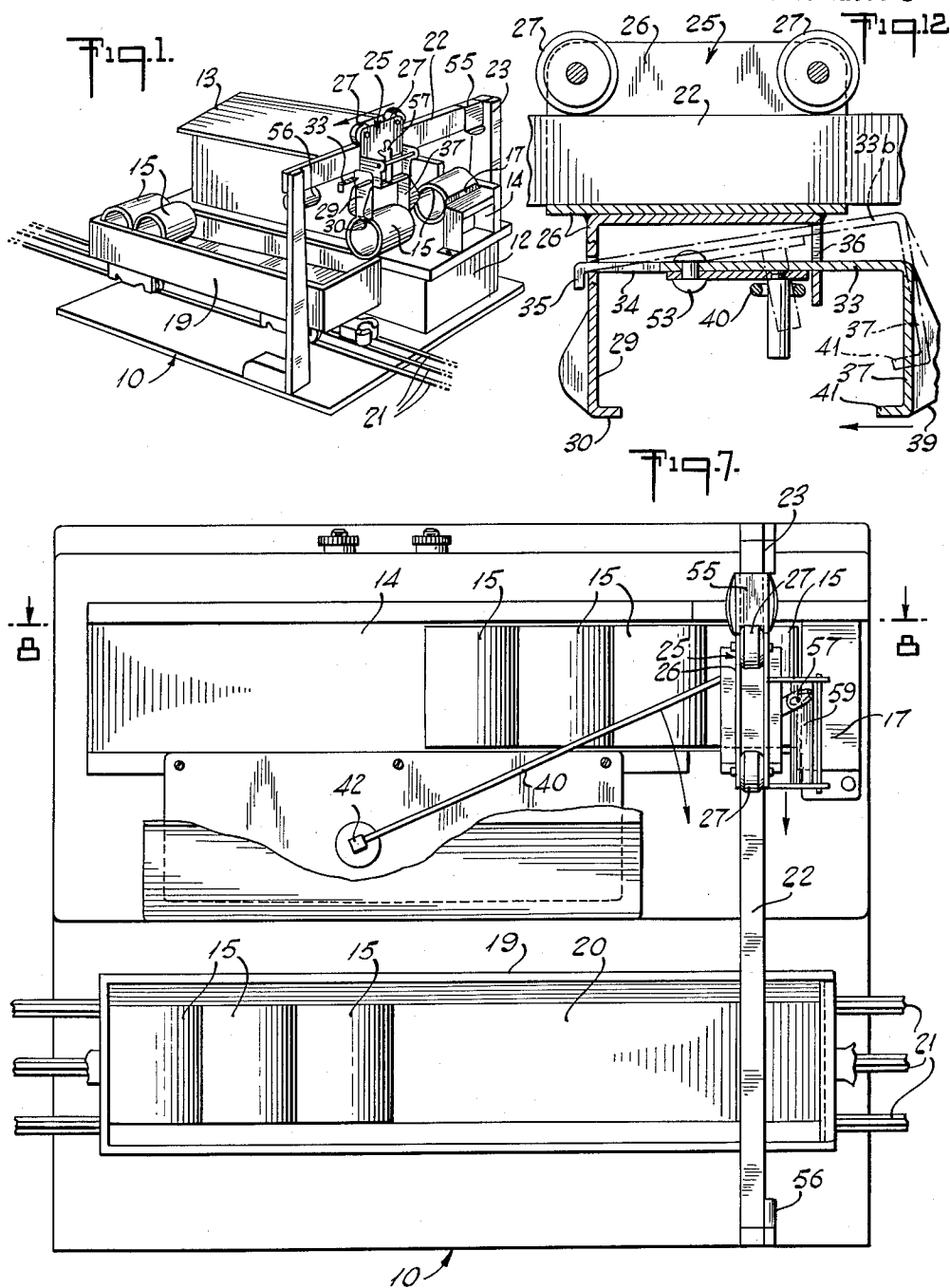
R. G. SMITH

2,985,982

CULVERT LOADER AND CAR

Filed Sept. 13, 1957

3 Sheets-Sheet 1



INVENTOR
RICHARD G. SMITH

BY
Moses, Nette, & Nette
ATTORNEYS

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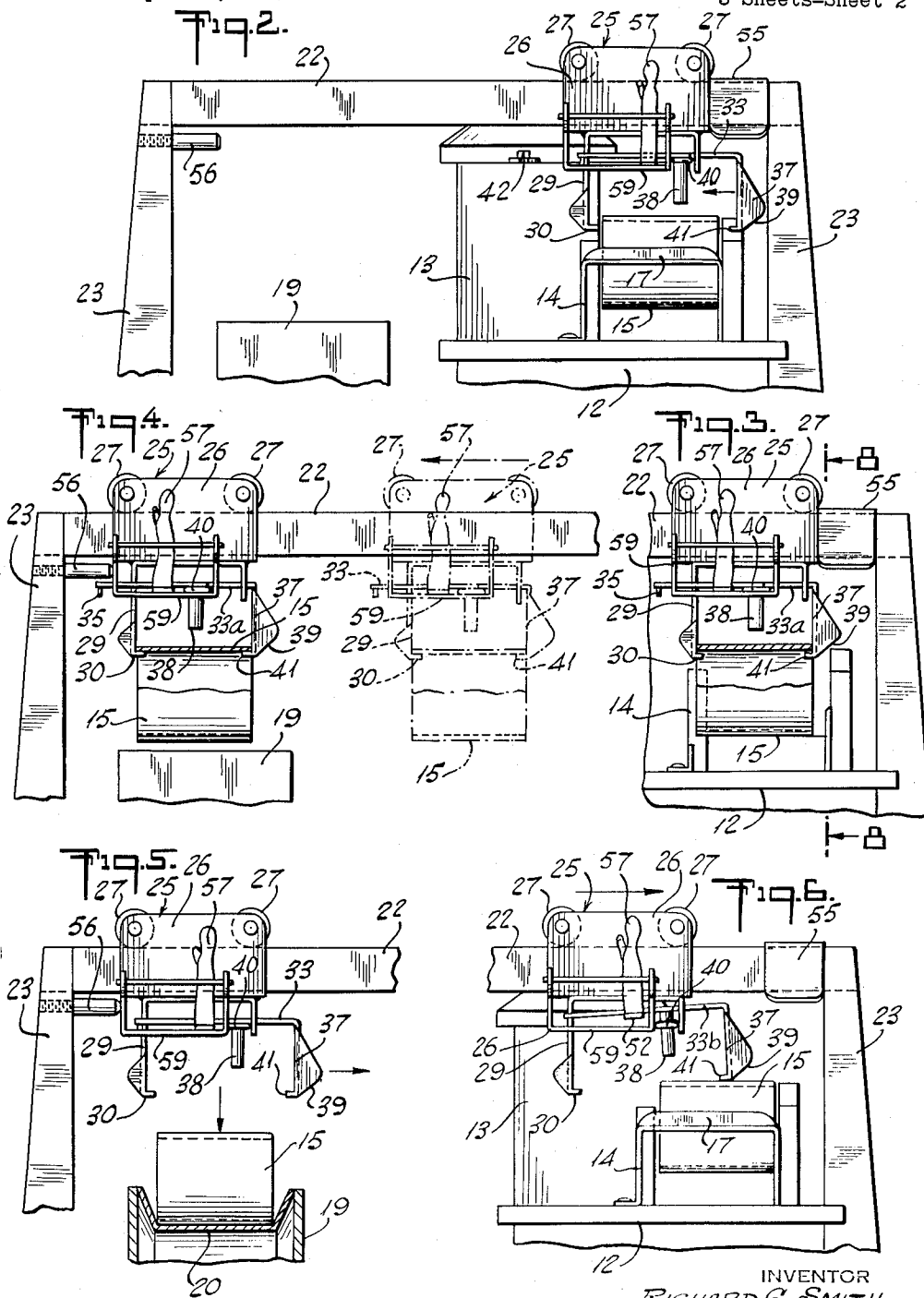
R. G. SMITH

2,985,982

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3 Sheets-Sheet 2



INVENTOR
RICHARD G. SMITH

BY
Moses, Nolte, & Nolte
ATTORNEYS

May 30, 1961

R. G. SMITH

2,985,982

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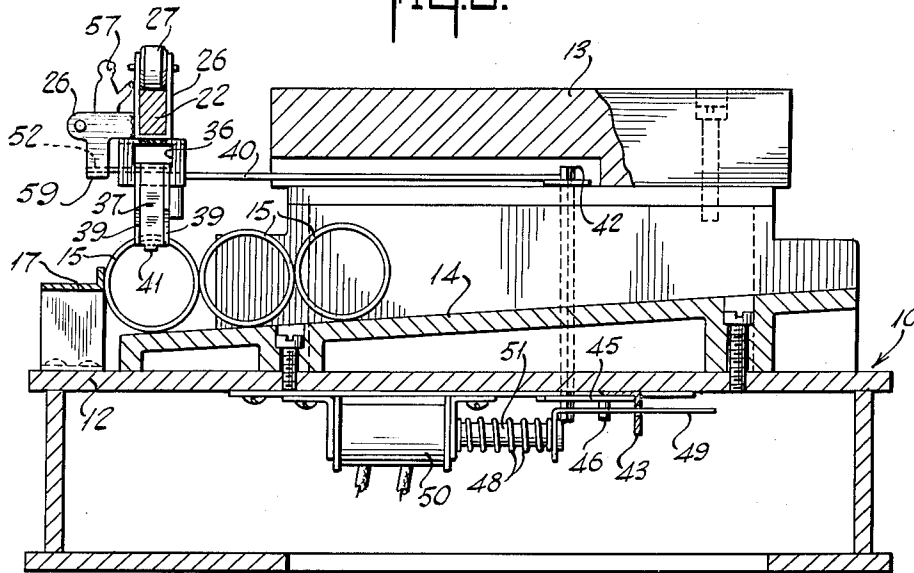
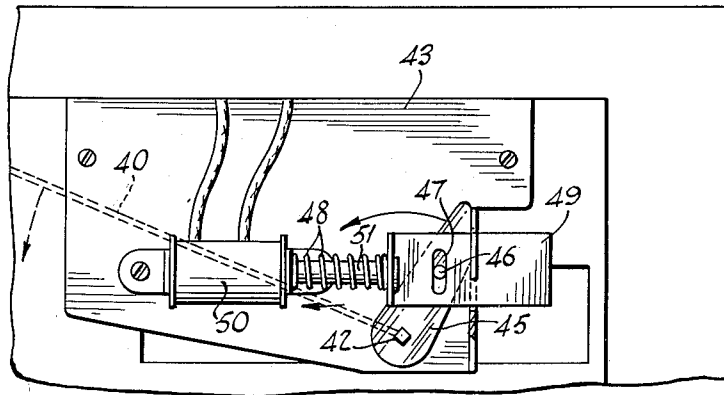


Fig. 9.



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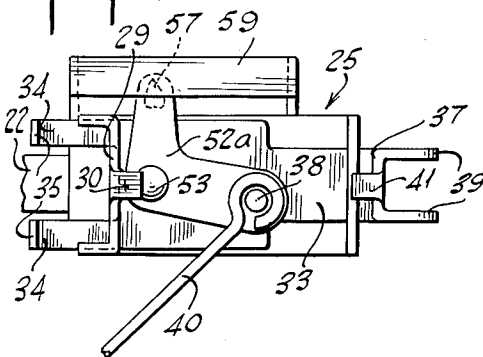
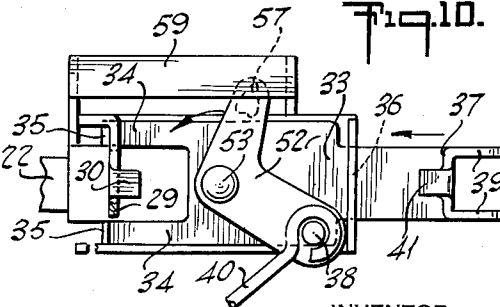


Fig. 10.



INVENTOR
RICHARD G. SMITH
BY
Moses, Nolte, & Nolte
ATTORNEYS

1

2,985,982

CULVERT LOADER AND CAR

Richard G. Smith, Hagaman, N.Y., assignor to The Lionel Corporation, New York, N.Y., a corporation of New York

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11 Claims. (Cl. 46—40)

This invention relates to model railways and more particularly to a simulated loading device therefor.

It is an object of the present invention to provide an accessory for model railways that is adapted to simulate the actual loading and unloading of conduits and pipes from a stationary loading platform to a railway car.

Another object of the present invention is to provide a conduit handling accessory for model railways that is automatically operative to load the article upon the device, transport it to an unloading position, unload the article, and return the carriage to the initial loading position, the entire operation being controllable from a remote location.

A further object of the present invention is to provide a miniature loading apparatus that may be used in connection with model railways for loading and unloading substantially any type of tubular article, a continuous action being possible so as to load and unload substantially any number of articles completely automatically.

Still another object of the present invention is to provide an accessory for model railways of the above type that may be readily installed for use with substantially any size and type of model railway and is so constructed as to not interfere with the normal operation of the railway apparatus.

Other objects of the invention are to provide an accessory for model railways bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawing, in which:

Figure 1 is a perspective view of an accessory for model railways made in accordance with the present invention;

Figure 2 is a fragmentary front elevational view of the device shown in Figure 1, showing the loading and conveyer mechanism in an unloaded position immediately before the device is actuated to effect movement thereof to a loaded position;

Figure 3 is a view similar to Figure 2, showing the arrangement of the parts immediately following actuation of the mechanism, with the parts in an initially loaded position;

Figure 4 is a view similar to Figure 3, showing the conveyer mechanism in a loaded position immediately prior to the unloading thereof;

Figure 5 is a view similar to Figure 4, showing the parts immediately following the unloading operation;

Figure 6 is a view similar to Figure 2 showing the return movement of the conveyer and the manner in which the structure is adapted to unload the next unit;

Figure 7 is an enlarged top plan view of the parts broken away, showing other operating parts of the apparatus;

2

Figure 8 is a transverse cross sectional view taken along line 8—8 of Figure 7;

Figure 9 is a fragmentary top plan view of certain parts of the apparatus shown in Figure 8;

Figure 10 is a bottom plan view of the conveyer mechanism shown in Figure 2;

Figure 11 is a bottom plan view of the conveyer mechanism shown in Figure 3; and

Figure 12 is an enlarged fragmentary front plan view of certain parts of the conveyer mechanism.

In accordance with the present invention, a simulated conduit loading device has been provided that has a loading station, conveyer means supported for movement relative to the loading station, loading and unloading means associated with the conveyer for effecting the loading and unloading of the simulated conduits, and electrically actuated means for effecting the reciprocation of the conveyer unit, whereby a completely automatic and authentic railway operation may be simulated.

Referring now more in detail to the drawing, and more particularly to Figure 1 thereof, a simulated conduit loading device 10 made in accordance with the present invention is shown to include a loading platform 12 upon which a simulated building 13 is disposed. As is more clearly shown in Figure 8, a building 13 houses an inclined ramp 14 which is adapted to direct hollow cylindrical pipe sections 15 downwardly to an abutment 17 forming a loading station for the conveyer mechanism. This conveyer mechanism, hereinafter described in more detail, is operative to transport a single section of conduit 15 from the loading station to a railway car 19 having a downwardly inclined bottom wall 20 for effecting movement of each subsequently loaded conduit toward the rear thereof. The railway car is mounted upon a trackway 21 that extends beneath a transversely extending beam 22 which is supported upon spaced apart columns 23 forming a part of the conveyer mechanism.

With reference to Figures 2 to 6, a carriage device 25 is shown supported for movement upon the beam 22 by means of wheels 27 rotatably mounted thereon. This carriage includes a frame 26 having a fixed downwardly depending leg 29 with an inwardly turned web 30 forming a lifting element for one side of the conduit. A longitudinal plate 33 having a pair of bifurcated legs 34 at one end slidably supported upon shoulders defined by the depending leg 29, has an opposite end that extends through a vertically elongated opening 36. The first end of the plate 33 is also provided with a downwardly depending stop member 35 which forms a pivot point about which the said opposite end of the plate may be rotated, such rotation being accommodated by the vertically elongated opening 36. This end of the plate 33 is provided with a downwardly extending arm 37 which is provided with an inwardly turned web 41 that cooperates with the aforementioned web 30 to define a pair of lifting jaws. This arm 37 is also provided with a downwardly inclined surface 39 for purposes hereinafter described.

One end of a link 40 is secured to a noncircular shaft 42 that is rotatably supported upon a plate 43 fixed within the simulated building 13 of the platform. A crank 45 is also secured at one end to the shaft 42 and at the opposite end is provided with a transversely extending pin 46 which is arranged for reciprocating sliding movement within a transverse slot 47 in a slide bar 49.

A solenoid 50 is carried upon the mounting plate 43 and has a plunger 51 that is adapted to be retracted inwardly of the solenoid in response to energization thereof and adapted to be extended outwardly therefrom by the action of a compression spring 48 in response to deenergization of the solenoid. The outer free end of the plunger 51 is rigidly connected to the slide plate

49, whereby the reciprocating movement of the plunger 51 is transmitted to the slide plate 49 and then to the crank 45 to effect reciprocating angular movement of the link 40. The outer end of the link 40 is connected to one end of a bell crank 52 by means of a pin 38, which bell crank is rotatably mounted upon the sliding plate 33 of the conveyer mechanism by means of a hinge pin 53, as is more clearly shown in Figures 10 and 11.

As is more clearly shown in Figure 2, the loading end of the beam 22 is provided with a stop member 55, while the unloading end thereof is provided with a similar stop pin 56. These stop members limit the longitudinal movement of the conveyer carriage in a manner hereinafter explained in further detail. A figure 57 simulating a railway workman is supported upon the opposite free end of the bell crank lever 52 and arranged for reciprocating movement relative to a simulated crane platform 59 that is carried by the carriage 25.

In operation, the parts assume an initial operating position as shown in Figure 2, wherein the plate 33 is extended away from the fixed arm 31 so that the jaws 30, 41 are operative to engage the opposite ends of the conduit 15 in response to longitudinal movement of the carriage toward the left. Immediately following energization of the solenoid, the link 40 rotates the bell crank 52 from the initial position shown in Figure 10 to the rotated position shown in Figure 11, during which movement the figure 57 moves from one end of the simulated platform 59 to the other, and following which, continued movement of the link 40 is operative to slide the plate 33 from the extended position to the retracted position 33a, as shown in Figure 3. In this position both of the jaws 30, 41 securely grasp the pipe section 15 so that upon continued movement of the link 40, the pipe section 15 is carried to the opposite end of the beam 22. In this position, the parts are stopped by the stop pin 56 and the unit is ready to unload the pipe. Upon deenergization of the solenoid, the return spring 58 is operative to effect movement of the link 40 in the opposite direction. During the initial movement of this link 40 in the opposite direction, the bell crank 52a is rotated in an opposite direction from the position shown in Figure 11 to the original position 52 shown in Figure 10. Thus, simulating movement of the figure 57, immediately following which, a slide plate 33a is moved to the extended position 33, as shown in Figure 5, so that the pipe 15 is released and dropped into the awaiting car 19. The carriage thus moves from the unloading position back to the initial loading position where the next pipe section 15 has moved down the inclined ramp 14 to the loading station 17. As the carriage 25 approaches this next pipe 15, the inclined surface 39 of the movable jaw rides up along the edge thereof, as shown in Figure 6, so that both jaws again assume the straddled initial position shown in Figure 2. The return movement of the carriage is limited by the stop 55, thus limiting the effect of the compression spring 48. After the upwardly pivoted plate 33b has been dropped into the initial position 33, as shown in Figure 2, the device is ready for the next operation so that upon energization of the solenoid, the aforementioned cycle will be repeated.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A loading device comprising in combination, a loading station, an unloading station, a trackway mounted above and running between said stations, conveyer means supported upon said trackway including a fixed jaw and a movable jaw, said movable jaw being mounted for rocking movement, the side of said movable jaw spaced furthest away from said fixed jaw defining an inclined

surface, said surface being adapted to act as a follower upon movement of said conveyer means past a stationary object to be loaded to rock said movable jaw to permit movement thereof above and past said object, means for reciprocating said conveyer means on said trackway between said loading and unloading stations, and means responsive to said reciprocating means for loading and unloading said conveyer means at opposite ends of said trackway including a crank for effecting longitudinal movement of said movable jaw between a loading position adjacent to said fixed jaw and an unloading position spaced further apart from said fixed jaw.

2. The combination according to claim 1, wherein initial movement of said crank in one direction is operative to effect movement of said movable jaw to said unloading position, initial movement in an opposite direction of said lever being operative to effect movement of said movable jaw to said loading position.

3. The combination according to claim 2, wherein said means for reciprocating said conveyer means comprises an electrically driven operator, an actuating lever connected at one end to said conveyer means, and means connected to the opposite end of said lever and said operator for effecting reciprocating limited angular movement of said lever about an axis common to said opposite end.

4. The combination according to claim 3, wherein said electrically driven operator comprises a solenoid.

5. The combination according to claim 4, wherein said means for effecting oscillating angular movement of said lever comprises a rotatable shaft secured to one end of said lever, a solenoid crank secured at one end to said shaft, and the opposite end of said crank being in driven engagement with said solenoid.

6. The combination according to claim 5, wherein said solenoid includes a reciprocating plunger and a slide plate secured to said plunger, said plate having a slot extending transversely of the longitudinal axis of said plunger, and a pin secured to said opposite end of said solenoid crank in slidable engagement with said slot.

7. A toy loading device for objects having recessed ends comprising an unloading station, a loading station, means for directing objects for loading to said loading station in succession as each previous one is removed, a trackway extending between said loading and unloading stations, conveyer means movable between said loading and unloading stations on said trackway, said conveyer means including gripper means engageable with the recessed ends of said object when moved beyond said object by said conveyer means at said loading station and disengageable with said object when said conveyer means' direction of movement is reversed at said unloading station, said gripping means including a movable jaw and including crank means connected to said jaw, a manikin connected to said crank means and visible on said conveyer means whereby said manikin is movable by said conveyer actuating means, and means to reciprocally actuate said conveyer means upon said trackway, said means for directing objects for loading to said loading stations including an inclined ramp upon which the objects will roll to said unloading station after each successive previous one has been removed.

8. In a toy device including a loading platform, objects supported on said platform for transportation therefrom, and an unloading station, the improvement comprising means supporting a conveyer trackway above said platform and unloading station, a conveyer member movable backwards and forwards on said conveyer trackway between said platform and said unloading station, a fixed jaw on said conveyer member extending downwardly to a level in alignment with the adjacent recessed end of the object to be transported, a movable jaw on said conveyer member slidably and pivotally supported on said conveyer member including an inclined surface on its outer face aligned with the side of the object to be trans-

5

ported and deflectable upon contact therewith upwardly to clear the object, means for limiting movement of said movable jaw along said conveyor member, said movable jaw including a portion on its inner face engageable with the opposite end of said object when moved beyond this end and permitted to fall off the top of the object and into alignment with the far end thereof, and conveyor member moving means connected to said movable jaw and effective to move said movable jaw relative to said fixed jaw and thereafter to move said conveyor member in an opposite direction away from said platform to first close said jaws and cause gripping of the object by the jaws and thereafter to move said conveyor member for transportation of the object therewith.

9. A toy according to claim 8 wherein said conveyor member moving means includes a crank rotatable on said conveyor member, said movable jaw being connected to one arm of said crank arm, a lever connected to the other arm of said crank, an electromagnetically actuated solenoid plunger connected to said lever for movement thereof in one direction upon energization of said solenoid, and resilient means connected to said lever to move said lever backwardly to its original position upon deenergization of said solenoid, and means to energize said solenoid.

10. In a toy device according to claim 8, including stop means on said conveyor trackway in alignment with said conveyor member to stop movement thereof, said conveyor member moving means being effective after said conveyor member contacts said stop to move said movable jaw and thereafter said conveyor member in an opposite direction whereby initial movement of said movable jaw effects separation of said movable jaw from said fixed jaw to release said object.

6

11. In a toy device including a loading platform, means for supporting objects on said platform for transportation therefrom, and an unloading station, the improvement comprising means supporting a conveyor trackway above said platform and unloading station, a conveyor member movable backwards and forwards on said conveyor trackway between said platform and said unloading station, a fixed jaw on said conveyor member extending downwardly therefrom, a movable jaw on said conveyor member slidably supported on said conveyor member, means for limiting movement of said movable jaw along said conveyor member, said movable jaw including a portion engageable with the opposite end of said object from said fixed jaw, and conveyor member moving means connected to said movable jaw and effective to move said movable jaw relative to said fixed jaw to close said jaws and thereafter to move said conveyor member in an opposite direction away from said platform, reversal of said conveyor member moving means being effective to first move said movable jaw to release the object and thereafter to return the conveyor member to said platform.

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